CAN CLIMATE FINANCE CONTRIBUTE TO GENDER EQUITY IN DEVELOPING COUNTRIES?

SAM WONG*

Geography and Planning, University of Liverpool, Liverpool, UK

Abstract: Climate finance helps mobilise additional development funds to help developing countries reduce CO₂ emissions and local communities adapt to changing climate. Increasingly, however, concerns have been raised about the implications of climate finance on gender equity. Drawing on the ‘contextual-procedural-distributive’ equity framework, this paper conducts an extensive review of literature on forest sequestration, climate-smart agriculture and disaster management. It indicates that the effectiveness of climate finance is constrained from a lack of awareness of the gender gap in access to land and capital. To maximise the impact of climate finance, it urges policy makers to tackle deeply rooted structural inequalities. © 2016 UNU-WIDER. Journal of International Development published by John Wiley & Sons, Ltd.

Keywords: gender; equity; finance; climate; mitigation; adaptation

1 INTRODUCTION

Climate finance is generally known as ‘financial flows mobilised by industrialised country governments and private entities that support climate change mitigation and adaptation in developing countries’ (Stadelmann et al., 2013: 720). Climate Policy Initiative estimates that annual global climate flows reached US$331 billion in 2013, rising from US$97 billion in 2011 (Buchner et al., 2014).

Climate finance debates have long been pre-occupied with issues, such as sufficiency (is climate finance big enough to meet the challenges of climate change?) and additionality (does climate finance offer new funds to developing countries to combat climate change?). Now there is a gradual shift of attention towards understanding how climate finance could achieve climate justice (Barrett, 2014) and on evaluating the effectiveness of climate finance at a community level (Bird et al., 2013). Taking up these two themes, in this paper,
I focus particularly on the potential and actual impact of climate finance on gender equity. It raises questions as to whether, and how, climate finance helps achieve what the World Bank calls ‘gender-smart’ (World Bank, 2012b:33)—whether climate finance creates a level playing field as women and men decide how climate resources are used and whether climate funds are able to challenge gender discrimination.

To achieve these goals, conceptually, this paper draws on the equity framework by McDermott et al. (2013) to interrogate the complex relationships between climate finance and gender equity. Methodologically, I select forest sequestration, climate-smart agriculture and information communication as case studies of mitigation, adaptation and disaster management respectively in order to explore the mechanisms and outcomes of how gender relationships are changed, challenged and reproduced when climate finance is channelled to climate change-related strategies.

Whether climate finance should be conceptualised as ‘the greening of aid’ or ‘climate debt’ remains controversial. Yet, this paper will suggest that climate finance, as a form of development assistance, offers significant implications for aid to further promote gender equity in two aspects: firstly, it should take a holistic approach to examining gender equity from the contextual, procedural and distributive dimensions. Secondly, if climate finance and aid do not pay sufficient attention to existing gender gaps or are not ready to challenge structural inequalities, they risk reinforcing, rather than challenging, women’s subordination in access to land and public participation.

The structure of this paper is as follows: it will first introduce the nature of climate finance and the gender equity conceptual framework. It will then draw on three case studies to examine the gender dynamics and outcomes through the contextual–procedural–distributive equity framework. I will conclude by highlighting the potential and challenges of achieving gender equity through climate funds.

2 NATURE OF CLIMATE FINANCE

Climate finance is a collective term, comprising a bundle of individual climate funds differing in scale and location. The overall goal is to ensure sufficient financial support from developed countries to help developing countries reduce greenhouse gas emissions and adapt to changing climate (Overseas Development Institute, 2014). Climate finance comes from four different sources: bi-lateral, multi-lateral, public and private (Clapp et al., 2012).

Table 1 summarises the nature and background of the four major global climate funds; they are the following: Climate Investment Funds, the Adaptation Fund, the Global Environment Facility and the Green Climate Fund.

Climate finance has become more politicised because the differences and tension between developed and developing countries have surfaced and widened (Ciplet et al., 2013). While much climate finance is currently sourced from existing aid commitments, many developing countries question how new and additional the financial support is. At present, most adaptation funds are distributed in the form of concessional loans, rather than grants. Calland and Dubosse (2011) are concerned that, in order to pay the debt, developing countries may have to reduce social expenditure budgets, which will have a greater negative impact on women, and thus increase gender inequities. Climate finance also helps expose the internal, bureaucratic politics within individual developing countries about how climate funds are allocated and transferred down through different ministries, departments and implementing agencies (Pickering et al., 2015).
Apart from the challenges of tracking the financial flows, especially the private funds, it is sometimes very hard to differentiate climate finance from development finance. Using solar home systems as an example, Steele et al. (2015) argue that offering poor households financial incentives to purchase the systems could be regarded as development funding because it addresses energy-poverty problems. It could, however, also be considered as climate fund, as it helps reduce carbon emissions from burning kerosene or deforestation. This confusion presents the risk of double counting.

3 CLIMATE FINANCE-GENDER EQUITY FRAMEWORK

This paper draws on the equity framework by McDermott et al. (2013) in order to analyse the relationships between climate finance and gender equity. The equity framework has been widely applied in assessing equity in various aspects, such as the carbon market (Mathur et al., 2014) or Reducing Emissions from Deforestation and Forest Degradation (Luttrell et al., 2013). By raising guiding questions, rather than using the universally applicable model, this framework enables researchers and policy makers to take an inclusive approach in examining the context-specific dynamics of equity.

