

# Gender and Climate Change

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## CHAPTER 4

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# Gender and Climate Change: Towards Comprehensive Policy Options

*Gregor Schwerhoff and Maty Konte*

## 1 INTRODUCTION

Climate change awareness is gaining in importance in everyday life and interacting with gender issues in important ways. The impacts of climate change can be clearly felt among women and men in different ways. Climate change is not gender neutral, which means the consequences of climate change are lived and experienced differently based on gender (MacGregor 2010). The United Nations Development Programme (UNDP) discusses gender-based vulnerabilities and the fact that ‘women are disproportionately vulnerable to the effects of climate change’ (2012, p. 1). Policies for climate mitigation and adaptation have the potential to either amplify those differences or contribute to improving opportunity equality for women and men.

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The recent literature has largely focused on investigating why women are more vulnerable to climate change impacts and why there is a gender difference in mitigation behaviours and attitudes. This knowledge is important for the development of comprehensive policies. When econometric studies simply include gender as an explanatory variable, gender differences may be understood as an inherent characteristic of men and women. Hence, a misinterpretation can lead to flawed conclusions that can negatively affect the situation of women. Additionally, simply targeting aid to the most vulnerable does not address the underlying power dynamics that contribute to female vulnerability (Djouidi et al. 2016). Similarly, Arora-Jonsson (2011) highlights the pitfalls of declaring women to be more ‘virtuous’ in climate change decision-making because that has led to instances in which women have been given more responsibility without a corresponding increase in power.

This chapter reviews the literature on women’s vulnerability to climate change and gender differences in attitudes and behaviours towards climate change, with a particular focus on the mechanisms that cause those differences, and gender differences in climate change adaptation. The chapter highlights the fact that gender vulnerability differences can be traced back to various types of cultural restrictions imposed on women. Gender differences in attitudes and mitigation behaviours often can be traced back to complementarity roles or activities between men and women in terms of, for example, skills or representation of different community subgroups. Further, differences in socialisation have been identified.

Understanding the mechanisms causing gender differences in vulnerability to climate change helps to identify comprehensive policy options for addressing both climate change and gender inequality. Gender mainstreaming, the design of climate policy with an explicit evaluation of gender effects, is an important approach emphasised in this context. Additionally, this chapter suggests addressing the causes of inequality, for example, by removing de jure or de facto restrictions on women owning land. Finally, it proposes prioritising climate mitigation policies that have proven co-benefits for women. One example is electrification that reduces health hazards for women and provides them with new opportunities.

Several papers have analysed the interactions between gender and climate change. MacGregor (2009, 2010) analyses the discourse on climate change and emphasises that it is not a gender-neutral, scientific problem but, instead, is deeply gendered. Arora-Jonsson (2011) identifies the narrative of ‘virtue and vulnerability’, pointing out the lack of a scientific

foundation for some of the statements as well as the problems associated with simple generalisations. Pearse (2017) takes a feminist view on climate change and argues for the importance of gender studies in the context of climate change. In addition to that literature, this chapter focuses on the mechanisms causing gender differences in the context of climate change and conducts the first assessment of the policy options available for simultaneously addressing climate change and gender equality. This chapter further provides solid guidance for policymakers who are interested in Sustainable Development Goal (SDG) target 5.a and in all the targets listed in SDG 13.

The remainder of the chapter is structured as follows: Sect. 2 is devoted to reviewing the literature on the cultural mechanisms that cause women to be more vulnerable to climate change. Section 3 investigates why skills and behaviours with climate change implications can be gender specific. Section 4 moves beyond the male–female dichotomy and discusses which groups of women are most affected by the mechanisms described here. Section 5 uses insights from the preceding sections to suggest three types of comprehensive policy options and, finally, Sect. 6 provides some concluding remarks.

## 2 VULNERABILITY OF WOMEN TO CLIMATE CHANGE

Many studies have observed that women are more vulnerable to climate change than men. This section focuses on the reasons behind this difference in vulnerability.

