

Capstone Project Research Report

Gendered Impacts of Weather and Climate: Evidence from Asia, Pacific and Africa

WEATHER CLIMATE WATER



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EXECUTIVE SUMMARY

In the last decade, the international discourse regarding the nexus between climate change and gender has evolved. However, the causes and types of gender-differentiated impacts on different groups of women and men as they emerge from their experiences “on the ground” are much less understood.

This research report was commissioned as a response to this precise knowledge gap. It analysed the gendered impacts of weather and climate and the gender-specific needs of climate information and services in Asia, Africa and Pacific Small Island Developing States, especially as they emerge from disaster risk management and agriculture and food security, two sectors heavily affected by climate change.

The central research questions that the study sought to answer were:

- How and why are different groups of women and men from the selected regions affected differently by climate-related changes in the disaster risk reduction and agriculture and food security sectors?
- What are the gender-specific needs for weather and climate information in the selected regions and how can climate providers better address these needs?

To address these questions, a comprehensive understanding of men and women’s interaction with their immediate environment (economic, political, cultural and social) and their situation with regard to access to climate resources is crucial. This required a deliberate gender differentiated enquiry into the experiences of these men and women in their respective contexts.

This was achieved by applying an intersectional and multi-level research framework in the analysis of eighteen case studies, including three model case studies from Bangladesh, Fiji and Botswana. The report thus goes beyond existing assumptions that women, in general, are more affected, by analysing the experiences of different groups of women and men, at the intersection of such social categories, like age, economic status, location, marital status, disability.

The **main findings** resulting from the analysis of primary data of this research are the following:

- **State of play:** Climate and weather impacts are not gender neutral but are experienced differently by different groups of women and men, at the intersection of other social determinants, such as economic status, location, age, disability, and marital status.
- **Opportunity:** Climate change has the potential of transformative change in gender relations and roles. Indeed, climate-induced impacts determine women and men to engage in different new activities, leading to new roles in the family and in the community. Women start taking a leadership role among their male counterparts as they engage in alternative livelihoods and income-generating activities.
- **Gap:** There is significantly scarce evidence about the impacts of climate change on different groups of men. There is also very limited empirical data on gender-differentiated needs of climate information. These are potential areas of research to be further explored through further fieldwork and case studies.

The report has also generated a systematic typology of gendered impacts of weather and climate developed by the authors, as emerging from the three regions under study, which found that:

- Rural women and men, disabled and older women, widowed and divorced women, pregnant women and widowers are most affected by climate-related changes;
- Physical impacts on women include extra workloads, increased rate and risk of mortality and morbidity in disasters, as well as of sexual and gender-based violence and early

marriage, while physical impacts on men include migration for livelihood diversification and increased risk of mortality among men with heroic behaviours or working as rescue workers;

- Psychological climate change impacts on women include issues associated with fear of gender-based violence and feelings of shame during disasters, while men are affected more by psychological impacts like social isolation, trauma and depression that can lead to alcohol abuse or even suicide;
- Material impacts are largely felt by both women and men as they lose their assets, however men tend to lose bigger livestock, while women lose small household livestock that tends to be sold the first as a coping mechanism. Women also have less time for livelihood diversification and are more affected especially when their livelihoods are connected to natural resources;

In order to address these impacts and reduce vulnerability by enhancing adaptive capacity of women and men, recommendations for gender-responsive climate information delivery at three levels were made.

- Governments should ensure equal access to resources for both women and men, adopt gender-responsive policies and indicators in climate, disaster and agriculture areas, collect and use gender-disaggregated data and conduct intersectional analysis in climate change;
- NMHS should foster their partnerships and cooperation with various actors, including users; diversify channels of distribution of early warnings and agricultural information to be adapted to users' needs and ensure that the content of messages is timely, user-friendly and comprehensible (by scale, format and language);
- The Global Framework for Climate Services and WMO should ensure meaningful and systematic gender mainstreaming and gender analysis in its programmes, activities, capacity building, trainings and baseline evaluation of National Frameworks for Climate Services.

Though the results of this study cannot be fully generalized, as the effects of climate change are differentiated across regions and countries and each community is different in terms of culture, social and economic aspects, the study finds that climate and weather effects are not gender neutral but are experienced differently by different groups of women and men, at the intersection of other social determinants such as economic status, location, age, disability, and marital status.

INTRODUCTION

Climate change already has severe, pervasive and in some cases irreversible detrimental impacts¹ and the associated risks are likely to increase with the current greenhouse gases emission rate. Four out of ten global risks identified in the 2018 Global Risks Report are environmental-related and they dominate in terms of potential devastating effects.²

These impacts are not gender-neutral, because of socially constructed gender roles, “social structures, institutions and rule systems, (...) differential access to social and environmental resources, social exclusion from decision-making processes and labour markets.”³

Understanding the gendered impacts of climate change can inform policy responses that strengthen the adaptive capacity of people and reduce these vulnerabilities. One such response could relate to climate information and services delivery in a gender-responsive way, which has the potential of reducing the negative gendered impacts of climate change.

The 2014 WMO Conference on the Gender Dimensions of Weather and Climate Services called on improving the understanding of (1) the gender-specific impacts of weather and climate and of the (2) gender dimensions of weather and climate services (...) through increased research (...), including by carrying out gender analysis.⁴ It also required the communication of gender-sensitive weather and climate services.

At the same time, the existing research on gender-differentiated impacts is inconsistent and often generalized, without specific substantiation on empirical evidence “from the field”. It identifies as a norm the impacts on women, without signalling the climate impacts on men and on gender relations and roles. It also very rarely addresses the impacts on different groups of women and men, at the intersection with such social categories as class, age, ethnicity, marital status.

Meanwhile, the CEDAW Committee recalled recently that women living in poverty, indigenous women, women belonging to ethnic, religious and sexual minorities, women with disabilities, women refugees and asylum seekers, internally displaced, stateless and migrant women, rural women, single women, adolescents and older women, are often affected disproportionately compared to men or other women.⁵

Therefore, this capstone project is a research partnership aimed to generate more in-depth knowledge, including by downscaling the findings of the WMO Conference to the regional and country level, through analysis of case studies and empirical evidence from Asia, Africa and the Pacific Small Island Developing States in two climate-related sectors: (1) disaster risk reduction and (2) agriculture and food security.

In doing so, it seeks to address **two objectives**: First, it aims to analyse and systematize the gendered impacts of climate change, as they emerge from empirical evidence in the selected sectors and regions. The study will focus on least developed countries and small island developing states as they are the most vulnerable states to climate change and extreme weather event impacts. Second, it intends to assess the gender-differentiated needs of climate information and services and the ways in which NMHS could respond to such needs, through gender-responsive climate information and services delivery.

Such an attempt will be guided by the following **research questions**:

- How and why are different groups of women and men from the selected regions affected differently by climate-related changes in the disaster risk reduction and agriculture and food security sectors?
- What are the gender-specific needs for weather and climate information in the selected regions and how can climate providers better address these needs?

This Report is **structured** in three sections:

- The first section aims to present the background of climate change and gender research, theoretical basis and concepts, while also presenting the research methodology used;
- The second section zooms in three case studies, one for each region, on both gendered impacts and gender-specific needs of climate information, using a multi-level analysis;
- The third section presents the main findings of a cross-analysis of the three constructed case studies with other primary data researched (especially from all 17 case studies identified in literature). It draws up a typology of gendered impacts and, given that gender impacts on women have been largely described in Section II and Annex II, explains mostly the groups of women and men who are most affected in the disaster and agriculture sectors, as well as the impact of climate-related changes on gender relations and roles. Lastly, it analyses the gender-differentiated needs of climate information as they emerge from analysis and discusses ways in which NMHS could better address those needs.
- The recommendations section of the report aims to be an effective policy-oriented tool for ensuring addressing gendered impacts and ensuring gender-responsive climate delivery.

The main **contributions** of the Report are:

- A systematic typology of gendered impacts of weather and climate developed by the authors, on the basis of primary data from 16 countries in three regions and other empirical evidence (See Annex 2 and Table 5);
 - Recommendations addressed to national policy-makers and NMHS, as well as international policy-makers, for reducing the gendered impacts of weather and climate, in general, and for providing gender-sensitive weather and climate services, in particular;
 - Good practices of climate information and services delivery, including a detailed account of the good practice of Women's Weather Watch and its potential for replication, challenges and lessons learnt;
 - Three constructed case studies with detailed overview of gendered impacts of climate change and gender-differentiated needs of climate information from Bangladesh, Fiji and Botswana.
-

CHAPTER 1. THEORETICAL FRAMEWORK OR SETTING THE CONTEXT

1.1. GENDER AND CLIMATE CHANGE: AN EVOLVING INTERNATIONAL AGENDA

Until a decade ago there was a striking absence of consideration of gender issues in international climate change debates, mechanisms and instruments.⁶ Sherilyn Mac Gregor⁷ wrote in 2009: “Understanding the gender politics of climate change is clearly not an urgent enough priority for it to be on the agenda”, whereas the small amount of gender-sensitive work that existed was carried out by GED researchers working for the UN and NGOs focusing almost exclusively on the material impacts of climate change on vulnerable women in the “Global South”.

Since then, the struggle to integrate gender in climate policy-making has gone a long way. In March 2008 the UNHRC for the first time recognized that climate change has implications for the full enjoyment of human rights⁸. The analytical study commissioned by the OHCHR in 2009⁹ underscored that the effects of climate change will be felt most acutely by those segments of the population who are already in a vulnerable situation due to factors such as poverty, gender, age, minority status and disability. It found that women, particularly older women and girls, are affected more severely and are more at risk during all phases of weather-related disasters, especially in societies in which the socio-economic status of women is low, vulnerability being exacerbated by factors such as unequal rights to property, exclusion from decision-making and difficulties in accessing information and financial services. It finally called for addressing the gender-differentiated impacts of climate change, including by conducting gender-specific vulnerability assessments.

The IPCC also started addressing gender implications of vulnerability and adaptive capacity in 2007, in its Working Group II Contribution to the Fourth Assessment Report¹⁰. It underscored, among others, that gender differences in vulnerability reflect wider patterns of inequality and that climate interventions that ignore gender concerns reinforce such vulnerabilities. A more complex analysis of gender and climate change was included in its 2014 Report, echoing relevant developments in the feminist literature.

The Women and Gender Constituency was established as observer to the UNFCCC in 2010. Under the motto “no climate justice without gender justice”, it keeps gender in focus at UNFCCC CoP meetings. Furthermore, the Paris Agreement for the first-time asked states to consider gender equality and the empowerment of women when taking action to address climate change. In 2017, the first operational Gender Action Plan¹¹ decided on concrete activities to enhance gender-responsive climate policy, building on the Lima Work Programme on Gender.

Finally, the latest annual UNHRC resolution on human rights and climate change adopted in July 2018 called upon states “to adopt a comprehensive, integrated and gender-responsive approach to climate change adaptation and mitigation policies (..), to address efficiently the economic, cultural and social impact and challenges that climate change represents, for the full and effective enjoyment of human rights for all, particularly to support the resilience and adaptive capacities of women and girls both in rural and urban areas to respond to the adverse impacts of climate change”.¹²

Therefore, gender is now well recognized as a critical factor in shaping vulnerability and impacts of climate changes, among other facets of the issue. However, there are also multiple gaps in the literature. The limited climate change and gender data is seemingly inconsistent when it comes to gendered impacts of climate change. A research gap also exists with respect to gender-specific climate information needs and preferred channels of information for women and men in different regions.

Furthermore, it is important to mention that while the vast majority of climate change research has not taken a gender lens, even the explicitly gendered research has focused mostly on women, primarily because of gendered inequalities and patriarchal social and cultural norms. Thus, climate vulnerability is often associated with women as an aggregate category, especially

women from developing and least developed countries, even though gender is a broad “multi-dimensional social” concept and gender analyses should focus on issues of gender relations between women and men.

1.2. DEFINING KEY CONCEPTS

1.2.1. Gender

This report defines ‘Gender’ as the politically and socially constructed roles of and relationships between women and men. Gender is constructed in relation to, and thus concerns both men and women, including conceptions of both femininity and masculinity. This report moves away from the tendency of equating the term ‘Gender’ to focus solely on women or female. Rather, the analysis of this report will focus on both women and men and the inequalities between them. The report aims to illustrate how men and women, based on these socially constructed identities and roles, face different types of climate change related challenges.¹³

1.2.2. Gendered impacts, vulnerability, and adaptive capacity

1.2.2.1. *The complex link between vulnerability, adaptive capacity and resilience*

Specialized literature underlines that climate vulnerability cannot be seen only through the natural hazard that the community is exposed to, but as an interaction of three elements: exposure, sensitivity and adaptive capacity. IPCC defines vulnerability as “a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, the sensitivity and adaptive capacity of that system.”¹⁴

A formal conceptualization to measuring vulnerability along these lines was proposed by Oxford scholar and expert on vulnerability modelling with functional programming and dependent types Cezar Ionescu in 2005¹⁵ (see Figure 1), which was later taken over by other studies and referred to by the IPCC.