Table 1. Nature and background of four major existing climate funds

| Climate funds                                      | Nature and background                                                                                                                                                                                                 |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Climate Investment Funds (CIF)                    | CIFs were jointly established by the World Bank and regional multilateral development banks in 2009. They aim to leverage private and public resources to assist developing countries to transit to a low-carbon and climate-resilient future. They are composed of two funds: Clean Technology Fund and Strategic Climate Fund (SCF). Under SCF, there are three programmes: the Pilot Programme on Climate Resilience, the Forest Investment Programme, and the Scaling Up Renewable Energy in Low-Income Countries. |
| Adaptation Fund (AF)                              | AF was established under the Kyoto Protocol in order to provide funds for adaptation programmes in developing countries. It became operational in 2009. Similar to Green Climate Fund (GCF), it is independent of development finance institutions. It is managed by a Board and is equally represent developing and developed countries. It is financed with 2% of revenues generated from the trade of certified emission reduction allocated to the Clean Development Mechanism. |
| Global Environment Facility (GEF)                 | Founded in 1991, GEF was a US$1 billion pilot programme of the World Bank. It is now an independent financial organisation representing 182 member governments in partnership with international institutions, NGOs and the private sector. It assists developing countries by providing grants to developing countries in support of the United Nations environmental agreements. There are two components under GEF: Least Developed Countries Fund and Special Climate Change Fund. |
| Green Climate Fund (GCF)                          | In 2012, the Conference of Parties in Cancun agreed to establish GCF under the United Nations Framework Convention on Climate Change. GCF offers a mechanism to deliver adaptation and mitigation finance in developing countries. GCF has caught most attention as it is the newest (coming into operation in late 2014) and the most ambitious (it has agreed a 10-year financing plan that developed countries will increase the funds to US$ 100 billion per year by 2020). The new fund is overseen by a Board of 24 members, equally representing both developing and developed countries. Headquartered in South Korea. Equally importantly, it lays down ‘gender sensitivity’ as one of the guiding principles. |

Table complied by author, sources from Kongsager and Corbera (2015), Pickering et al. (2015) and Oxfam (2011).
There are three levels of analysis in the equity framework of McDermott et al. (2013); they are the following: contextual, procedural and distributive. Contextual equity touches on the capacities of different actors and examines how existing social and institutional conditions shape people’s access to resources. Procedural equity is concerned with the decision-making process in participatory space. It highlights inclusion/exclusion, representation and accountability. Distributive equity explores how costs, benefits and risks are shared amongst group members and examines elements of fairness in the distribution process.

I add gender into their equity framework and develop my own climate finance–gender equity model (Figure 1).

The ‘contextual–procedural–distributive’ equity framework is useful to analyse what Schalatek (2009) calls ‘mitigative and adaptive capabilities’ between men and women. Firstly, the contextual equity touches on how the social positions of men and women affect their entitlements to climate finance and how different actors negotiate access. In this dimension, I focus on three aspects: (i) incentives: what motivates women and men to take certain climate actions, and how livelihood priorities explain the differences; (ii) access: who can get access to what resources and what mediates the access process; and (iii) processes of negotiation.

Secondly, the procedural equity scrutinises the process of public participation and analyses how previously marginalised women and men make decisions in the use of climate finance. I am particularly interested in exploring whether the engagement process is inclusive and democratic and how decisions are made in both formal and informal settings. Thirdly, the distributive equity examines whether, and how, the practical and strategic needs of women and men are met through climate finance. Practical needs are a response to immediate perceived necessity, whereas strategic needs address the structural causes that lead to subordination and inequalities (Moser, 1993).

In my framework, mitigation, adaptation and disaster-management are selected as three climate change-related strategies that financial resources are channelled to. Under mitigation, I choose to consider forest sequestration and surveillance. I select agriculture for adaptation, and then information and communication dissemination for disaster management. These particular interventions are selected based on two criteria: Firstly,
significant amounts of climate funds have been invested in these areas. Buchner et al. (2014) estimate that 8 per cent of total climate finance (equivalent to US$26.5 billions) were diverted to forestry and agricultural activities and 9 per cent (US$30 billions) to disaster risk management. Secondly, these areas have direct links to land-use management and human livelihoods. Access to resources involves complex processes of negotiation, and this has significant implications for gender relationships.1

Methodologically, I focus on development and gender literature and journals and use the three strategies as the keywords to filter the literature. Attention is paid to case studies that provide details of local contexts and institutional arrangements that shape the processes of negotiation between women and men in access to land, capital and other climate-related resources.

4 MITIGATION, FOREST SEQUESTRATION AND SURVEILLANCE

Forest sequestration, one of the key mitigation strategies, ranks high in climate finance. Forest Trends (2015) reports that forest carbon finance reached a record-breaking US $257 million. On the one hand, 20 per cent of global carbon emissions come from deforestation (van der Werf et al., 2009). Modern technologies, such as digital images by satellite, have been used to monitor illegal logging and to avoid existing forests being further degraded. On the other, afforestation, reforestation and forest restoration facilitate bio-sequestration of atmospheric CO2. Palm et al. (2005) estimate that reforestation in the humid tropics alone would be able to sequester 27 to 90 billion tonnes of carbon [cited in Le et al. (2012)]. In the New York Climate Summit in 2014, for instance, the endorsers of the Declaration on Forests committed to restore 150 million hectares of forest globally by 2020 and 350 million hectares by 2030 (Locatelli et al., 2015).

A varied body of research also suggests that getting local communities involved in forest management, such as tree-planting and forest surveillance, helps improve their livelihoods in various ways (World Bank, 2009; Food and Agriculture Organization (FAO), 2010). Villagers obtain valuable resources from forests, such as fuel and fruit. Engaging communities in monitoring local forests, known as participatory forest surveillance, could also increase their incomes because some surveillance projects offer community members money for conducting on-the-ground carbon-stock assessment by using mobile mapping and hand-held devices (Elson, 2012).

Women are targeted in community forest projects because they are considered the primary users and managers of forest resources. Some projects also advocate the use of women’s specific knowledge of ecosystems, forest history, tree species, plant distribution and geography to maximise the impact (Jhaveri & Giri, 2013).

