



**Gender and climate change:
mapping the linkages**

A scoping study on knowledge and gaps

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1. Introduction

“Climate change presents the most serious threat to development and could potentially reverse many of the gains that have been made.” (DFID 2007: 32)

1.1 Rationale

The issue of climate change is not new, but its take-up as a key development concern and its integration into pro-poor planning is a fairly recent departure. Even more recent is the integration of a gender-sensitive perspective in climate change research and responses. For this reason, there is little existing research considering the linkages between climate change and gender. Similarly, while there is a wealth of literature on gender and the environment, gender and energy, gender and water, gender and conflict and gender and disasters, there are few explicit references to gender and climate change.

This paper, prepared for the UK Department for International Development’s (DFID) Equity and Rights Team, seeks to make the most of the available resources, pulling from them useful insights that could inform and strengthen future research on and interventions into gender and climate change. Drawing on existing publicly available literature and personal communications with experts in the field of gender and climate change¹, the paper outlines key linkages between climate change and gender inequality – focusing particularly on adaptation and mitigation policies and practices. It seeks to identify gaps in the existing body of work on gender and the environment, which has focused primarily on women’s agricultural livelihoods, access to natural resources, or disaster risk reduction. Where possible it reviews best practice on adaptation and mitigation, with an emphasis on research, policy and practice. The paper ends with recommendations regarding priority areas for future research and highlights some practical steps required to achieve more equitable, appropriate climate change policies and programmes.

1.2 What constitutes a gender-sensitive response to climate change?

Climate change is a global phenomenon, with impacts that are already being experienced on a human level. It is recognised that it is those who are already the most vulnerable and marginalised who experience the greatest impacts (see IPCC 2007), and are in the greatest need of adaptation strategies in the face of shifts in weather patterns and resulting environmental phenomena. At the same time, it is the vulnerable and marginalised who have the least capacity or opportunity to prepare for the impacts of a changing climate or to participate in negotiations on mitigation. As women constitute the largest percentage of the world’s poorest people, they are most affected by these changes. Children and youth – especially girls – and elderly women, are often the most vulnerable.

Even where there is a lack of hard evidence, it is commonly recognised that climate change exacerbates existing inequalities in the key dimensions that are not only the building blocks of livelihoods, but are also crucial for coping with change, including: wealth; access to and understanding of technologies; education; access to information; and access to resources (Masika 2002). It follows that donors’ responses to climate change should be gender-sensitive. For example, DFID needs to apply the principles of its new Gender Equality Action Plan and the UK government’s commitments to international human rights conventions such as the United Nations Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), to its response on climate change. But what does this mean in practice?

¹ See references for list of experts consulted

A gender-sensitive response requires more than a set of disaggregated data showing that climate change has differential impacts on women and men. It requires an understanding of existing inequalities between women and men, and of the ways in which climate change can exacerbate these inequalities. Conversely, it also requires an understanding of the ways in which these inequalities can intensify the impacts of climate change for all individuals and communities. For example, men may have greater access to vital information on climate change mitigation or adaptation strategies for cultural reasons, or because women are too busy with caring and other domestic responsibilities. This lack of information and lack of opportunity to feed their own knowledge into community or national-level adaptation and mitigation strategies could jeopardise larger processes of reducing climate change and its impacts.

Gender sensitivity in consultation and decision-making is also essential for effective mitigation and adaptation responses to climate change. More than simply thinking about how these processes can be tailored to the specific needs of poor and vulnerable men and women, there is a need to recognise the capacity of women and men, girls and boys, to contribute important knowledge and insights. With more participative processes, these strategies and interventions can truly identify and meet the needs of those they aim to assist. In this way, processes can be forged that respond to local realities while feeding into a broader vision of climate change deceleration. Yet women are more likely than men to be absent from decision-making, whether in the household or at community, national or international levels – either because their contribution is not valued or because they do not have the time, confidence or resources to contribute. Recent research by the Institute of Development Studies and Plan International has also pointed to the marginalisation of children's voices in household, community and national decision-making relating to climate change – particularly in disaster risk reduction (Mitchell et al forthcoming 2008). It is critical that more is done to promote women's and children's meaningful participation in decision-making on climate change responses, to ensure that climate change policy and grassroots interventions respond to their specific needs and draw on their knowledge and experience. In this way the profile and status of women and girls in the community can also be raised, while challenging traditional assumptions about their capabilities.

Finally, it is important to note that a gendered approach to climate change should not simply be about women. Men and boys are also vulnerable to the impacts of climate change but often in different ways, and these need to be identified and communicated. Furthermore, women and girls are involved in relationships with men and boys and it is at the level of these gender relations and the social expectations influencing them that research needs to be conducted and change needs to happen.

1.3 Structure of the paper

This paper is divided into three parts. The first part examines some of the differential impacts of climate change on men and women, as well as highlighting implications for gender in/equality. The second part takes a gendered approach to climate change adaptation, drawing particularly on a recent study from ActionAid and the Institute of Development Studies (IDS) which centres around poor, rural women's own experiences of and responses to climate change. The final section provides insights into the complexities of climate change mitigation. It emphasises the need to include women in developing and implementing mitigation strategies, both to ensure their full participation in these processes and to ensure that such strategies are effective in addressing the 'bigger picture' of climate change and its human impacts.

2. Mapping the gender impacts of climate change and the implications for gender equality

“The impacts of climate change are not evenly distributed – the poorest countries and people will suffer earliest and most” (UK Treasury: 2006)

2.1 What do we mean by gender inequality in the context of climate change?

Women’s and men’s differential access to social and physical goods or resources is one of the key dimensions of gender inequality. Women’s social positioning in many situations means that the roles they are expected to take on are often supportive and reproductive, centred around the home and local community rather than the public sphere. This does not mean that women do not play crucial roles in agricultural production or other activities crucial to sustainable livelihoods and national economies. But the roles they play are generally less visible and attract less public recognition than the work men engage in.

Typically women – particularly those in poor, rural locations – are expected to assume primary responsibility for their families’ subsistence. Yet because they often do not earn a wage, women are frequently excluded from decisions about spending or about their children’s education. The expectation that girls will help their mothers with household tasks and with caring for younger siblings means that they are more likely to be excluded from opportunities to gain an education than boys, although these gaps are gradually closing. Women earning a wage often earn less than men, leaving them more vulnerable to changes in their working environment caused by external phenomena, including climate change. This section considers some of the ways in which these inequalities are deepened by the impacts of climate change, and how gender inequality limits the effectiveness of mitigation strategies.