In this context, exposure is the nature or degree to which a community is exposed to natural hazards (extreme events or slow-onset events). Sensitivity would refer to the degree in which the respective community is affected by other factors (such as social and institutional) and adaptive capacity is the ability of the community to better respond and manage the exposure and sensitivity.

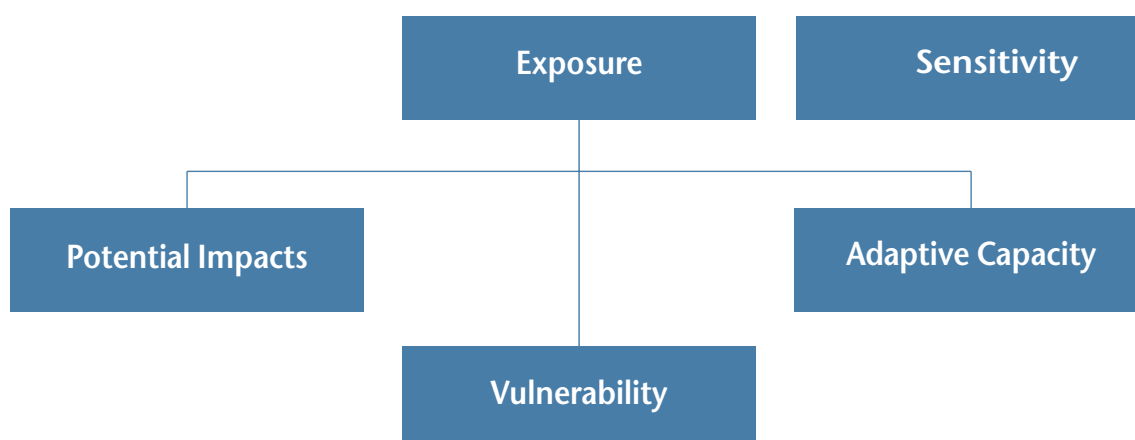


Figure 1. Conceptualizing Vulnerability

Vulnerability, therefore, is directly linked with the capacity to “anticipate, cope with, resist and recover from the impact of natural hazards”.¹⁶ It refers to “factors that in combination produce a lack of capacity to respond effectively”, which are “characterized by gender, poverty, educational disadvantage, reduced service access, lack of employment options and other aspects of socio-economic disadvantage.”¹⁷ IPCC has also recognized in its 2014 Report the gender dimension of vulnerability and has emphasized that vulnerability is rarely due to a single cause, rather it is “the product of intersecting social processes that result in inequalities in socio-economic status and income, as well as in exposure”.¹⁸

Peoples, households’ and countries’ vulnerability have a multidimensional and complex nature¹⁹, which can rely on different socio-economic indicators. Vulnerability is not a static concept and its dynamics need to be captured also in relationship with resilience (or adaptive capacity). The IPCC report²⁰ defined resilience as the capacity of “social, economic, and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure.”

Therefore, there is a direct link between vulnerability and adaptive capacity (which includes access to climate information and services). Increasing resilience and adaptive capacity through better access to climate information and services has the potential to reduce vulnerabilities.

1.2.2.2. ***Gender-differentiated impacts and vulnerability***

Literature has evolved from viewing individual gender vulnerability in terms of physical and biological intrinsic characteristics of women as a group to understanding them as expressions of existing gender inequalities and different gender roles and relations in society.

Recent gender analysis of climate change issues also criticizes earlier tendencies to present all women as victims, especially women from the «Global South», women from developing and least-developed countries and linking such statements to poverty.

According to Hemmati and Röhr, women represent a significant share of the poor and are likely to be disproportionately vulnerable to the effects of climate change²¹. Others note that 70% of the people in the developing world living below the threshold of poverty are women.²² This indicated that people who are more socially and economically marginalized are more vulnerable to the detrimental effects of climate change. The argument that women constitute a particularly vulnerable group were also put forward by international climate change documents and submissions to the UNFCCC, including by the CSW, Gender CC, UN Women Watch, as documented by Resurrection.²³

While recognizing that earlier work done on the gender inequalities in the material impacts of climate change is important, particularly in alerting us to the hardships experienced by poor women in the developing world, such an analysis is believed to be too narrow. MacGregor²⁴ argues that the focus on women only leaves out the broader socio-cultural context in which norms are embedded. She argues that with such an approach there is a reduced chance of understanding the gender relational aspects of climate politics, particularly those shaped by inequalities of power and access to resources.

Arora-Johnsson²⁵ also argues that while poverty is a key component of vulnerability, it is not the only, nor necessarily the best, component in terms of predicting impact. Nancy Tuana²⁶ echoes these criticisms by underscoring that such generalizations risk reinforcing the current inequalities, by rendering women as passive and susceptible; assuming that men are not vulnerable to climate change; and making it difficult to appreciate women’s agency. She underlines that the importance of gender, just like the impacts of climate change, will not be effectively understood as long as it is approached in an aggregate perspective.

IPCC²⁷ also underlines that reasons for gendered differences in vulnerability include various socially and culturally determined gender roles and presents examples of the way in which gender roles affect male vulnerability.

Therefore, when assessing gender-differentiated impacts and vulnerabilities, this paper goes beyond determinants of poverty only, aiming to understand the different social, economic, cultural and institutional factors that may determine such vulnerability. It uses Ionescu's framework to determine these "sensitivities", as well as the "adaptive capacity" that may reduce vulnerabilities. It also looks at both female and male vulnerabilities and how these may affect gender relations and roles.

1.2.3. **Intersectionality**

Intersectionality is a feminist theory that has shaped gender analysis in recent years, drawing insights from both materialist and post-structuralism feminist perspectives. More specifically, intersectionality is "the critical insight that race, class, gender, sexuality, ethnicity, nationality, ability, and age operate not as unitary, mutually exclusive entities, but as reciprocally constructing phenomena that in turn shape complex social inequalities".²⁸

Thus, while gender is a useful analytical category, it must always be richly situated and studied from specific locations with continued attention to complex and intersecting power relations. Gender outside of its complex contexts will always risk repeating dominant patterns of thinking and thereby reinforce sexist assumptions about women.²⁹

In other words, when we use intersectionality, we mean that gender and other social categories such as age, class, marital status, economic status, disability, interact to shape people's experiences of climate change.

Gender, environment and development scholar Arora Johnsson³⁰ also calls for a contextual and intersectional analysis in conjunction with socio-economic status, class, ethnicity or type of employment among other factors, as well as addressing vulnerabilities experienced by men, albeit in different ways. The 2014 WMO Conference³¹ also established that men and women are affected by climate change in different ways, and the effects that each gender faces depend largely on local contexts.

The strong potential of using intersectionality in climate issues was thus underlined on multiple occasions. It makes it possible to reach a more complete and accurate understanding of how individuals and groups relate differently to climate change, shedding light not only on adverse impacts on vulnerable groups, but also on underlying assumptions and problematic norms that can reinforce social categorizations and distributions of power, including through institutional practices.³²

1.3. **METHODOLOGY NOTE**

1.3.1 **Research framework**

The current research will be underpinned by an intersectional multi-level research framework (see Figure 2). It was adapted from the framework for gender and intersectionality research in environmental crisis and conflict proposed by Dr Amber Fletcher³³, scholar focusing on the sociology of gender, as well as gender and climate change.

Such a framework allowed for conducting analysis on gendered impacts at different levels, in the context of each identified case study:

- *Meta level:* sectorial impacts of climatic changes on agriculture and food security, and disaster risk reduction in the respective regions;
- *Macro level:* the most relevant social, economic and institutional features of the studied country from a gender perspective, for example access to resources like land, information, education, labour, and analysis whether climate institutional arrangements and policies have a gender dimension;

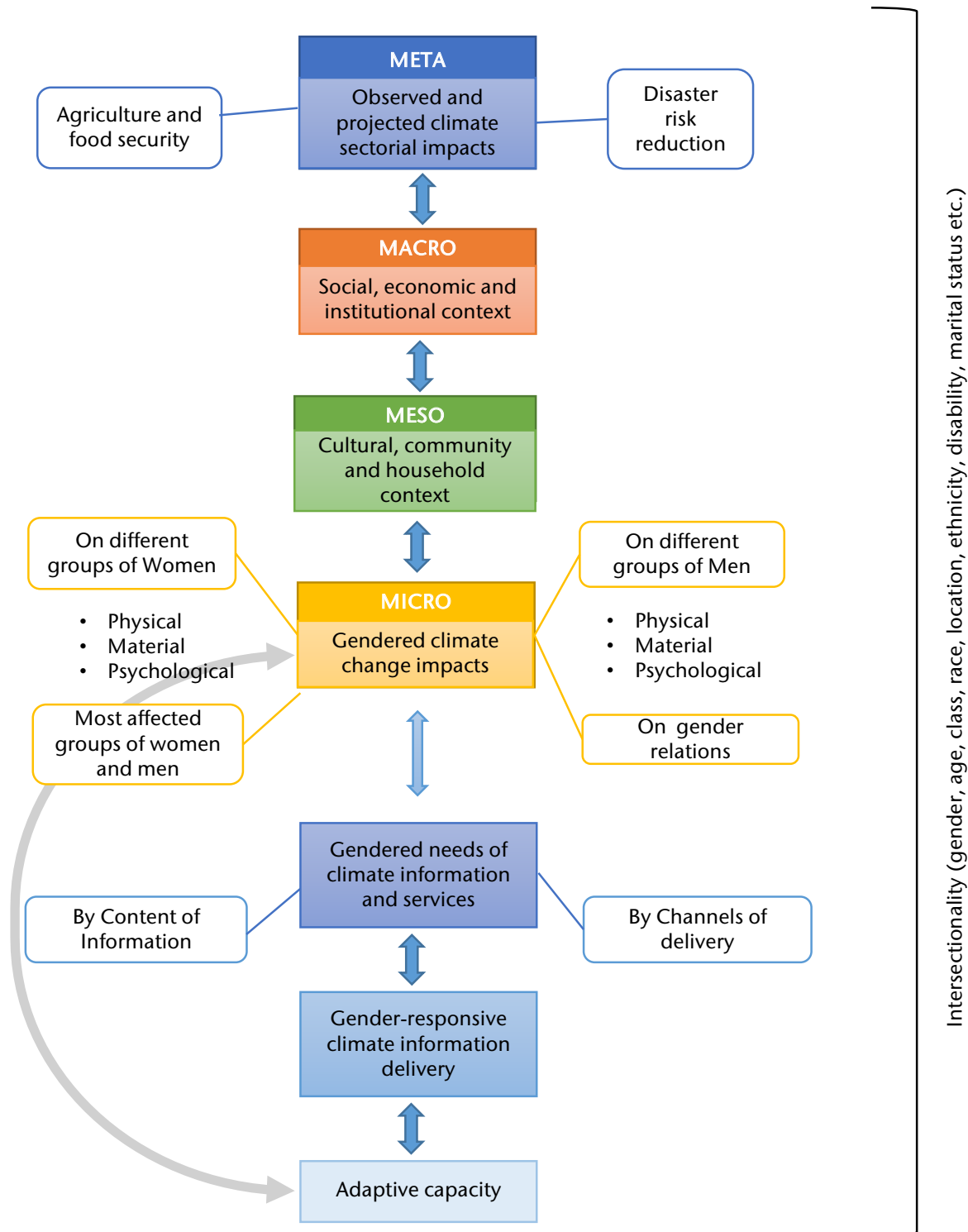


Figure 2. The multi-level intersectionality research framework

Source: adapted from Fletcher, 2018 and developed by authors

- *Meso level*: the cultural and societal norms that can shape gender roles and responsibilities, as well as occupations and labour division within the household and the community;
- *Micro level*: understanding the impacts of climate change at the level of the individual, as differentiated by gender and deconstructed by other criteria, such as class, age, race. Impacts of climate change on different groups of women and men and on gender relations were thus captured and classified in: physical, psychological and material.

Furthermore, gender specific needs of climate information as emerging from gender differentiated impacts were also analysed, where data was available.