4.1 Contextual Equity

While financing forest sequestration projects may sound straightforward, questions as to what tree species are planted, how trees are protected and who carries out the planting in

1Apart from these three areas, climate finance touches on many other interventions, such as renewable energy, energy efficiency and transport in the area of mitigation and water supply and management, resilience infrastructure and coastal protection in regard to adaptation. Readers are reminded that the gender implications may be different because of different contexts, politics and institutional arrangements around them.
local communities matter to gender equity. Tree-planting is not a gender-neutral activity. Men and women may not often share the same preferences for certain tree species (Kiptot & Franzel, 2011). Research by Djoudi and Brockhaus (2011) in northern Mali shows that women prefer planting fruit- and fuel-wood trees on farms for local use, but men, in contrast, favour the planting of commercial timber, which might involve export markets. These variations in tree selection reflect different priorities in the livelihoods of women and men. Women consider food security as their primary duty at home. Fruit- and fuel-wood trees provide fruit for own consumption and materials for domestic handicraft production. To them, planting timber trees for timber production takes much longer to reach a harvest and that does not meet families’ immediate needs. On the surface, the differences between men and women may reflect the different types of knowledge and skills they possess, but Nelson and Stathers (2009) argue that these differences can be explained by the gendered expectations and responsibilities in production, reproduction and trade between men and women.

Another explanation for the differences between male and female preferences lies in their unequal access to land rights, entitlements and assets. According to Bernier et al. (2013), women face more obstacles in accessing credit and cash and that prevents them from replacing dead trees. Being deprived of land rights, women are also aware that they will lose all the benefits of tree-planting after divorce or widowhood. Quite a few studies also indicate that men control access to land through customary tenure (Agarwal, 2009; Cleaver, 2012). They are the final decision-makers in tree management. With limited land ownership and control over productive resources, women, compared with men, may not have strong incentive to engage in tree-planting.

Some research also suggests that the selection of certain tree species is not simply based on free will, but social construction and cultural constraints. In their study, Banana et al. (2012) find that there is a belief in Uganda that if women plant ‘Mutuba’ trees, their husbands will become impotent.

### 4.2 Procedural Equity

To promote good governance, community members, especially women, are encouraged to be active in forest management and to join in forest surveillance. A varied body of research suggests that women’s active involvement in local forest committees and groups has a positive impact on forest conservation and gender empowerment (Jhaveri & Giri, 2013). Based on their forest research in Uganda, for instance, Buyinza and Naguula (2007) suggest that increasing women’s involvement in the decision-making process helps speed up forest regeneration and reduce illegal harvesting.

However, there is emerging evidence suggesting that not all participatory arrangements automatically lead to empowerment. Without the right kind of support or without the determination to challenge existing gender discrimination, women’s involvement may simply help reinforce gender inequalities. In their study in Mexico, Peters-Guarin and McCall (2010) discover that the reason only men take up senior management posts is because women are not selected for, or do not have the time, to attend, the necessary training courses. Women may easily be excluded from making decisions on communal sacred forests because these forests are controlled by male clan elders and village leaders. On some occasions, some forest managers and funders simply take an instrumental perspective, considering community forest surveillance to be a cost-saving exercise, rather than an empowering process. In their research in Cameroon, Minang et al. (2007) find out...
that compared with hiring professional or state forest personnel for forest monitoring, using local people can save 50 to 70 per cent of recruitment and labour costs.

Women may face more constraints in supporting forest surveillance than men. For instance, women are not encouraged to make long journeys (Castren & Pillai, 2011). The social expectations around women being domestic carers also reduce their chances of participation. Additionally, compared with men, women have lower levels of literacy and general education. The lack of human capital also undermines their confidence and capability in using advanced digital technology, such as hand-held devices, for surveillance.

4.3 Distributive Equity

Using climate finance to promote carbon storage and forest sequestration may improve rural people’s livelihoods by income generation, social capital building and forest conservation. However, whether women could share the benefits hinges on their bargaining power with men. A varied body of research suggests that women’s disadvantaged social positioning and the unequal intra-household relationships mean that the benefits of sustainable forest management are not always evenly distributed (Agarwal, 2010).

Tree management could be a gendered activity—while men are expected to take up tasks, such as pruning, thinning and digging, women are often responsible for watering. Yet, trees require daily watering, especially during the period of establishment or during the dry seasons (Wong, 2014). Kobbail (2012), therefore, argues that the environmental tree-planting projects could add the burden of water collection on women and girls, and simultaneously trap them at home because of the gendered division of labour.

Forest monitoring may help women and girls gain freedom by leaving their home and engaging with forest surveillance. Forest monitoring, however, poses a serious threat to the personal safety of women and girls. They bear a high risk of assault and rape, if they are caught by illegal loggers, and that would bring shame to their families and communities (Fischer & Chhatre, 2013).

5 ADAPTATION AND CLIMATE-SMART AGRICULTURE

Adaptation is a process of adjustment to climate-related shocks and stressors (Okali & Naess, 2013: 2). Ospina and Heeks (2010) suggest that climate finance helps enhance the adaptive capacity of vulnerable communities by ‘strengthening their coping strategies to withstand, recover from and adapt to climate change’ (p1). It also builds livelihood resilience with information, tools and support that will enable them to address long-term climate impact. The Green Climate Fund (2015) reports that US$2 billion has been spent to support adaptation in the agricultural sector alone.

I select agriculture as a case for three reasons: firstly, according to The Food and Agriculture Organisation (2002), agriculture is responsible for 14 per cent of global greenhouse gas emissions. Methane and ammonia, generated from animal manure, are 20 times more powerful in their warming action than CO2. FAO also predicts that, by 2030, emissions of methane and ammonia from the livestock sector in developing countries could be 60 per cent higher than at present.

