



# Roots for the Future

The Landscape and Way Forward on  
Gender and Climate Change



This publication was produced by the International Union for Conservation of Nature (IUCN) Global Gender Office (GGO) under the auspices of the Global Gender and Climate Alliance (GGCA) joint programme, which has been made possible by the generous support of the Government of Finland. A wide range of collaborators, including from across the diversity of the GGCA membership, have contributed content, case studies, and peer review. The views expressed in this publication do not necessarily represent the whole of IUCN, nor the views of all collaborators.



<http://iucn.org/>  
<http://genderandenvironment.org/>



[www.gender-climate.org](http://www.gender-climate.org)

Roots for the Future: The Landscape and Way  
Forward on Gender and Climate Change

ISBN 978-9968-938-70-9

The GGCA, founded by IUCN, United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP) and Women's Environment and Development Organization (WEDO) in 2007, is a unique alliance comprised of nearly 100 members—UN, intergovernmental and nongovernmental organizations from around the world, working together to ensure climate change decision-making, policies and initiatives at all levels are gender responsive and improve the lives and livelihoods of women and men.

## Lead authors and editors

Lorena Aguilar, Margaux Granat, and Cate Owren

### In collaboration with

- Manuel Oliva (*Chapter 1*)
- Eleanor Blomstrom and Bridget Burns (*Chapter 2.1*)
- Cheryl Anderson, with Molly Gilligan, Fidaa F. Haddad, Ali Raza Rizvi, and Cristina Tirado (*Chapter 3*)
- Ana Rojas, with Maria Prebble and Jackelline Siles (*Chapter 4.1*)
- Elizabeth Eggerts (*Chapter 4.2*)
- Gotelind Alber and Kate Cahoon, with A.E. Boyer (*Chapter 5*)
- Liane Schalatek (*Chapter 6*)

### Case study coordinators

- A.E. Boyer and Cate Owren, drawing content from *inter alia* GGCA member submissions and the UNFCCC Momentum for Change initiative

### Publication coordinators

Cate Owren and Margaux Granat

### Designers

Pablo Porta and Laura Hidalgo,  
Estudio Relativo

### Sourcing and formatting

Molly Gilligan

### Copy editor

Georgina Kenyon

### GGO communications coordinator

Maggie Roth

The citation for the full publication is: Aguilar, L., Granat, M., & Owren, C. (2015). *Roots for the future: The landscape and way forward on gender and climate change*. Washington, DC: IUCN & GGCA.

An example chapter citation is: Blomstrom, E., & Burns, B. (2015). Global policy landscape: A supporting framework for gender-responsive action on climate change. In L. Aguilar, M. Granat, & C. Owren (Authors), *Roots for the future: The landscape and way forward on gender and climate change*. Washington, DC: IUCN & GGCA.

# Acknowledgements

This publication—much like the GGCA itself—was made possible by the collective effort of a wide range of contributors. The GGCA membership and joint programme results inspired this publication in large part, thanks to the tremendous gains achieved across the gender and climate policy and programming landscape, especially over the last eight years.

The lead authors of each chapter ensured that each theme was covered comprehensively and in light of the very latest developments in the respective fields. IUCN Global Gender Office (GGO) deeply appreciates the collaboration with Manuel Oliva, Eleanor Blomstrom and Bridget Burns, Cheryl Anderson, Elizabeth Eggerts, and Gotelind Alber and Kate Cahoon, and Liane Schalatek. Lead authors were supported by a number of expert contributors for key content in the adaptation chapter, including Fidaa F. Haddad (drylands, desertification), Cristina Tirado (nutrition, food security, health), and Ali Raza Rizvi (ecosystem-based adaptation, loss and damage).

Expert reviewers added another layer of insight to each chapter. GGO extends thanks to Ana Rojas (introduction), Aira Kalela (international policy), Fleur Newman (national policy, and CDM section), Verania Chao (national policy), Itzá Castañeda (national policy), Patrick Wylie (REDD+), Marcela Tovar-Restrepo (cities), Manuel Oliva (cities), Elizabeth Eggerts (finance), Gabriella Richardson (GEF), and Dima Shocair Reda (Adaptation Fund).

This publication, along with a wide range of impactful programming that IUCN GGO is proud to implement, has been made possible thanks to the generous

financial support—as well as technical partnership and transformative leadership on the gender and climate agenda—from the Government of Finland.

GGO also expresses gratitude to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat and to all the collaborators affiliated with the innovative initiative, Momentum for Change: Women for Results—which has uniquely generated applications from and spotlighted extraordinary examples of women and women's initiatives leading the way on mitigation and adaptation. This publication has benefitted from the ability and access to draw on those examples and share them.

Finally, inside the GGO, this publication was a team effort: Global Senior Gender Advisor, head of the GGO, Lorena Aguilar was supported by publication coordinators Cate Owren and Margaux Granat, who were in turn joined by Ana Rojas, Jackeline Siles, Molly Gilligan, A.E. Boyer, and Maggie Roth in writing sections of chapter narrative, reviewing dozens of drafts, identifying illustrative cases, formatting and researching citations, and analyzing and including original data, including from the GGO's own Environment and Gender Index (EGI). GGO team members Itza Castaneda, Natalia Armijo, Barbara Clabots, Erin Knight, and Maria Prebble also contributed research and support—and nothing in the GGO is possible without the financial and administrative backbone provided by Celia Steele and Roxanne Halley. GGO moreover expresses its appreciation to IUCN and especially to the Washington, D.C. office for its support.

# Prologue

Women living in developing countries face two different, but intrinsically linked scenarios when it comes to climate change.

On the one hand, they are disproportionately vulnerable to the effects of climate change. On the other hand, they are powerful agents of change.

Because these women are the ones adapting to droughts, floods and other extreme weather events right now, they are at the front lines in the battle against climate change. This puts them in a better position to recognise some of the opportunities that climate change presents.

For example, nearly 2.4 billion people—the majority of them women—still cook on open fires inside their homes. New, clean technologies are allowing many of these women to switch from open fires to fuel-efficient cookstoves that improve their health, use less wood and cut down on emissions.

At the UNFCCC, we work hard to showcase the critical role women play in responding to climate change through our Momentum for Change initiative. The initiative highlights women-led activities that are making a real difference in the fight against climate change—activities that can be replicated and scaled up at the local, national and international levels.

We tell the stories of women making transformational change, such as the Thai industry leader who has turned her solar company into a billion-dollar business, or the Australian trailblazer who is creating a movement to get 1 million women across the country to act on climate change, or the Ghanaian entrepreneur who is bringing bamboo bicycles to the global market.

But if women are to be true agents of change, real and measurable action at all levels must be ramped up.

This new publication is a valuable tool to help increase the capacity of policy and decision makers to develop gender-responsive climate change policies and strategies that ensure women are engaged at all levels of the decision-making process. This publication comes at a crucial moment in time, as governments around the world work toward a new, universal climate change agreement in Paris, France, this year.

It is my sincere hope that the practical examples contained in this publication will strengthen efforts toward a new agreement, one that enables women to act as agents of change at all levels.



**Christiana Figueres,**  
*UNFCCC Executive Secretary*

# Foreword

Climate change will have direct or indirect impacts on everybody's life. It is unfair that it will affect most the lives of the poorest people, in the poorest regions, who have contributed least to the causes. The majority of these deeply affected are women. What we can do first to change this injustice is to ensure that those perspectives and experiences shape and drive our action on climate change.

In the recent years, our collective understanding of the various roles and responsibilities of men and women in our societies has increased considerably. It has convinced us that the engagement and leadership of both men and women, equally, are needed to make our global response to climate change fully effective. Women's contribution is essential, for example, in moving toward sustainable consumption and production, as women do most of the purchasing in developed countries and decide on consumption patterns in households and in some workplaces. In developing countries, women play a powerful role in sustainable agriculture and food security, in particular, as well as conservation of soil, forests and water resources.

Understanding of these roles led to the establishment of the Global Gender and Climate Alliance (GGCA) in 2007, when negotiations were launched toward a

new international climate agreement. The founding partners decided to consolidate and strengthen efforts toward gender equality in combating climate change. Finland has supported the work of the GGCA from the very beginning and cooperated with interested partners to make progress toward a truly gender responsive agreement.

Our objective in this cooperation has been to act against climate change in the most efficient way and prevent it from further exacerbating gender inequality. We cannot allow climate change to undermine our efforts toward poverty eradication. Lifting millions out of poverty is still the overall target of the Sustainable Development Goals. They build on the best achievements of the Millennium Development Goals. Combating climate change and promoting gender equality are both explicitly among the new goals. I am particularly pleased that gender equality is also integrated in a horizontal way in many activities under the other goals and is a stand-alone priority in spotlight.

This vision is shared by all partners of the GGCA. It has grown under our cooperation from four founding members to a powerful, unified actor of nearly a hundred organizations. This is a convincing indication that there is a growing understanding of the need to

advance gender equality in all development efforts and support for the participation of women in international and national work on climate change.

The co-operation of the GGCA members and active Parties has brought many arrangements, which encourage women to participate on full and equal basis in efforts to fight climate change.

Together, we have contributed to great results in the international cooperation within the UNFCCC. These include establishment of “Gender and Climate” as a permanent agenda item under the Conference of Parties and more than 50 decisions by the Conference on various climate actions. They cover all major programmes of the Convention and a specific Lima Work Programme on Gender agreed in 2014. Gender issues are highlighted during a Gender Day in the Conference and the official web page of the Convention also includes now a dedicated page on Gender. The UNFCCC Secretariat now benefits from a Gender Focal Point, too.

These points of progress would not have been achieved without the tireless efforts of the International Union for Conservation of Nature (IUCN) and other GGCA members. The Women Delegates Fund conceived by Finland

and the Women’s Environment and Development Organization (WEDO) within the GGCA has supported the least developed countries female delegates participation in the negotiations. Capacity building of developing countries’ female delegates, training and awareness raising of all delegates and decision-makers as well as national Climate Change Gender Action Plans (ccGAPs)—all discussed more in depth in this publication—are practical steps that have empowered women and amplified their voices in global negotiating spheres.

Finland is proud to be a partner in this cooperation. The best lessons and experiences are described in this publication. It is a forward-looking testimony of success stories, and I hope it inspires us for strong partnerships and further practical steps promoting successful work for combating climate change and gender equality.



**Tarja Halonen,**

*President of the Republic of Finland 2000-2012*

# Introduction

In 2008, under the auspices of the Global Gender and Climate Alliance (GGCA)—a first-of-its-kind multi-stakeholder network to advance gender-responsive climate change policies, plans, and actions—the International Union for Conservation of Nature (IUCN), together with key partners including especially UNDP, WEDO, and the Government of Finland, created the Training Manual on Gender and Climate Change ([https://cmsdata.iucn.org/downloads/eng\\_version\\_web\\_final\\_1.pdf](https://cmsdata.iucn.org/downloads/eng_version_web_final_1.pdf)). This was, at the time, one of the first comprehensive collections of information on gender and climate themes—ranging from the normative international policy framework to support then-nascent gender-responsive decision making, to gender mainstreaming across adaptation, mitigation, technology, and finance.

Translated into all the UN languages, the Training Manual has been used in dozens of technical trainings, including Trainings of Trainers with women's organisations and thematic orientation sessions for delegates to the UNFCCC, and was—and continues to be—downloaded tens of thousands of times from all over the world. The appetite for user-friendly training information and tools on gender and climate concerns proved to be strong. Given that the Training Manual is still widely used, and requests for updated information have increased in light of significant progress in recent years, the demand appears only to be growing.

Given that, seven years later—thanks in part to the technical support and capacity building for a range of stakeholders; awareness raising and advocacy; and progress in gender-responsive climate planning at regional, national, and subnational levels that the

GGCA joint programme has undertaken—significant progress has been made and thus updates to the 2008 version are necessary to aid the global community in remaining proactive and intently focused on advancing a gender-responsive climate agenda.