1.3.2. **Methods and data sources**

This study used general social science and qualitative methods such as:

- **Desktop scoping review**: helped formulate the study design and focus on:
 - Two climate-related sectors: disaster risk reduction and agriculture and food security, which are interlinked and considered to be most affected by climate change and weather events;
 - Three regions: Asia, Africa and the Pacific, which are among the most affected by climate change and weather events;
- A broad **literature review** of academic articles and policy documents identifying the main themes of the gender and climate change interface, through combinations of key word searches like “gender”, “climate change”, “impacts”, “adaptation”, “information”, as well as 24 country and 2 regional case studies in three regions: Africa, Asia and the Pacific;
- **Case study analysis**: 25 case studies identified in the three regions were merged per countries, resulting in 16 country and 2 regional case studies, in total (see Annex I). All case studies rely heavily on primary data, collected through fieldwork and other qualitative and quantitative methods. They were analysed on the basis of the multi-level research framework, using standardized factsheets;
- **Construction of three model case studies**: Bangladesh (Asia), Fiji (Pacific) and Botswana (Africa) were selected on the basis of the following criteria:
 - Representativeness of each of the three regions and two sectors under study;
 - High exposure to climate-related impacts (extreme weather events and impact on agriculture, respectively) according to the Global Risk Report Index;
 - Relatively low rank of gender equality, according to the UNDP Gender Inequality Index, but high demonstrated commitment to integrating gender in climate-affected sectors (disaster and agriculture, respectively);
- **Gender analysis** of primary documents in the field of disasters and agriculture, such as National Reports under the HFA and Post-Disaster Needs Assessments was conducted for the model case studies. Disaster-related recommendations and information was also analysed in the context of documents pertaining to the CEDAW Periodic Review of Bangladesh, Fiji and Botswana (latest National Report, List of Issues by the Committee, Replies to List of Issues and Concluding Observations);

- **Three semi-structured interviews/data inquiries** with key informants (one Government authority, one representative of international organization and one non-governmental organization) contributed to enriching the content and findings of this research.
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CHAPTER 2. GENDERED IMPACTS AND GENDER-DIFFERENTIATED CLIMATE INFORMATION NEEDS: ZOOMING IN SELECTED REGIONS

2.1. ASIA: THE CASE OF BANGLADESH

2.1.1. Meta level. General impacts of disasters

Bangladesh is one of the most densely populated countries with 160 million people living in one of the most disaster-prone areas in the world. It is the fifth highest at risk country, according to the 2018 Global Risk Report.³⁴ It has experienced various catastrophic events over the last two decades: droughts, river erosion, cyclones, storms, saltwater intrusion, hotter and drier summers that threaten food and water scarcity.³⁵ Even though Bangladesh is a minor contributor to global warming with low carbon emissions per capita³⁶, the scale of damages is exacerbated by climate change.

One third of the land is flooded nearly every summer and the tropical cyclone events are likely to increase in frequency, intensity, duration and extent.³⁷ The IPCC³⁸ notes that the number of events will increase in South Asia, negatively impacting agricultural production, food security and water scarcity. The severity of climatic change also affects human health and well-being, their livelihoods, population movements and poverty levels.

Bangladesh has the highest disaster mortality rate in the world, the record on 171 natural disasters between 1970 and 2005³⁹, and a severe cyclone strikes the region on average every three years.⁴⁰ The 1991 cyclone resulted in more than 138,000 deaths, 90% of whom were women and children,⁴¹ the death rate of women aged 20-44 was 71 per 1000, compared to 15 per 1000 for men⁴², which means that women had five times higher mortality rate than men. Since then, the system of early warning has considerably improved and the number of people who lost their lives significantly decreased, for example the number of people who lost their lives as a result of 2007 Cyclone Sidr was 3,347. No gender-disaggregated data could be identified on more recent disasters. However, the economic damage is still very high, Cyclone Sidr cost in damages was estimated at \$1,7 billion.

2.1.2. Macro and Meso levels. Socio-economic, cultural and institutional gender-related context

According to UNDP report in 2010, approximately 72% of the population lives in rural areas, which relies on agriculture and food production as the main source of income and occupation. Migration to cities is one of the options for rural women to work in ready-made garment factories, which allows them to send remittances to families. However, the negative side is that women who migrate alone from rural to urban areas are more likely single, divorced or widowed women⁴³ and exposed to low-wage and unsafe working conditions for a long time.

Table 1. The scale of damages from disasters in Bangladesh

	<i>Number of deaths</i>	<i>Number of damaged houses</i>	<i>Number of damages schools</i>	<i>Destroyed Land</i>	<i>Destroyed road</i>
1970 cyclone	500,000	400,000	3,500		
1991 cyclone	140,000	10 million			
1998 floods	1,000	30 million		700,000 ha.	11,000 km.

Source: developed by authors on the basis of Alston, 2015.

Poverty, which is constant in Bangladesh, makes women more vulnerable and less able to resist and recover from the disasters. The vulnerability is increased in the case of divorced and widowed women combined with poverty. According to the Asian Development Bank⁴⁴ 20-30% of households are female-headed and over 95% of them are below the poverty line. In addition, the fact that Bangladesh ranks very low in UNDP's 2017 Gender Inequality Index (136th out of 189 countries)⁴⁵ shows that women are socially marginalized.

After obtaining independence from Pakistan in 1971, the constitution of Bangladesh granted equal rights to men and women, and freedom from discrimination. While the legal system is based on British Common Law, Islamic law is still applied in this Muslim majority country.

A common cultural practice is purdah, which is restricting women's movement outside the home, separating them from unknown men, and imposing a dress to cover the face and body of women.⁴⁶ This is often the reason why women do not go to public shelters in disaster situations.

Cultural practices like purdah and feelings of shame restrict women's mobility in disasters and lead to a higher risk of mortality.

Poor parents in rural areas justify marrying their daughters at a young age, below the legal age of 18, in order to reduce the dowry burden, which is the practice that the bride's family gives a substantial amount of money to the groom's family for the security and happiness of the daughter. Early marriage and childbearing bring about negative maternal health outcomes, child mortality and deprivation of education opportunities of girls. Divorce is uncommon (2% of divorce rates) and is associated with poor protection for divorced women. Since this form of patriarchy is prevalent in the society, remarrying is culturally discouraged even though women without husbands are socially and economically disadvantaged.

In terms of policy and institutional context, Bangladesh has a Climate Change Gender Action Plan in place since 2013.⁴⁷ According to the Government's replies to the List of Issues raised by CEDAW in its latest review, the National Plan for Disaster Management identified women as a distinct target group and agent in disaster forecasting, preparedness and management and women's participation is ensured in Disaster Management Committees at the district, Upazila and union levels.⁴⁸ However, the Committee still expressed concern about the impact of disasters on women and girls, the lack of a gender-sensitive approach to disaster risk reduction and post-disaster management and limited participation of women in climate policy-making.⁴⁹

2.1.3. **Micro level. Physical, Psychological and material gendered impacts of disasters**

Cannon⁵⁰ underlines women's poorer nutritional status as the key aspect of reduced capacity to cope with hazards. For example, women of all ages suffer more from calorie-deficiency than men, which negatively affects their health vulnerability to water-borne illness and results in increased hardship for domestic burdens like fetching water. Women and girls in Bangladesh are also typically the first to skip meals, if there is a shortage of food, as is usually the case during droughts, floods, or storms.⁵¹

Existing gender-based division of labour increases working hours for both men and women in disaster situations. Women play a crucial role in collecting household assets such as documents, cash money, and valuable clothes and taking care of family members while men try to save livestock, boats, fishing nets and the like.⁵²

Societal attitudes restrict interaction between men and women, as mentioned above, affecting women's survival and self-protection, because of reluctance to congregate in public disaster shelters.⁵³ Women's mobility is also restricted due to their responsibility for children, the elderly and the sick.

Women also expressed difficulties to swim in floods wearing the traditional dress sari. In post-disaster situations, pregnant women are at greater risk of abortion and miscarriage as a result of less access to health care services in public shelters.⁵⁴ Pregnant women are also at higher risk of malaria.⁵⁵

Moreover, disasters in Bangladesh brought about increased mental strain both for men and women. It is reported in many studies that people felt fear and anxiety of insecurity, of repeated disasters, of the loss of livestock and crops, and of children drowning. However, women had more fear over gender-based violence such as abuse, harassment, and rape in shelters. Mental stress was often combined with social constraints. For example, women felt more ashamed to use sanitary latrines or to be seen by unknown men when in wet clothing.⁵⁶

Box 1. Early marriage exacerbated by climate change in Bangladesh

An important issue affecting women's lives is the practice of early marriage. The median age for marriage is 15 while the legal age to marry is 18. Bangladesh records one of the highest rates of adolescent childbearing in the world. In the study on perceptions of climate change in Bangladesh, 45% of respondents thought that girls are forced into early marriages as a direct impact of climate events and consequence of poverty. Evidence also suggests that parents are marrying off their girls very early who then go to live with their husband's family as a coping mechanism to address financial challenges associated with climate change. In post-disaster situations, women are often exposed to violence after marriage, as it is difficult for the bride's family to pay dowry.

Source: UNICEF, 2010; Alston, 2015.

In terms of material aspects, it is reported that people lost their household resources including important documents, livestock, houses and crops. However, studies underscore that there are also positive aspects associated with the response to disasters, in particular by gaining access to resources for livelihood, work and opportunities. For example, people can get new materials for their houses including eco-sun toilets and solar panel systems from aid agencies, livestock such as cattle and hen from NGOs. They can also obtain interest-free loans, vehicles such as motor cycles and rickshaws for income generation purpose, cash for work programmes like road repairing.⁵⁷

2.1.4. Gender-responsive climate information and services delivery

The Bangladesh Government heavily invested to build disaster preparedness including early warning systems, constructing disaster shelters and other infrastructure, and raising awareness by distributing climate information to the public. However, due to the variety of terrain, the fragility of national infrastructure, and the high magnitude of disasters, certain vulnerable areas are isolated and early warning does not always work.⁵⁸ People tend to neglect the warnings, as they cannot imagine that the scale of event would be different to previous cyclones or storms even though they have received them.⁵⁹

"Most of the time we get a signal [early warning]. But we don't get a signal if the storm starts suddenly. ... Women and children along with the elderly and cattle go to the shelter. Some start crying and lamenting for their husbands and children [lost in the water] ... we do not have life-jackets. If we had, the death rate [from Sidr] would have been reduced."

(Older male, Barguna in Bangladesh)

Difficulties for women are often associated with information dissemination. Women are less likely to directly receive the early warning information and depend on men to share the warning messages, as they have less access to information services. For example, focus group discussions held by Oxfam UK with women in some of the most heavily affected communities by the 2007

cyclone found that a number of female-headed households or women whose husbands were away fishing or working in other places, did not receive the warnings, because they were given in the marketplace which was distant from their homes.⁶⁰

WEDO⁶¹ has also listed the significant challenges of women in coping with disasters:

- Lack of preparedness (ability or resources to implement actions);
- Limited access to early warning information, critical services and facilities (shelters with spaces for women and with proper sanitation), financial security (low interest rate loans), markets and communication, and decision-making arenas;
- The social expectations of the appropriateness of women's actions;
- Increased responsibility to the household;
- Difficulty in accessing relief goods;
- Physical constraints (such as long hair and clothing).

Moreover, the head of the household or male relative usually takes the decision on whether to evacuate. Without male guardians, women could be isolated at home and their mobility can be restricted, because of customary practices.⁶²

“... If the women try to take any step before a disaster, the men would stop them. Suppose we say that there has been a cyclone warning, the men ignore that. The problem is they do not value us unless they are in trouble. If we want to move to safety before a disaster, they would not allow us. They even stop us from taking preparedness measures such as preserving dry food. If we ask them to strengthen the house before the season of storm, they would not listen to us. Even many women are not allowed to touch the TV or radio. So they have little chance to get the early warning.”

(Older woman, Satkhira in Bangladesh)⁶³

The study clearly shows that a combination of various factors affect the magnitude of disaster damage for both men and women. The underlying societal stressors we studied are economic situation, marital status, age, cultural norms and attitudes including gender roles and so on. As a general recommendation the government could diversify the channels of delivering information considering the accessibility of women, provide training in disaster evacuation and build more shelters for women and children.

2.2. PACIFIC: THE CASE OF FIJI

2.2.1. Meta level. General impacts of disasters in Fiji

It has been long recognized that SIDS are particularly vulnerable to climate change⁶⁴ and relative to other areas, they are disproportionately affected by hydro-meteorological extreme events, both in terms of the percentage of the population affected and of the losses as a percentage of GDP⁶⁵, even though they are contributing the least to global greenhouse gas emissions.