Secondly, both arable and livestock farming are vulnerable to climate change, not least because the industry already consumes some 70 per cent of abstracted water. Climate change
brings about unpredictable rainfall patterns resulting in prolonged droughts and devastating floods. Such changes can trigger shifts in agricultural processes and reduce productivity. This, in turn, could lead to food shortages and malnutrition—thus, worsening poverty and increasing vulnerability (International Institute for Sustainable Development, 2011).

Thirdly, the World Bank has been promoting climate-smart agriculture that aims to enhance the adaptive capacity of farmers facing changing climate. Climate-smart agriculture is defined as new farming practices that intend to increase productivity and strengthen farmers’ resilience, and simultaneously, to reduce greenhouse gas emissions and to increase carbon sequestration by changing farming practices (World Bank, 2012a). Farming is particularly crucial to women as they make up of 43 per cent of the total agricultural labour force in the world, and 50 per cent in Sub-Saharan Africa (Doss, 2011). Changing farming and water management practices, induced by climate change, will have significant gender impact because women and girls are generally expected to secure water, energy and food resources for their families in developing countries. Water stress, caused by prolonged droughts, means that they have to walk greater distances to find water in rural areas or spend more time queuing for intermittent water supplies in urban areas. These changes have significant health implications for the increased workload and through sheer physical exhaustion (Bathge, 2010).

5.1 Contextual Equity

Evidence has shown that channelling climate finance to promote climate-smart agriculture by providing farmers with more climate information and climate-friendly innovations help them adjust their farming practices (Nciizah & Wakindiki, 2015; Robert et al., 2015). Research by Nelson and Stathers (2009) in semi-arid Tanzania, for example, shows that farmers have been growing drought-tolerant food crops and faster-maturing sorghum varieties to reduce risk from changing rainfall patterns.

A varied body of research underlines the role of gender in shaping farmers’ incentives for adaptation. Asking male and female farmers in Dodoma Region, Tanzania, about their motivations for changing their cultivation practices, Swai et al. (2012) find out that women are driven by the worries about crop failure and shortages of food, water and firewood caused by climate change and how that affects the well-being of their family members. Their male counterparts, in contrast, are more confident in minimising the negative impact of climate change on their crops, livestock and the environment. Similarly, in their participatory research in Rakai District, Uganda, Jost et al. (2015) discover that the incentives for adaptation are equally gendered. While their male respondents consider changing their farming practices as an income-generating opportunity, the females, in contrast, are more concerned with access to resources, such as cash, which makes them feel less vulnerable to climate change.

The impact of introducing new varieties of seeds shows a rather mixed picture. Based on their research in the semi-arid Tanzania, Nelson and Stathers (2009) suggest that the increased sale of groundnuts, bambara nuts and cowpeas—all traditionally sold by women—has increased women’s access to, and control of, incomes. The introduction of sunflower and sesame plants has, however, made some women worse off because these new crops require more frequent weeding, and thus bring about an increase women’s workload. Although the overall household incomes may have been increased by cultivating these crops, the unequal intra-household power relationships mean that women do not get the same return as men from their input.
5.2 Procedural Equity

Building adaptive capacity of men and women by participation has been widely discussed. A wide range of literature has indicated that encouraging more women to become involved in local land and water management affect resource governance and conservation outcomes (Agarwal, 2009; Leisher et al., 2015).

There is, however, emerging evidence highlighting the constraints of adaptation that many women face. Research by Jost et al. (2015) shows that both women and men in Kyengeza, rural Uganda, are aware of the importance of micro-irrigation, water harvesting and trench construction in the management of soil and in water conservation. In practice, however, these measures are so labour- and capital-intensive that they are largely used and carried out by men only, because women are constrained by limited access to labour and cash that they need for these tasks. In the same research, Jost et al. find out that men in Kyengeza are twice as likely as women to travel outside their home towns to buy improved seeds and to sell their produce at markets. Apart from lacking money to pay for transportation, the researchers argue that factors, such as women’s heavy household responsibilities, the perception of safety, health and the failure to obtain permission to travel from their husbands, all play a role in restricting their participation and mobility.

Women’s struggle in pursuing adaptive strategies requires a deeper understanding of the unequal power relationships in communities. To avoid successive flooding and droughts, women in Soroti district in Eastern Uganda want to shift their cultivated fields to higher ground during times of flood and to lower ground during periods of drought. However, land in that area is owned and controlled by male clan leaders. Women constantly need to seek permission in order to make any changes on the farmland (Nabikolo et al., 2012).

To empower women to influence adaptation plans and policies, many adaptation projects try to promote women leadership and to seek fairer gender representation in water committees and farming groups. In the irrigation projects in Egypt, for instance, Deloitte (2012) report that each village was asked to select at least one woman and one man to be trained as community facilitators so as to share the knowledge of climate-smart farming with their community members.

Promoting equal representation of men and women in formalised governance structures has the potential to bring about greater gender equity if questions, as to who these women are, what interests they represent, and what they are expected to perform, are answered. In his trans-boundary water governance project in West Africa, Wong (2009) suggests that villagers often choose the wives of their chieftains to represent their interests in meetings because they were the authority figures in the villages. The chieftains’ wives were also keen to partake because their involvement could further develop their husbands’ social and political capital. This means they may not always represent the interests of the female villagers.

5.3 Distributive Equity

The impact of channelling climate funds to adaptation depends on how costs and benefits are distributed. Some evidence, indicated in the preceding texts, shows that women could be better off. However, MacGregor (2010) warns that adaptation practices could be built on women’s unpaid labour because adaptation projects tend to believe that women are closer to nature, so they are predisposed to take up an environmental care-tending role. This mistaken belief risks increasing women’s workload, without properly addressing their
strategic needs. Another unintended consequence is that, in order to juggle increasing demands, women may shift more domestic responsibilities to their daughters, and that could reproduce inter-generational inequalities (Oxfam, 2011).