## Purpose of this publication

While not a training manual per se, this publication is intended as a full update and overhaul to the 2008 manual content. In other words, this publication was inspired by the 2008 manual, its authors, and its thousands of users, who have continued to request up-to-date information on policy, planning, and—especially—concrete examples of action on the ground. It is therefore a celebration of progress and results achieved. Even more importantly, this publication joins the global call for implementation that is fair and equitable—and demonstrates that is possible.

The target audience is wide: from policy makers at international level who seek a political framework upon which to advance decision-making in line with women's rights and gender equality mandates; to grassroots practitioners who might benefit from best-case project strategies; to those entirely new to these topics but curious to understand the basics or the links—this publication is written for you. Some readers may be gender experts while some may be climate change or sector-specific professionals; this publication aims to fill knowledge gaps and possibly inspire new questions, as well as solutions. The language, while technical, has been drafted to be as 'user-friendly' as possible.

## Inside the pages ahead

---

The line-up of chapters aims to serve as a comprehensive presentation of major issues related to gender and climate change decision making; international, regional and national policies; adaptation and mitigation; sustainable cities; and finance mechanisms. The chapters are intended to flow together but, especially as they have been uniquely authored, they are also meant to stand independently and can thus be individually accessed online. There is overlap across the chapters, as the nature of gender and climate change concerns are inextricably linked. This is as true for gender equality issues as it is for climate and climate mechanisms: the Clean Development Mechanism (CDM), for example, is touched upon in both the energy chapter, Chapter 4.1, as well as the finance mechanisms chapter, Chapter 6. These overlaps are not errors—but signals that one issue cannot be taken in isolation from others.

Along those lines, the table of contents that shapes this publication is far from exhaustive. Important issues and sectors have been left out as subject headings—not for any political reasons, but only because of space, time, or capacity. Education, capacity building, information sharing across broad traditional and untraditional modes, and other public outreach issues, for example, are not addressed here as an independent chapter; profoundly important issues relative to social protections and welfare are likewise not adequately delved into as stand-alone issues.

Many of these concerns, however, find home in the targeted recommendations that culminate each chapter; ‘Moving Forward’ sections aim to both summarise key issues but also trigger new ideas and approaches for a range of stakeholders and decision makers. Even more importantly, capacity building and information exchange drive the numerous programme and project examples featured throughout this publication: from women solar engineers empowering and training other women entrepreneurs, to advocates employing best practices across levels to inform forest, agriculture, or disaster risk reduction policy reform, cross-sectoral and cross-contextual learning and collaboration shines as a key issue of importance throughout the chapters.

Also useful to note: there are tools offered in specific chapters that are most certainly applicable or valuable to others. The gender analysis tools in the energy chapter, Chapter 4.1, might be applicable to cross-sector adaptation projects, as well, for example, while the tools provided in the REDD+ chapter, Chapter 4.2, echo some of the resources suggested in the chapter on sustainable cities, Chapter 5. Readers are invited to consider the numerous ways in which lessons and tools from one sector can benefit the policy making and programming in another.

A special focus of this publication has been on spotlighting new ideas and real examples of positive change, of transformation, happening all over the world. Tremendous gains at policy level go hand-in-hand with an upsurge of innovative implementation approaches with tangible results—from national policy

reform programmes to village-level projects that are resulting in enhanced resilience, food security, safety, and more. The last chapter of case studies<sup>1</sup> celebrates this in particular.

Taking advantage of the diverse, unique ways in which, especially, the GGCA membership working across all levels have programmed ‘gender and climate change’, the final chapter presents a range of case studies, which, in brief, showcase effective strategies and outcomes toward climate mitigation, adaptation, resilience, and sustainable development, and—in tandem—toward gender equality.

The Momentum for Change: Women for Results initiative of the UNFCCC Secretariat recognises activities that demonstrate the critical leadership and participation of women in addressing climate change. These activities show measurable results, which can be potentially replicated and scaled up at the local, national and international levels. They celebrate a wide range of activities happening across sectors all over the world, from women energy entrepreneurs in Indonesia to women transforming waste to reusable products in Peru.

Look for these tags throughout the chapters to learn more about specific examples of these initiatives:

### READ MORE IN CHAPTER 7!

**THROUGHOUT THIS PUBLICATION, ‘READ MORE’ TAGS SUGGEST SPECIFIC INITIATIVES INCLUDED IN THE CASE STUDY CHAPTER AHEAD – ‘LEADING THE WAY: CASE STUDIES ON GENDER-RESPONSIVE INITIATIVES’ OFFERS 35 EXAMPLES OF PROJECTS AND PROGRAMMES HAPPENING ALL OVER THE WORLD AND ACROSS SECTORS.**



## Learn, apply and share feedback

Given that this publication is not a training manual—but, again, builds upon and updates thematic content of the 2008 manual—it is suggested that readers carefully consider the narratives, cases, and recommendations posed and explore meaningful ways to take action in their own trainings, project activities, programme design and evaluation processes, and decision making spheres.

As lessons and best practices continue to emerge and knowledge evolves, IUCN GGO welcomes your feedback and your updates. Please send them to:

**[GlobalGenderOffice@iucn.org](mailto:GlobalGenderOffice@iucn.org)**

1. It is important to note, as the case study chapter itself states, that the case studies presented in this publication have been drawn from GGCA member submissions and websites, as well as public information on UNFCCC Momentum for Change: Women for Results, applicants and winners, and from other sources, such as the Climate and Development Knowledge Network (CDKN). IUCN has not vetted the results claimed by the implementing organizations, nor has it verified or made an assessment of the value of their strategies.

# 3

## PROMOTING RESILIENCE, RIGHTS AND RESOURCES:

Gender-responsive adaptation  
across sectors



By Cheryl Anderson (Univ. of Hawaii),  
Lorena Aguilar and Molly Gilligan (IUCN),  
with Fidaa F. Haddad and Ali Raza Rizvi (IUCN),  
and Cristina Tirado (UCLA and IUNS)





# CHAPTER CONTENT



	<b>Key messages</b>	<b>132</b>
<b>3.1</b>	<b>Understanding adaptation</b>	<b>133</b>
	• Gender dimensions of adaptation	134
<b>3.2</b>	<b>Gender and adaptation concerns by sector</b>	<b>137</b>
	• Disaster risk reduction	137
	• Water	144
	• Agriculture, food and nutrition security, and food sovereignty	151
	• Drylands and desertification	155
	• Coasts, oceans, and fisheries	160
	• Health	165
<b>3.3</b>	<b>Negative effects of adaptation initiatives on gender inequality and possible solutions</b>	<b>171</b>
<b>3.4</b>	<b>Adaptation planning: National to community-based initiatives</b>	<b>178</b>
	• National Adaptation Programme of Action (NAPA)	180
	• Programmatic climate adaptation planning	182
	• Disaster risk reduction planning	182
	• Community-based adaptation planning	183
	• Ecosystem-based adaptation planning	183
<b>3.5</b>	<b>Moving forward</b>	<b>186</b>
	<b>References</b>	<b>189</b>



# ACRONYMS

<b>ADB</b>	Asian Development Bank	<b>LDCs</b>	Least Developed Countries
<b>CBA</b>	Community-based adaptation	<b>MDGs</b>	Millennium Development Goals
<b>ccGAP</b>	Climate Change Gender Action Plan	<b>MFF</b>	Mangroves for the Future
<b>CEDAW</b>	Convention on the Elimination of All Forms of Discrimination Against Women	<b>NAPA</b>	National Adaptation Programme of Action
<b>CO<sub>2</sub></b>	Carbon dioxide	<b>NAP</b>	National Adaptation Plan
<b>COP</b>	Conference of the Parties	<b>NGO</b>	Non-governmental organization
<b>DRR</b>	Disaster risk reduction	<b>PPCR</b>	Pilot Programme for Climate Resilience
<b>EbA</b>	Ecosystem-based Adaptation	<b>SDGs</b>	Sustainable Development Goals
<b>EGI</b>	Environment and Gender Index	<b>UN</b>	United Nations
<b>FAO</b>	Food and Agriculture Organization of the United Nations	<b>UNDP</b>	United Nations Development Programme
<b>FTFA</b>	Food and Trees for Africa	<b>UNEP</b>	United Nations Environment Programme
<b>GEF</b>	Global Environment Facility	<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>GHG</b>	Greenhouse gas	<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>HFA</b>	Hyogo Framework for Action	<b>UNISDR</b>	United Nations International Strategy for Disaster Reduction
<b>IPCC</b>	Intergovernmental Panel on Climate Change	<b>WHO</b>	World Health Organization
<b>IUCN</b>	International Union for Conservation of Nature		



## Key messages

- Adaptation measures reveal the human dimension of climate change.
- The ability of communities to adapt to climate change is inextricably linked to their access and ability to exercise their basic human rights, their socio-economic conditions, and to the health of the ecosystems they depend on for their livelihoods and wellbeing.
- Vulnerabilities and exposure—which shape gender-differentiated risks of climate change—result not only from climatic factors, but from non-climatic factors such as multi-dimensional inequalities often produced (and reproduced) by uneven development processes and social norms.
- Adaptation efforts may be unsuccessful if isolated in sector-specific strategies; multi-dimensional, multi-sectoral, and multi-stakeholder approaches appear to tackle interlinked issues, e.g., food and nutrition security, with health, water management, livelihoods, gender considerations.
- Men and women can and do have different needs and interests in adaptation efforts; men and women also have different experiences, expertise and capacities that can and should influence adaptation efforts.
- While often overlooked, women's knowledge is essential for shaping and enacting effective, efficient, and equitable adaptation measures and policies; full and effective participation of women is vital at every level to realise their rights and to ensure integration of diverse and unique knowledge and experience.
- Various adaptation approaches—from community-based to ecosystem-based approaches—have anchored gender equality as a guiding principle and have revealed valuable lessons and best practices upon which future adaptation initiatives should be based.



## 3.1 Understanding adaptation

As it became clear to the global community that mitigation efforts would not be sufficient to reduce impacts caused by climate change already felt by many people in the world, the role of adaptation as a response has become increasingly critical. Humankind, particularly communities experiencing societal inequalities who are at risk from climate-related impacts, have begun to experience these negative impacts and must develop adaptive capacities to prepare for the imminent effects of climate change. Societies must adopt approaches that build resilience at all levels—individual, household, community, national, and international—to withstand and recover from climate-related impacts. Despite rising awareness of the need for and prioritisation of adaptation interventions, many actions have not been pursued because of limited resources for implementation.

Many forms of adaptation are required to effectively deal with the varied array and levels of likely impacts of climate change that will affect various sectors, resources management, economic activities, and population dynamics.

The Intergovernmental Panel on Climate Change (IPCC) defines adaptation as:

*The process of adjustment to actual or expected climate change and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.<sup>1</sup>*

The development of adaptation strategies, at all levels, requires integrated, multidisciplinary, multi-sectoral planning. It is critical to understand the types and extent of climate impacts, vulnerabilities and capacities to effectively assess the appropriate adaptation interventions required. The IPCC assessments take the best available physical analysis of change—to temperature, rainfall, sea level rise, and other climate factors—and analyses the likely regional impacts to natural and built

### KEY TERMS:

**Vulnerability**, as defined by the IPCC, is the level of inability of a system—such as a community, household, ecosystem, or country—to cope with the adverse effects of a shock, for instance, one caused by climate change.<sup>2</sup> Vulnerability is affected by the system's exposure to, sensitivity to, and ability to adapt to these effects. Overall, vulnerability is dynamic and changes with time; place; and social, economic, and political conditions.<sup>3</sup>

**Adaptive capacity** — the ability of a system to adjust to a shock—consists of both socio-ecosystem and socio-economic resilience.<sup>4</sup> Adaptive capacity includes the knowledge systems, resources, financial institutions, economic systems, governance, and capability of the population. The resilience of an individual, household, community, institution, or government refers to its capacity to withstand and quickly recover from impacts—ideally rebuilding and reorganising even more strongly, soundly, and sustainably.



environments, economies, livelihoods, and other human dimensions. These assessments provide information for developing strategies to reduce risks, address impacts, and adapt to the projected changes over time.