2.2 Gender, health and climate change

It has been widely recognised that the rising water levels associated with climate change will lead to an increase in water borne diseases. Other likely health consequences of climate change include higher rates of malnutrition due to food shortages, increases in heat-related mortality and morbidity, and increased respiratory disease where air pollution worsens. Children under five are the main victims of sanitation-related illnesses, and – along with the elderly – are most affected by heat stress (Bartlett 2008). Gender discrimination in the allocation of resources, including those relating to nutrition and medicines, may put girls at greater risk than boys. More research into the gender-specific health impacts of climate change on children and adolescents would help to illuminate the extent to which this is the case, and would in turn enable a more targeted response.

Women and girls are generally expected to care for the sick, particularly in times of disaster and environmental stress (IUCN/WEDO 2007). This limits the time they have available for income generation which, when coupled with the rising medical costs associated with family illness, heightens levels of poverty. It also means they are less able to contribute to community-level decision-making processes on climate change or disaster risk reduction. In addition, being faced with the burden of caring for dependents while being obliged to travel further for water or firewood makes women and girls prone to stress-related illnesses and exhaustion (Voluntary Services Overseas 2006; CIDA 2002). Women and girls also face barriers to accessing healthcare services due to a lack of economic assets to pay for healthcare, as well as cultural restrictions on their mobility which may prohibit them from travelling to seek healthcare.

The elderly are at highest risk from climate change-related health impacts like heat stress and malnutrition. Elderly women are likely to be particularly vulnerable, especially in developing

countries where resources are scant and social safety nets limited or non-existent. Despite this, there has been little research on their specific vulnerabilities in the context of climate change. Elderly women may have heavy family and caring responsibilities which cause stress and fatigue while also preventing wider social and economic participation; and their incomes may be low because they can no longer take on paid work. They may also not understand their rights to access community and private sector services, such as local clinics. Even when they are aware of these services, even nominal amounts for clinic visits and drugs may not be affordable. Access is further restricted for older women living in rural areas, who are often unable to travel the long distances to the nearest health facility. Older men are particularly disadvantaged by their tendency to be less tied into social networks than women and therefore unable to seek assistance from within the community when they need it (WHO 2000).

A decline in food security and livelihood opportunities can cause considerable stress for men and boys, given the socially ascribed expectation that they will provide economically for the household. This can lead to mental illness in some cases. It has been recognised that men and boys are less likely to seek help for stress and mental health issues than women and girls (Masika 2002), meaning that preparation for, and responses to, climate change need to be sensitive to gender differentials in healthcare (including mental) seeking behaviour. Stress is likely to be heightened after disasters, particularly where families are displaced and have to live in emergency or transitional housing. Overcrowding, lack of privacy and the collapse of regular routines and livelihood patterns can contribute to anger, frustration and violence, with children (especially girls) and women most vulnerable (Bartlett 2008).

Areas for future research and action

Qualitative scoping studies on the gender-specific use of health facilities are required - how has people's health been affected by climate change and what may be preventing their access to facilities? What are the gender-specific health impacts of climate change on children and adolescents and how could programmes respond to this?

In terms of practical steps, programmes are needed to improve access to health care, particularly for women and the elderly, including introducing cash transfers, free health checks and mobile health units. Programmes to offset the demands of care work on women and girls are also critical. Considerable knowledge exists regarding appropriate support and interventions to alleviate women's care burden in the context of HIV (see in particular VSO 2006). These insights should be drawn upon to inform climate change policy and programming.

2.3 Gender, agriculture and climate change

Although rural women and men play complementary roles in guaranteeing food security, women tend to play a greater role in natural resource management and ensuring nutrition (FAO 2003). Women often grow, process, manage and market food and other natural resources, and are responsible for raising small livestock, managing vegetable gardens and collecting fuel and water (FAO 2003). For example, in Southeast Asia, women provide up to 90 percent of labour for rice cultivation and in Sub-Saharan Africa they are responsible for 80 percent of food production. Men, by contrast, are generally responsible for cash cropping and larger livestock. Women's involvement in an agricultural capacity is most common in regions likely to be most adversely affected by the impacts of climate change, particularly Sub-Saharan Africa and Asia. In these contexts, responsibility for adaptation is likely to fall on their shoulders – including finding alternative ways to feed their family (CIDA, 2002).

However, statutory and/or customary laws often restrict women's property and land rights and make it difficult for them to access credit and agricultural extension services, while also reducing their incentive to engage in environmentally sustainable farming practices and make long-term investments in land rehabilitation and soil quality. Despite these obstacles, recent evidence

demonstrates that women who are already experiencing the effects of weather-related hazards – such as erratic monsoon patterns, flooding and extended periods of drought – are developing effective coping strategies, which include adapting their farming practices (see Mitchell et.al. 2007). The importance of women’s role in adaptation will be taken up later in this paper.

Areas for future research and action

More research is needed into the adaptation strategies of women in the face of existing climate change impacts on agricultural productivity and food security, including how these are manifested in different contexts. What are the barriers to women's access to new technologies, extension services and credit facilities? What aspects of their own agricultural knowledge have been overlooked and could contribute to effective adaptation? What are women already doing and what do they identify as their needs and priorities?

Future adaptation and/or agriculture policies should explicitly draw on these insights and seek to better support these existing strategies. (See the later section on adaptation for more detailed discussion).

2.4 Gender, water and climate change

The gendered dimensions of water use and management are fairly well-documented. It has long been noted in the gender and environment literature, for example, that women and girls generally assume primary responsibility for collecting water for drinking, cooking, washing, hygiene and raising small livestock, while men use water for irrigation or livestock farming and for industries (Fisher 2006; Khosla and Pearl 2003). These distinct roles mean that women and men often have different needs and priorities in terms of water use.

But while this knowledge isn’t new, it does take on a pressing significance in the context of climate change. 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 disruptive (WEDO 2003: 61). Climate change may also lead to increasing frequency and intensity of floods and deteriorating water quality. This is likely to have a particularly harsh effect on women and girls because of their distinct roles in relation to water use and their specific vulnerabilities in the context of disasters (see the section on disasters). In drought-prone areas affected by desertification, for example, the time absorbed by water collection will increase as women and children (mostly girls) will have to travel greater distances to find water. The heavy rainfalls and more frequent floods predicted to result from climate change will also increase women’s workloads, as they will have to devote more time to collecting water and to cleaning and maintaining their houses after flooding. This is time that could be spent in school, earning an income or participating in public life. Walking long distances to fetch water and fuel can expose women and girls to harassment or sexual assault, especially in areas of conflict; there are many accounts of women and girls being attacked when searching for water and kindling in refugee camps around Darfur (MSF 2005). In urban areas, water collection is also an issue as women and girls may spend hours queuing for intermittent water supplies (WEDO 2003).