Similar to the previous section on mitigation, women are often not entitled to land rights because of customary laws and that affects their access to loan, credit and agricultural extension services (Bernier et al., 2013). A lack of power to make decisions arising from climate change for their own farms, Olson et al. (2010) argue, weakens women’s incentives in making long-term investments in land rehabilitation and engaging in environmentally sustainable farming practices.

One of the solutions to address these structural problems could be formalising women’s legal land rights. A number of studies have found that land certification, for instance, significantly increases productivity on plots farmed by females in Ethiopia (Bezabih et al., 2012). Under the right circumstances, formalising women’s legal land rights could contribute to empowering women’s decision-making power. The stickiness of cultural norms, however, remains a challenge to achieving gender equity. Gladwin et al. (2001), for instance, suggest that many women still accept the idea that land is not individually owned. Rather, they view land as joint resources that share among family and kin members. They are, therefore, reluctant to fight for their individual land rights when conflicts arise. In addition, women still consider food provision as their primary role at home. This internalised, gendered stereotype places them under disproportionate pressure in balancing productive and domestic responsibilities.

6 DISASTER MANAGEMENT AND INFORMATION DISSEMINATION

Climate change brings about erratic climatic patterns and that could result in losses of human life, property and livelihoods. A significant proportion of climate finance has, therefore, been invested in improving climate monitoring and detection, installing early warning systems for disasters and strengthening disaster response capacities. Watson et al. (2015) estimate that at least US$13.6 billion has been spent on disaster risk reduction between 1991 and 2010.

The effectiveness of disaster management, Artur and Hilhorst (2012) argue, depends on how well we capture people’s ‘everyday practices of disaster response’ (p530) that enable some men and women to have better preparation for disasters and constrain others from efficient evacuation. In this section, I focus on the disaster information dissemination. By assessing how information is collected, processed, analysed, managed and disseminated before, and during, the occurrences of disasters, I will highlight the gender-differentiated vulnerability to disasters. I will also examine how access to information and process of evacuation are culturally shaped.

6.1 Contextual Equity

Men and boys, and women and girls, are exposed to different types and levels of disaster risks and these impact on them in different ways (International Federation of Red Cross and Red Crescent Societies (2010). Worldwide, disasters generally hit women and girls more than men and boys. Wright et al. (2015) draw on the Intergovernmental Panel on Climate Change research, suggesting that based on statistical evidence from 141
countries between 1981 and 2002, disasters kill more women, and these at an earlier age, than men. In the Asian Tsunami in 2004, women were accounted for 70 per cent of total deaths in the most affected areas. In Aceh alone, two-thirds of the victims were female. Most of the deceased were the elderly and children of nine years old and younger (Benelli et al., 2012).

Biologically, men have stronger upper body strength and that helps them pull themselves out of the currents when tsunami and floods strike. The physical weakness of women and girls could also be explained by nutritional deficiencies caused by less access to food than men and boys (World Health Organisation, 2014). Furthermore, during the Tsunami, many women and children were caught inside their homes, while men were working out in the open. Owing to the traditional social roles, women are responsible for the care of children, the elderly and the disabled. Their attempts to rescue these family members are at the expense of their own safety. Similarly, research by Dhungel and Ojha (2012) also suggests that women in Nepal are generally not allowed to leave home without male permission. This social norm delays their escape attempts and adds to their vulnerability.

Because of these factors, early warning systems need to address the cultural constraints that delay the timely escape of the vulnerable. Swimming and tree climbing, for example, are useful skills for escaping flash floods, but these skills are traditionally taught to males. In Muslim societies, women’s style of clothing could reduce their mobility in an emergency (Institute of Development Studies, 2008).

### 6.2 Procedural Equity

The high death tolls of women and girls, according to Bradshaw and Fordham (2013), are not inevitable. Citing the research by Buvinic (1999), they suggest that no deaths were recorded after Hurricane Mitch hit La Masica in Honduras largely because women had access to the early warning systems, so that they were able to act upon these early warnings.

Traditionally, early warnings for disasters in developing countries were disseminated in the public open spaces. Such open-space communication may offer an opportunity for community members to meet face-to-face. Yet, women in many countries are still disadvantaged by cultural practices, such as seclusion, that they need to be accompanied by male relatives in public spheres (Schwoebel & Menon, 2004). These restrictions on their access to public spaces reduce their chance of obtaining useful information in times of emergency.

Modern-day use of mobile phones, community radios and public announcements may help women break the effects of cultural barriers by creating real-time disaster alerts. SMS messages about disaster early-warnings are sent to mobile-phone owners before disasters strike. Community radio offers another platform to launch public campaigns and education programmes. In North Nigeria, for instance, radio drama is used to enhance the interactive process of learning and dialogue with farming communities. It helps promote local adaptation strategies and link up audiences with local climate change organisations (Ospina & Heeks, 2010). To encourage dialogue with community members and to improve governance, community radio encourages listeners to provide feedback through text messages or phone-ins (IISD, 2011). Such communication systems raise awareness of possible disasters arising from climate change and enable community members to respond more positively when emergency messages are replayed.
The success of the interactive and participatory approach of the modern technologies, Schwoebel and Menon (2004) argue, hinges on whether, and how effectively, the vulnerable social groups, including women, are involved in the disaster management decision-making process. Drawing on the case study of the Comite de Emergencia Garifuna de Honduras, Bradshaw and Fordham (2013) find out that women were active members of emergency preparedness committees, which enabled them to receive leadership training for disaster management. Illiteracy and language barriers may become an obstacle for text-based messaging services. To address these constraints, IISD (2011) suggests that the Community Flood Information System in Bangladesh makes the SMS services more user-friendly. Instead of sending word-based messages, the System uses simple symbols, such as +ve and –ve, to indicate flood intensity.