Fiji, one of the 14 Pacific SIDS that are WMO members⁶⁶, situated in the “tropical cyclone belt”, is frequently impacted by multiple devastating cyclones, floods and other disasters, increasing in intensity and frequency as a result of climate variability (see Table 2). Based on its exposure to natural hazards, as well as societal vulnerability Fiji is among the top 20 highest-at-risk countries globally, among other Pacific countries, according to the Global Risk Report.⁶⁷

Table 2. Human impact of major disasters in Fiji, 1970-2016

Disaster	Number of events	Number of people affected	Number of people killed
Drought	6	840,860	0
Tropical cyclone	66	1,888,490	355
Flood	44	563,310	103
Severe local storm	2	8,370	17
Earthquake	10	5	5
Tsunami	2	0	0
Total	130	3,299,030	480

Source: Climate Vulnerability Assessment: Making Fiji Climate Resilient (Government of Fiji, World Bank and Global Facility for Disaster Reduction and Recovery, 2017).

Note: Numbers include major events only, numbers of people affected are rounded to nearest 10

For example, the 2016 TC *Winston* was the first Category 5 cyclone to directly impact Fiji, the strongest to hit the country and one of the most powerful cyclones ever recorded in the Southern hemisphere⁶⁸ (see Figure 3).⁶⁹

2016 TC *Winston* in Fiji

- The strongest tropical cyclone on record
- Affected 62% of total population
- Damages equal to 20% of its GDP.

In addition to disasters, climate change brings long-term existential threats linked to sea-level rise. Flood frequency increase caused by changing rainfall patterns and salinity intrusion due to sea level rise lead to large losses in almost every sector of the economy, including agriculture and fisheries, affecting peoples' lives and livelihoods. Tropical cyclones and floods push about 25,700 people into poverty every year in Fiji.⁷⁰

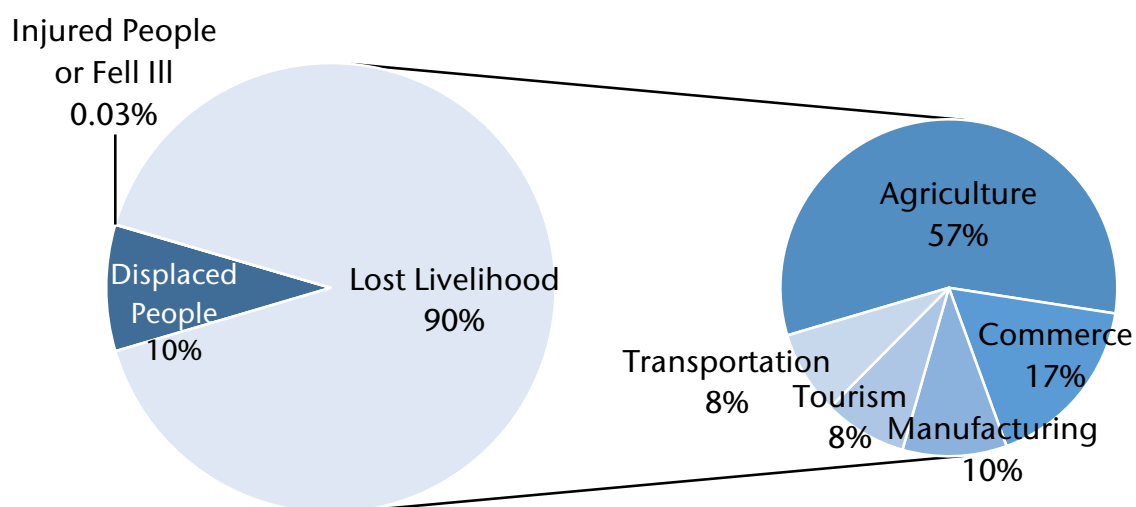


Figure 3. The affected population and sectors by the 2016 cyclone *Winston*

(Source: developed by authors on the basis of the 2016 Fiji PDNA)

2.2.2. **Macro and Meso levels.** **Socio-economic, cultural and institutional gender-related context**

Fiji is a small state spread over 332 islands in the South Pacific, of which 110 are permanently inhabited. It has a population of about 900,000, most of whom live on the islands Viti Levu and Vanua Levu. About 49% of them are women and girls, and 51% are men and boys.⁷¹

72% of ever-partnered women in Fiji have experienced physical, sexual or emotional violence.⁷² Such high rates (60-80%) of SGBV are representative for the entire Pacific region, being some of the highest in the world.⁷³

Progress on integration of gender in DRR and CCA

- 2013 PDNAs – first time gender is integrated
- HFA 2013-2015 - better gender indicators than 2011-2013
- Current review of the Disaster Management Act envisions gender

The Government of Fiji has made significant efforts and is committed to integrating gender in disaster and climate change policies. According to its HFA 2013-2015 Progress Report, gender integration in DRR and DRM areas has evolved compared to 2011-2013 (see Table 3). The Government indicated positive progress on all six gender-related indicators, including measures undertaken to address gender-based issues in recovery, undertaking gender-disaggregated vulnerability and capacity assessments or including gender considerations in post-disaster needs assessments. Fiji reported strengthened DRM messages which include gender and human rights issues, providing training on gender and human rights issues, and gender-disaggregated data albeit in an ad-hoc manner, and conducting a mapping of evacuation centres to be gender and disability-friendly, among others (see Table 3).⁷⁴

Table 3. Fiji's progress on gender-related indicators reporting under the Hyogo Framework for Action: 2013-2015 compared to 2011-2013

<i>Priority for Action</i>	<i>Core Indicator. Key questions</i>	<i>HFA Interim Report 2011-2013</i>	<i>HFA Interim Report 2013-2015</i>
Priority for Action 2. Identify, assess and monitor disaster risks and enhance early warning	Core indicator 1. Gender disaggregated vulnerability and capacity assessments	No	Yes
Priority for Action 4. Reduce the underlying risk factors	Core indicator 5. Measures taken to address gender-based issues in recovery	No	Yes
Priority for Action 5. Strengthen disaster preparedness for effective response at all levels	Core indicator 2. Plans and programmes are developed with gender sensitivities	Yes	Yes
Priority for Action 5. Strengthen disaster preparedness for effective response at all levels	Core indicator 4. Post-disaster needs assessment methodologies include guidance on gender aspects	Yes	Yes
Drivers of progress. Part B. Gender perspectives on risk reduction and recovery adopted and institutionalized	Is gender-disaggregated data available and being applied to decision-making for risk reduction and recovery activities?	-	Yes

Priority for Action	Core Indicator. Key questions	HFA Interim Report 2011-2013	HFA Interim Report 2013-2015
Drivers of progress. Part B. Gender perspectives on risk reduction and recovery adopted and institutionalized	Do gender concerns inform policy and programme conceptualization and implementation in a meaningful and appropriate way?	-	Yes

Source: Developed by authors on the basis of Fiji's HFA National Progress Reports 2013-2015 and 2011-2013

Box 2. The need of participatory consultations for addressing climate impacts on women from low-lying coastal areas

Women from low-lying coastal areas are among those most impacted by climate change, as their livelihoods are disproportionately affected negatively. According to Her Excellency Ms Nazhat Shameem Khan, Ambassador, Permanent Representative of Fiji to the UN Office in Geneva, Chief Negotiator of Fiji's COP23 Presidency, 63 villages in Fiji will have to be relocated, following the 2016 tropical cyclone *Winston*. The damage to offshore fisheries and sea level rise places an extra burden on women who have to change their livelihoods, by re-specializing to agriculture or other income-generating activities.

UN Women provided another example on the relocation to higher ground in Vunidogoloa Village. Women were not able to access their coastal resources for fishing, as the new village was too far from the coast, and their household responsibilities restricted them from taking lengthy absences to fish. Men, on the other hand, were still able to make the long walks to their old fishing grounds.

Therefore, participatory and inclusive consultations are crucial to address the needs of affected women and men. This may require substantial cultural changes with a transformative potential. As the Ambassador underlines, "what countries need to do, and that is what Fiji is doing now, is to change the way we talk to communities. We need to ensure that women are included and not only have a voice, but are actually listened to. (...) Without adapting traditional communal ways of consultations and without asking women, the relocation of villages will be very ineffective, (...) it will lead to greater poverty".

Source: Compilation by authors, on the basis of the Interview with Her Excellency Ms Nazhat Shameem Khan, Ambassador, Permanent Representative of Fiji to the UN Office in Geneva, and the 2016 UN Women Regional Office for Asia and the Pacific Report on gender, climate change and disaster risk reduction in the Pacific region.

Indeed, a gender analysis of the Government's PDNAs of disasters since 2007 TC Cliff reveals that the gender dimension of disasters started to be present as of 2013 in the PDNA of the 2013 TC *Evan* and strengthened in 2016 TC *Winston* PDNA.

The Permanent Secretary for Women and Culture is on the Disaster Management Council and the Disaster Preparedness Committee, according to the disaster management law of Fiji.⁷⁵ Gender mainstreaming is also envisaged in the review process of the Disaster Management Act and of the National Platform for DRR and CCA.⁷⁶

Gender disaggregated data is available and used in work plans on an ad hoc basis as relevant to each ministry, but it is not systematically applied.⁷⁷

2.2.3. Micro level. Gendered impacts of TC *Winston* and other disasters in Fiji

2.2.3.1. Most affected people

TC *Winston* affected approximately 540,400 people, including 264,000 women and girls. 44 people died because of the cyclone. While there was no real difference in mortality rates between women and men, discrepancies exist among age groups. Thereby, the elderly made up for 37% of deaths, even though they make up only 4% of the population. The i-Taukei were also

over-represented with 92% deaths though they make up only 57% of the population. The largest affected population was concentrated in the Western Division, which could lead to increased economic burdens for the Indo-Fijians concentrated in the division.

According to TC *Winston* PDNA, women have been disproportionately affected by the cyclone. Single women, the elderly, widows and widowers, pregnant women and PLWD have been impacted the most. Statistics also show that female-headed households (12%) where the head is divorced or never married have a 71% higher poverty rate, making them more vulnerable to disaster impacts.⁷⁸

2.2.3.2. **Material impacts**

Even though, according to TC *Winston* PDNA, men have supported the largest damage and production losses, women's losses had more considerable implications at the household level, as their subsistence activities contribute directly to the household food security and well-being.

71% of all dead livestock was small livestock (like poultry, pigs and beehives) which are usually under the control of women and which are sold first as a coping mechanism for additional earnings in difficult times.

In addition, women's livelihoods are more connected to availability of non-timber forest resources, which have been heavily affected by the cyclone. Their reliance on voivoi (pandanus) for basket and mat weaving exacerbate their vulnerability and pose additional obstacles to economic recovery.

The combination of such factors as lower income, dependence on subsistence farming, and increased household responsibilities, may increase women's economic hardship and economic dependence on their spouse.

2.2.3.3. **Gender-based violence during and after disasters**

Evidence shows that sexual and gender-based violence increases during disasters, including because of inadequate infrastructure in evacuation centres, among which poor lighting, lack of separate sleeping arrangements for women and men, and lack of segregated WASH facilities, leading to lack of privacy, among others. For example, after two tropical cyclones hit Tafea, the southern province of Vanuatu, in 2011, the Tanna Women's Counselling Centre experienced a 300% increase in new domestic violence cases.⁷⁹

According to UN Women citing Government information,⁸⁰ after the 2013 floods in the Western Division of Fiji, cases of sexual violence were reported especially on unaccompanied adolescent women.

Reports from the field after TC *Winston* indicated that women were feeling insecure in some locations, including evacuation centres.⁸¹ Some women also felt scared about sleeping at night, because of lack of electricity and possible sexual harassment.⁸² There was also a risk of post-disaster domestic violence against women and children, because of reported increase in abuse of alcohol by men as a coping mechanism. Disabled women were also at particular risk.⁸³

2.2.3.4. **Malnutrition**

It was reported that, in the immediate aftermath of TC *Winston*, women, particularly pregnant and lactating women living in rural areas, were affected the most. For example, in Burewaki, women mentioned that they were eating only twice per day; because of food insufficiency.⁸⁴ Food rations distributed by the Government, such as the Expanded Food Voucher Programme for pregnant women in rural areas, are aimed to address this issue.