### 2.1 *Lack of Resources Due to Poverty*

In many studies, the higher vulnerability of women to climate change is attributed to their lack of resources. Studies have provided evidence that people with fewer resources are generally more affected by climate change (MacGregor 2010). People with lower incomes tend to work in agriculture, which is the sector most easily affected by climate change (Hope 2009; Mubila et al. 2011). People in low-income households are also more vulnerable to external factors because they work in fragile employment with high levels of income insecurity (Mubila et al. 2011). Food security, which is a concern for people with fewer resources, is also greatly affected by climate change, which exacerbates food insecurity (Mubila et al. 2011). The negative impact of climate change on people with fewer

resources is also based on the fact that limited resources prevent people from adapting to changing conditions. With limited resources, women do not have the necessary means to adapt and, therefore, are more vulnerable than men. Jaggernath (2014) further claims that women have a lower capacity to cope with climate change consequences than men because of their lower and less steady incomes. Kumar and Quisumbing (2013) find that, in Ethiopia, male-headed households own considerably more land and livestock and are more likely to own oxen than female-headed households. According to Jost et al. (2016), crop yields would be 20–30 per cent higher in developing countries if rural women had the same access to resources as men do. Similarly, Kakota et al. (2011) report that women in Malawi have lower income levels than men.

Women do not have the means to adapt and farm successfully, which further decreases their income (Magrath 2010). Research in South Africa has proven that because of limited resources, women in agriculture are not learning new strategies to cope with droughts and rising temperatures (Magrath 2010). In Ghana, the lack of resources prevents women from participating in climate change negotiations on coping strategies (Glazebrook 2011). Finally, in Benin, women's limited income prevents them from purchasing new land, which can be a means of coping with the destruction of natural resources (Bob and Babugura 2014).

## 2.2 *Division of Labour*

The traditional division of labour in developing countries has unfavourable effects on women. Women have traditionally assumed the role of carers and provisioners, which implies that they rely on natural resources for many activities. For instance, they are responsible for collecting water and growing food for the family and, therefore, are more dependent than men are on the natural resource base for their livelihoods. With the environmental disruptions caused by climate change, women are being forced to find other ways to provide for their families, which can be more dangerous and time-consuming with the consequences of climate change (MacGregor 2010). For instance, the water shortages induced by climate change in Africa mean that women have to walk longer distances to collect water (Mubila et al. 2011). They also are more exposed to health risks from carrying heavy loads over those long distances (Meyiwa et al. 2014) and to possible sexual abuse by armed groups in forests and remote areas (UNDP 2012).

### 2.3 *Cultural Restrictions*

Adaptation to climate change is also affected by cultural restrictions. In Ethiopia, women have smaller networks and, thus, poorer access to informal forms of insurance (Kumar and Quisumbing 2013). Smucker and Wangui (2016) identify the lack of access to social networks as the greatest challenge to adaptation by women. In Nepal and India, migration is considered an option mainly available to men (Sugden et al. 2014). In Mali, women are affected negatively by male out-migration because the women are expected to take over some of the activities previously performed by men (Djouidi and Brockhaus 2011). Further, women's lack of power in Mali households prevents them from realising the full potential of adaptation options.

Education contributes to climate change adaptation because it facilitates relations with external agencies and provides access to new sources of information (Cohen et al. 2016). It also increases opportunities for paid employment (Cohen et al. 2016), in particular by increasing sectoral mobility (Kumar and Quisumbing 2013). However, women and girls in Africa have attained only 80 per cent of the rate of male education. That difference is explained by a number of factors, including cultural factors such as the high incidence of early-age marriage in Malawi (Kakota et al. 2011).

Overall, the fact that climate change has a greater impact on women than on men can be explained by two conditions specific to women: the fact that women have to provide for their families (which is based on traditional gender roles) and the fact that women have greater difficulty in adapting to climate change because of their lack of resources. Those conditions imply that climate change has a multidimensional impact on women's lives.