Research has shown that there will be negative consequences and impacts from implementation of adaptation interventions if these interventions were designed without understanding and including the adaptive capacity of the community, region, or government.<sup>5,6</sup> The vulnerability and capacity approach examines relations between human populations and their environment, whereby vulnerability, and associated risk, are largely social constructs that relate to development processes, structural (in)equalities, and sustainable resource management. Therefore, developing effective and beneficial adaptation strategies requires comprehensively considering the societal dynamics at work within a community. Strong adaptation policies will provide opportunities for communities to strengthen their resilience to climate change and other shocks, while reducing social inequalities and promoting the advancement of marginalised peoples. Adaptation strategies should aim toward positive development, despite climate change.

## Gender dimensions of adaptation

Adaptation measures are implemented to reduce negative impacts from climate change and disasters. The causes and impacts of disasters are not merely the result of 'natural' phenomena, but result from decisions made within a social, economic, and political context—including before, during, and after a disaster incident. Gender relations play a major role in

structuring this context, and are therefore important for understanding vulnerability, risk construction, and the effects of disasters, as well as opportunities for reducing negative impacts.

***“Disasters, when they strike, do not discriminate between people. Disasters have no mind. Anyone and everyone in the disaster zone is affected. However, whereas disasters do not discriminate against people, humans most certainly do. In the aftermath of disasters, humans perpetuate social patterns of discrimination, and these entrenched patterns of discrimination cause certain groups of people to suffer more.”***

- Dr. Abhimanyu Singh, UNESCO Director and Representative Speech at the International Conference on Gender and Disaster Risk Reduction, 20 April 2009

There is significant socio-economic differentiation between men and women that is deeply rooted in social structures around the world.<sup>7</sup> These include differences in access to resources such as land, credit, and education. Access to these fundamental resources provides women with the tools, skills, and preparation to effectively engage in environmental decision making,<sup>8</sup> while a lack of access to these resources contributes to unequal opportunities for women to participate in and influence decision-making processes.

Although meaningful representation and participation of women in decision-making processes can have a powerful impact on policies and programmes, more



is required for the development and implementation of gender-responsive adaptation strategies. A case study of women in environmental decision-making in the Philippines completed in March, 2015, shows that even though the Philippines has a comparatively high participation rate of women in various levels of environmental decision-making (i.e., 20% of environmental-sector ministers and 67% of government delegates to the United Nations Framework Convention on Climate Change (UNFCCC) 19th Conference of the Parties (COP) were women), there is still a lack of implementation of gender-responsive policies and frameworks.<sup>9</sup>

Because women use and manage natural resources differently than men, and degradation of natural resources affects each group differently, patterns of disadvantage may increase with the change in or loss of natural resources associated with climate change. For example, rural women in developing countries are the principal producers of basic foods, and the agricultural sector is exposed to uncertain precipitation, especially with risk of drought; this means that climate change endangers food and nutritional security, the livelihood of women, and the wellbeing of families.<sup>10</sup>

A lack of access to resources and structural inequalities generally result in greater vulnerability for women to the impacts of climate change. The gender wage gap ensures that women will not have as many resources as men to recover from disasters.<sup>11</sup> In many regions, women conduct the lesser-paid work, and often there is no compensation for work such as household management and caretaking. These factors can hinder building community resilience, but recognising and supporting the roles that women play in homes and communities can aid in adaptation to climate risks.

The *Human Development Report (HDR) 2007–2008* affirms that the historic disadvantages of women—with limited access to resources, restricted rights, and little or no voice in decision-making—make them extremely vulnerable to climate change.<sup>12</sup> In order to address these factors in a systematic fashion throughout the development of adaptation strategies, the following key questions concerning representation, roles and responsibilities, rights, and risk should be comprehensively explored.



### Box 1: Gender analysis for effective adaptation

Gender analysis is a tool that aids in understanding not only gender dimensions of climate change, but the socio-economic, cultural, and structural equality issues embedded in the impacts of interventions and adaptation strategies. In order for this to be effective it is important to identify:

1. Representation—*Who is involved in leadership and has decision-making authority at all levels (from local to international policies, agreements, and adaptation)? Who has access to information? Who has control of the distribution of resources? Who allocates benefits? Is traditional knowledge validated and represented?*
2. Roles and Responsibilities—*Who is involved in resource management? Who works with resources that earn cash incomes? Who is involved in subsistence and livelihood activities? Who provides caretaking in families? What are the ages of family members, and what are intergenerational activities, actions, and roles? How do cultural and indigenous knowledge factor into gender roles and responsibilities?*
3. Rights—*Who has rights and entitlements to resources and services? How are goods and services distributed? Do legal systems protect male and female citizens equally, regardless of class status, race, ethnicity, and age? What are entitlements (e.g., education, health, land ownership) and who receives them? Do institutional and legal systems support equality?*

4. Risk—*What are the differential risks, vulnerabilities, adaptive capacity, and resilience among women, men, girls, and boys at all levels? Are there added risks by gender from age, class status, race, or indigenous community? What is the autonomy of women and men in dealing with risks? Are capacities to deal with risks analysed and understood?*

These questions are relevant for developing, implementing, and evaluating strategies to understand the consequences of intervention and to ensure that positive benefits are achieved and equally distributed. Beyond the adage of adapting in ways that have ‘no regrets’ and that ‘do no harm’ while potentially increasing capacity and building resilience, it is important to recognise ways that these adaptation strategies will contribute to achieving greater good, such as poverty reduction, equality, and sustainable development.



It is important to note that the differences in men and women's social positions not only create specific gendered vulnerabilities and risks but also generate gender-specific capacities. The unique capacities that women have developed in different social and cultural settings can be very important for climate change mitigation and adaptation efforts, particularly during all phases of disaster management: mitigation, preparedness, response, and recovery.<sup>13</sup> For example, research on women's risk at the local level in the Caribbean has shown that Caribbean women consider family and friend networks as their main support during disaster situations.<sup>14</sup> Women in communities tend to have valuable information regarding community and family members, such as who is missing and who needs special attention.

Although women may be particularly vulnerable to the effects of climate change due to social inequalities and societal roles, they are more than just victims; women are vital agents of change, holders of valuable knowledge and skills, and can be powerful leaders from community to global level in adapting to climate change. Involving women in the development and implementation of strategies related to deforestation, economic growth, science, technology, policy development, among other sectors, can strengthen the effectiveness of these strategies for the entire community. Their leadership, capacities, innovations and knowledge, as seen in the development of national solutions in this chapter, is crucial in defining solutions related to adaptation.

## 3.2 Gender and adaptation concerns by sector

The following resource sectors, in addition to the forestry, energy, and other sectors outlined in related chapters of this publication, are relevant for finding equitable adaptation responses to climate change.



### Disaster risk reduction

The field of disaster risk reduction (DRR) was the first area of adaptation to focus on identifying risk and developing methodologies that recognised the linkages with development, socioeconomic factors, and human rights-based issues of equality. Needing

to cope with disasters is not a new phenomenon. However, climate change is increasing the voracity and frequencies of disasters and it is changing the need to reduce and to build resilience in responding to these events.

Climate change adaptation measures and DRR practices are necessarily interlinked concepts as 91% of recorded major disasters caused by natural hazards from 1994 to 2013 were linked to climate and weather.<sup>15</sup> Therefore, adaptation policies should consider lessons learned from DRR strategies, and DRR strategies must consider the impacts of climate



change as they are increasingly linked. Climate change is impacting both sudden onset disasters—by increasing the magnitude and frequency of disaster events, and slow onset disasters—by changing the average climate conditions and climate variability.<sup>16</sup>

The *Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters (HFA)*,<sup>17</sup> the main international DRR framework, describes the cross-sectoral work required to reduce disaster risk for nations, communities, and ecosystems to adapt to the impacts of disasters due to climate change and other factors. The HFA does not differentiate between sudden onset and slow onset hazards. It does, however, “promote the integration of risk reduction associated with existing climate variability and future climate change into strategies for the reduction of disaster risk and adaptation to climate change”.<sup>18</sup>

## Gender in DRR

In the last decades, there have been important efforts made toward including a gender perspective within DRR strategies. Methods aid in understanding how ‘gender’, as a socially constructed category that varies by place and time, can reveal differential risks and types of impacts that people will face from threats caused by hazards and climate change. These analyses assist in identifying the vulnerabilities and capacities that will need to be addressed in climate adaptation. As described previously, it is important to identify areas of representation, roles and responsibilities, rights and access to resources and services, and differential risk.

The HFA includes a principle mandate in relation to gender equality and empowerment of women in the context of DRR; this mandate includes integrating

gender perspectives into DRR policies, plans, and decision-making processes for all areas of risk management and through all phases of the disaster cycle.<sup>19</sup> Nonetheless, the HFA mid-term review 2010-2011 concluded that the “inclusion of a gender perspective and effective community participation are the areas where the least progress seems to have been made”.<sup>20</sup> In fact, data from the 2009-2010 HFA Monitor shows that 62 out of 70 countries do not collect sex-disaggregated data on vulnerability and capacity information.<sup>21</sup>

In 2011, the HFA commissioned a report on women as agents of change for DRR. In this report, authors Gupta and Leung found that:

*Women’s organisations with strong track records in advancing community development find themselves excluded and disconnected from national disaster risk reduction and recovery programs” and that “multilateral institutions report that they have inadequate knowledge and political commitment required to advance gender concerns in the field of resilience.”*<sup>22</sup>

Related to the aspect of DRR is the concept of loss and damage.<sup>23</sup> The Warsaw International Mechanism for Loss and Damage is the UNFCCC work programme on loss and damage that considers approaches in developing countries in relation to slow onset and gradual impacts of climate change.<sup>24</sup>



## Box 2: Loss and damage

‘Loss and damage’ refers to negative effects of climate variability and climate change that people have not been able to cope with or adapt to. ‘Damage’ can be seen as negative impacts that can be repaired or restored (such as windstorm damage to the roof of a building, or damage to a coastal mangrove forest). ‘Loss’

can be characterised as negative impacts that cannot be repaired or restored—such as loss of geologic freshwater sources related to glacial melt, or loss of culture or heritage associated with potential population redistribution away from areas that become less habitable over time.<sup>25</sup>

Approaches to addressing issues related to loss and damage arising from the adverse effects of climate change mainly focus around the management of sudden onset events. Limited efforts are being made with regard to slow-onset climate change hazards, with little to no gender related knowledge and information regarding the impacts of such hazards. There is an urgent need to identify effective approaches to manage slow-onset hazards as they are expected to cause potentially the greatest loss and damage.<sup>26</sup> While there is a need to expand existing international legal frameworks dealing with issues of human displacement and migration as a result of slow-onset events, it is crucial that these frameworks specifically include issues related to gender.

A challenge that must be overcome is the lack of knowledge regarding the potential for large-scale disruption through loss and damage, especially in the context of slow-onset events, meaning that special attention must be paid to the needs and concerns of women. Economic and non-economic losses have disproportionate impacts on individuals depending on their socio-economic status and gender. Numerous studies have indicated that the poorest and most

marginalized people and women suffer most due to these losses. Rights-based approaches and gender considerations should be integrated into the loss and damage discourse and any future mechanisms established in this connection.<sup>27</sup>

With these goals, successes, challenges, and recommendations in mind, the post-2015 framework—the Sendai Framework for Disaster Risk Reduction 2015-2030<sup>28</sup>—was adopted at the Third United Nations (UN) World Conference in Sendai, Japan, on March 18, 2015.<sup>29</sup> The priorities of the Sendai Framework include the following: understanding disaster risk; strengthening disaster risk governance to manage disaster risk; investing in disaster risk reduction for resilience; and enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction. It formally recognises the importance of women’s participation in every stage of DRR strategies—from design to development and from implementation to monitoring. This framework promotes dedicating resources to empowering and building the capacity of women to participate in and lead DRR efforts.



Climate change is exacerbating certain aspects of disasters and disaster risk management. The gender-differentiated impacts of disaster risks must be considered in order to develop comprehensive

disaster risk management strategies that go beyond protecting resources to promoting positive development, social equality, and the advancement of women (Table 1).