2.2.3.5. **Increased work burden**

As a result of extensive damage to crops and loss of fisheries, the work burden of women increased. Lack of electricity and disruptions in water supply in the immediate aftermath of cyclone *Winston* has also hardened the work burden of women, resulting in limited time for searching income-generating activities.⁸⁵

2.2.4. **Gender-responsive climate information and services delivery: through the lens of Women's Weather Watch**

Fiji's 2013-2015 HFA Report underlines that a national disaster information system is publicly available and mechanisms are established to pro-actively disseminate information through different means.

Box 3. Fiji's response to SGBV during and in the aftermath of disasters

The Government of Fiji is addressing SGBV during and in the aftermath of disasters through the following undertaken or planned initiatives, among others:

- Recent launch of the project "Federation Project Sanctuary" in partnership with the NGO Soroptimist International of the South-West Pacific, aiming to provide shelters, including housing for women affected by violence during disasters;
- Strengthening grievance and referral systems from all national actors to support victims of SGBV;
- Implementation of a Code of Conduct in all evacuation centers;
- A planned mapping of existing evacuation centers to assess upgrading requirements for facilities to be gender and disability-friendly;
- Prioritizing vulnerable communities in short-, medium- and long-term recovery and development assistance, including via the Poverty Benefit Scheme, the Food Voucher Programme and the "Help for Homes" initiative.

Source: Developed by authors on the basis of 2016 TC *Winston* PDNA, 2018 Replies of Fiji to CEDAW List of Issues, the 2013-2015 National Interim Progress Report on the implementation of HFA and Soroptimist International of the South-West Pacific website.

In the case of TC *Winston*, the Fiji Meteorological Service and the private sector weather forecaster NaDraki issued early warning messages. They were distributed through print media, radio, social media and websites.⁸⁶ Campaigns, such as Get Ready. Disasters Happen. (<http://www.getready.gov.fj/>), were carried out in preparation for TC *Winston*, which provided the public with information on what to do before and after TC *Winston*.

However, the fact that it was the first Category 5 cyclone in Fiji's history meant that public understanding of the associated risks was low. For example, a number of coastal communities were not prepared to the intensity of the storm. According to the IPCC, increased risk to climate change can also result from lack of awareness, especially of communities in rural areas and outer islands of archipelagic countries such as Cook Islands, Fiji, Kiribati, and Vanuatu, whose climate change knowledge often contrasts sharply with that of communities in the major centres.⁸⁷

"The women's weather watch updates helped in preparation for what was one of the scariest hurricanes I have come across. (...) With access to information, women are able to better prepare and engage – before, during and after natural disasters occur".

Yashmin Khan

(farmer and the President of the Malamala Al-Madina Women's Club in Nadi)

Source: Edition 1, 2016 of Community Radio Times, a publication by FemLINKPacific

2.2.4.1. **Good practice: Women's Weather Watch**

One successful initiative that addresses such issues is Women's Weather Watch (WWW), a programme of the organization FemLINK Pacific aimed to ensure that information on weather patterns reaches communities in remote areas, including women; that evacuation strategies are gender-inclusive; and that women are involved in disaster preparedness, management and response.

The programme started in 2004 after large-scale floods hit Vanua Levu island. According to Ms Sharon Bhagwan Rolls, former Executive Producer-Director/Co-founder of FemLINK Pacific, "what began as a simple SMS update for a core group of rural women leaders across Fiji, today is an inter-operable information- communications platform that not only provides a network of rural women leaders with weather updates and preparedness information but is also a platform to document their lived realities through disasters and climate change." More than 200 women from 10 rural districts across Fiji contribute now to WWW (see Annex 3).

2.3. **AFRICA: THE CASE OF BOTSWANA**

2.3.1. **Meta level. General impacts of disasters in Botswana**

The detailed analysis of this case study was derived from the Heinrich Böll Foundation (HBF) study. Their study remains one of the most comprehensive investigations on the gender differentiated impacts of climate change in Southern Africa, specifically, Botswana, Mozambique, Namibia and South Africa. This section is supported by the findings in the Botswana case study, conducted between July and November 2008.⁸⁸

Agriculture has been identified as one of the most climate sensitive sectors and particularly vulnerable to the effects of climate change. The IPCC Fourth Assessment Report predicts that yield from rain-fed agriculture will decrease by 50% in Africa as a result of climate change. Agricultural production is projected to be severely compromised by climate change.

- Over 60% of employed women in Sub-Saharan Africa work in agriculture
- 80% of farmland in Asia and Sub-Saharan Africa is managed by small farmers.
- Yet, nearly 1 billion people lack secure land rights, among them many are women

Source : Landesa rural Development Institute

Over the years, Botswana has seen a steady increase in temperature, particularly during the summer season. The rains have also been less frequent and more sporadic, and since climate status is the single most important determining factor for arable rain-fed agriculture, reduced rains have led to reduced rain-fed agricultural yield for the farmers. The rainy season has also changed causing confusion to the farmers regarding first rains and planting times. Furthermore, increased temperatures and reduced rainfall has been associated with livestock death, cattle for example.

In Botswana rainfall is highly variable in space and time. Drought is the most frequent extreme weather event. Drought adversely affects the already fragile food and agricultural situation and seriously impairs the rural economy and socio-cultural structures. According to the 2007 and 2008 Botswana Annual Agricultural Survey Report, about 70% of the rural households obtain significant parts of their livelihoods from agriculture. With crop production mainly reliant on rain-fed farming.

2.3.2. **Macro and Meso levels.** **Socio-economic, cultural and institutional gender-related context**

Botswana is ranked 98th on the 2017 UNDP Gender Inequality Index. According to the National Statistical Office “women constitute a majority of the population and working poor compared to their male counterparts. A higher proportion of female-headed households are “poor” or very poor (50%) than the male – headed households’ category at (44%).⁸⁹

According to the Government’s Fourth Periodic Report submitted to CEDAW in 2017, women represent 26,6% of participation in political and public life. While women continue to be generally underrepresented in institutions of decision-making such as Parliament, the Cabinet, Local Authorities, the Public Service and in most national boards, efforts at national level are ongoing to promote participation of women in decision-making.⁹⁰

Botswana Core Welfare Indicators Survey 2009/10 indicated that unemployment still affects more women (22,6%) than men (17,7%). The share of women in non-agricultural wage employment is also significantly lower than that of men (see Table 3).

Livestock ownership by sub-sector shows that cattle ownership is highly skewed towards men (See Table 4). However, ownership of small livestock like goats, although predominantly owned by men, shows a slightly smaller gender gap. The same gendered pattern of livestock ownership is also reflected in the ownership of sheep. Lack of disposable income, animal husbandry skills and the disinheritance of women all combine to reduce women’s access to livestock resources. Government agricultural subsidy schemes such as the Livestock Management and Infrastructure Development (LIMID) promote increased women’s access to productive resources including small livestock and boreholes.⁹¹

Consultations are also ongoing to formulate a comprehensive policy on Gender in agriculture and rural development. The policy aims at specifically addressing the issues and challenges faced by rural women across Botswana.⁹²

Table 4. Women in non-agricultural wage employment and discrepancies in access to livestock by women in Botswana

<i>Indicators</i>	<i>Women</i>	<i>Men</i>
Share of women in non-agricultural wage employment (%)	48,8%	51,2%
Ownership of rural farms	31,866	50,112
Ownership of urban houses/plots	1,896	1,972
Ownership of livestock	1,040,789	2,711,096

Source: Fourth Periodic Report submitted by Botswana to CEDAW, 2017

2.3.3. **Micro level. Physical psychological and material gendered impacts**

Because of the gender differences in property rights, access to information and in cultural, social and economic roles, the effects of climate change affect men and women differently. Women, particularly rural women, compared to men show higher levels of vulnerability to climate change, since their participation in institutional and economic dynamics is characterized by gender-based limitations in access to resources when performing their productive, household and community roles.⁹³

Women are most affected also as arable farming is culturally a predominantly female activity. It is expected that with reduced natural resource-based livelihood options, more people will be looking for employment. In many cases, particularly in the district Seronga, men are more likely to be employed in a village setting, as the women end up staying at home taking care of the children, elderly and the sick.

There is an increased physical toll, workload and time spent farming in rural Botswana experienced by both men and women. However, because agriculture is widely regarded as a female occupation, the physical burden is greater on women. The cultural assumption that women are the care-givers in society increases their labour burden and decreases their productivity.

Furthermore, with reduced livelihood options, climate induced poverty and lifestyle changes, women in Botswana get poorer and they may also cope through prostitution to sustain families. This leads to increase in HIV and AIDS cases and other related sexually transmitted diseases. It is also expected that with increased temperatures due to climate change, the prevalence of Malaria- carrying mosquitoes will likely increase, not only affecting the most vulnerable groups like women and children, but also increasing the burden of women caring for the sick.

Box 4. Prevalent gender issues in climate change in Botswana

Rural livelihoods of women and men differ broadly between regions. However, certain issues are relevant to understanding gender-related patterns of vulnerability and impacts.

- A significant majority of women do not have land rights. This negatively hampers women's ability to adapt their agriculture to the changing climate.
- Women's owned productive assets tend to be valued less, often due to inheritance patterns.
- Women in rural areas tend to have significantly lower education levels than men, which hamper their access to information and technical knowhow that can help their livelihoods.
- The participation of women in institutional organizations and commercial networks is often limited, which hampers their access to markets, for selling their agricultural products.
- Men often face an array of psychological issues as crop failure forces them to look for jobs elsewhere, often this means relocation and struggling with family separation.
- Class (economic status), location, gender, and education level are factors that influence the severity of impact felt and the nature of vulnerability for both women and men.

Source: Heinrich Böll Foundation, 2008

The study, though limitedly, highlighted impacts on men who, as traditional breadwinners, were often forced to move to urban areas to look for employment after crop failure and deal with the trauma of family separation, and often-psychological impacts of unemployment.

2.3.4. Gender-responsive climate information and services delivery

The IPCC 2014 report⁹⁴ has indicated that parts of sub-regions in Africa are among the most vulnerable to the negative impacts of climate variability and change coupled with extreme weather events. Thus, climate information, products and services are vital for several reasons.

First, the majority of the agricultural industry in Botswana and sub-Saharan Africa is rain-fed, climate information is thus vital to improve planning and decision-making in crop types and yielding. It is this information that will help farmers achieve a sustainable level of food production.

Furthermore, climate information has to be gender sensitive and cater to the respective needs of both men and women. The report found that the agricultural sector was increasingly feminized.

Katz⁹⁵ and Deere⁹⁶ provide more specific definitions for the feminization of agriculture:

"1. An increase in women's participation rates in the agricultural sector, either as self-employed or as agricultural wage workers; in other words, an increase in the percentage of women who are economically active in rural areas.

2. An increase in the percentage of women in the agricultural labour force relative to men, either because more women are working and/or because fewer men are working in agriculture."

Second, gender sensitive climate information provision is essential in supporting agribusinesses, a majority of which are run by women. Thato Supang, a young female farmer and agribusiness owner in Botswana, emphasized the need for women farmers to find the information that was useful to them: “for example, what are the best seeds to buy, when the time to plant was, and how to get crops to market.”

Many women in Africa were in charge of farms because the men had gone to urban areas to work, and they needed help at a practical level. NMHSs should transmit information to the community level, using all available avenues, from sending SMSs to utilizing farmers’ organizations.⁹⁷

The study has shown that women and men, because of their differential productive and reproductive roles and limited control over productive resources are likely to experience the impact of climate change differently. Additionally, their limited access to common coping mechanisms such as formal credit facilities and limited representation in decision-making institutions increases their vulnerability to climate change. Adaptation is therefore a crucial response to climate change in Southern Africa. It is a key component of an integrated and balanced response to climate variability and change.

As a general recommendation, Governments should be encouraged to mainstream gender perspectives into their national policies, action plans and other measures on sustainable development and climate change, through carrying out systematic gender analysis, collecting and utilizing sex-disaggregated data, establishing gender-sensitive indicators and benchmarks and developing practical tools to support increased attention to gender perspectives. Consultation with and participation of women in climate change initiatives must be ensured and the role of women’s groups and networks strengthened.

CHAPTER 3. DISCUSSION AND ANALYSIS

3.1. GENDERED IMPACTS OF CLIMATE CHANGE

3.1.1. Types of gendered impacts and societal stressors causing them

The increase in frequency and/or intensity in disasters induced by hydrometeorological hazards including extreme weather events such as floods, tropical cyclones, heat waves, as well as slow onset events such as droughts or sea level rise affect women and men differently. Changing rainfall patterns combined with soil erosion and salinity intrusion are also having a significant impact on agriculture, reducing crop yields, impacting the distribution of aquatic resources, food access, use and security.