## 3 GENDER-SPECIFIC SKILLS AND BEHAVIOURS

There is substantial empirical evidence, both scientifically rigorous and disaggregated, that demonstrates that women do react differently to the challenges surrounding climate change than men do. However, women should not be considered only as victims; they are also relevant actors of change. Arora-Jonsson (2011) criticises the narrative—found in some of the literature—that women are more 'virtuous' in reacting to climate change as lacking scientific evidence and being overly simplistic.

The UNDP (2011) claims that women possess unique skills and a strong knowledge of resource management. Evidence in Africa has shown that women have skills that can be used to recognise which soils will be the most favourable for growing crops as well as how to adapt when unpredictable rainfalls damage those soils (Glazebrook 2011). Women also rotate crops in Ghana depending on the quality of the soil that is affected by climate change. That allows them to grow crops by using their specific knowledge of soils (Glazebrook 2011). In Rwanda, the disruption of rainfall has led women to rotate crops and assess how plants react (Oxfam 2015). Connolly-Boutin and Smit (2016) explain how adaptation strategies are different for men and women in Ghana and state that ‘women tended to prefer adopting post-harvest technology more than men, while men favoured light infrastructure projects such as the construction of community drains’ (p. 394). The following subsections provide concrete examples of strategies adopted by women in developing countries.

### 3.1 *Forest Governance*

In many countries, executive committees resolve issues or discuss concerns about forest governance. The percentage of women on those committees has a significant positive influence on forest conditions (Agarwal 2009a). The most important mechanism for this result is that women who participate in decision-making have a sense of ownership of the forest and, thus, take responsibility for it through actions such as patrolling and vigilance. Women also inform other women more about rules than men do. Qualitative survey responses indicate that women have a particular interest in conservation because of the significant economic importance forests have for them and the gender-specific knowledge women have about forest conservation. Westermann et al. (2005) add that the presence of women in groups increases collaboration, solidarity, and conflict resolution.

There is also evidence regarding the effect of the number of women in executive committees on conservation outcomes. In line with general gender studies, Agarwal (2010) describes the effect of a critical mass of women on forest conservation in India and Nepal. The presence of women on executive committees substantially increases once women reach a share of approximately 25 per cent. The likelihood that women speak up during meetings increases at higher membership percentages of approximately 33 per cent and above. McCarthy and Kilic (2015) find that similarities between the leadership and the general population, with respect to gender,

increase the ability for collective action in Malawi. This suggests that a share of approximately fifty per cent women in decision-making is optimal. Finally, Agarwal (2009a) presents evidence that executive committees entirely composed of women achieve better forest regeneration and canopy growth even though they tend to be in charge of the most degraded forests. A very degraded forest requires more conservation, and this initial poor forest quality causes all-women groups to implement stricter conservation rules (Agarwal 2010).

### 3.2 *System Justification*

Gender differences in environmental behaviours and attitudes have been studied by many scholars. A general finding is that women report more pro-environmental behaviours and attitudes (Goldsmith et al. 2013). That finding has been attributed to differences in socialisation that make women more altruistic and socially responsible (Zelezny et al. 2000). The different prioritisation of altruism could have originated in men's socialisation to cooperate within the group but compete outside of the group (Dietz et al. 2002). Following research in the United States, these results have been confirmed by international comparisons (Hunter et al. 2004). These general findings also have been observed in attitudes towards climate change. Although cognitive risk judgements are comparable in both men and women, women are more worried about climate change (Sundblad et al. 2007). At the top political level, however, it appears that ideology and partisan politics outweigh gender differences in attitudes (Sundström and McCright 2014). In summary, women are more active than men in environmental protection. Women are more willing to acknowledge ecological problems and risks and, thus, are less engaged in 'system justification'.