In the context of climate change, it is imperative that policies and programmes draw on the existing body of knowledge on gender and water to inform interventions – and scale these up fast. There is evidence that simple strategies work. For example, providing local water sources frees up time for women to engage in income-generation by reducing the time required to fetch water and making domestic tasks faster to complete. It also has a positive impact on school attendance: in Morocco, a World Bank Rural Water Supply and Sanitation Project succeeded in increasing girls’ school attendance by 20 percent over four years, in part by reducing the traditional burden on them to fetch water (Fisher 2006). It is evident that further participatory research with local communities on the benefits that the provision of local water sources could bring would provide enough convincing evidence to justify the infrastructural costs involved.

Equally, efforts are urgently needed to better highlight actual and potential risks of attack for women and girls who are obliged to walk long distances, and produce strategies to offset these dangers, such as community policing of water routes.

Areas for future research and action

Most of the existing literature on gender and water focuses on the challenges faced by women in rural areas. Research on the challenges specific to water use and management in urban contexts is needed to address this gap.

Existing evidence points towards effective strategies for ensuring water supply and quality, and reducing the burden on women caused by water collection. Now what is needed is the political will and resources to scale up these interventions and put research into action.

2.5 Gendered impacts of climate change on wage labour

As noted above, women's access to economic resources in terms of income and property ownership – including land – is already often unequal, particularly in developing countries. A gender gap in earnings persists across almost all employment categories, including informal wage employment and self-employment (ILO 2007). Women comprise the majority of those working in the informal employment sector which is often worst hit by climate change-related disasters and other shocks (IUCN/WEDO, n.d.), increasing women's already unequal access to resources and diminishing their capabilities to cope with unexpected events/disasters or adapt to change. There is a clear need for studies that can accurately map these impacts across global regions and sectors in order to trace patterns. Such evidence could provide the basis for policy on labour rights at national and international levels but there is also a role for labour unions and local non-governmental organisations (NGOs) in raising awareness of rights among groups of women workers and in reporting back on employers' unjust practices.

Areas for future research and action

Policies are needed that safeguard the rights of women to equal pay, access to a union and secure contracts, especially in times of insecurity caused by climate change.

2.6 Gendered impacts of climate change-related disasters

Gender inequality is a major factor contributing to the increased vulnerability of women and girls in disaster situations, such as Hurricanes Mitch and Katrina and flooding in South and East Asia, that are being increasingly linked to climate change. According to a recent report from the World Conservation Union/ Women's Environment and Development Organization (IUCN/WEDO), women and children are 14 times more likely to die than men during disasters (IUCN/WEDO 2007). Gender and age differentials in mortality rates were strikingly apparent in the aftermath of the Asian Tsunami where the largest numbers of fatalities were women and children under the age of 15 (Synthesis Report of the Tsunami Evaluation Coalition, in Mitchell et al 2008). While the tsunami was not directly related to climate change, it does provide important lessons about the impacts of a large scale disaster and the effectiveness of responses.

Women and girls' particular vulnerability is due to a combination of factors, including differences in socialisation where girls are not equipped with the same skills as their brothers, such as swimming and tree climbing. For example, it has been documented that women in Bangladesh did not leave their houses during floods due to cultural constraints on female mobility and those who did were unable to swim in the flood waters (see the box below).

The differential impact of a natural hazard on women and men

Following the cyclone and flood of 1991 in Bangladesh the death rate was almost five times as high for women as for men. Warning information was transmitted by men to men in public spaces, but rarely communicated to the rest of the family and, as many women are not allowed to leave the house without a male relative, they perished waiting for their relatives to return home and take them to a safe place. Moreover, as in many other Asian countries, most Bengali women have never learned to swim, which significantly reduces their survival chances in the case of flooding.

(Röhr 2005)

Boys and men also experience particular gendered vulnerabilities in disasters. Hurricane Mitch, which hit Honduras in 1998, has been cited as encouraging 'heroic' actions from boys and men, putting themselves at risk. More research is therefore needed in order to identify the extent to which gendered social constraints or expectations have led to greater risk, and to map out possible areas for interventions to mitigate the impacts of future disasters.

Research is also needed to highlight the effective mitigation strategies that are already in place, which can provide models of best practice for communities in disaster-prone areas. For example, 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 of the early warning system. This led to a quick evacuation when the hurricane struck (IUCN, n.d.). The above example demonstrates how a gender-sensitive strategy was the key to an effective response that saved the lives of both men and women.

2.7 Gendered impacts in the aftermath of climate change-related disasters

Research shows that gender inequalities can also be exacerbated in the aftermath of disasters. The household workload may increase substantially, forcing many girls to drop out of school to help with chores (Davis et al 2005). There is also evidence that women and girls are more likely to become victims of domestic and sexual violence after a disaster, particularly when families have been displaced and are living in overcrowded emergency or transitional housing where they lack privacy. The increase in violence is often partly attributed to stress caused by men's loss of control in the period following a disaster, compounded by longer term unemployment or threatened livelihoods.

Adolescent girls report especially high levels of sexual harassment and abuse in the aftermath of disasters and complain of the lack of privacy they encounter in emergency shelters (Bartlett 2008). In Sri Lanka after the tsunami, according to local field workers on the ground, these conditions were a key contributing factor in the harassment and abuses experienced: *"There were repeated references to the difficulties associated with many families living together in one open space, with no privacy for dressing or bathing – or even for families crowded together in a tent. Many were reluctant to acknowledge the extent of the problems, and said that given the situation, people had managed well. But staff from both Save [the Children] and partner organisations, along with some of the more vocal women, made it clear that the situation resulted in many abuses"* (Save the Children Sweden, in Bartlett 2008, 36).

Helpful responses, especially for older girls and women, may involve working with girls on ways to protect them from these potential abuses (Bartlett 2008). This could involve lighting the way to the toilets, or finding people who are willing to monitor the route or accompany children, adolescent girls and women. It can also mean finding ways to ensure their privacy while they are bathing or dressing (ibid).

While there is some excellent work that traces the links between climate change/disasters and violence against women², there is a clear need for more in-depth research in this area to shape effective policy and practical interventions. As with research into other impacts of climate change, poor women's voices and experiences need to be at the core of this work.

Areas for future research and action

Research is needed to highlight existing models of best practice for communities in disaster prone areas – such as the provision of gender-sensitive training and involving women and men equally in hazard management activities. Sensitive qualitative research is also needed to explore the links between climate change and violence against women. The particular concerns and needs of girls and adolescents should be central to this.

2.8 Gender, migration and climate change

Climate change and displacement

The number of internally displaced persons (IDPs) is expected to rise dramatically in the coming decades. And those already displaced look likely to be joined by at least equal numbers of people forced from their homes because of climate change. The impact of climate change is the great, and frightening, unknown in this equation. Existing estimates of its potential to displace people are more than a decade old and are widely disputed. Only now is serious academic attention being devoted to calculating the scale of this new human tide.

(Christian Aid 2007)

Although voluntary migration in response to seasonal changes is a long practiced strategic response by many communities, migration is increasing with climate change and includes traditionally static populations who have needed to move because their environment has been adversely affected by climate change. A Christian Aid report projects that one billion people will be displaced by 2050 and that climate change is likely to exacerbate existing challenges around migration, particularly forced migration (Christian Aid 2007).