As discussed in Section I of this Report and shown in the case studies in Section II, vulnerability to these climate-related issues is exacerbated by social and economic factors, cultural norms and institutional rules that underpin gender inequality and injustice.

Among the main climatic stressors leading to gender-differentiated impacts, as identified in a cross-case study analysis with other empirical data, are the following:

- i. Socio-economic factors
 - Poverty and unemployment
 - Labour division and occupational segregation (for example: responsibility of women for household crops compared to responsibility of men for cash crops or male-dominance of the rescue worker profession);
 - Lower access of women to resources, including land, livestock, education, climate information and services;
- ii. Institutional
 - Low or erratic integration of gender in disaster, climate change and agriculture policies;
 - Low rates of participation of women in community, local and national decision-making;
- iii. Cultural and societal norms
 - Gender roles and unequal responsibilities of women in the household work;
 - Reduced mobility of women during disasters;
 - Restrictive social attitudes for interaction between women and men in shelters;
 - Internalized norms of masculinities of men, including heroic behaviour;
- iv. Intersection with other social categories like class, age, disability, marital status and ethnicity.

Gendered impacts are thus a result of the interaction of physical climate impacts with such societal stressors. Based on empirical evidence and primary data from the three model constructed case studies and the other case studies identified in literature, a typology of gendered impacts was formulated (see Annexes 2 and 4, and Table 5).

Table 5. Types of gendered impacts of climate change in Asia, Pacific and Africa (an illustration)

	<i>Women</i>	<i>Men</i>
Physical	Higher mortality and morbidity rates in disasters	Mortality risks among men with heroic behavior and rescue workers
	Extra workloads (time and labor)	Migration for livelihood diversification
	Malnutrition	Other health issues, like rheumatism
	Sexual and gender-based violence during and after disasters	
Material	Loss of small household livestock	Loss of livestock and assets
	Loss of livelihoods connected with natural resources, less time to re-establish them	
	Loss of land because of inheritance issues	
	Disparities in access to disaster relief and aid	
Psychological	Psychological issues associated mostly with fear of gender-based violence and feelings of shame during disasters and stress for providing food for the family	More psychological impacts, including social isolation, trauma, depression, stress that can lead to alcohol abuse and even suicide
Most affected groups	Girls (early marriage) and adolescent girls (risk of sexual harassment)	
	Rural women and women without access to resources	Rural and poor men
	Women living in low-lying areas	
	Disabled and older women	
	Widowed, divorced and single women	Widowers
	Pregnant and lactating women	
	De-jure female-headed households	
Gender relations	Negative: weaker family structures, domestic violence	Positive: change in household and community roles, women taking leadership

Source: Developed by authors on the basis of three detailed case studies (Bangladesh, Botswana, Fiji), analysis of other case studies in 16 countries from 3 regions (Asia, Africa, and Pacific Small Island Developing States) and empirical evidence in the literature

3.1.2. Gendered impacts on different groups of women

While the types of gendered impacts on women have been largely illustrated in case studies in Section II and complemented with findings and empirical evidence described in Annex I, it is important to underline that not all women are equally vulnerable, even if their gender locations often make them as a group more vulnerable to various forces and systems.⁹⁸ Most researchers in the field already describe gender relations as ‘intersecting’ with race, ethnicity, class, and caste, and increasingly there is recognition of intersecting differences associated with age, sexuality, and disability.⁹⁹

3.1.2.1. **Rural women**

Most case studies identified in this research, analysed vulnerability as intersecting with economic status/ location and poverty, thereby concluding that rural women are among the most vulnerable. The case studies from Bangladesh and Botswana confirm this finding. In Fiji, however, from the point of view of location women living in low-lying areas proved to be among the most vulnerable, even though women living in the mainland are also affected, in particular by floods.

Another case study on women's vulnerability to flooding in Orissa, India¹⁰⁰ also showed that it is difficult to speak of gender effects without looking also at caste and class. Lower caste and lower-class households were more vulnerable to the cyclones and flooding in the state due to their unfavourable location by the river.

In contrast, a case study in Central Vietnam¹⁰¹ found that vulnerability to climate-related water scarcity differs even among rural women and is shaped by their age, education, and access to credit. It concluded that it is their ability to mobilize entitlements to be accessed that determines the differentiation in adaptation options and actions among women and, therefore, their vulnerability.

3.1.2.2. **Older women and women with disabilities**

Evidence from Fiji and Bangladesh showed that older women and women with disabilities are among the most affected groups during and in the aftermath of disasters. Women with disabilities are affected in particular because of lack of disability-friendly infrastructure and often lack of accessible information on climate and early warnings. Another study from Vietnam¹⁰² showed that older women were also among the most vulnerable, as they did not actively work and had heavy care obligations, especially for children of women migrated abroad.

3.1.2.3. **Pregnant and lactating women**

The case studies from both Bangladesh and Fiji found that pregnant and lactating women are also at higher risk during disaster and post-disaster situations, because of poor access to or low-quality of health services in public shelters and in the aftermath of disasters. They were also more impacted by malnutrition (as seen in the case of Fiji).

Box 5. How marital status affects vulnerability to climate change in Tanzania

Compared with other women, widows (especially those elderly and illiterate) are the most vulnerable to the impacts of climate change, as they have a low adaptive capacity, facing challenges in both agricultural water management and livelihood diversification (access to non-farm activities). Divorced women are the next, being disadvantaged in the field of agricultural water management, but assuming relatively more non-farm income-earning activities. The unmarried women, like the widows, also depend mostly on farming, but cope with agricultural water management more successfully. The situation of married women is more ambiguous: although they are often the ones who implement the farm work, through for example irrigation, they lack independent access to and control over household resources.

Source: Developed by authors on the basis of Van Aelst and Holvoet, 2016

Pregnant and lactating women also face higher discomfort, including because of lack of infrastructure adapted to their needs. For example, during the latest disaster that hit Indonesia¹⁰³, women expressed the need for trauma counselling and for involvement of more women in disaster emergency response. Young mothers were feeling uncomfortable in the shelters.

“My sister; she wasn't comfortable in the temporary shelter because she had to breastfeed in front of all the other people living there”
(Mumun, victim of the disaster in Indonesia)

3.1.2.4. **Widowed and divorced women**

Case studies from Bangladesh and Fiji found that widowed and divorced women were more affected. Another study in Tanzania¹⁰⁴ showed that women's marital status is a critical factor in determining their access to adaptive strategies and it is more important than for men (see Box 5). It attempted to deconstruct the unitary household showing the situation of each woman. It argued that, while a comparison between male- and female-headed households is a valuable first step in climate change analysis, it is also important to transcend this level of analysis and to recognize the diverse positions of women in both types of households.

In Sri Lanka the post-tsunami relief programme was criticized for not addressing the pre-tsunami land tenure laws that discriminated against women. This meant that many female widows were left without any right to restitution or compensation in the post-disaster redistribution process.¹⁰⁵

3.1.3. **Gendered impacts on different groups of men**

Although the differential vulnerability of women to extreme events has long been understood, there is now increasing evidence to show how gender roles of men can also affect their vulnerability.¹⁰⁶ However, in the three case studies analysed (Bangladesh, Fiji and Botswana), no data with regard to vulnerabilities of men were identified, except for sporadic mentions of men's migration in search for new livelihoods, straining households and often breaking up families.

A more detailed analysis in Burkina Faso showed that rainfall variability is significantly associated with migration of men who are likely to move from areas with poor rainfall to other rural areas that are wetter. This is illustrative of a more general tendency of male migration to urban areas in most rural communities affected by climate change.¹⁰⁷

Other empirical data shows that men are often expected to be brave and heroic during disasters and are more exposed to risks given that they are most of the relief workers.

Men also seem to suffer more psychological impacts like depression, isolation and increased pressure to adjust to farming activities and crops than women. For example, a study in the Philippines¹⁰⁸ showed that men suffered more from isolation and worried more about crop loss due to floods, while women had stronger social networks to help them. Men felt useless and flooding brought more emotional stress to men than women, who were also concerned with their husbands resorting to alcohol as a coping mechanism.

There is also evidence that mental health of men may suffer during prolonged period of drought in Australia, with an estimated 15% increase in the rate of suicides among males, while such an increase is associated with a slight decrease in the suicide rate for females. In rural Australia, traditional masculinities, in particular reluctance among men to seek for help when having difficulties serves as an important contributor to the risk of suicide.¹⁰⁹

It is also worth noting that in other regions not covered by this research, men may also have higher mortality rates during heat waves and floods.

For example, women had a higher risk of mortality than men due to heat stress in Mexico City, although the reverse was true in Santiago and São Paulo.¹¹⁰ In USA, the death rate from extreme heat was 2,6 times greater for men than for women, while in the Mediterranean cities similarly-aged women were more likely to die in heat waves between 1990-2004.¹¹¹

Studies examining flood mortality in the USA, Europe and Australia found that men are substantially more likely to be killed by flood events than women, often as a result of being trapped in vehicles in floodwaters.¹¹²

Box 6. Disaster impacts on men, in particular widowers

Many in these coastal towns [in Indonesia] were fishermen who survived at sea or farmers in the hills above the high water line. But their wives and children were killed at home not far from the beach when the driving waves turned the village into ruins on December 26. In Lamteungoh, there are 105 widowers and only 19 widows. These rugged men are now grappling with unfamiliar roles, dependent on one another and uncertain about what comes next. With their families gone, some say their lives have lost purpose. They are caring for children in communal style and tending to the injured. They are struggling to move through their grief and reclaim their future. "Life today has no meaning at all for me," said Baharuddin, 49. "Now, suppose I find a job and make money. To whom can I distribute it?"

Source: Gender note 3, Gender and Disaster Network, 2005

Widowers are among the most impacted group, as exemplified by the personal testimony of a survivor of a disaster in Indonesia (see Box 6).¹¹³

3.1.4. Gendered impacts on gender relations and roles

One of the recurrent impacts of climate-related changes were weaker family structures, because men often have to leave in search for work elsewhere.

At the same time, surprisingly, the studies mentioned some positive impacts of climate change and adaptation programmes. In Bangladesh, it underlined that women have more access to credit and programmes to restore their livelihoods. Programmes targeted specifically at women could also be identified both in Fiji (the Expanded Food Voucher Programme for pregnant women in rural areas) and Botswana (Government agricultural subsidy schemes such as the Livestock Management and Infrastructure Development), though the impact on gender relations and roles was not expressly described.

A case in South Africa¹¹⁴ underlined the change in gender roles in the family and in the community. Women in search of alternative livelihoods and income-generating activities like informal trade became more independent and involved in taking decisions. Some men got in household chores, like home gardens, collecting water. Boys and girls also started alternating in household chores.

There is also evidence regarding changes in livelihoods, starting to slowly blur occupational segregation. For example in Malawi¹¹⁵, as a result of the reduction of agricultural yields caused by climate variability, women who were previously involved mostly in subsistence agriculture, start to be involved in the charcoal business, selling it, while men are responsible of the charcoal processing.

3.2. GENDER-RESPONSIVE CLIMATE INFORMATION AND SERVICES DELIVERY

The obligation of States to facilitate access to environmental information has strong roots in human rights law, in the rights to freedom of opinion and expression. Article 6 of the UNFCCC provides the bedrock for access to climate information. The adoption of the Doha Work Programme on Article 6 in 2012 was a milestone in highlighting the specific situation of vulnerable groups and supporting the importance of a crosscutting gender approach.

Access to climate information is strongly linked with the other elements of Article 6 of the UNFCCC, particularly public participation, awareness raising, education, training and capacity building.

Evidence shows that improving early warning and weather information effectiveness has the potential to save lives and assets and avoid significant negative impacts related to climate variability and weather patterns.

Improving early warning and weather information has the potential to save lives and assets.

3.2.1. **Overcoming gender inequalities in access to climate information**

It is critical that early warning and alerts of extreme events, climate information for the agricultural community, as well as forecasts and warnings of floods and water levels and discharge within river basins, watersheds and coastal areas, be provided in a manner accessible to both genders.

Multiple examples underscore the lower access of women to climate information, early warning and formal agricultural extension services.

Women have less access to early warning and climate information.