### 3.3 *Farming Decisions*

Gender behavioural differences also can be observed in climate change adaptation. Because the climate in Africa is already changing and is most commonly manifested in low and unpredictable rainfall, it is possible to study adaptation behaviours on a large scale. Dah-gbeto and Villamor (2016) observe that men tend to react to worsening climate conditions with out-migration, which subsequently results in more women making decisions on land use. The authors describe female decision-making as



more active, dynamic, and innovative with respect to income diversification. Jost et al. (2016) report a variety of differences in the adaptation behaviours of men and women in Northern Ghana. The farmers themselves describe women as more interested in the family's food supply and men as more interested in earning profit. Saenz and Thompson (2017) show that women in Zambia maintain more crop diversification than men in response to government maize subsidies, and that has positive effects on soil quality and on resilience in regard to climate change.

### 3.4 *Economic Behaviour in General*

As in farming, women adapt to climate change differently from men in other contexts. This is due to the gendered division of labour. A second reason for the different adaptation abilities is gender-specific knowledge. Aregu et al. (2016) describe the consequences of excluding women from informal institutions governing access to communal pastures in the Ethiopian highlands. As more female knowledge and preferences are disregarded, the ability of the community to adapt declines. Similarly, Díaz-Reviriego et al. (2016) show that knowledge of medicinal plants among Tsimane' Amerindians is gendered such that women's knowledge is an important factor in adapting local medical systems to climate change.

Some of this evidence is relevant for the mitigation of climate change. The participation of women in decision-making often improves forest conservation, and women are less likely to ignore and deny climate change. Women have gender-specific skills for adapting farming to climate change, and they can contribute to that adaptation in various other forms. Section 4 discusses how this analysis can be taken beyond a simple gender distinction and how doing so would lead to a better understanding of gender differences in vulnerability and adaptation to climate change.

## 4 BEYOND THE MALE–FEMALE DICHOTOMY

Focusing on women and men as homogeneous groups with fixed characteristics is problematic for two main reasons: one is that these groups are not homogeneous, and subgroups may be particularly vulnerable to climate change, thus requiring policy responses that take *intersecting identities* into account (Thompson-Hall et al. 2016). Women may be particularly vulnerable to climate change when they have a low level of income, when they are unmarried, or when they are from a low caste or class. Ajibade

et al. (2013) study the effect of flash flooding, an extreme event expected to become more frequent under climate change, on the coastal city of Lagos in Nigeria. Women in low-income neighbourhoods were affected much more severely than more well-off women, due in part to hazardous housing but more directly because of their low socioeconomic status.

In addition to household wealth, other personal characteristics can determine a person's ability to adapt to climate change. As the following examples will show, however, these other characteristics—including marital status, caste, and class—are closely associated with poverty. Studying a rural region in Tanzania, Van Aelst and Holvoet (2016) demonstrate the central role of marital status in adaptation ability, especially for women. Although married women can obtain access to more drought-resistant valley land through their husbands, unmarried women cannot rely on such opportunities. Unmarried women also are more dependent on agriculture because they are tied to agricultural work and cannot share risks with a husband.

A second reason for taking the analysis beyond the male–female dichotomy is that the behaviours and abilities of men and women are shaped by social power dynamics. Understanding these social dynamics allows one to design comprehensive policies to achieve equal opportunities for both women and men and to mitigate climate change and adapt to it. Describing women as vulnerable instead of addressing the underlying power dynamics can contribute to reinforcing the situation instead of improving it. Djoudi et al. (2016) express concern that it might be easier for donors to focus their support on the most vulnerable instead of initiating transformational change that would address the cause of gender inequalities. Ravera et al. (2016) point out that power dynamics are renegotiated in communities under pressure to adapt with the possibility of either improving or worsening the situation for women. In India, they found that a collective agency of women emerges, which decreases vulnerability. Further examples of how environmental pressure affects social structures and starts new dynamics are provided by Onta and Resurreccion (2011) and Andersson and Gabrielsson (2012). As noted above, viewing women as more resilient in mitigating climate change can distract from the inequality in the power balance between men and women (Arora-Jonsson 2011).