**Table 1: Key adaptation factors relating to DRR**

#### Anticipated climate impacts

- Increased frequency or magnitude of catastrophic climate events,
- Cumulative and cascading hazards, decreasing ability for recovery,
- Sea level rise, and
- Loss of ecosystem integrity, and therefore decreased ecosystem protection from disasters.

#### Gender issues

- Lack of sex- and age-disaggregated data resulting in poor understanding of gender-differentiated risk,
- Limited/no inclusion of gender indicators in monitoring and evaluation,
- Lack of women's views integrated in planning, design, and implementation and response processes due to women's restricted representation in formal DRR leadership and decision-making activities,
- Little understanding of differentiated risk throughout the disaster cycle, and
- Gender inequalities affecting access to resources, information, early warning systems, health and social services, entitlements, land ownership, and institutional and government support.

#### Gender-responsive adaptation

- Use gender-specific data to monitor and evaluate programmes and interventions,
- Ensure gender equality and diversity within planning, design, decision-making, and leadership roles,
- Include gender and differentiated risk analyses within DRR policies, programmes, and interventions, and
- Improve equality in access, control and benefits derived from resources.



## **Roles and responsibilities, rights, and risks: Facts and figures**

Countless examples and studies have revealed the gender dynamics of preparedness in periods of disaster and post-disaster situations. The following examples highlight the necessity of considering roles and responsibilities, rights, and risks. Assessing these factors can lead to the development of more informed and more equitable adaptation strategies, reflecting issues such as the following:

- Worldwide, women tend to suffer more from the impacts and fatalities caused by disasters compared with men. For example, women represented an estimated 61% of fatalities in Myanmar after Cyclone Nargis in 2008, 70% after the 2004 Indian Ocean Tsunami in Banda Aceh,<sup>30</sup> and during the heat wave that affected Europe in 2003, most deaths in France were among elderly women.<sup>31</sup>
- In Bangladesh, of the 140,000 people who perished from the flood-related effects of Cyclone Gorky in 1991, women out-numbered men by 14:1. The cause of deaths was associated to socially constructed gender norms such as preventing women from leaving their homes or staying in cyclone shelters without a male relative.<sup>32</sup> As a result of this devastating situation, the government conducted improvements in hazard monitoring, community preparedness, and integrated response efforts. When Cyclone Sidr hit in 2007, the casualties were around 3,000 and the gender gap in mortality rates had shrunk to 5:1. This was achieved, for example, by addressing the sociocultural causes of why women were reluctant to use cyclone shelters, including paying particular attention to engaging women as community mobilisers—more likely to be heard by other women—and creating women-only spaces within cyclone shelters.<sup>33</sup>
- Following a disaster, it is more likely that women will be victims of domestic and sexual violence; many women even avoid using shelters for fear of being sexually assaulted.<sup>34</sup> Gender-based violence is found to increase due to disaster-induced stress and the temporary breakdown of law and order.<sup>35</sup>
- A 2007 study of 141 natural disasters over 1981–2002 found that when economic and social rights are realised equally for both sexes, disaster-related death rates do not differ significantly for men and women. But when women's rights and socio-economic status are not equal to those of men, more women than men died in disasters; boys were given preferential treatment during rescue efforts and, following disasters, both women and girls suffered more from shortages of food and economic resources.<sup>36</sup>
- In some Latin American and Islamic countries, women's relative lack of decision-making power may pose a serious danger itself, especially when it keeps them from leaving their homes in spite of rising water levels, waiting for a male authority to grant them permission or to assist them in leaving.<sup>37</sup>
- In some cases, gender differences in roles and responsibilities in disaster increase men's mortality in disaster situations. Men may engage in riskier behaviour that represents heroic actions in disaster situations—such as being firefighters—that may result in death or injury.<sup>38</sup> For example, there were more immediate deaths among men when Hurricane Mitch struck Central America in 1998, not only because they were engaged in outdoor activities, but because of less cautious behaviour in the face of risks.<sup>39</sup>



## Gender-responsive adaptation examples and lessons from DRR

Disaster risk management is a process where the ultimate aim, as part of a sustainable development proposal in the social, economic and territorial spheres, is the permanent reduction of risks leading to disasters.<sup>40</sup> Therefore, climate change adaptation efforts should be integrated.

Disasters could provide women—as well as men—with unique opportunity to challenge and change gender roles in their society.<sup>41</sup> The following examples illustrate this:

- As part of its Climate Change Gender Action Plan (ccGAP), Liberia has proposed to conduct gender-sensitive vulnerability studies on coasts to be used in planning for disasters. For this they proposed to conduct gender disaggregated vulnerability studies in coastal zones; to develop a process for capacity building for women so that they can run local meteorological stations to report on coastal weather conditions and enhance the initiatives contained in their National Adaptation Programme of Action (NAPA); and mobilise these women to act as information focal points for weather information that has to be transmitted to communities regarding major meteorological events along the coasts. (For more information, see Chapter 2.2 on national policies).
- In 1998, the Honduran community of La Masica received gender-sensitive community training about early warning and risk systems. With that training, the women in the community took charge of monitoring the early warning systems that had

been abandoned. Six months later, during Hurricane Mitch, not a single death was reported in La Masica because the municipal government was able to evacuate the population in time.<sup>42</sup> This strategy was successful because women were informed about risk and response measures, taking an active role in an area that was traditionally considered only for men.

- After Hurricane Mitch, the Nicaraguan non-governmental organization (NGO) *Puntos de Encuentro* organised the information campaign, “Violence against women is one disaster that men can prevent”. The campaign proved effective in changing men’s attitudes towards violence against women, and therefore tackled existing power structures.<sup>43</sup> Instances of gender-based violence typically increase following a disaster; this campaign contributed to the resilience of this community by helping to reorganise and rebuild stronger and safer after Hurricane Mitch.
- During the aftermath of Hurricane Georges in the Dominican Republic, local rural and urban women’s organisations were the first to deal with the situation in shelters. Due to their work with endemic medicinal plants, the women were able to help with remedies and providing care, before official medical personnel could arrive. These organisations also helped with reconstruction efforts, including getting aid for rebuilding homes for the community and encouraging women to take part in helping other women gain access to credit for rebuilding. This gave women a new status in their community, changed the way they are perceived, and increased their role in decision-making.<sup>44</sup>



- In Bangladesh, Climate Change Adaptation and Disaster Risk Reduction is a women-centred initiative that sets out to curb and adapt to the negative impacts of disasters by bringing together groups of women who are charged with conducting vulnerability assessments of climate risks and identifying action plans, including building temporary dams to avoid salinisation of fresh water, and creating a raised cluster village for landless families in flood-prone areas while sharing knowledge and experiences with community members.
- In the face of disasters, in many countries, more women than men face difficulties in accessing information that could affect their wellbeing or survival. As part of an initiative of GrameenPhone in Bangladesh, mobile phones are now being used by women to alert authorities about risks in infrastructure, such as bridge collapses.<sup>45</sup>
- During a drought in the small islands of the Federated States of Micronesia, the women's ancestral knowledge of the islands' hydrology allowed them to easily find places to dig wells for drinking water. The women do not normally become involved with decision-making, but the information they provided benefited the entire community.<sup>46</sup>
- Projects supported by the World Bank in post-flooding reconstruction in Argentina, El Salvador, Mozambique, Indonesia, Viet Nam, and India have elevated women's status in society by including women in programme design and implementation while promoting land rights for women. This was accomplished through developing an understanding of the gender dimensions of disaster and promoting equality during the recovery process.<sup>47</sup>

### READ MORE IN CHAPTER 7!

#### CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION IN BANGLADESH: WOMEN LEADING COMMUNITY-BASED ACTION TO BUILD RESILIENCE

*ActionAid Bangladesh*



As the importance of gender mainstreaming in DRR is increasingly understood, lessons and best practices have informed international policy-making, as indicated above with respect to the Sendai Framework, and should continue to shape national and subnational strategies for response and resilience. The following steps, adapted from "Gender Perspectives on Climate Change"<sup>48</sup> for gender mainstreaming in DRR plans, remain relevant guidelines for including women in all levels of reducing risks to climate change and disasters:

- Include gender perspectives in disaster reduction efforts at the national, regional, and international levels—including in policies, strategies, action plans, and programmes,
- Analyse climate change data (such as desertification, floods, drought and deforestation) from a woman's perspective,
- Take gender-conscious steps to reduce the negative impacts of natural disasters on women, particularly in relation to their critical roles in rural areas in provision of water, food and energy,



- Increase the participation of women in all levels of the decision-making process,
- Identify key women at local levels to guarantee gender perspectives are considered when preparing early warning mechanisms,
- Ensure that women are being visibly integrated as agents of change at all levels of disaster preparedness, including early warning systems, communication networks and educational opportunities,
- Consider the level of a woman's access to technology and finance in times of crisis, and
- Collect and analyse data that includes both men and women.



## Water

Climate change causes increased water availability in humid tropics and at high latitudes and a decline in water availability and increase in droughts at mid latitudes and low semi-arid latitudes. These changes lead to hundreds of millions of people being exposed to increased water stress. There are two key components of water stress: water scarcity and water security. Water scarcity is the lack of water resources to meet the water usage demand of communities and ecosystems, whereas water security relates to the reliable availability of accessible, affordable, and improved drinking water sources and sanitation facilities.<sup>49</sup> In less developed countries, 663 million people do not have access to improved drinking water, and 2.4 billion people lack access to improved sanitation facilities.<sup>50</sup> Water scarcity and water security will both be exacerbated by climate change, leading to the necessity of adaptation strategies that implement a plan for how communities will cope with these stressors.

The changes in precipitation, melting ice patterns, and glacier reduction will affect the levels of rivers and lakes, limiting access to drinking water. This is vitally important for a sixth of the world's human population who live in regions that rely on melting mountain snow and ice as the source of their drinking water. The inhabitants of drylands will face more frequent and longer-lasting droughts. As this situation worsens, millions of people will be obliged to relocate as their water sources become impaired or depleted.

The natural response of human beings to the rise in temperature will likely be to increase their demand for potable water, particularly for agriculture and in growing urban environments. This will cause wetlands to be over-exploited, reducing flows in rivers and streams, with additional consequences on ecosystem resources and disasters affecting lives and livelihoods of surrounding communities. The rise in temperature will lead to increased evapotranspiration, reduced run-offs and infiltration, and, therefore, less availability of fresh water and soil humidity. Increasing incidence of drought also contributes to the increased risk of forest fires, and less of a means for fighting such fires.

Access to water resources results in increased humanitarian conflicts and violence where water is scarce,<sup>51</sup> such as for regions of sub-Saharan Africa. Water scarcity presents an increased risk to men and male youth, as participation in such conflict increases mortality.

Climate change affects water resource availability, which will in turn have significant ramifications on every other sector. The Millennium Development Goals (MDGs) highlighted the importance of access to fresh water for drinking, health, and survival, and the post-2015 Development Agenda—the Sustainable



Development Goals (SDGs)—recognise the impacts from climate change and call to “Ensure availability and sustainable management of water and sanitation for all.”<sup>52</sup> These development goals are key to reducing the drivers of risk to impacts from the lack of access to water and sanitation resources.