Remittances from migrant labour may mean that households are able to rely less on agricultural activities for income, enabling them to meet their food security needs in an environment of declining land productivity while also reducing the pressure on natural resources in dryland areas (FAO 2003). In other cases, migrating men may contribute little to family incomes, increasing the workload of those left behind, often women, who become de facto heads of households and must take on men's farming roles in addition to their existing agricultural and domestic responsibilities. This may lead to changes in gender roles as women have more opportunities for decision-making and exercise greater control over household resources (FAO 2003). At the same time, it may be difficult for a household that is treated as female-headed in a husband's absence to retain control over land and other productive assets because of restrictions on women's property and land rights. This heightens women's vulnerability at exactly the point at which their responsibilities increase.

² For more information see the work of the work of the Gender and Disaster Network www.gdnonline.org

With migration set to increase in response to the adverse impacts of climate change, increasing conflicts over land and resources in receiving areas are also likely (Reuveny 2007, 657) – see the section below.

Areas for future research and action

Securing women's land and property rights is a priority: more support should be given, financial and otherwise, to existing advocacy initiatives working towards this goal.

2.9 Gender, conflict and climate change

It is well-recognised that climate change will – and is already – resulting in a growing scarcity of natural resources such as water and arable land in some parts of the world. With heightened competition over diminishing and unequally distributed resources, conflict over resources is set to increase (Hemmati, 2005; Rohr, 2008). Furthermore, conflicts resulting from non-inclusive processes around climate change mitigation strategies may be imminent as large scale Clean Development Mechanisms (CDM) projects in the south, which share environmentally sound technologies developed in industrialised countries with developing countries, rarely involve consultation with local stakeholders (Röhr, 2008). Although there is currently little research explicitly linking climate change with both conflict *and* gender, there is a considerable body of work that exists on gender and conflict, from which lessons can and should be drawn.

So what do we already know? Innovative work has been carried out on engendering conflict early warning systems to better ensure that previously overlooked signs of instability are taken into account. These approaches could be usefully drawn on to help recognise when conflict over resources is imminent, and to potentially prevent the conflict from occurring. For example, the United Nations Development Fund for Women (UNIFEM) has developed a set of gender-sensitive early warning indicators which include: increased gender-based violence, increased unemployment among male youths, reduced trust between ethnic groups, and a reduction in women's involvement over land disputes (Moser 2007). Many of these indicators reflect the projected effects of climate change on communities – particularly around depleting resources.

In cases where conflict over resources does occur, the gender and conflict literature again presents useful insights which should be used to inform appropriate, gender-sensitive responses. For example, existing work on gender and conflict points to women and men's 'traditionally' differing *roles* in conflict – with men and boys expected to be combatants while women and girls are expected to maintain the home and community in men's absence. This points to the need for policies and programmes that respond to the different roles that women and men play in conflicts, including those over natural resources – for example, interventions that provide women with safe routes to collect water and firewood.

The differential *impacts* of conflict on men and women are also well documented, and include gender and sexual based violence targeted particularly at women and girls; women's reduced access to resources to cope with household responsibilities; the increased time women and girls are required to spend caring for the injured and sick; as well as the obvious risk of death and disability faced by men engaged in armed conflict. The effects of natural resource conflicts on women and men can be clearly seen in existing conflicts. Take for example the case of Sudan. Both the conflicts between the north and the natural resource rich south, and the conflict in Darfur between nomadic and sedentary tribes, are partly a result of quarrels over natural resources. The horrific levels of sexual violence in Darfur, particularly against women and girls, which occur in villages when men and boys are away fighting, in and around refugee and IDP camps, and outside the camps at times when scarce fuel and water is being collected, provide a stark example of the gendered effects of climate-change related conflicts.

It has also been well documented that gender equity is key to effective post-conflict disarmament, demobilisation and reintegration. For climate change adaptation and mitigation, it is essential to ensure that female ex-combatants are equally integrated into political processes and decision-making following conflict. In turn, this will enhance their ability to participate more systematically in decision-making around climate change mitigation and response.

Opportunities for enhancing gender equality in climate change-related conflict

UN [Security Council] Resolution 1325 on peace-building calls for women's greater participation in such processes. Although implementation still leaves much to be desired, a resolution ensuring the participation of women in all processes for preventing climate change, adapting to changing environments and dealing with increased natural disasters will go a long way towards effective and socially just climate policy and the prevention of related conflicts.

(Röhr 2008)

Implications for policy and practice

Drawing from what is already known in the literature about the need for gender-sensitive interventions in cases of conflict, it follows that interventions to reduce the likelihood of conflict over natural resources, and interventions responding to conflict over resources where it occurs, must be gender-sensitive. One strategy is to design and implement gender-sensitive environmental management systems – intended to decrease the likelihood of resource conflict. Ensuring these systems are gender-sensitive involves taking into account the differing needs of women and men, as well as the differing needs of groups who, for example, may need water for farming and those who require water primarily for domestic use. Such programmes must take into account conflicting groups within communities, potential conflicts between in-migrants and receiving communities, and the possibility of conflicting household members quarrelling over resource provision.

Areas for future research and action

Urgent research is required on how to manage environmental migration in a gender-sensitive way. This includes recognising and responding to gender roles and responsibilities around natural resources, and may include ensuring that scarce resources are available for receiving communities, and that water is provided for in-migrants.

Research is further needed to establish how best to respond to violent conflict over natural resources in a gender-sensitive way, taking in to account the needs of women and girls, boys and men.

Finally, it is essential that research is undertaken into the impacts of natural resource depletion and limited access on intra-household conflict. This is in order to establish policies and practices which lessen the likelihood of arguments over scarce natural resources which may result in gender-based violence.

3. Adaptation in the face of climate change: a gendered perspective

"If we do not change our attitudes and practices, it is difficult to survive in the changing conditions. We are adopting systems like the ones used by migrant hill societies. We are strengthening our social institutions to cope with flood and drought by providing support to each other, like food and shelter for our flood-affected neighbours" (Muna Mukeri, 55, from Malehiya, Nepal, in Mitchell et al 2007:13)

3.1 Why is a gendered approach to adaptation imperative?

"Even in a society effective in catalysing adaptation, actions that address gender and other forms of differential vulnerability are essential" (Mary Thomas, DFID, personal communication, 2007)

It is now widely acknowledged that "the impacts [of climate change] will be felt more acutely by those with least adaptive capacity: poor countries and the poor in developing countries" (Lambrou and Piana 2006: 5). It is also recognised that "the vulnerability or susceptibility of a population group to the effects of climate change depends on the resilience of the surrounding natural landscape unit and society's capacity to adapt" (ibid).