These examples have shown that, whether climate information is effectively disseminated amongst affected communities depends on who owns the technology and the knowledge about people’s preferences for receiving information. In term of mobile phone ownership, Groupe Speciale Mobile Association (2010) estimates that there are 300 million fewer women than men who own mobile phones in developing countries. In research, women may claim to have their own mobile phones. Yet, based on their ethnographic research in rural Northern Uganda, Wesolowski et al. (2012) finds out that the mobile phones of many women actually belong to their husbands. Some of them require permission before they can use them. This further restricts women’s freedom in access to disaster- and climate-related information.

The effectiveness of community radios to disseminate information can also be constrained by unequal intra-household power dynamics. Research by Gurumurthy (2004) shows that it is often men, rather than women, who control the access to radio. This may explain why, in their comparative studies in Bangladesh, Ghana and Uganda, Chaudhury et al. (2012) find out that it is the men, rather than the women, who use radio to obtain climate information.

6.3 Distributive Equity

I have suggested, in the previous section, that women are statistically more likely to die during disasters. It is yet always the case, especially in the aftermath of a disaster. When Hurricane Mitch hit El Salvador and Guatemala in 1998, most victims were actually men (International Federation of Red Cross and Red Crescent Societies, 2010). Research by the WHO (2002) finds out that men, separated from their wives by disasters, can suffer from poor nutrition because they do not know how to cook properly. These examples show that disasters hit both women and men.

Disaster-related resources are, however, distributed and disbursed based on gender stereotypes. Men tend to receive more evacuation resources because they are considered effective rescuers when disasters occur, but this can expose men to greater risk (Haynes et al., 2010). Using climate finance to enhance the capacities of disaster preparedness and evacuation, therefore, needs to deal with the impact of masculinity. During the 2004 Asian Tsunami, the United Nations (2011) reports that men often consider saving their families as heroic, so they often become the last persons to leave the disaster scenes. Additionally, masculinity has significant implications to the welfare of women. Schwoebel and Menon (2004) show that women’s workload is increased considerably when their husbands are absent after disasters.
7 CONCLUSIONS AND POLICY IMPLICATIONS

Whether climate finance makes real differences to climate change and gender equity simultaneously it deserves closer scrutiny. Drawing on an extensive range of literature, this paper has used the contextual–procedural–distributive equity framework to assess the effectiveness of the implementation processes and outcomes of the three key climate finance-targeted interventions in forest sequestration, climate-smart agriculture and disaster management.

In forest sequestration interventions, existing climate funds have not shown adequate awareness of the diverse and complex motivations of men and women for tree-planting and forest surveillance. By assuming that forest sequestration and surveillance are necessarily beneficial to both women and men, there is the risk of homogenisation, especially of women’s livelihood priorities. Similarly, the existing policies of climate-smart agriculture have not paid sufficient attention to the gender gap in access to land, capital and other productive resources. Eagerly engaging women in climate-smart agriculture, without fully understanding the constraints and insecurity they face, risks reinforcing women’s subordinated positions. In disaster management, not sufficient attention has been paid to the cultural norms that shape information dissemination. This would constrain women, in particular, from timely evacuation. All in all, these three strategies have tried to engage with local communities, but my examples have illustrated that the costs and benefits of formal participation and resource allocations are not often evenly distributed between women and men. Greater participation amongst women, without adequate understanding of underlying factors, would simply increase their workloads, without empowering them.

My analyses have, however, pointed out that climate finance, especially Green Climate Fund, has the potential to strengthen the resources and rights of both previously-deprived women and men, and consequently to achieve gender equity, if climate finance is willing to take up the challenges of addressing gender discrimination. For example, more attention and resources are needed to tackle the deeply rooted social structures that have left the majority of women insecure in terms of land tenure. Some of the strategies could be re-designed by better incorporating gendered behaviours and knowledge in land and water management. A more critical power analysis would also help enhance the effectiveness of community involvement in mitigative and adaptive capacity building.

This paper also suggests that climate finance offers significant implications for aid to further promote gender equity. The effectiveness of aid, similar to climate finance, depends on building the right capacities and institutions that help both powerless women and men to challenge structural constraints. Furthermore, the three dimensions of contextual, procedural and distributive equity may result in trade-offs, which require aid policy makers to conduct more robust gender monitoring and evaluation.

REFERENCES

Agarwal B. 2009. Gender and forest conservation: the impact of women’s participation in community forest governance. Ecological Economics 68: 2785–2799.

Agarwal B. 2010. Gender and Green Governance: the Political Economy of Women’s Presence. Oxford University Press: Oxford.
Artur L, Hilhorst D. 2012. Everyday realities of climate change adaptation in Mozambique. *Global Environmental Change* **22**: 529–536.

Banua A, Bukenya M, Arinaitwe E, Birabwa B, Ssekindi S. 2012. *Gender, tenure and community forests in Uganda*. Working Paper 87. Centre for International Forestry Research.

Barrett S. 2014. Subnational climate justice? Adaptation finance distribution and climate vulnerability. *World Development* **58**: 130–142.

Bathe S. 2010. Climate change and gender: economic empowerment of women through climate mitigation and adaptation. Working Paper. Governance and Democracy Division, GTZ Governance Cluster.

Benelli P, Mazurana D, Walker P. 2012. Using sex and age disaggregated data to improve humanitarian response in emergencies. *Gender and Development* **20**(2): 219–232.

Bernier Q, Franks P, Kristjanson P, Neufeldt H, Otzelberger A, Foster K. 2013. Addressing gender in climate-smart smallholder agriculture. ICRAF Policy Brief 14. World Agroforestry Centre.

Bezabih M, Holden S, Mannberg A. 2012. The role of land certificate in reducing gender gaps in productivity in rural Ethiopia. Centre for Land Tenure Studies. Norwegian University of Life Sciences.