### Gender analysis of risk in the water sector

In most parts of the world, domestic and public gendered roles dictate women and girls as responsible for collecting water for cooking, cleaning, health, hygiene, and—if they have access to land—growing food. This leads to women being disproportionately and adversely impacted by water accessibility, system design and management, and the high costs of water distribution.<sup>53</sup> While often not considered to be ‘work,’ women and girls spend a disproportionate amount of time on such resource management tasks and unpaid care work that is necessary to sustain their families but also local economies, development and infrastructure.<sup>54</sup>

Women are often under-represented in decision-making processes, even though they can make important contributions to these discussions due to the knowledge of ecological and water-related conditions gained as a factor of their societal roles of natural resources managers.<sup>55</sup> Within water management policies, women are often cast as the role of victims instead of influential stakeholders and agents of change.<sup>56</sup>

Extreme flooding has changed family structures and roles in families during recovery. Men leave communities to find paid income for recovery, while women stay at home as caretakers and try to restore the communities. Factors that should be studied further to gain a better understanding of the inter-relatedness of water fetching, gender inequity, and climate change concerns include the following: road casualties, assault and attack risks, health concerns, the number of trips taken and the weight of water carried on each trip, the conditions of the terrain, and water usage priorities.<sup>57,58,59</sup>

**Table 2: Key adaptation factors relating to water**

Anticipated climate impacts
<ul style="list-style-type: none"> <li>• Increased extremes in rainfall leading to floods or droughts,</li> <li>• Increased wildfire and drought impacting ecosystem services,</li> <li>• Increased salinity in coastal and low-lying lands/inundation from sea-level rise or storm surge,</li> <li>• Increased sanitation problems,</li> <li>• Increased potential for water-borne diseases and contributions to other health risks, and</li> <li>• Decreased availability of potable water resources and water for agricultural use.</li> </ul>

**Table 2: Key adaptation factors relating to water (Cont.)**

### Gender-differentiated impacts

- Increased labour required to access and provide water for families, households, and communities,
- The lack of women's views being integrated due to lack of representation in formal water resource planning and decision-making activities,
- Less formal opportunity for women than men, (e.g., due to fewer technical roles in hydrology and engineering),
- Financial barriers for accessing water systems in urban areas,
- Health and sanitation risks for households and communities,
- Political rights constrain women's rights to access water resources, and
- Increased risk of assault and violence as women travel further to access water sources.

### Gender-responsive adaptation

- Enhance water resources development, storage, conservation, and systems management,
- Increase gender equality and diversity in planning, design, decision-making, and leadership roles of water resource systems,
- Improve access for women in technical, scientific fields,
- Engage in sustainable development practices, and
- Improve equality in access to resources and services.

### Roles and responsibilities, rights, and risks: Facts and figures

- Globally, women and girls spend an estimated 150–200 million hours a day collecting water, yet they are frequently shut out of decisions relating to water.<sup>60</sup>
- In Kenya, fetching water may use up to 85% of a woman's daily energy intake; in times of drought a greater work load is placed on women, when some spend up to eight hours a day in search of water.<sup>61</sup>
- In Bangladesh, climate patterns have changed in recent years and rains have become increasingly stronger and less predictable. The floods of 2004 left enormous losses with 280 people losing life, around four million having to be evacuated, and thousands of others left without food or housing.<sup>62</sup>
- A survey study from 45 developing nations shows that women are responsible for collecting water in 64% of households; in 12% of households, children were responsible, with girls being twice as likely to be responsible for this duty as boys.<sup>63</sup> In households with access to an improved water source—meaning they have local, affordable sources of potable water, there was a more equal gender and age distribution for who fetched water. Therefore, in communities where it does not take much time or effort to gather water, the responsibility for fetching the water is less gender-biased. On the other hand, in communities where water collection takes a substantial amount of time and effort, women are much more likely to be water carriers.<sup>64</sup> This disparity is growing as climate



change is leading to water quantity and quality issues, especially within the developing world. As women have to walk further and further away from their homes and communities to collect water, more of their time is spent on this task, leaving less time for other tasks that could increase their livelihoods and autonomy.<sup>65,66,67</sup>

- There are a limited number of women professionals in the water sector—hydrologists, engineers, water technicians, environment specialists, and scientists—who are qualified and ready to fill professional positions in these fields.<sup>68</sup>
- In addition to gender disparities, there is also a large urban-rural gap<sup>69</sup> impacting every aspect of water security—and making rural women particularly susceptible to the impacts of climate change on water—in many countries, including Uganda, where:
  - Piped water is used by 67% of urban households but by only 10% of rural households,
  - 71% of urban households are likely to boil their drinking water and only 38% of rural households do so,
  - 59% of rural households take no measures to treat their drinking water,
  - 28% of urban households and 2% of rural households have improved water sources on their premises,
  - 17% of urban households and 62% of rural households travel a half hour or more to reach their drinking water source, and
  - 21% of urban households and 15% of rural households have access to unshared improved sanitation facilities; these percentages change to 52% urban and 11% rural for households that have access to a toilet that separates waste from human contact but that is shared with other households.<sup>70</sup>

## Gender-responsive adaptation examples and lessons about water

A study by IRC the International Water and Sanitation Centre of community water supply and sanitation projects in 88 communities in 15 countries found that projects designed and run with the full participation of women are more sustainable and effective than those that do not involve women as full partners.<sup>71</sup> Therefore, it is fundamental that women are fully engaged in adaptation measures to help reduce vulnerability associated with climate change. Some of the possible measures are to:

- Develop the capacity of women to improve observation and forecasting,
- Develop gender-sensitive early warning systems,
- Conduct gender-sensitive maps of hazards and vulnerabilities,
- Promote water conservation and market-based water allocation with active participation of women, and
- Increase irrigation efficiency for women's needs.

Seasonal floods and droughts in Gujarat, India, make it extremely difficult for poor farmers to have productive crop yields with water logging during peak cropping season and water scarcity in the rest of the year. Female farmers are particularly vulnerable as their livelihood depends on the monsoon, but these women are using this crisis as an opportunity and they are creating an improved water management system that stores water underground during excess rainfall, and then lifts it out for irrigation during dry spells. Farmers—especially female farmers—are benefitting from increased fresh water access and more consistent crop yields.



## READ MORE!

### **BHUNGROO WATER MANAGEMENT IN GUJARAT, INDIA: EMPOWERING WOMEN TO BUILD FARMING RESILIENCE THROUGH IMPROVED IRRIGATION TECHNOLOGY**

*Naireeta Services Pvt. Ltd. with funding from the Rockefeller Foundation*



The Asian Development Bank (ADB) highlights a community-based water project in Kegalle District, Sri Lanka. According to Lalitha Nanamearchchi, the manager of the Bisowela community-run water project, prior to the establishment of the project, women in this community had to walk significant distances to fetch water for domestic use; this 'women's work' gave them little time for anything other than domestic duties. As part of the ADB water project, Lalitha took part in technical training and capacity building and became a leader of a community-based organisation set up to improve access to water. Since the women desperately

needed water, and a household water supply was critical to them, they took the main role in leadership and shouldered the chief burden in project activities. They took a keener interest in pipe-laying than the men, even working through the night to complete the project. The women leaders also initiated tree-planting programs to protect water sources and to preserve the environment. They ensured that the views of women were taken into account when identifying water resources and in assessing water needs. In all these activities women's participation was relatively high compared to that of the men.<sup>72</sup>



### Box 3: Adapting water management in ccGAPs: Water as a priority sector in Nepal, Tanzania and Jordan

As shown, the negative effects of climate change on water stress disproportionately impact women. However, women are much more than victims. If women are provided equal opportunity to engage as actors, instead of characterised as victims or beneficiaries, they can improve resilience of their communities, as shown, for example, through some of the unique activities of the ccGAPs developed in Nepal, Tanzania and Jordan, where water was identified as a priority sector for managing and adapting to climate change.

#### Nepal<sup>73</sup>

National mandates dictate that efforts be made to ensure gender equity in program planning and budgeting. Community water resource management projects are requiring 30% participation of women in user groups and committees such as the Water and Sanitation User Committees (WSUCs). However, active engagement remains limited. A study conducted by ADB revealed that within Nepal, each female water carrier must reserve 1.3 hours per day during the monsoon season and an average of 2-3 hours per day in the dry season to meet their daily household supply.<sup>74</sup>

Within Nepal's ccGAP, objectives, action steps, and indicators of success were developed to:

- Develop water supply infrastructure addressing the needs of women,
- Ensure women's participation as decision makers,
- Ensure gender mainstreaming in existing water-related policies, and
- Promote research relating to gender and climate change dimensions in the water sector, among other goals.

#### Tanzania<sup>75</sup>

In such an arid country, it is very difficult for people to find access to clean, sanitary water if they do not live near one of the three major lakes that border the country. As a result, Tanzania's ground water is the major source of water for the nation's people. However, it is not always clean. Many of these ground water wells are located near or next to toxic drainage systems that leak into the fresh ground water and contaminate it. Consequently, Tanzanians have no choice other than to turn to surface water that contains harmful bacteria and/or human waste. In 2011, only 54% of the population had access to improved water supplies and 24% had access to adequate sanitation. On average, women and children spend over two hours a day collecting water, and this figure increases to up to seven hours in remote areas.



### Box 3: Adapting water management in ccGAPs: Water as a priority sector in Nepal, Tanzania and Jordan (Cont.)

To overcome these development obstacles, Tanzania has prioritised tapping into the expertise of women in the water sector.

Objectives include:

- Building the capacity of men and women in local communities on water management related to climate change,
- Establishing gender-based programs for improved conservation and management of lakes and river basins,
- Ensuring that national indicators for integrated water resource management are gender-responsive,
- Instituting gender-based programs for improved conservation and management of lakes and river basins,
- Training more women experts in the water sector, and
- Investing in private sector and NGO expertise to develop tailor-made and innovative solutions to improve women access to water.

#### Jordan<sup>76</sup>

Residential water supply, irrigation, water quality, and socio-economic issues are addressed as priorities in the ccGAP, and women are viewed as agents of change in this sector, including by recognising that:

- Women are the main custodians of water at the household level, and therefore perform a crucial role in sustainable water use and management,
- Women in rural areas are able to adapt to and implement new techniques in water conservation,
- Women ensure household sanitation, and
- Women—and therefore families—can cope better with water security when they have access to information and decision-making.

Objectives, action steps, and indicators for enhancing Jordan's resilience to the effects climate change has on issues surrounding water, include:

- Enhancing the capacity of women and men from local communities to save water by providing refresher courses on water and gender issues at top management level,
- Ensuring gender sensitive budgeting to monitor the amount of funds made available for gender activities at the local level, and
- Ensuring that climate change and gender are integrated in water policies and strategies and adaptation measures proposed, national legislation related to water should be revised to ensure that gender and climate change considerations are fully integrated.



## Agriculture, food and nutrition security, and food sovereignty

Agricultural ecosystems and food and nutrition security are especially vulnerable to climate change, variability, and extremes and will be at the forefront of adaptation planning and programming to secure the health and nutrition of the global population. There are localised negative impacts on small landowners, subsistence farmers, and fishermen, resulting in a decline in cereal crop yield, depending on the region.

Since the practice of agriculture began more than 12,000 years ago, about 7,000 species of plants have been cultivated for food, and today 90% of our food is provided by only 15 species of plants and eight species of animals. Conserving varieties of wild ancestors of these foods could provide alternatives so that, in the future, new species could be developed that are resistant to climate changes. Unfortunately, many of these wild ancestors are already in danger of extinction. For example, it is predicted that a quarter of the wild potato species will disappear in the next 50 years.<sup>77</sup> Projections made by the IPCC indicate that agriculture in hot subtropical countries will be more affected than in temperate subtropical countries.

Most people in the world are poor, and most of the world's poor people earn their living from subsistence farming—working as wage labourers, farmers, small-scale processors, or traders. Their circumstances are often difficult: roads are bad, distances between fields and markets are long, inputs (resources, equipment, tools, etc.), market information and services (business knowledge, accounting, accessing capital and loans, transportation services, etc.) may not be available, and access to secure markets can be cumbersome.<sup>78,79</sup>

## Food and nutrition security

Climate change and variability affect all four dimensions of food security: food availability (i.e., production and trade); stability of food supplies; access to food; and food utilisation.<sup>80,81</sup> In addition, food security depends not only on climate, environmental and socio-economic impacts, but also on changes to market and trade flows, stocks and food-aid policy, social protection programs, safety nets, to name a few.<sup>82</sup>

Climate extremes, variability, and change influence and exacerbate the three key determinants of under-nutrition, including: household food security, maternal- and child-care, and access to health services and environmental health.<sup>83</sup> Other factors, such as livelihoods, formal and informal institutions, economic and political structures, resources, and structural transformations shape these three key determinants, in turn.

Increasing concentrations of carbon dioxide (CO<sub>2</sub>) in the atmosphere—the very same phenomenon that drives climate change—can directly affect the nutritional value of plant foods. Elevated CO<sub>2</sub> results in a reduction in protein concentration and other nutrients in many plant crops that humans eat.