At the household level, the ability to adapt to changes in the climate depends on control over land, money, credit and tools; low dependency ratios; good health and personal mobility; household entitlements and food security; secure housing in safe locations; and freedom from violence (Lambrou and Piana 2006). As such, women are often less able to adapt to climate change than men since they represent the majority of low-income earners, they generally have less education than men and are thus less likely to be reached by extension agents and they are often denied rights to property and land, which makes it difficult for them to access credit and agricultural extension services. Moreover, gender biases in institutions often reproduce assumptions that it is men who are the farmers (Gurung et al 2006). As a result, new agricultural technologies – including the replacement of plant types and animal breeds with new varieties intended for higher drought or heat tolerance – are rarely available to women farmers (Lambrou and Piana 2006).

3.2 Adaptation strategies

Women therefore face particular constraints in their capacity to adapt to existing and predicted impacts of climate change. Yet many women are already adapting to the changing climate and are clear about their needs and priorities. A recent participatory research project by ActionAid and IDS, mentioned above, clearly shows that women in rural communities in the Ganga river basin in Bangladesh, India and Nepal are adapting their practices in order to secure their livelihoods in the face of changes in the frequency, intensity and duration of floods (Mitchell et al 2007). The women who took part in the research described various adaptation strategies such as changing cultivation to flood and drought resistant crops, or to crops that can be harvested before the flood season, or varieties of rice that will grow high enough to remain above the water when the floods come (ibid). For example, one woman said:

"As we never know when the rain will come, we had to change. I started to change the way I prepare the seedbed so that we don't lose all our crops. I am also using different crops depending on the situation" (Mitchell et al 2007: 6)

3.3 Adaptation needs and priorities

The women were also clear about what they needed in order to adapt to the floods: crop diversification and agricultural practices, but also skills and knowledge training to learn about flood and drought-resistant crops and the proper use of manure, pesticides and irrigation. The box below captures some of the specific priorities articulated by the women during the research.

Poor Women's Climate Change Adaptation Needs and Priorities

The poor women of the Ganges River basin, in adapting to climate change want:

- A safe place to live:
 - Relocation of communities to safer areas
 - Solid houses built with a high plinth level to reduce inundation
 - Shelters required for people, animals and agricultural inputs/ products
- Better access:
 - To climate change information and related knowledge and skills
 - To services, such as doctors and veterinaries
 - To safe, reasonable and fair credit and insurance
 - To communications, through safer roads and access to boats
- Other livelihood options:
 - Through knowledge and resources for crop diversification and adaptive agricultural practices
 - Through access to irrigation
 - Through locally available training.

(Adapted from, Mitchell, T. et al 2007: 16)

Clearly, these women have a great deal of knowledge and experience of coping with the impacts of climate change and understand their own needs and the types of interventions required for ensuring more sustainable agricultural processes in the face of these changes. This re-affirms the point made repeatedly in the literature on gender and the environment that women and men have distinct and valuable knowledge about how to adapt to the adverse impacts of environmental degradation (FAO 2003; Gurung et al 2006; WEDO 2003). It is critical that this local innovation and context-specific knowledge and experience be captured through further participatory research into women's existing coping strategies and adaptation priorities. As noted by the ActionAid/IDS report, "They [the women who took part in the research] might not be aware of all the possible adaptation strategies, of all the ways to overcome constraints to the ones they are using, but they certainly know their present situation best and have an urgent list of priorities to secure a livelihood in the face of the new challenges" (Mitchell et al 2007: 14). It is vital that these priorities are made visible and are used to inform policy decisions and programmes on adaptation.

3.4 Research gaps and recommendations

The research project outlined above is an innovative and valuable initiative which could be usefully replicated, especially in Sub-Saharan Africa, where to our knowledge there has been no documented research that has specifically set out to ask women *what they want*. Information on the specific challenges and strategies adopted by women in urban contexts is also sparse: participatory research in diverse urban contexts should be a priority.

This requires investment in building the capacity of women to have the skills and confidence to engage with climate change debates at the local, national, regional and international levels, for example through advocacy training (see also the next section on mitigation). Additional obstacles

to women's participation also need to be addressed, such as poor infrastructure and limited time. Further consideration should be given to how to best support NGO involvement in developing capacity-building processes.

Moreover, whilst the importance of engaging with women's concerns and priorities cannot be over-estimated it is also important to finance and undertake participatory research that engages with men and boys to make visible the constraints they experience in their gendered roles. The equal involvement of men and women in adaptation planning is important both to ensure that the measures developed are beneficial for all those who are supposed to implement them, and also to ensure that all relevant knowledge is integrated into policy and projects (Röhr 2006: 5).

The new research by IDS and Plan International, discussed above, shows that children and youth are clearly able to identify the main risks to their local environments and the actions needed to manage these risks, pointing to children's potential role as both sources and recipients of risk information (Mitchell et al 2008). These findings are consistent with the perspective adopted in the Convention on the Rights of the Child (CRC), which explicitly recognises the need to incorporate children's perspectives into development planning. Investing in further participatory research with children and youth to elicit their *adaptation* needs and priorities, similar to the IDS/ActionAid research discussed in this section, could produce valuable insights to inform adaptation policies and programmes. Any such research must be sensitive to the potentially divergent needs and priorities perceived by girls and boys, so as to shape more appropriate responses.

Areas for future research and action

Existing research on gender and climate change – such as the ActionAid/IDS research on adaptation strategies – focuses mainly on South Asia, but there is a need for these research questions and methodologies to be replicated and applied in other global contexts and situations, since impacts are often socially and culturally specific. Carrying out similar gender-sensitive participatory research with communities in urban areas is also needed.

4. Climate change mitigation and gender inequality

Work on gender and climate change has largely focused on impact and adaptation. This may be due to the widespread acceptance that climate change will hit the poorest the hardest, with women making up a large proportion of 'the poor'. What receives less attention is women's willingness and potential to significantly contribute to climate change *mitigation* strategy design and implementation. For this potential to be realised, however, women need opportunities for meaningful involvement in these decision-making processes (Skutsch 2002, in Dennison 2003).

4.1 Scoping initiatives on gender and climate change mitigation and adaptation

Due to the reasons outlined above, there is currently little published work on good practices around gender-sensitive mitigation. It is worth noting, however, that there are several initiatives calling for good practice case studies. For example, the UN/International Strategy for Disaster Reduction (UN/ISDR) secretariat, in collaboration with IUCN/WEDO, has issued a global call for good practices and lessons learned that link disaster risk reduction as a key tool for reducing the impact of climate change, with a gender analysis. The resulting publication will prove valuable for addressing gender gaps in disaster risk reduction (Ana Cristine Thorlund, personal communication, 2008).