Bird N, Beloe T, Ockenden S, Corfee-Morlot J, Zou S. 2013. Understanding Climate Change Finance Flows and Effectiveness – Mapping of Recent Initiatives. ODI: London.

Bradshaw S, Fordham M. 2013. Women, Girls and Disasters. A Review for DFID. DFID: London.

Buchner B, Stadelmann M, Wilkinson J, Mazza F, Rosenberg A, Abramskiehn D. 2014. The Landscape of Climate Finance 2014. Climate Policy Initiative. San Francisco.

Buyinza M, Naguula A. 2012. Adoption of agroforestry technology and land conservation strategies in the Highlands of Southwestern Uganda. *Makerere University Research Journal* **2**: 13–24.

Calland R, Dubosse N. 2011. The Politics of Climate Finance. Heinrich Boll Stiftung. Berlin.

Castren T, Pillai M. 2011. Forest Governance 2.0: A Primer on ICTs and Governance. Program on Forests (PROFOR): Washington, DC.

Chaudhury M, Kristjanson P, Kyagazze F, Naab B, Neelormi S. 2012. Participatory gender-sensitive approaches for addressing key climate change-related research issues. Working Paper 19. CGIAR Research Program.

Ciplet D, Roberts T, Khan M, Fields S, Madden K. 2013. Least Developed, Most Vulnerable: Have Climate Finance Promises Been Fulfilled for the LDCs? European Capacity Building Initiatives. Oxford.

Clapp C, Ellis J, Benn J, Corfee-Morlot J. 2012. Tracking Climate Finance: What and How? Organisation for Economic Co-operation and Development. Paris.

Cleaver F. 2012. Development Through Bricolage. Rethinking Institutions for Natural Resource Management. San Francisco.

Deloitte. 2012. eTransform Africa: Agriculture Sector Study. Sector Assessment and Opportunities for ICT. Deloitte Consulting: New York.

Dhungel R, Ojha R. 2012. Women’s empowerment for disaster risk reduction and emergency response in Nepal. *Gender and Development* **20**(2): 309–321.

Djoudi H, Brockhaus M. 2011. Is adaptation to climate change gender neutral? Lessons from communities dependent on livestock and forests in Northern Mali. *International Forestry Review* **13**(2): 123–135.

Doss C. 2011. *The role of women in agriculture*. ESA Working Paper No. 11. Cheryl Doss and SOFA Team.

Elson D. 2012. Guide to Investing in Locally Controlled Forestry. Growing Forest Partnerships. http://www.growingforestpartnerships.org/

FAO. 2010. Climate-Smart’ Agriculture. Policies, Practices and Financing for Food Security, Adaptation and Mitigation. : Rome.

FAO. 2002. World agriculture: towards 2015/2030. Summary report. Rome.
Fischer H, Chhatre A. 2013. Environmental citizenship, gender and the emergence of a new conservation politics. *Geoforum* 50: 10–19.

Forest Trends. 2015. Converging at the Crossroads: State of Forest Carbon Finance in 2015. Forest Trends Association: Washington D.C.

Gladwin C, Thomson A, Peterson J, Anderson A. 2001. Addressing food security in Africa via multiple livelihood strategies of women farmers. *Food Policy* 26: 177–207.

Green Climate Fund. 2015. Analysis of the expected role and impact of the Green Climate Fund. Meeting of the Board. 24–26 March: Songdo, Republic of Korea.

GSMA. 2010. Women and Mobile: A Global Opportunity. Partnership with the Association and Cherie Blair Foundation. London.

Gurumurthy A. 2004. Gender and ICTs: Overview Report. Institute of Development Studies: University of Sussex.

Haynes K, Lassa J, Towers B. 2010. Child centred disaster risk reduction and climate change and climate change adaptation. Working Paper II. IDS: Brighton.

IDS (Institute of Development Studies). 2008. Gender and Climate Change: Mapping the Linkages - A Scoping Study on Knowledge and Gaps. IDS: Brighton.

IISD. 2011. Africa transformation-ready: the strategic application of information and communication technologies to climate change adaptation in Africa.

International Federation of Red Cross and Red Crescent Societies. 2010. A practical guide to gender-sensitive approaches for disaster management.

Jhaveri N, Giri K. 2013. Scoping Study of Good Practices for Strengthening Womens’ Inclusion in Forest and Other Natural Resource Management Sectors. UN-REDD, Geneva.

Jost C, Kyayazzie F, Naab J, Neelomi S, Kinyangi J, Zougmore R, Agarwal P, Bhatta G, Chaudhury M, Tapio-Bistrom M, Nelson S, Kristjanson P. 2015. Understanding gender dimensions of agriculture and climate change in smallholder farming communities. *Climate and Development* 1–12 (open access article). http://www.tandfonline.com/doi/full/10.1080/17565529.2015.1050978

Kobbail A. 2012. Local people attitudes towards community forestry practices. *International Journal of Forestry Research* (open access) 2012: 1–7.

Kiptot E, Franzel S. 2011. Gender and agroforestry in Africa: are women participating? Occasional Paper No.13. World Agroforestry Centre: Nairobi.

Kongsager R, Corbera E. 2015. Linking mitigation and adaptation in carbon forestry projects: evidence from Belize. *World Development* 76: 132–146.

Le H, Smith C, Herboln J, Harrison S. 2012. More than just trees: assessing reforestation success in tropical developing countries. *Journal of Rural Studies* 28: 5–19.

Leisher C, Temsah G, Booker F, Day M, Agarwal B, Matthews E, Roe D, Russell D, Samberg L, Sunderland T, Wilkie D. 2015. Does the gender composition of forest and fishery management groups affect resource governance and conservation outcomes: a system map protocol. *Environmental Evidence* 4(13): 1–7.