## Gender analysis of risk in agriculture, food and nutrition security, and food sovereignty

Climate-related nutrition insecurity and ill health are associated with poverty and gender inequality. Approximately 60% of chronically hungry people are women and girls.<sup>85</sup> Many of the world's poorest people are rural women in developing countries who rely on subsistence agriculture to feed their families. Women are on the frontline in food production, gathering



resources necessary for preparation (including water and wood), and distributing food within their households and communities, which makes them exposed to climate change impacts—particularly risks of drought and/or flooding—affecting food and nutrition security and health. Climate change is also contributing to water and energy insecurity, thereby increasing the work burden of women subsistence farmers who need access to these for food production and preparation.<sup>86</sup> These increasing insecurities will adversely affect health and nutrition security through lack of time for necessary childcare practices, such as breastfeeding, and reduced access to and availability of food, due to inadequate agricultural water supply

and quality.<sup>87</sup> In areas threatened with drought and desertification, women's increased domestic care responsibilities could reduce their opportunities to engage in alternative income-generating activities, with negative implications for household food security and nutrition.<sup>88</sup>

The globalisation of food markets increase reliance on imported foods in many places in the world where land is no longer used, or unable to be used, productively for food—especially in places where land commands higher value for resort development and corporate profits, and labour is undervalued.

**Table 3: Key adaptation factors relating to agriculture, food and nutrition security, and food sovereignty**

#### Anticipated climate impacts

- Increased extremes in rainfall leading to floods or droughts,
- Increased wildfire and drought impact ecosystem services and availability of water for irrigation and growing,
- Increased salinity in coastal and low-lying lands prevent crop growth,
- Decreased availability of water resources for livestock and crops,
- Increased risk of pests, weeds and invasive species threaten plants, and
- Decline in food production, and food and nutrition security.

#### Gender issues

- Gender-differentiated risk in types of crops and food production (greater risk to cash crops production impacts more men, but greater risk to women for impacts on staples and household food crops),
- Increased labour in food production,
- Globalisation of food production impacts local autonomy for rural men and women in access to food production resources,
- The lack of women's representation in formal agriculture decision-making activities and leadership roles, and
- Health and nutrition risks for households and communities.



**Table 3: Key adaptation factors relating to agriculture, food and nutrition security, and food sovereignty (Cont.)**

### Gender-responsive adaptation

- Enhance water and natural resources management with equal access to resources,
- Diversity in planning, design, decision-making, and leadership roles of agricultural systems to achieve gender equality,
- Engage in sustainable development practices,
- Improve methods for food production,
- Promote equal food distribution, and
- Integrate gender analysis and value-chain analysis to improve agribusiness, alleviate poverty, and improve markets as an adaptation strategy.

### Roles and responsibilities, rights, and risks: Facts and figures

- Agricultural extension services are often directed to men, because they are normally deemed to be the heads of households. The assumption is that once the information reaches the head of the household, it will automatically be shared with the rest of the household. However, this is not always true, and often women have little technical information necessary to improve their farm and manage water resources. For activities in which women are the key actors, information is a must if they are to participate.<sup>89,90</sup>
- As a result of low education levels, most women workers in the global South are small traders, casual labourers, cleaners, home-workers doing piece-work, and unpaid workers in family enterprises, amongst other 'hidden' roles in the informal sector.<sup>91</sup> This informal work is often combined with subsistence farming and tends to be inferior to paid employment in that earnings, if existent, are lower and more irregular, working conditions are worse, there is less security, and there are no benefits such as pensions and sick leave.<sup>92</sup>
- Although women and men both contribute to and benefit from rural development, women still lack legal and property rights, as well as access to finance and modern business practices to enhance their farm management, inputs, and outcomes.<sup>93,94</sup>
- In most countries in sub-Saharan Africa, agriculture is the lifeline of the economy and women are key farmers, food producers and natural-resource managers. In the region, women produce 60-80% of domestically produced food, provide nearly half the farm labour, and shoulder over 90% of the domestic responsibilities. Women work almost twice as many hours as men. Nearly all rural women, 96%, work on family farms, providing 75% of the farm labour and 60% of farm-derived income.<sup>95</sup>



## Gender-responsive adaptation examples and lessons for agriculture, food and nutrition security, and food sovereignty

The Oslo Policy Forum recommends land use, land tenure and legal aspects concerning the poorest populations be taken into consideration when looking at climate change adaptation. As discussed above, in all of these aspects women have specific roles and responsibilities that could place them at a disadvantage.<sup>96</sup> Due to women's higher level of vulnerability, as a result of historic and existing socio-economic inequalities, their needs, perspectives, capacities and direct participation in climate change adaptation initiatives is critical. Furthermore, it may be expected that women could make a significant contribution to the efforts that will be required to confront climate risks in their specific relation to natural resources, through the conservation of soil and water, the building of embankments to avoid floods, and other types of related activities.

Women and men play different roles in community conservation efforts, with women often taking leadership in seed selection and preservation. Women have a profound knowledge of the flora and fauna in their environment and respective conservation methods, and traditionally have used indigenous resources for food, medicines, and energy. It has been found that women invest 90–95% of the money they receive related to biodiversity on improving the family's quality of life.<sup>97</sup> When species are lost, this has an impact on the most vulnerable groups, including women. While biodiversity management systems rely on women's knowledge, skills, and labour, it often does not include women in decision-making, including related to new technology or information.<sup>98</sup> Family farming contributes to gender-responsive climate change adaptation since in many countries homestead gardens are the domain of women.

### READ MORE!

#### GENDER-RESPONSIVE INTEGRATION OF CLIMATE CHANGE ADAPTATION IN LOCAL PLANNING IN MOROCCO: EMPOWERING WOMEN FARMERS AND ENTREPRENEURS

*UN Women and the Swiss Agency for Development and Cooperation, implemented with local partners in eight pilot municipalities; Annama Association for the Development of Rural Women*



Recommendations from numerous reports guide various actions for adaptation in the agricultural sector to improve food security. Some of these recommendations include:

- Change in agricultural production and food crops available for sustenance and nutrition:
  - Involve women and men in conservation of biodiversity,
  - Provide training on agricultural extension for both women and men,
  - Supply better nutrition supplements for needy families,
  - Make marketing facilities available, and
  - Improve and ensure land rights for women.<sup>99</sup>
- Integrate gender analysis and value-chain analysis:
  - Improve gender equality, access to resources, and agribusiness.<sup>100</sup>

Ensuring a gender responsive approach is considered one of the key principles of nutrition-sensitive adaptation.<sup>101</sup> Successful strategies have been proposed for addressing the challenges that climate



change poses to food and nutrition insecurity including the promotion of girl's education, promotion of women's engagement and leadership in climate-resilient sustainable development planning and decision-making, protection of women's rights, and empowering women to enhance their capacity to address climate challenges for nutrition by participating equally in the climate consultation processes at community local and national levels. Then, For example:<sup>102</sup>

- In the community of Keur Moussa in Senegal, where erosion was making less water available, washing the soil off the land used for sowing crops, and causing young men and women to migrate to the cities, women's organisations helped to control erosion by building canals in the shape of a half-moon to retain the water, recover the croplands and improve agricultural output.<sup>103</sup>
- Since 1990, Food and Trees for Africa (FTFA) has been addressing issues of food security, poverty and climate change in South Africa by teaching women skills and fostering their leadership to create a healthier and more sustainable environment. Through six programmes, FTFA focuses on fostering women's leadership in tree planting, gardening and farming projects to meet the goals of emission reductions while also working to improve food access, food security, and alleviate poverty.

- Tree Aid, an NGO working in the Sahel, developed a project called Village Tree Enterprise to support women and men using forest resources as a source of income in Ghana's three northernmost regions: the Upper West, Upper East, and Northern. This project was conducted in collaboration with the government's Wildlife and Forest Service, the Food and Agriculture Organization of the United Nations (FAO), and six local community-based organizations. The project also aimed to increase the number of trees needed to sustain market demand. The project partners helped local communities and entrepreneurs to recognise the importance of forest products like shea in generating income, and the significant role that women entrepreneurs can play in this value chain. The project enabled them to understand the products and the market system, their own roles in the value chain, and changes such as increasing demand. It showed them how to ensure their businesses remain profitable. It helped the producers to form business groups focusing on particular activities, and to develop business plans to link them with markets and banks. It trained women and men to better bargain and negotiate prices for their products. In addition, it trained women in leadership and family life skills so they could cope with existing and emerging social challenges and it arranged for women in the shea business to receive small loans to increase the volume of their businesses.<sup>104</sup>

## READ MORE!

### FOOD AND TREES FOR AFRICA INITIATIVE IN SOUTH AFRICA: WOMEN LEADING SOUTH AFRICAN COMMUNITIES TO A HEALTHIER AND MORE SUSTAINABLE ENVIRONMENT

*Food and Trees for Africa (FTFA)*



## Drylands and desertification

Desertification refers to the process of land degradation that results from various factors in arid, semi-arid, and dry sub-humid areas. It is a process



by which drylands lose their agricultural productive capacity, leading to food insecurity and poverty, in a cause-and-effect relationship. Characterised by climate variability, these lands sustain pastoralists and small-scale farmers, but are susceptible to desertification as a result of increasing human population and poverty, settlement, deforestation, expropriation of rangelands, land clearance, overgrazing, inappropriate land-use policies and irrigation practices, and, political instability, all of which are compounded by climate change.<sup>105</sup>

Climate change accelerates the loss of vegetation and thus desertification. As rainy seasons become shorter and droughts increase, land erosion and infertile soils become the norm. Decreased vegetation cover causes an increase in evapotranspiration, which then perpetuates reduced rainfall creating a positive feedback loop exacerbating desertification.

Droughts are the most serious cause of food shortages, causing 60% of food emergencies.<sup>106</sup> In addition to threatening food and water security, rural communities may encounter conflicts over resources forcing families or whole communities to migrate. In West Asia, droughts have been shown to increase rural-to-urban migration in the region, but, in cities across the region flash floods are increasing as a result of more intense rainfall events with the number of people affected by flash floods doubling over the last ten years to 500,000 people across the region.<sup>107</sup>

*In arid regions of Africa, extreme events such as droughts and floods thus appear to have become both more intense and more irregular over the last three decades. The reduction in the overall length of the rainy season and the increase of dry pockets are explicit indicators of climate change and increased risks for local communities.*<sup>108</sup>

In areas, such as the Sahel, where major droughts have occurred, populations have developed several forms of adaptation measures. These include:

- Changing management practices for agro-silvo-pastoral systems—the development of a combination of farming and livestock breeding,
- Using diverse plant varieties that may be drought-resistant, have shorter growing cycles, and other adaptation features,
- The development of irrigated farming through water management; market and greenhouse gardening,
- Improved forest management, through promoting improved cook stoves, use of butane gas, and management by villagers of forest edges,
- Water management of domestic and agricultural water through storage and wells,
- Pastoralism and mobility of herds, and
- Migration.<sup>109</sup>

Most of these measures provide economic diversification to support their livelihoods as pastoralists and small-scale farmers, but can also offer alternative options.

### **Gender analysis of risk in drylands and desertification**

The World Bank's Middle East and North America (MENA) flagship report on adaptation to climate change in Arab countries launched in 2012 and indicated that in rural areas, climate change is forcing communities to rethink long-standing gender roles. This has led men to migrate to cities looking for paid work, leaving women to assume the men's household and community duties but with the additional challenges of being poorly educated, being responsible for childcare, and lacking legal authority, thus perpetuating gender inequality. As a result, climate change presents many opportunities, not



only to reduce vulnerability, but also to contribute to greater long-term development.<sup>110</sup>

Women's traditional roles and knowledge in natural resource management and agricultural practices are central to preserving food, water, and medicines. Yet in drylands throughout the world, particularly in much of Africa, women are affected by erosion and decreased crop and livestock productivity. In addition, women suffer more from extra responsibility for tending to the land around her house and livestock, keeping them occupied outside the dwelling for most of day in addition to tending to household chores in the evening.