4.2 What do we understand by 'mitigation'?

While adaptation has been described as changes in "processes or structures to moderate or offset potential dangers or to take advantage of opportunities associated with changes in climate" (Lambrou and Piana 2006: 8), mitigation is about preventing or limiting the occurrence of climate change. As such, mitigation focuses on tackling the causes of climate change: the increase of greenhouse gases (GHGs) (Lambrou and Piana 2006). To date there has been little gender-focused work that specifically looks at climate change mitigation. This may be due to the seemingly 'technical' or 'scientific' nature of mitigation as being about reducing GHGs. However, as it is now generally accepted that human behaviour is driving climate change, analysis and future work around mitigation must also be gender-sensitive. The first part of this section will discuss mitigation as defined above, with an emphasis on decision-making. Part two will look at ensuring gender equitable access to technologies in mitigation strategies, while the third part will focus on gendering transport and climate change mitigation work.

4.3 Towards gender equitable participation in international negotiations and decision-making

"The international climate change process will be unable to achieve truly global legitimacy or relevance until it adopts the principles of gender equity at all stages of the process, from scientific research, through analysis, agenda formation, negotiation and decision-making, regime implementation, and finally in further development and evaluation." (Dennison 2003)

Gender-sensitive priorities and processes need to be mainstreamed at all levels of negotiations and decision-making around climate change mitigation and adaptation. It is in the remit of all governments who are part of international negotiations on climate change to ensure that gender concerns are reflected in policies and related programming. All policies and programmes also need to be coherent with existing commitments – such as the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). Furthermore, the 1995 UN Beijing Platform for Action states that a gender perspective needs to be mainstreamed throughout all UN activities and negotiations (Dennison 2003). As contributions to the recent international United Nations

Framework Convention on Climate Change (UNFCCC COP 13) argue, women need to be involved in these negotiations and consulted on their priorities (see for example Women's Gender CC 2007). Ultimately, neglecting to incorporate a gender-sensitive approach to international climate change negotiations means that the decisions and actions taken cannot reflect the needs, capabilities, priorities and concerns of all stakeholders and cannot therefore be effective in either reducing greenhouse emissions, or upholding principles of gender equitable sustainable development (Dennison, 2003). As the box below illustrates, women may in some cases be more likely than men to support or accept progressive and significant climate change mitigation and adaptation policies – so there is also a very strategic rationale for their greater involvement in policy and decision-making processes.

Women's risk perception and policy formulation – a northern perspective

Women and men perceive risks differently, including in relation to climate change. Women are more sensitive to risks and less likely to perceive governmental policies and measures taken to deal with climate change as sufficient. Women also seem more prepared for behavioural changes than men, as “fewer women than men believe that science and technology will solve environmental problems without our having to change our lifestyles. They also rate more highly the influence that each individual has on climate protection”. This points to a higher likelihood that women would support more drastic policies and measures on climate change – in other words, they would be the most “natural allies” of those promoting progressive and significant climate change mitigation and adaptation policies (see Hemmati, M., 2005).

As noted above, recent research by the Institute of Development Studies and Plan International has also pointed to the marginalisation of children's voices in household, community and national decision-making relating to climate change, particularly in disaster risk reduction (DRR) (Mitchell et al. forthcoming 2008). Children are assumed to have no role to play in reducing the risk of disasters. Yet research carried out in El Salvador and New Orleans revealed numerous cases where children and youth have taken actions to prevent future disasters within their communities, including by promoting changes in local government policies (see box below) (Mitchell et. al. forthcoming 2008). This kind of participatory research is hugely valuable in terms of challenging stereotypes about children as passive victims and developing a more nuanced picture of children's own perceptions of risk, and the actions needed to reduce these risks. Replicating this kind of participatory research with groups of women would be illuminating, since, as noted above, women's perceptions, strategies and priorities are often given little visibility in decision-making (see the recommendations section below).

Children in El Salvador organising to take charge of their risk environment

A children's group in Petapa in El Carrizal Municipality [of El Salvador] identified the unregulated quarrying of stone and sand from the river as a major risk, leading to increased erosion and vulnerability to flooding of houses near the river. Together and initially without adult support, and despite many adults objecting, they devised a campaign of direct action and lobbying their parents and the local government authorities. They blockaded roads to the river, pleaded with lorry drivers, erected signs warning of the dangers, pressured their parents to stand up against quarrying and persuaded the local authority to enforce regulations that would stop illegal extraction. Quarrying along vulnerable stretches of river bank has now stopped. (Mitchell et. Al., 2008)

4.4 Strategies for making climate change mitigation negotiations more inclusive

At the 2007 Thirteenth Session of the Conference of the Parties (COP13) in Bali, women comprised only 28 percent of delegation parties and 12 percent of heads of delegations³ (Ulrike Röhr, personal communication, 2008). Although it cannot be assumed that women will automatically know or represent poor women's concerns, achieving a gender balance in participation in climate change negotiations and representation at decision-making tables is a good starting point (Villagrasa 2002, 41 in Dennison, 2003).

Policies to promote a more equal gender balance can draw from current knowledge and strategies around promoting women's political participation at the national level and local levels, such as the use of quotas. To enable genuine involvement in decision-making at all levels, donors need to invest in people's capacity, particularly women and youths, to participate meaningfully in policy-making process through supporting advocacy and leadership training to build skills and confidence (see for example Villagrasa, 2002, 43 in Dennison, 2003). This would build competencies, enable a wider cross-section of stakeholders to be involved, ensure continuity of the process, and ultimately improve efficiency in implementation and enforcement of strategies developed (Dennison, 2003). Two examples of efforts by donor agencies to strengthen women's ability to participate meaningfully in decision-making processes around natural resource management and climate change policies and programmes are presented in the boxes below.

Building women's leadership capacity through DFID-funded Renewable Natural Resources Research Strategy (RNRRS) projects (1995-2006)

Building women's leadership capacity was a common theme in many of DFID-funded Renewable Natural Resources Research Strategy (RNRRS) projects, which aimed to draw women into the management process by equipping them with skills (e.g. literacy, information and leadership) and providing them with opportunities. The Natural Resources Systems Programme (NRSP) project 'Strengthening Social Capital for Improving Policies and Decision-making in Natural Resource Management' (R7856) had an implicit objective of encouraging more women to take part in management processes. This was achieved by establishing forums and committees in which women participated and by providing all members of the community with leadership skills training. There were challenges, however. Although women were encouraged to attend project meetings, men often prevented them from attending, while they treated women's meetings about traditionally male domains, such as resource management, with suspicion. This points to the need to also engage men in discussions about the benefits of women's involvement in management processes.