The literature reviewed in Sects. 2 and 3 shows how scientific analysis of gender and climate change has evolved from the narrative of 'virtue and vulnerability' towards a comprehensive study of power dynamics. The vulnerability of women to climate change, discussed in Sect. 2, can be traced

to gender-specific access to resources, gendered labour divisions, and further cultural restrictions. The gender-specific behaviours and abilities of women and men, described in Sect. 3, are complementary to each other either because women responsible for decision-making improve their representativeness or because men and women have complementary skills. Furthermore, Sect. 3 identifies situations in which women achieve better mitigation or adaptation results than men do. These gender differences, however, are not ascribed to inherent gender differences but rather to differences in socialisation.

## 5 IMPLEMENTING GENDER EQUALITY AND IMPROVING MITIGATION AND ADAPTATION

The need to address climate change with mitigation and adaptation and the need to eliminate gender inequality—which limits women’s capabilities compared to men—are linked. The straightforward way of designing policy is to aim at achieving synergies by simultaneously addressing both needs. Such a comprehensive design is known as the gender mainstreaming of climate policy, and it is discussed in Sect. 5.1. In addition, policies addressing one of the challenges can have positive co-benefits for the other. Section 5.2 discusses the co-benefits of improving gender equality to enhance the ability of women to adapt to climate change. Section 5.3 discusses how one important climate policy, electrification, can improve the lives of women and promote gender equality.

### 5.1 *Gender Mainstreaming of Climate Policy*

Given the gender differences in the ability to adapt to climate change described above, gender mainstreaming has been advocated as a policy response. Alston (2014) defines it as ‘the process of incorporating a gender perspective to any action, policy, legislation or action in order to ensure that the concerns of all are addressed and that gender inequalities are not perpetuated through institutional means’. In her analysis, Alston finds that policies and practices designed to mitigate climate change, or to adapt to it, lack attention to social outcomes and to vulnerable women in particular. Allwood (2014) confirms this finding for European Union policy and explains it as the result of institutional resistance. Nhamo (2014), by contrast, does find gender mainstreaming gaining momentum in national climate policy in East and Southern Africa.

An obvious first step in gender mainstreaming would be to provide services to both women and men. However, according to Jost et al. (2016) and Bhattarai et al. (2015), there are still extension services and NGOs that mainly target men. Ultimately, mainstreaming gender into climate policy will have to address structural inequalities, especially land ownership and access to resources and technologies (Bhattarai et al. 2015). To that end, Alston (2014) demands a reappraisal of all policies to ensure that they do not reinforce or create new gender imbalances. The meaning of gender-sensitive adaptation in climate adaptation policy is spelled out by Buchanan et al. (2016) in the case of communities engaged in traditional activities. They recommend providing men with better opportunities to build up human capital outside traditional activities. They also suggest encouraging women to actively engage in policymaking.

Taking gender aspects into account also can benefit environmental policy. Agarwal (2009a, b) shows that having a significant percentage of women engaged in decision-making can improve forest conservation outcomes in India and Nepal. Goldsmith et al. (2013) show, in an experimental setting, that reformulations of environmental policy that are consistent with the established way of life can help gain the support of men who tend towards system justification. Below the national level, female policymakers report greater environmental concern (Sundström and McCright 2014), suggesting that a higher share of women in decision-making also could increase support for environmental policy.

## 5.2 *Gender-Specific Restrictions*

Gender mainstreaming refers to the gender-specific design of climate-related policies. Evidence from Sect. 2 indicates that a simpler approach could also achieve progress in both gender equality and climate adaptation (i.e., by removing the gender-specific restrictions imposed on women that reduce their adaptation abilities). Where women do not have the formal right to own land, land ownership can be made independent of gender. If land registration is a practical difficulty for women, registration services can be made more accessible and transparent. Employing women as contact persons in these services could further reduce barriers to accessing services. Other access restrictions to women—on credit, forest plantation allocations, or irrigation rights, for example—also can be causes of high female vulnerability. Removing those restrictions would improve the resilience of women to climate change.