Moreover, the unsustainable uses of rangelands with the stress of climate change have led to a vegetation cover increasingly undermined by water scarcity, resulting in large-scale groundwater extraction and thus depleted aquifers. These uses were also of detrimental consequences on indigenous plant biodiversity and land productivity, reducing areas to arid and industrialized zones with limited fodder production. Therefore, local community members had to choose between forsaking pastoralist mode of life and purchasing fodder—a choice between unemployment, or lower standards of living. Despite women's key role in pastoral lifestyles, and traditionally bearers of knowledge, a variety of cultural restrictions contribute to women's unequal access to services and decision making, including lack of land ownership, illiteracy, political will and gender bias.

**Table 4: Key adaptation factors relating to drylands and desertification**

#### Anticipated climate impacts

- Loss of evapotranspiration, vegetation, and ecosystem services,
- Increased wildfire risk,
- Decreased rainfall and drought,
- Decreased availability of water resources for drinking and food production,
- Decreased livestock reproduction, and
- Famine.

#### Gender issues

- Gender-differentiated risk in loss of food and water resources,
- Gender-differentiated risk in loss of life, rise of conflict over resources, and in forced migration,
- Increased use of fertilizers that will contaminate scarce groundwater resources,
- Increased labour required for food production, and
- Health and nutrition risks for households and communities.

**Table 4: Key adaptation factors relating to drylands and desertification (Cont.)**

### Gender-responsive adaptation

- Enhance water resources management with equal access to resources,
- Establish equal and diverse options in relocation, planning, design, decision-making, and leadership roles of agricultural systems,
- Engage in sustainable development practices, and
- Ensure equity in food distribution.

### Roles and responsibilities, rights and risks: Facts and figures

As discussed in other sectors, in most countries, women are among the least able to adapt to the impacts of change because they are more likely to be poorer than men; are often responsible for natural resource and household-management; lack access to resources and opportunities for improving and diversifying livelihoods; and have low participation in decision-making. Related issues include:

- Women in dryland areas, as in other ecosystems, are an important source of knowledge related to environmental management for medicines, food, and water. Indigenous and local traditional knowledge systems are particularly vital to the maintenance of these environments, in which residents have learned how to survive in harsh and variable conditions. Through their responsibilities in relation to both crop and wild resources, women have developed valuable knowledge about environmental sustainability and—critical in areas of desertification—survival mechanisms during times of drought and famine.
- Women are significantly affected when erosion and diminished soil fertility result in decreased crop and livestock productivity, thereby reducing the sources of income derived from these products.<sup>111</sup>
- In dryland areas, there are differences in responsibilities, user rights, legal status, the division of labour and decision-making between men and women in relation to land. In most countries in the world,<sup>112</sup> female ownership of agricultural land is less than 10%, with Qatar and Saudi Arabia having no women owning agricultural land. In many African societies, women's lack of rights to land ownership denies them user rights, as well, including rights to plant trees and build soil control measures.<sup>113</sup> In the Arab region, rural women have access to land, as they are responsible for much of the cropping and pastoral activities including taking animals to pasture on the land. However, men generally control ownership and management of land, and although women may inherit land, their husbands or their brothers manage many of their holdings. Investments in land infrastructure such as repair of irrigation canals or conduits; the maintenance of terraces, etc. is also men's prerogative.
- Household and farm chores are becoming not only more difficult, but also more crucial to survival. Besides the resulting increase in workloads, women are particularly affected by the migration of growing numbers of men away from homesteads. As environmental conditions worsen,



more men migrate for longer periods, sometimes even permanently. Meanwhile, as men migrate, contributing less and less to family incomes, women are trying to expand their productive role by adapting techniques to increase yields to earn incomes and ensure living standards above mere survival for their households.<sup>114</sup>

### **Gender-responsive adaptation examples and lessons for drylands and desertification**

Investing in women is considered the most important approach in dryland areas, based on the need for high levels of poverty reduction and women's ability to work well in groups to manage external resources such as credit and natural resources. Different organisations seek to enable rural poor women to take development into their own hands. While there are clear practices and lessons that are similar to those for drought, agriculture, and food security adaptation measures, the extreme situations of those living in drylands and deserts have resulted in consideration of activities that address these particular risks and focus on empowering women, who have often been left with work in communities with deteriorated lands while men have migrated seeking work for cash income outside of the region. Studies show that there is an increased interest in the promotion of gender-sensitive indigenous and traditional local knowledge to observe and respond to environmental uncertainties and changes, at local, national, and regional level.

In Arab countries, rangeland governance is increasingly being strengthened through revival of Hima, a traditional conservation system used by Bedouins to organise grazing and protect land for better natural resource governance, conservation,

and sustainable management. Hima has shown promise in a number of locations, and governments are becoming increasingly interested in adopting Hima more widely to meet combined agricultural, environmental, and social goals. A case from Jordan shows that the Hima approach emphasised on the indispensable role of gender mainstreaming in improving conditions while relaying on women's traditional knowledge and livelihoods benefits has proved the effectiveness of this role.<sup>115</sup>

In West Africa, the Association for Indigenous Women and Peoples of Chad, the Indigenous Peoples of Africa Coordinating Committee, and the United Nations Educational, Scientific and Cultural Organization (UNESCO) piloted an initiative bringing together pastoralist M'bororo weather-forecasting knowledge with scientific seasonal and long-term forecasts. The initiative builds upon a series of dialogues and exchanges between indigenous and scientific knowledge holders, with the support of indigenous knowledge experts.

Drought, chronic malnutrition and low-incomes in Aguié, Niger contribute to the extreme climate vulnerabilities of communities in the area, with women being especially vulnerable because of their increasing economic responsibilities, lower education levels and heavier workloads. To more effectively address specific vulnerabilities of women, the Project for the Promotion of Local Initiative for Development in Aguié, with the Government of Niger and the International Fund for Agricultural Development (IFAD), introduced several innovative approaches to existing adaptation strategies. One approach was to support goat-rearing so that the manure could be used as fertilizer, leading to increased income and improved yields. Another was to encourage the use of short-cycle, high-production seed to compensate for the scarce rainfall



in the area. Income-generating activities for women were also developed through soap and hair cream production, knitting, and embroidery, which could be sold at market. Through these activities, the project helped increase food security, knowledge about gender mainstreaming and mobilization between groups of men and women in this region.<sup>116</sup>



## Coasts, oceans, and fisheries

Human-induced climate change presents many global challenges, with coastal zones being of particular importance for urgent adaptation. Coastal zones contain unique ecosystems with significant economic assets and activities, and they typically have higher population densities than inland areas. Coastal zones also provide natural barriers and resources for managing climate change risk, such as storm surge from disasters, but if these coastal landscapes are degraded it can cause even more severe impacts for surrounding communities and ecosystem resilience. Phenomena will vary considerably over regional and local scales but coastal areas are highly vulnerable to climate change-induced impacts with significant implications for low-lying areas and beyond.

Coasts are particularly vulnerable to increasing sea surface temperatures and have a low adaptive capacity, as do coastal wetland ecosystems, such as salt marshes and mangroves, which are especially threatened by encroaching development that deter sediment runoff from coastal regions. Increased flooding and degradation of freshwater, fisheries and other natural resources could impact hundreds of millions of lives, and socioeconomic costs on coasts will escalate with future climate change. Degradation of coastal ecosystems—especially wetlands and coral

reefs—have serious implications for the wellbeing of societies dependent on the coastal ecosystems for goods and services, as well as protection from slow onset and sudden onset disasters.

The IPCC reported in 2007<sup>117</sup> and 2014<sup>118</sup> that growing populations and human-induced pressures would exacerbate the impacts of climate change in coastal regions. People and assets at risk in coastal areas are subject to additional stress due to the indirect impacts on land-use and hydrological changes (e.g., dams that reduce sediment supply to the coasts).

It is important to recognise the cost of inaction will be drastically higher than the cost of prioritizing adaptation for vulnerable coasts and fishery resources. Often, post-event impacts on coastal business, people, housing, public and private social institutions, natural resources, and the environment go unaccounted for in disaster cost tallying. However, it is crucial that coastal communities and their respective fishery industry begin adaptation processes soon, as some research warns that these communities will be unviable by 2100.<sup>119</sup>

## Gender and coasts, oceans, and fisheries

More than 120 million people throughout the world are estimated to depend on fish for all or part of their income. According to the FAO, about 58 million people worldwide are directly engaged in fishing and aquaculture, including substantial numbers of women.<sup>120</sup> In the Pacific region alone, it is estimated that women catch about a quarter of the total seafood harvested. In Cambodia, Laos, Thailand, Viet Nam and the Philippines, there are communities where women have a greater role in aquaculture production and harvesting of littoral organisms than that of men.<sup>121</sup>



Women are involved in the fisheries sector, particularly in processing fish, preparing for market, and small-scale harvesting—activities that are close to the shore. Due to their focus on activities that are often on the sideline of harvesting, women's tasks in relation to fisheries have not been prioritised in economic analyses or resource investment. Limited access to and representation in decision making has also led to women's interests not being included in coastal plans.<sup>122</sup>

In spite of the importance of women's participation in fishing activities—be it at the time the fish are caught, processed, or sold—the conditions under which they are involved in this sector worldwide are not of an equitable nature; for example:

- Women do not usually participate in the meetings held by the fishermen's organisations,
- Most of the fishing projects are oriented toward men, and the participation of women is limited with respect to planning, programming and management,

- There are very few policies or programmes within the fishing sector where gender aspects are considered, as indicated by recent results from the Environment and Gender Index (EGI):
  - Of survey responses from 24 nations, 3 respondents (12.5%) stated that the fishery ministry or agency of their nation has a formal gender policy, and 7 respondents (29%) stated that the fishery ministry or agency of their nation includes gender considerations in policies and programmes.<sup>123</sup>
  - Of survey responses from 49 nations, 14 respondents (28.5%) stated that the fishery ministry or agency of their nation has a gender focal point.<sup>124</sup>

Climate change is expected to have specific impacts on coasts, oceans, and fisheries; many of these will have gender-differentiated effects on communities. In order to develop and implement effective adaptation strategies for this sector, a close examination of these impacts must be conducted (Table 5).

**Table 5: Key adaptation factors relating to coasts, oceans, and fisheries**

Anticipated climate impacts
<ul style="list-style-type: none"> <li>• Due to sea level rise, low-lying areas and countries will increasingly experience adverse impacts such as submergence, coastal flooding, seawater inundation and coastal erosion,<sup>125,126</sup></li> <li>• Increased salinity in coastal and low-lying lands impact freshwater ground systems and anchialine pools,<sup>127</sup></li> <li>• Ocean acidification threatens habitats and degrades shorelines,</li> <li>• Significant changes in community composition and structure of coral reef systems,</li> <li>• Loss of marine and coastal ecosystems, biodiversity and ecosystem resources, functions and services they provide for coastal livelihoods, and</li> <li>• Increased risk of invasive species threatens marine and coastal wildlife.</li> </ul>

**Table 5: Key adaptation factors relating to coasts, oceans, and fisheries (Cont.)**

### Gender-differentiated impacts

- Risk in coastal resource use and fisheries (shifts in pelagic fish may increase fishing labour and increase costs of fish and the income from post-harvest production will decline),
- The loss of near-shore resources' sustenance, and declines in household nutrition,
- Impacts on built environments threaten roadways, coastal buildings and developments, and housing,
- Tourism and resorts threatened—both facilities and activities (beach, diving, etc.), with resulting impact on jobs (indigenous people and women often predominately employed in low-paying work in this sector), and
- Gender distinctions in migration and return migration due to climate impacts.

### Gender-responsive adaptation

- Identify gender-differentiated risk and develop plans for shoreline protection, including DRR, adaptation, and plans for protected areas,
- Stabilize shorelines, including planting native species, such as mangrove restoration in Asia, Latin America, and the Pacific—to be conducted by women,
- Relocate critical infrastructure and facilities with consideration of gender-specific socio-economic impact,
- Establish protection of marine and coastal systems and infrastructure managed by women,
- Ensure equal access to resources,
- Establish gender equality and diversity in planning, design, decision-making, and leadership roles of marine and coastal systems, and in designation of marine protected areas,
- Ensure equal access to education and employment in technical, scientific fields, and
- Strive for, or guarantee, equality in food distribution.