(Turrall, 2006)

³ For gender disaggregated data from previous COPs, see, www.genanet.de/unfccc.html

Empowering women to participate equally in the development and implementation of climate-change-related policies and programmes in China

A goal of the Canada-China Cooperation in Climate Change (C5) Project, funded through the Canada Climate Change Development Fund (CCCDF) and administered by the Canadian International Development Agency (CIDA), is to increase the contribution of women to decision-making on climate change by empowering them to participate equally in the development and implementation of climate-change-related policies and programmes, particularly within Chinese government agencies and research institutions. Specific objectives include:

- Increase awareness of gender inequalities and support for women's full participation in decision-making and technical activities associated with climate change
- Increase the capacity to analyse gender equality issues relevant to the project and incorporate the results of the analysis into project activities
- Develop and implement appropriate targets for male/female participation in project activities, based on sex-disaggregated baseline research; the minimum expectation is 30 percent participation by women; and
- Increase the awareness, abilities, self-confidence and motivation of women working to address the issue of climate change

(Adapted from CIDA 2002: 3)

The following table offers a useful summary of some of the enabling factors and constraints for women's participation in decision-making, some of which have been discussed above.

Enabling factors and constraints for women's participation in decision-making

Enabling factors for women's participation in public life and decision-making include:

- an awareness of their rights and how to claim them
- access to information about laws, policies and the institutions and structures which govern their lives
- confidence, self-esteem and the skills to challenge and confront existing power structures
- support networks and positive role models
- an enabling environment, meaning a political, legal, economic and cultural climate that allows women to engage in decision-making processes in a sustainable and effective way

Constraining factors include:

- economic dependency and a lack of adequate financial resources
- illiteracy and limited access to education and the same work opportunities as men
- discriminatory cultural and social attitudes and negative stereotypes perpetuated in the family and in public life
- burden of responsibilities in the home
- intimidation, harassment and violence
- lack of access to information

Strategies deployed by WOMANKIND Worldwide⁴ include:

- In Albania - support training for existing and potential women leaders in local and national elections. Work with a range of actors, including journalists and politicians, to change negative attitudes and to create an enabling environment for women's participation.
- In Afghanistan - provide training in basic health and literacy skills and human rights education to give women the practical skills they need to take part in development. Support the lobbying of decision-makers to increase women's representation at all levels of government.
- In India - support education and training for women from the poorest and most marginalised dalit and tribal communities in Tamil Nadu state to give them the confidence and skills to speak out about the issues that concern them, such as electricity and water for their communities. Some of the women have gone on to stand for local council elections - with 50 percent then elected.

(Adapted from WOMANKIND Worldwide webpage)

Areas for future research and action

In order to design gender-sensitive mitigation strategies, we need to know more about gender differences in the impacts of climate change. This should entail gathering existing knowledge on climate change, including local practices and indigenous knowledge. Sex disaggregated data and in-depth qualitative studies into impacts – based on gender-sensitive participatory approaches to data collection, are essential to furthering the mitigation agenda and ensuring it is both efficient and equitable.

Critical research questions include: To what extent have programmes aimed at mitigating environmental impacts or at improving resource management included women? What are the current levels of female participation in decision-making on climate change at local, regional, national and international levels – both in terms of the numbers of women participating as well as the quality of that participation? What are the barriers to participation, or to being heard and taken seriously? What can be learnt from existing literature on promoting women's and youth's participation in decision-making?

Equally important is for current and future research and interventions designed to promote children's participation in disaster risk reduction to be gender-sensitive. Particular attention should be given to promoting girls' participation, since girls may be doubly excluded from decision-making processes and for a. As such, child-centred climate change interventions could be strengthened by a greater awareness of the gendered constraints that mitigate against girls' capacity to act as 'resources' or 'receivers' of disaster management information – such as limitations on girls' mobility, lower levels of education and a higher risk of violence. In many contexts, boys rather than girls are expected to be knowledgeable and make the decisions: what are the implications of this in terms of girls' ability to affect DRR policies and processes? Do participatory research programmes and child-centred interventions have the potential to challenge assumptions about gendered roles and capacities? Do gender differences affect children's perceptions of the hazards facing their communities, and if so what are the implications of this?

⁴ <http://www.womankind.org.uk/>

Perhaps most importantly, researchers and practitioners working to enhance the participation of women, girls and boys in decision-making on climate change must work together – sharing learning and strategies, while being sensitive to both gender and age as critical, cross-cutting variables in people’s vulnerability to and capacity to manage and respond to risk.

In terms of practical action, governments and donors should invest in people’s capacity, particularly women and youths, to participate meaningfully in policy-making process through supporting advocacy and leadership training to build skills and confidence. This should be done in partnership with civil society organisations that already have considerable expertise in this area.

4.5 Ensuring gender equitable access to technologies in mitigation strategies

Gender-sensitive approaches to existing mechanisms for climate change mitigation are also important. This could include the Clean Development Mechanism⁵ (CDM), which is expected to result in sharing environmentally sound technologies developed in industrialised countries with developing countries, with a view to achieving sustainable development objectives (Lambrou and Piana, 2006, 8). However, poor women’s priorities regarding energy and technology have not been systematically fielded. As a result, new technologies may be poorly suited to their needs. Moreover, because access to progressive technologies is typically restricted to men, and since it is men who tend to exercise decision-making power over the purchase of technology, women often do not have the opportunities to benefit directly from these types of innovation. In Zimbabwe, for example, men are reported to have rejected the use of solar cookers by their wives because technology is seen as traditionally belonging to the male domain (Nyoni, in Clancy and Skutsch 2003). Women’s lower levels of education in many developing contexts may also reduce their awareness of mitigation options such as the use of energy-efficient devices (Lambrou and Piana, 2006).

The Canada-China Cooperation Project in Cleaner Production

In China, CIDA funded the Canada-China Cooperation Project in Cleaner Production, which took aim at emissions in the pulp and paper, fertilizer, plastics and brewing industries. The project contained a specific component to increase the participation of women as workers, technicians, and managers. Women received training in process improvement, auditing practices, monitoring of equipment, computers and other technical aspects of their work. At the same time, gender equality awareness sessions began to transform the attitudes of both men and women. Women not only applied the new clean-production techniques at work, they started taking initiatives on their own to help clean up the environment.

(Adapted from CIDA 2002: 3)

Areas for future research and action

More research is needed to document the different energy consumption patterns of men and women to inform targeted mitigation and technological adaptation strategies. Further research is

⁵ “The CDM mechanism is designed to reduce atmospheric carbon dioxide by reducing emission through renewable energy or conservation measures to reduce consumption, or by increasing sequestration (collecting or trapping carbon from the atmosphere) rates, at sites in developing countries, mainly through finance from industrialised countries which have reduction quotas to meet” (Skutsch, 2004)

also required into how involving women in using environmentally sound technologies could improve mitigation and adaptation at the community level.