Education has been found to be an important determinant of the ability to adapt to climate change. While progress in terms of the average years of schooling has been rapid, and the gender gap has closed or narrowed at the primary school level, there is still much to be done at the higher levels of education. The early age of marriage for women has been identified as a cause of the lower educational attainment of women. Adjusting and/or enforcing a minimum age of marriage could be an indirect way of closing the gender gap in education and, thus, in climate change adaptation.

Some cultural restrictions on women will be difficult to address through government policy; examples are the gendered division of labour and the gender difference of power within families. Andersson and Gabriellson (2012) suggest a potentially creative way of addressing this problem: they show that, in East Africa, new social institutions have emerged in response to climate change. These institutions are mainly formed by women, and their main purpose is to share resources through collective action. It may be possible to transfer this model to other communities and, thereby, strengthen existing social institutions.

### 5.3 *Co-Benefits of Electrification for Gender Equality*

Many households in developing countries, particularly in Africa, live without access to electricity; they rely on carbon-intensive ways of producing energy, particularly traditional forms of biomass. An effective way of reducing these emissions and the associated deforestation is to provide access to electricity. Doing so can have a direct positive effect on the lives of women and improve their capabilities. Thus, when setting development priorities, it might be useful to consider the gender effect of electrification.

An important direct effect of policies on electrification is that the availability of electricity reduces the need for time-consuming tasks traditionally performed by women. For instance, having access to electricity in South Africa allows women to save so much time on household work that they have time to work in the market (Dinkelman 2011). Electricity also enables them to run microenterprises. Finally, electric lighting permits children to do more homework (Daka and Ballet 2011) and benefits girls in particular because they are in charge of fetching firewood and, therefore, may have less time for homework. Additionally, the smoke from traditional biomass used for cooking results in significantly negative effects on the health of women (Torres-Duque et al. 2008; Parikh 2011).

## 6 CONCLUSION

As far back as 2001, the Inter-Governmental Panel on Climate Change acknowledged that Africa will be significantly affected by climate change. Its socioeconomic and land conditions make Africa particularly vulnerable to any climate disruptions. Climate change is not gender neutral because the causes and consequences of climate change are lived and experienced differently across the two genders, and women are more 'vulnerable' to climate change and more 'resilient in mitigating it'.

Research on gender and climate change defies the simple narrative that women are more vulnerable to the effects of climate change and more resilient at mitigating it. Most studies investigate where gender differences come from and reveal mechanisms and causal chains that have great relevance for policy design. Gender differences in vulnerability to climate change can mostly be traced back to inequality in the power between men and women. That can take the form of limited access to resources, a gendered division of labour, or several other types of cultural restrictions that limit the options of women to react to environmental changes.

In societies where production involves gender-specific tasks, women and men also have gender-specific knowledge. This implies that women and men take different approaches to mitigation and adaptation such that both genders can make specific contributions to the adaptation capacity of the community. Further, the quality of decision-making is better when decision makers are more representative of their community. Thus, women have a positive impact on decision-making because they represent the interests of women better than men do. Finally, some differences in behaviour have been attributed to differences in socialisation. This suggests that pro-environmental behaviours can be learned.

Simply allocating more aid to women to reduce their vulnerability addresses the symptoms but not the cause. Climate policy needs to be conscious of the power relations between women and men, both existing ones and newly created ones. These social dynamics are constantly evolving and can be directed in a more cooperative and fair direction. Gender mainstreaming of climate policy is the most explicit method of doing this. However, the synergy effects of gender equality on climate policy, and vice versa, can be reinforced intentionally to achieve both objectives simultaneously.

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