23% of the men respondents received agricultural information compared to only 7.5% of the women in Andhra Pradesh, India¹¹⁶. “Extension systems” delivering trainings also fail to adequately target women in agriculture and aquaculture in Gujarat, India.¹¹⁷ In Nepal, NGOs often target information on adapting agricultural activities to climate change to men, reflecting established gender roles¹¹⁸. In Senegal and Uganda, men tend to have access to better weather information that helps them adapt crop production practices.¹¹⁹

The understandings by men and women of their risks, access to and abilities to act on information, are further differentiated by class, ethnicity, literacy rate and the like.¹²⁰ Women in developing countries and indigenous women tend to have even more limited access to climate and weather services.¹²¹

These information asymmetries among and within countries are coupled with frequent lack of technical capacity to engage with scientific materials and financial constraints.¹²² Moreover, the lack of women in science and technology fields widens the information asymmetry.¹²³

Box 7. The power of the community radio in disasters

« FemLINKPACIFIC is once again a testament to the way in which radio can work for the empowerment of the most marginalized, reaching them not only as listeners but at the centre of content” (Sharon Bhagwan-Rolls, FemLINKPACIFIC former Executive Producer-Director).

- Radio is the mass media reaching most people in the world. In developing countries 75% households have access to it;
- UNESCO 2016 World Radio Day focused on Radio in times of emergency and disaster;
- Between 2000-2006 in 11 countries surveyed across Africa, community radio grew by a striking 1,386% on average;
- 10,000 community radio stations in Latin America;
- 5000 community radio stations in Thailand and other stations in South-East Asia.

Source: compiled by authors on the basis of UNESCO Statistics on radio and FemLINKPacific Community Radio Times (see Section 2 case study on Fiji)

3.2.2. **Addressing gender-specific needs in climate services delivery**

It is crucial to provide accessible and appropriate climate information and services to both women and men as a “priority strategy”¹²⁴ to enable them to adapt to the impacts of climate change and reduce their gendered vulnerabilities.

For example, it was found that climate change communication in the African context needs to take into account cultural diversity, communities’ understanding of issues as well as how women and youth in these contexts express their hopes and aspirations.¹²⁵

It is also worth recalling the place-specific nature of both vulnerability and empowerment, different even within the same country; therefore climate information should also take into account social context and cultural norms.

In different contexts, women prefer:

- Radio
- Mobile phone communication
- Radio programmes enabled by SMS alerts
- Group-based approaches

3.2.2.1. **Delivery channels and feedback mechanisms**

The methods chosen for information dissemination should take into account, among others, gender differences in literacy, mobility and access to public venues, labour schedules, and general preferences for the means of information.¹²⁶

For example, as seen in Section II of this Report, women with disabilities or older women may need home visits by other women to inform about upcoming disasters and provide protection. Television broadcasts could add sign language to the warnings, and text messages could be sent targeting the hearing impaired.¹²⁷

A study¹²⁸ that evaluated gender specific perceptions and the extent of adoption of a climate-smart push and pull technology in eastern Africa found that extension officers were the main source of information for the majority of users (72.7% women and 66% of men). Women however preferred extensions channels more than men possibly because of their intensive household and farming roles, leaving them less time to go out to village meetings. A higher percentage of men were reached by NGOs, which may be due to construed misconceptions that women are not the main farmers.

Traditional communication tools such as radio, theatre, video and face-to-face interactions have indeed proven the most effective for women, particularly in instances where new technologies are not accessible. Radio has emerged as the most accessible communication tool for grassroots women because it is cheap, easy to use and does not require literacy. Also, it does not interfere with their work and allows information to reach communities immediately and over large areas.¹²⁹

At the same time, the rise of ICT and other innovative tools, like social media, mobile phones, the Internet, and interactive voice-response systems, could contribute to bridging the gap in access to and action upon climate information. They are an important complementary tool to community-based approaches that could enhance both women and men’s capabilities in managing climate-related risks.

The number of people owning mobile phones in Africa is expected to increase in the next few decades, for example in Zambia¹³⁰ it is already increasing, though women still lag behind (see

Table 6). Mobile-based platforms could enable farmers to respond to weather information and make inquiries about their specific crops, receiving personalized replies from agricultural extension officers on their phones.¹³¹

In Nigeria, mobile phones are already distributed by Government to rural farmers for better access to climate-smart agriculture information from extension workers. There is also potential of using space applications, like geo-data, for providing timely agricultural advice and early warnings on droughts, floods and diseases through mobile phones, thereby maximizing its use.¹³²

Table 6. Ownership of mobile phones in Zambia by sex (%)

	2004	2006	2010
Women	8,2	18,5	42,5
Men	11,5	26	51,5
Total	10,8	24,2	49,4

Source: Adapted from Namukombo, 2016

A study¹³³ in India also found that precise and timely weather based agro-advisories have reduced the information asymmetry between male and female farmers. The same mobile phone messages were sent to women and men, the listening rate being equivalent. Feedback from women farmers showed that the information they listened to helped increase their knowledge about climate-smart technologies and encouraged their participation in decision-making.

Multiple channels of delivery are the most effective in meeting gender-differentiated needs

Therefore, multiple channels of delivery¹³⁴ (such as community radio, mobile phone messaging, and community groups) may reach women and different socio-economic groups more effectively. In fact, most of these channels of delivery are not mutually exclusive, rather mutually reinforcing. For example, listening to more detailed radio warnings could be triggered by SMS alerts, which have the value of immediate reach.

“Women still find communications and information (of the weather bulletins through the mainstream media) as unclear, inaccurate (for their areas), infrequent or ineffective. If we could have a special alert to hear before they update us (over the radio), that would let the women know when to listen.”

(Losana Derenalagi, FemLINKPacific’s convener based in Nadi)

Thus, cooperation among the different institutions responsible of early warnings and climate information (including NMHS) with the intermediaries, such as civil society, the media, schools and universities, and community-based organizations is essential to expand the reach of information to all.

Participatory approaches and community-based disaster risk management are effective responses and should be gender-inclusive

Effective communication should also embrace participation in order to promote inclusiveness in climate change discussions and decision-making. No individual climate change communication approach can be effective; rather the use of an integrated and structural participatory approach that includes both women and men and is based on a two-way exchange of knowledge and information can be successful.¹³⁵

Community-based disaster-risk management has proven to be an effective policy for implementing prevention, mitigation, and preparedness activities and enhancing communities' understanding of the risks of disasters. For example, according to the 2016 TC *Winston* PDNA, Nawaqarua village in Ba Province constructed a community evacuation centre and conducted evacuation drills following participation in CBDRM training, which contributed to the fact that no lives were lost during TC *Winston*, despite Ba being one of the most affected areas.

3.2.2.2. **Issues of perception and trust**

Women tend to trust extension agents and social groups rather than climate science and meteorology

It is equally important to take into account issues of perception and trust regarding climate change and the environment, when deciding on climate information delivery.

For example, a study in the Pacific¹³⁶ showed that although all respondents believed that climate change was happening, there was a variation in attitudes across demographic factors such as age, region and gender (see Table 7).

Studies in Africa have revealed similar findings¹³⁷ women having more trust in information that they acquired through extension agents and social groups, while men highly trusted information from meteorologists.

Table 7. Perception of climate change and sources of information in the Pacific

	<i>Female respondents</i>	<i>Male respondents</i>
Disagree that the seriousness of climate change is exaggerated	37.6%	30.6%
The environment in island/place of origin is in bad condition	43.3%	35.5%
Trust in climate science information	42.5%	49.2%

Source: Adapted from Scott-Parket et al., 2016

Even in the online climate change communication realm, female twitters seem to be more easily targeted via local campaigns and news media, while male twitters seem to follow more political and scientific climate-related information.¹³⁸

3.2.2.3. **Content of climate and weather information**

Gender differences usually exist also in terms of needed types and content of information.

In rural Kenya¹³⁹, it was found that husbands had more access to information on crop and livestock production and early warning systems for severe or abrupt events such as floods and drought, while wives had more access to weather forecast and to advice on climate adaptation options.

According to a study in Senegal¹⁴⁰, while all farmers expressed the need for information on seasonal onset of the rains, length of rainy season, distribution of rainfall within the season, and warnings on the arrival of rainfall-related events and hazards (such as storms, strong rains, strong winds), female farmers specifically required information on rainfall deficit/dry spell forecasts (which they define as no rain for a period of 20 consecutive days) and information on the likely

rainy season cessation period. That was due to the fact that women plant their plots a month later than the husbands who control the means of production and, therefore, a dry spell or early seasonal rainfall cessation is devastating for most women in Kaffrine, Senegal.

Climate and weather information should include content relevant to women and men's roles in farming

Women may take responsibility in different aspects of agriculture than men, therefore needing different information. For example, in many countries, women manage household kitchen gardens and small livestock, while men take responsibility for commercial crops and large livestock. Interventions on climate-related agricultural information should thus take into account these differences in resources and demands.¹⁴¹

One way of approaching this in the short-term is by disseminating information in a gender-differentiated way, taking into account the division of labour among women and men, depending on their roles and responsibilities¹⁴² (See Box 8).

Box 8. Gender-differentiated radio programming

In the rice production in Ghana, women are predominantly involved in the harvesting, winnowing, manual de-stoning, parboiling and marketing. Men are mostly responsible for the land preparation, sowing, water management and weeding; and the household may join together for certain tasks such as threshing and transport. Radio extension programmes, therefore, need to be prepared in a way that makes them accessible to the target audience. This will require consultation with the community to identify not only the different subject priorities of men and women but also the timing of the broadcasts including any meetings of listeners' groups or follow-up training, to fit in with work and household schedules. Radio Peace in southern Ghana broadcasts to the women's cooperative on issues such as fish processing and marketing but on Tuesdays, for example, programmes are targeted at the fishermen who stay ashore in Elmina port to repair their nets.

Source: Chapman et al., 2003

Therefore, needs assessments¹⁴³ that explicitly clarify women's and men's priorities and needs should inform policy and programme design, including of hydro-meteorological services.

3.3. DOWNSCALING FORECASTS TO THE COMMUNITY LEVEL AND SIMPLIFYING MESSAGES

Scientific information on climate and weather is available but with different degrees of accessibility and often not sensitive to the needs of all users, in particular from the most vulnerable groups. Therefore, there is a need to better tailor climate information, which would benefit both women and men.¹⁴⁴

Climate information that is downscaled to the community level is more relevant and helps address current and future climate risks. Downscaling, in this context, refers to:

- Delivering accurate weather forecasts at a subnational level, as compared to national forecasts and regional climate outlooks;
- Providing information on different time scales, daily and seasonal forecasts being the most comprehended by grassroots people and having the potential to impact long-term adaptation¹⁴⁵;
- Delivering clear, simple, and easy to understand forecasts and early warnings to enable direct use by the grassroots people.

An accessible climate message or alert is:

- Sub-national
 - Timely in case of disasters
- Daily/ seasonal in case of agriculture
- Simple and easy to understand
 - In the local (including vernacular) language

A study¹⁴⁶ on downscaling climate information in Kenya found that appropriate use of downscaled climate information by farmers significantly contributes to climate change adaptation. It recalled that the majority of farmers in Kenya never used to receive any simplified climate forecast information for their location, yet over 90% of farming households owned a mobile phone. Farmers also used to misinterpret forecasts, as they were broadcasted over the radio. In addition, there were minimal or no formal community-level climate services in sub-Saharan Africa.

The messages should be delivered in languages that reach all vulnerable communities, including in the vernacular language. For example, in order to overcome the lack of climate information (in terms of language and form of material) especially in rural communities, GenderCC South Africa developed understandable information on gender and climate change in the form of brochures which have been translated into Zulu, SeSotho and Afrikaans and distributed during capacity building workshops with grassroots women.¹⁴⁷

Another recommendation¹⁴⁸ was to ensure that warnings are simplified and standardized, for example using “Colour coding” to define the intensity of a disaster (different colours for “Alert”, “Take Action”, “Stand down”). A colour-coding warning system has been in place in Hong Kong and has proven to be effective¹⁴⁹ (see Box 9). Development of Standard Operating Procedures (including message templates and communication modalities) in disseminating early warning text messages is also encouraged.¹⁵⁰

Box 9. Colour-coding in rainstorm signals for better school operation

Hong Kong is affected by severe local rainstorms, which can develop with dense rainfall. In order to manage a coordinated response by different authorities and guide concrete actions to citizens a colour-coded rainstorm warning system has been operating since 1992. It consists of 3 levels, namely: Amber, Red, and Black.

The Amber signal is issued to alert on potential heavy rain, which may develop into Red/Black rainstorms. The Red and Black signals are issued to warn the public about the occurrence of heavy rain (50 and 70 mm/hr respectively), which can be hazardous and may result in major disruptions.

Forecasters collaborate closely with the education authority when heavy rain is expected and the Red signal is imminent. Such close coordination has been in operation for over ten years and there is practically no deaths or injuries of students as a result of such inclement weather conditions.