4.6 Gendering research on transport and climate change mitigation

To date, little attention has been paid to the ways in which gender has an affect on people's consumption and lifestyles and the impact this has on climate change. Noting this gap, a recent Swedish study examined the extent to which women generally live in a more sustainable way and leave a smaller ecological footprint than most men (Johnsson-Latham 2007). The study argued that men account for the bulk of energy use, carbon-dioxide emissions, air pollution and climate change – both among the rich and the poor. It particularly emphasised gender differentiations in transport use. For example, evidence suggests that women in industrialised countries use much less emissions-intensive modes of transport than men, their level of car-ownership is lower, and their share of public transport use is higher (Johnsson-Latham 2007; Lambrou and Piana 2006; Hamilton et al 2005). In Sweden, for instance, men account for 75 percent of car owners (Swedish National Road Administration, in Johnsson-Latham 2007), partly because they commute more widely than women. They also travel by air more than women. By contrast, women use public transport, such as bus and rail travel, to a greater extent (ibid). Evidence from the UK's Equal Opportunities Commission supports this, showing that women and men travel for different purposes. Men are more likely to do so for commuting and business reasons, whereas women are more likely to use transport for shopping or taking children to school (Hamilton et al 2005).

The relevance of research into attribution of carbon footprints to women and men, boys and girls is for the purposes of targeted mitigation strategies which are aimed at behaviour change – rather than attributing 'blame'. One strategy that has been proposed to promote sustainable and gender-equitable transport is to boost women's participation in decision-making on community planning, traffic systems and transportation (Johnsson-Latham 2007). There is also a need to invest more resources in improving women's mobility through better provision of public transport like trains and buses, which cause less environmental damage and which create real options for non car drivers (ibid). However, recognition of the links between gender and transport has only recently begun to emerge in the gender and climate change literature, and there is little evidence of research into the gender dimensions of transport use in newly industrialising countries such as India and China. With transport experts in Asia predicting that thousands of cities will soon have to make major new investments in modern transport systems (ibid), this research is urgently needed, alongside practical efforts to increase women's participation in decision-making on future transport systems.

Areas for future research and action

As noted in the section on technology above, more research is required to explore how gender affects people's consumption and lifestyles, both in industrialised countries and in newly industrialising countries, and among both the rich and poor. This is important in order to better inform the design of mitigation policies and programmes that are appropriate and effective, such as awareness raising campaigns for the purposes of behaviour change.

Meanwhile, practical steps are needed to increase women's participation in decision-making relating to transport. This will help to ensure that existing and future transport systems are better suited to the particular needs of women as well as men. Age is another critical dimension that needs to be considered, especially given the pressing challenge posed by growing aging populations in middle and high income countries. Greater investment in appropriate public transport is needed, to enhance women's mobility and that of elderly people, while also being more environmentally sustainable.

5. Key conclusions and recommendations for future research

It is by now widely accepted that failure to include women in decision-making processes around climate change mitigation and adaptation at local, national, regional and international levels not only exacerbates gender inequalities, but also undermines the effectiveness of climate change responses. There is thus an urgent need to clearly identify obstacles to women's participation in decision-making, and find ways to address these constraints through supporting grassroots awareness-raising, confidence-building and advocacy and leadership training programmes. Particular attention needs to be given to promoting girls' participation, since girls may be doubly excluded from decision-making processes and fora on account of being both a child/youth and female. This is perhaps the single most important step towards achieving more equitable, appropriate climate change policies and programmes.

5.1 Suggested areas for future research

Identifying and overcoming barriers to participation in decision-making

To what extent have programmes aimed at mitigating environmental impacts or at improving resource management included women? What are the current levels of female participation in decision-making on climate change at local, national, regional and international levels – both in terms of the numbers of women participating as well as the quality of that participation? What are the barriers to participation or, for those involved in consultations, the barriers to being heard and taken seriously? What can be learnt from existing literature on promoting women's and youth's participation in decision-making? Below we highlight key recommendations for future research, drawn from this paper.

Identifying the gendered impacts, coping strategies and adaptation priorities of women and men in contexts where this has currently been under-researched

Women and men, girls and boys, should be involved in a participatory capacity to inform climate change responses at a local level. This will enable the specific experiences and voices of people most affected by climate change to inform understandings of climate change impacts, adaptation and mitigation. This is critical if policy and practice is to respond appropriately to people's needs in specific contexts, and be informed by their everyday knowledge of coping with these phenomena.

As this paper has shown, existing research on gender and climate change – such as the excellent ActionAid/IDS research on adaptation strategies – is focused mainly on South Asia. The ActionAid/IDS research provides a best practice model which can be replicated and applied in other global contexts and situations, since impacts are often socially and culturally specific.

Identifying the gendered impacts, coping strategies and adaptation priorities of women and men in urban contexts

Notably, much of the existing research on gender and climate change focuses on rural communities. More participatory research is needed into the impacts of climate change in urban settings, particularly in terms of gender in/equality, and the coping strategies and priorities of women and men in urban contexts.

Identifying the impacts of climate change on gender roles and relations at the household level

Little research has currently been done into the impacts of climate change on gender relations at the household and community levels. Research is needed to determine where women's and men's priorities conflict and where there is consensus, and how policies and programmatic

responses to climate change can best respond to the differing vulnerabilities, needs and priorities of women and men.

Identifying how gender affects people's consumption and lifestyles

More research is needed to document the different energy consumption patterns of men and women to inform targeted mitigation and technological adaptation strategies, such as awareness raising campaigns for the purposes of behaviour change. Further research is also required into how involving women in using environmentally sound technologies could improve mitigation and adaptation at the community level.

Identifying best practices for gender-sensitive responses to climate-change related disasters, conflict and displacement

Research is needed to highlight existing models of best practice for communities in disaster prone areas – such as the provision of gender-sensitive training and involving women and men equally in hazard management activities. Sensitive qualitative research is also needed to explore the links between climate change and violence against women. The particular concerns and needs of girls and adolescents should be central to this.

Urgent research is required on how to manage environmental migration in a gender-sensitive way. This includes recognising and responding to gender roles and responsibilities around natural resources, and may include ensuring that scarce resources are available for receiving communities, and that water is provided for in-migrants.

Research is needed to establish how best to respond to violent conflict over natural resources in a gender-sensitive way, taking into account the needs of women and girls, boys and men.

Finally, it is essential that research is undertaken into the impacts of natural resource depletion and limited access on intra-household conflict. This is in order to establish policies and practices which lessen the likelihood of arguments over scarce natural resources which may result in violence.

Identifying the gender implications of long-term drought and starvation in Sub-Saharan Africa

Research on the gender implications of disasters and related policy also needs to be more responsive to the long-term disaster of drought and starvation in Sub-Saharan Africa, which is less prominent in the media than recent events such as the Asian Tsunami, but whose impacts are equally if not more damaging to the lives and livelihoods of women and men. For example, what are the gender implications of drought and starvation in Sub-Saharan Africa? How should the development industry respond to these challenges at all levels?

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