Locatelli B, Catterall C, Imbach P, Kumar C, Lasco R, Marin-Spiotta E, Mercer B, Powers J, Schwartz N, Uriarte M. 2015. Tropical reforestation and climate change: beyond carbon. *Restoration Ecology* 23(4): 337–343.

Luttrel C, Loft L, Gebara M, Kweka D, Brockhaus M, Angelsen A, Sunderland W. 2013. Who should benefit from REDD+? Rationales and realities. *Ecology and Society* 18(4): 52–69.

MacGregor S. 2010. Gender and climate change: from impacts to discourses. Research Centre for the Study of Politics, Keele University.

McDermott M, Mahanty S, Schreckenberg K. 2013. Examining equity: a multidimensional framework for assessing equity in payments for ecosystem services. *Environmental Science and Policy* 33: 416–427.
Minang P, McCall M, Skutsch M, Verplanke J. 2007. S data support infrastructure for clean development mechanism forestry implementation. Mitigation and Adaptation Strategy Global Change.

Moser C. 1993. Gender Planning and Development: Theory, Practice and Training. Routledge: London.

Nabikolo D, Bashaasha B, Mangheni M, Majaliwa J. 2012. Determinants of climate change adaptation among male and female headed farm households in Eastern Uganda. *African Crop Science Journal* **20**: 203–212.

Neziah A, Wakindiki I. 2015. Climate-smart agriculture: achievements and prospects in Africa. *Journal of Geoscience and Environment Protection* **3**: 99–105.

Nelson V, Stathers T. 2009. Resilience, power, culture and climate: a case study from semi-arid Tanzania and new research directions. *Gender and Development* **17**(1): 81–94.

ODI. 2014. Climate Finance: Is it Making a Difference? A Review of the Effectiveness of Multilateral Climate Funds. Overseas Development Institute: London.

Okali C, Naess L. 2013. Making Sense of Gender, Climate Change and Agriculture in Sub-Saharan Africa. Future Agricultures Consortium: Brighton.

Olson J, Rubin D, Wangui E. 2010. Gender, Agriculture and Climate Change. A Regional Analysis for USAID/East Africa. United States Agency for International Development: Washington D.C.

Ospina A, Heeks R. 2010. ICTs and climate change adaptation: enabling innovative strategies.

Climate Change, Innovation and ICTs Project, Strategy Brief 1

Oxfam. 2011. Climate change and women farmers in Burkina Faso. Impact and adaptation policies and practices. Oxfam Research Report. Oxfam: London.

Peters-Guarin G, McCall M. 2010. Community Carbon Forestry (CCF) for REDD.

Pickering J, Skovgaard J, Kim S, Roberts J, Rossati D, Stadelmann M, Reich H. 2015. Acting on climate finance pledges: inter-agency dynamics and relationships with aid in contributor states. *World Development* **68**: 149–162.

Robert Z, Traore T, Mboodjo Y. 2015. Overview of the scientific, political and financial landscape of climate-smart agriculture in West Africa. Working Paper No.118, CGIAC.

Schalatek L. 2009. Gender and Climate Finance: Double Mainstreaming for Sustainable Development. Heinrich Boll Foundation North America: Berlin.

Schwoebel M, Menon G. 2004. Mainstreaming Gender in Disaster Management Support Project. CEDPA and Chemonics International Inc.: New Delhi.

Stadelmann M, Michaelowa A, Roberts T. 2013. Difficulties in accounting for private finance in international climate policy. *Climate Policy* **13**(6): 718–737.

Steele P, Rai N, Nhantumbo I. 2015. Beyond loans: instruments to ensure the poor access climate and development finance. IIED Briefing.

Swai O, Mbwambo J, Magayane F. 2012. Gender and adaptation practices to the effects of climate change in Bahi and Kondoa districts Dodoma Region, Tanzania. *Journal of Sustainable Development* **5**(12): 65–77.

U Nations. 2011. Fact sheet: women, gender equality and climate change. The UN Internal Gateway on Gender Equality and Empowerment of Women.

van der Werf G, Morton D, DeFries R, Olivier J, Kasibhatla P, Jackson R, Collatz G, Randerson J. 2009. CO₂ emissions from forest loss. *Nature Geoscience* **2**: 737–738.

Mathur V, Afionis S, Paavola J, Dougill A, Stringer L. 2014. Experiences of host communities with carbon market projects: towards multi-level climate justice. *Climate Policy* **14**(1): 42–62.

Watson C, Caravani A, Mitchell T, Kellett J, Peters K. 2015. Financing for Reducing Disaster Risk: 10 Things to Know. ODI and UNDP: London.

Wesolowski A, Eagle N, Noor M, Snow R, Buckee C. 2012. Heterogeneous mobile phone ownership and usage patterns in Kenya. *PLoS ONE* **7**(4): e35319.
Wong S. 2014. Can climate finance achieve gender equity in developing countries? UNU-WIDER Working Paper No.64.

Wong S. 2009. Lessons from a transboundary water governance project in West Africa. In Participatory Learning and Action 60 – Community-based Adaptation to Climate Change, Reid H, Alam M, Berger R, Cannon T, Huq S, Milligan A (eds). IIED; 99–106: London.

World Bank. 2009. Rethinking Forest Partnerships and Benefit Sharing: Insights on Factors and Context that Make Collaborative Arrangements Work for Communities and Landowners. World Bank: Washington D. C.

World Bank. 2012a. Climate-smart Agriculture. A Call to Action. World Bank: Washington D.C.

World Bank. 2012b. World Development Report 2012. World Bank: Washington D.C.

World Health Organisation (2014) Gender, Climate Change and Health. Geneva. WHO. 2002. Gender and Health in Disaster.

Wright H, Huq S, Reeves J. 2015. Impact of climate change on least developed countries: are the SDGs possible? IIED Briefing.