Source: WMO, 2010

3.4. GLOBAL FRAMEWORK FOR CLIMATE SERVICES: GENDER ENTRY POINTS

The Global Framework for Climate Services provides a worldwide mechanism for coordinated actions to enhance the quality, quantity and application of climate services. The World Climate Conference-3 (Geneva, 2009) unanimously decided to establish the GFCS, a UN-led initiative spearheaded by WMO to guide the development and application of science-based climate information and services in support of decision-making.

In 2015, during the second meeting of the International Board on Climate Services, the then WMO Secretary-General emphasized the need for tailored, including gender-sensitive, services.

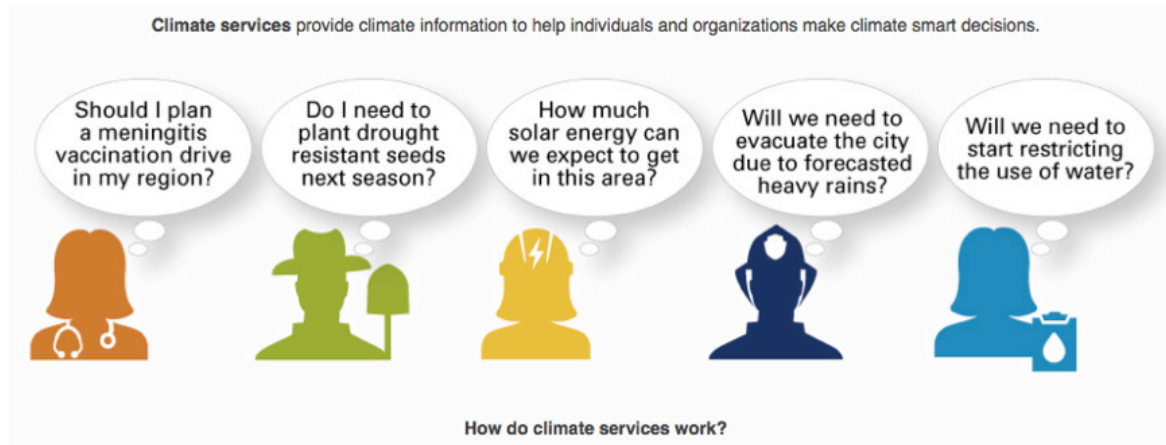


Figure 4. Climate information content adapted to users' needs

Source: WMO, GFCS website

The meeting's Report also recalls the 2014 WMO Conference on the Gender Dimensions of Weather and Climate, calling to incorporate gender-related recommendations into the GFCS Implementation plan and to ensure that GFCS projects and activities are gender-sensitive.¹⁵¹

According to data gathered through interviews, the development partners of GFCS typically apply a gender dimension in the implementation of climate services programmes.¹⁵² However, there is not a process for tracking progress towards a common set of gender related goals or outcomes or for sharing learning on gender aspects across the framework. Having metrics to measure the improvements of climate services at the national level, including through a gender lens and aggregating this knowledge at the global level would thus be beneficial.

It was also noted during interviews that the current WMO mechanism for tracking NMHS capacity to provide climate services does not address gender aspects. It was recommended that lessons learned from the USAID funded Assessing Sustainability and Effectiveness of Climate Information Services in Africa programme be taken into account into the WMO monitoring and evaluation processes. One output of the programme was a survey instrument and accompanying metrics to assess effectiveness and sustainability of NMHS to deliver climate services. The instrument considers gender aspects in staff capacity (staff specialization and management by gender), sex disaggregated user feedback, and tracking climate information requests by women. A recommendation from the programme for the next steps was to examine more fully how NMHSs integrate gender considerations in their structures and how the role of women in NMHSs influence the ability of the NMHSs to provide climate services.

Another opportunity for strengthening gender considerations in climate services is ensuring that gender aspects are included in the Baseline evaluation of National Frameworks of Climate Services (NFCS) and systematically track progress in the implementation of common goals (including gender targets) in national climate services.

CONCLUSION

This report found that climate and weather impacts are not gender neutral but are experienced differently by different groups of women and men, at the intersection of other social determinants such as economic status, location, age, disability, and marital status.

Rural women and men and those with limited access to and ownership of resources, widowed and divorced women, older women and women with disabilities, pregnant women and adolescent girls, as well as widowers, tend to be impacted the most.

While both women and men are physically, psychologically and materially affected by disasters and losses in agricultural productivity, these impacts are manifested differently as a result of existing societal stressors, among which the strongest are socially constructed roles and responsibilities, occupational segregation, and cultural norms.

Because of these factors, the results suggest that women bear most of the burdens, including increased time and labour workloads, health issues like malnutrition, increased rates of sexual and gender-based violence and even early child marriage, as well as an increased risk of mortality and morbidity as a result of disasters.

However, some of these gender roles, which are the root cause of disproportionate impacts, are changing. Indeed, one of the surprising findings of this research was that climate induced unemployment and difficulties determine women and men to engage in different new activities, leading to new roles in the family and in the community. Women start taking a leadership role along their male counterparts as they engage in alternative livelihoods and income-generating activities.

At the same time, coping and adaptation mechanisms with negative effects have also been identified. Men's migration in search for new income-generating activities often weakens the family unit and men tend to suffer more from isolation and worry more about adjusting farming activities and saving crops, sometimes resorting to alcohol abuse.

These impacts can be reduced if ambitious gender-responsive and gender-inclusive climate change adaptation, agriculture and disaster risk management policies are in place, which is often not the case, even though certain progress is being made. Similarly, disaster and post-disaster needs assessments started to include a gender dimension only recently, for example starting in 2013 in Fiji, however many of them still are totally gender-neutral (for example Bangladesh). Sex and age-disaggregated data is also often lacking or collected in an ad-hoc manner. Baseline needs assessments therefore often do not include a gender dimension to them.

Most importantly, access to climate and weather information, a key element of adaptive capacity, is often not equally available to men and women. Women, especially women from remote areas, women with disabilities, indigenous women and female-headed households, often have lower access to the content of the information (early warning, weather information that helps adapt agricultural practices), to some of the intermediaries and channels for delivering it (agricultural extension services, mobile phones), as well as to training developing understanding and abilities to act on this information.

Therefore, it is crucial to ensure that climate information and services are provided in an accessible and appropriate manner to both women and men, in order to enhance their adaptive capacity to climate impacts and to reduce their vulnerabilities.

Decisions regarding the content of information and channels of delivery should be taken on the basis of an early evaluation of community's needs, both women and men, through a participatory approach. Women may prefer radio, mobile phone or group-based approaches in different contexts, but an inter-operable system with multiple channels of delivery has the biggest chances of success (see Women's Weather Watch good practice). Cooperation among climate providers and intermediaries that deliver the message is also crucial. In terms of the content of information, it should be accessible, easy to understand including in terms of

language and downscaled to the community level. Different time-scale forecasts (in particular daily and seasonal) should take into account women's and men's different roles in farming, while early warning should be timely and specific to the impact on the community. Effective communication takes place through participatory approaches with feedback mechanisms that include both female and male users.

Finally, this study revealed that there was no or very little empirical evidence about the impacts of climate change on different groups of men. Therefore, more fieldwork and empirical data on climate gender-differentiated impacts on men would be necessary and this is a potential area of research to be further explored. There was also very limited fieldwork research on the gender-differentiated needs of climate information, such as which channels and content are preferred by women and men in different contexts, which could also be further researched.

RECOMMENDATIONS

For Governments:

1. Access to resources
 - Ensure equal access to resources to women and men to adapt to climate variability, including land, credit, decision-making, education and training, natural resources and ICTs;
 - Ensure that the content of disaster preparedness trainings and the designing stage of the trainings takes gender into account;
 - Conduct gender trainings for NMHS, disaster preparedness actors (in particular at the local level) and the media on the meaning of gender and its and gender-differentiated needs;
 - Ensure appropriate funding of NMHS and increase their capacity and other organizations engaged in gender-sensitive climate information delivery and inclusive climate change policy-making;
2. Gender-responsive policies
 - Ensure that climate change, disaster risk reduction and management, agriculture and food security policies are gender-responsive;
 - Implement community-based participatory gender-sensitive disaster risk management;
 - Ensure that different groups of women are meaningfully engaged and consulted at all levels of disaster preparedness and response, disaster preparedness trainings, information and networking opportunities;
3. Data and research
 - Collect and use sex and age-disaggregated data, as well as establish gender-sensitive indicators and benchmarks;
 - Ensure that the design of damage assessments, including Vulnerability and Capacity Assessments, Post-Disaster Needs Assessments, as well as initial post-disaster field survey forms, are gender-sensitive;
 - Conduct further intersectional analysis and research with regard to the gendered impacts of weather and climate;

For NMHS:

1. Cooperation and partnerships
 - Carry out regular activities and campaigns of engagement with the users, including the provision of explaining climate information and services, both to women and men in order to gain their trust and perception of it;
 - Actively cooperate with various actors, including international organizations and donors, as well as intermediaries for efficient dissemination of climate information;

2. Diversifying delivery

- Use multiple channels of climate information delivery adapted to users' needs, including commercial media, community radio, mobile messaging, community-based women's organizations, universities and schools and church leaders. The method of dissemination should take into account literacy, communities' understanding of issues, cultural diversity, mobility, access to public venues, labour schedules and general preferences;
- Partner with community radio networks to air programmes on disaster preparedness and explain it to the users all year round, not only immediately before or after; as well as programmes on agricultural information all year round, including through gender-differentiated radio programming;
- Target dissemination of climate information especially at remote and rural communities to be affected by climate change;
- Ensure that feedback mechanisms with users on climate information and services delivery are in place;

3. Content of messages

- Ensure that the climate information messages design is clear, simple, understandable and downscaled to the sub-national level, and that their content is tailored to the different groups of users, accessible to both women and men;
- Adopt Standard Operating Procedures in early warning dissemination (including early warning message templates and communication modalities) in order to standardize and simplify information (e.g. colour coding);
- Ensure that climate information is delivered in the local languages, especially in the vernacular language and local dialects;
- Provide climate information and services on different time scales, in particular daily and seasonal;

4. Importance of awareness

- Ensure that public awareness campaigns are gender-sensitive and value women's needs;
- Conduct trainings for women and men in order to increase their understanding of and awareness to climate information;

For the Global Framework for the Climate Services Board and WMO:

- Ensure that gender is incorporated in the Baseline Evaluation of National Frameworks of Climate Services;
- Ensure that the WMO monitoring and evaluation of climate services implementation by NMHS includes gender-sensitive indicators;
- Update the Guidelines on the frameworks for climate services at the national level to respond to gender differentiated needs;
- Ensure that a gender dimension is systematically integrated in the GFCS programmes and activities, including in the User Interface and Capacity Building components, at the design phase of these programmes;

- Continue incorporating gender issues in the Regional Climate Outlook Forums, as in the case of the fiftieth Greater Horn of Africa Climate Outlook Forum, which was for the first time dedicated to exploring the gendered impacts of climate, different user needs and service provision strategies for gender-responsive climate services;
 - Develop, as envisaged, a training module adapted for each region, in partnership with WMO Regional Training Centres, on gender-responsive weather and climate services delivery.
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LIST OF ABBREVIATIONS

CBDRM	Community-based Disaster Risk Management
CEDAW	Committee on the Elimination of All Forms of Discrimination against Women
CoP	Conference of the Parties to the UNFCCC
CSW	UN Commission on the Status of Women
DRR	Disaster Risk Reduction
DRM	Disaster Risk Management
GED	Gender, Environment and Development
GGCA	Global Gender and Climate Alliance
HFA	Hyogo Framework for Action
IGOs	Inter-Governmental Organizations
INGOs	International Non-Governmental Organizations
IPCC	Intergovernmental Panel on Climate Change
IOM	International Organization for Migration
IUCN	International Union for Conservation of Nature
NGO	Non-Governmental Organization
NMHS	National Meteorological and Hydrological Services
OHCHR	Office of the UN High Commissioner for Human Rights
PDNA	Post-Disaster Needs Assessment
PLWD	People Living With Disabilities
SGBV	Sexual and Gender-Based Violence
SIDS	Small Island Developing States
TC	Tropical Cyclone
UNHRC	UN Human Rights Council
UN	United Nations
UNDP	UN Development Programme
UNFCCC	UN Framework Convention on Climate Change
UNISDR	UN Office for Disaster Risk Reduction
VAW	Violence Against Women
WASH	Water, Sanitation and Hygiene
WB	The World Bank
WEDO	Women's Environment and Development Organization
WMO	World Meteorological Organization
WWW	Women's Weather Watch

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