### Roles and responsibilities, rights, and risks: Facts and figures

- In some regions, women have become important entrepreneurs along the fishing value chain. For example, in the European Union, women control 39% of the fish industry; administering and controlling significant sums of money and generating substantial returns for their household and community.<sup>128</sup>
- Out of the world's 100 top seafood companies, only one company currently has a woman CEO, according to the report, compared with 8% of top positions held by women in the Fortune 100 US companies.<sup>129</sup>

- Fisheries and tourism have a strong relationship and for that reason are generally male dominated, providing the local male fishers with most of the monetary benefits. Although, women do take part in post-harvest activities, such as processing, selling, and marketing of marine resources providing access to monetary income and livelihood security.<sup>130</sup>

Few sustainable development programs in coastal areas have reached out to women as strategic partners due to the misconception that women are not actively involved in the fishing industry. And yet, gender perceptions and opportunities can vary from coastal fishing communities to professional levels



and across different geographies and cultures. For example, in Latin America, approximately 75% of the technicians involved in quality assurance are women. These include veterinarians, biologists, chemists and fishing engineers. In the same region, 20% of the fish inspectors and 55% of professionals involved in research and development are women.<sup>131</sup>

Conversely, at least 50 million women in developing countries are employed in the fishing industry, predominantly in low grade, unskilled jobs.<sup>132</sup> For example in Tanzania, women's role in the industrial processing of marine products is central. In some factories the ratio of women working is three women for one man. Despite this, a study conducted in 2002<sup>133</sup> pointed out that only men were permanently employed; women did not have any leadership position jobs, nor were they involved in the planning process. The company also practiced different wage compensation for men and women, with women's wages lower than men's.

Fishing communities in Mozambique have demonstrated that with climate change the women's role in subsistence agriculture has been changed because of increased temperature, irregular rainfall and storms, which have not allowed female participants to get much, or any, agricultural yield. This has increased female participation in fishing activities—especially in dragnet fishing—as well as the increased profitability of selling fish.<sup>134</sup>

Coastal concerns go well beyond the fishery sector; they have a cross-sectoral impact relating to salinisation, human health, ecosystem stability, food security, and forced relocation of communities. Water sources in coastal Bangladesh, such as rivers and groundwater, have become contaminated by varying degrees of salinity due to saltwater intrusion

from rising sea levels. Studies conducted show that consumption of saline water has a differentiated impact in men and women. For example, salt intake during the dry season contributes to:

*The seasonal pattern of hypertension in pregnancy. Hypertension in pregnancy is associated with increased rates of adverse maternal and fetal outcomes, both acute and long term, including impaired liver function, low platelet count, intrauterine growth retardation, preterm birth, and maternal and perinatal deaths. The adverse outcomes are substantially increased in women who develop superimposed (pre)eclampsia.*<sup>135</sup>

In the Southwest Pacific the tiny, low-lying islet of Han—part of the Carteret Atoll—has been witness to some of the first climate change refugees. The Atoll, made up of six islets, suffered saltwater intrusion, contaminating freshwater wells and making it impossible for the islanders to farm taro—a staple crop for the communities. Shorelines have eroded and the majority of the islet is under water. This has caused the permanent relocation of 2,000 people to mainland Bougainville in Papua New Guinea, led by a woman, Ursula Rakova. The refugees have not only faced the challenge of adjusting to relocation, but they are struggling with different sociocultural gender norms: Han was a matrilineal community where women own land and were responsible for the agricultural production, in the new society, this is not the case and women are facing barriers to gain rights to land access and tenure.<sup>136</sup>



## Gender-responsive adaptation examples and lessons for coasts, oceans, and fisheries

Gender equitable wetland planning decisions have included broader and more diverse perspectives at local, national and regional levels, and have better reflected women's needs and preferences (e.g., access to land and other wetland resources, reliable water transport of market goods, more diverse forms of tourism employment). In Guyana, the Mangrove and Restoration Project was the first initiative implemented by the Government as a means of protecting coastal communities from flooding without the use of sea walls or other manmade infrastructure. Women make up 80% of participants and they serve as educators, protectors of the forest, growing mangroves and planting seedlings.<sup>137</sup>

### READ MORE!

#### **MANGROVE RESTORATION PROJECT (GRMP) IN GUYANA: WOMEN INCREASING COASTAL RESILIENCE THROUGH MANGROVE CULTIVATION**

*Government of Guyana, Guyana Women's Leadership Institute, Guyana Office for Climate Change, and National Centre for Education, Research, & Development (NCERD) with funding from the European Union*



Mangroves for the Future (MFF) is a unique partnered initiative to promote investment in coastal ecosystem conservation that helps mitigate and adapt to climate change in Asia. MFF strongly focuses on gender-responsive project planning. All members of the MFF implementation team are expected to be knowledgeable and skilled in the gender integrated

planning process, in order to be able to facilitate that process with national partners on the ground.<sup>138</sup>

### READ MORE!

#### **REEF-TO-RIDGE FISHERIES MANAGEMENT IN THE FEDERATED STATES OF MICRONESIA: AN INTEGRATED GENDER-INCLUSIVE APPROACH TO COASTAL RESOURCE MANAGEMENT**

*Secretariat of the Pacific Community (SPC), part of the Coping with Climate Change in the Pacific Island Region Programme*



On the eastern coast of Africa various coastal villages are adapting strategies and methods to include women. In Tanzanian coastal villages, activities such as seaweed farming that includes multiple areas of work (i.e., production, weeding, harvesting, drying and marketing of the products) dominate livelihoods, thus seaweed farming has been developed as an alternative to destructive fishing practices, or coral and sand mining.<sup>139</sup> On Zanzibar islands, women are conducting innovative sustainable entrepreneurial activities such as octopus fishing in Jibondo and Juani, where 90% of fishing businesses are in the hands of women. As part of the development of the business, women have been trained, learning the importance of keeping records of biological parameters to facilitate conservation. Additionally, in Mozambique, one of the strongest supportive frameworks for gender equality in the fishing sector is a government program co-financed by Norway and Iceland from 2009-2012, promoting the role of women as increasingly important along the fishing value chain. Some lines of action have included the following indicators: a positive evolution in women's



representation in fisheries' participatory management bodies and in grassroots community organizations; and policy documents and development plans containing references to objectives and strategies seeking greater equity within the fisheries sector.



## Health

The health and wellbeing of people all over the globe will be affected by a wide range of climate change impacts, including climate-related disasters, infectious diseases, availability of clean air, water and sanitation services, sufficient food, and adequate shelter.<sup>140</sup> Of the cross-sectoral health consequences of climate change, most will be adverse. It is estimated that in 2000 alone, climate change was responsible for 2.4% of cases of diarrhoea worldwide and 6% of cases of malaria.<sup>141</sup> Almost 90% of the burden of diarrhoeal disease is attributable to lack of access to safe water and sanitation.<sup>142,143</sup> The reduction in the availability and reliability of fresh water supplies is expected to amplify this hazard. Shifting rainfall patterns, increased rates of evaporation and melting of glaciers, and population and economic growth are expected to increase the number of people living in water-stressed water basins from about 1.5 billion in 1990 to 3-6 billion by 2050.<sup>144</sup> In general terms, climate change will have three types of health repercussions:

1. Direct effects of extreme climate events,
2. Consequences on health caused by environmental disorders due to climate change, and
3. Other indirect consequences on health (i.e., traumas, infections, psychological diseases and negative effects on food security, among others) caused by populations being displaced due to economic problems, environmental degradation, or conflicts arising because of climate change.<sup>145</sup>

Climate change will lead to increased under- and malnutrition and gastro-intestinal, cardio-respiratory, and infectious diseases,<sup>146</sup> as well as various other issues already flagged in previous sections of the this chapter, such as preeclampsia for pregnant women due to increased salinisation of water sources. Heat waves, floods, and droughts will lead to increased mortality and changes in the distribution of some disease vectors.<sup>147</sup> Health services will also be burdened by an increase in patients.

Climate change will affect progress made during the global commitment period of the MDGs and will jeopardize the potential gains of the SDGs across a range of issues, not least the health and wellbeing of people around the world. The SDGs identify "achiev[ing] food security and improved nutrition" and ensuring "healthy lives and promot[ing] wellbeing for all at all ages". To make progress toward this end, the impacts of a changing climate on the spectrum of health concerns must be examined and addressed.

### Gender analysis of risk to health

Differences occur in women's and men's vulnerabilities to climate change in both direct impacts on health (e.g., heat waves, droughts, storms and floods) and indirect impacts (e.g., water and food and nutrition insecurity).<sup>148</sup> Climate-sensitive health impacts, such as under-nutrition and malaria show important gender differences.<sup>149</sup> Children, particularly girls, and the elderly are the most affected by vulnerability to heat stress and the spread of disease. In times of disaster and environmental change, women and girls are expected to care for ill members of the family, which takes time away from income generation and education. In addition, women and girls may have difficulty accessing health services due to high medical costs and cultural restrictions related to mobility.<sup>150</sup>

**Table 6: Key adaptation factors relating to health**

### Anticipated climate impacts

- Sea level rise and climate extremes threaten freshwater resources,
- Loss of food security and nutrition,
- Increased incidence of water-borne diseases,
- Increased risk of vector-borne diseases (malaria, dengue, chikungunya, etc.) and spread of pandemic flu,
- Mental health and depression in areas where livelihood activities are lost,
- Decline in reproductive health in severe, chronic drought areas, and
- Loss of life.

### Gender issues

- Gender-differentiated risk in access to resources, health system services, and early warning systems,
- Gender-differentiated risk susceptibility to diseases and mental health impacts,
- Gender-differentiated loss of life,
- Fewer women participating in scientific and technical occupations,
- Fewer women in leadership and decision-making roles in health authorities, and
- Loss of resources used in indigenous traditional healing practices.

### Gender-responsive adaptation

- Identify gender-differentiated risk to health impacts,
- Develop with multi-stakeholder participation climate and health early warning systems to prevent severe outbreaks, disease occurrence, and spread of risk,
- Ensure equal access to resources for coping, recovery, and services,
- Ensure equal access to education and employment in technical, scientific fields, and
- Engage in sustainable development practices.

### Roles and responsibilities, rights, and risks: Facts and figures

- Rising temperatures may increase the transmission of malaria in some locations, which already causes 300 million acute illnesses and kills almost one million people every year.<sup>151</sup> Pregnant women are particularly susceptible to malaria as they are twice as 'appealing' as non-pregnant women to malaria-carrying mosquitoes.<sup>152</sup>
- Women's nutritional needs make them more prone to deficiencies caused by the impacts of climate change and extremes on food and nutrition insecurity, particularly while they are pregnant or breastfeeding. In South Asia and South-East Asia, 45-60% of women of reproductive age are underweight, and 80% of pregnant women have iron deficiencies.<sup>153</sup>



- Extreme weather events often create conditions conducive to outbreaks of infectious diseases; heavy rains produce insect breeding grounds and contaminate clean water sources while drought can cause fungal spores and spark fires.<sup>154</sup> Women, especially expectant mothers, are highly susceptible to water-borne diseases, as well as thermal and other extreme events.
  - The loss of culturally appropriate clothing because of disaster impacts inhibits women from leaving temporary shelters to seek medical care, or obtain essential resources for themselves or family members.<sup>155</sup>
  - The majority of European studies have shown that women are more at risk, in both relative and absolute terms, of dying in heat waves. However, another study in the USA have also shown that unmarried men tend to be at greater risk than unmarried women, and that social isolation, particularly of elderly men, may be a risk factor, as they do not leave their homes regardless of the conditions.<sup>156</sup>
  - Droughts in developing countries bring health hazards through reduced availability of water for drinking, cooking and hygiene, and through food insecurity. Women and girls disproportionately suffer health consequences of nutritional deficiencies and the burdens associated with travelling further to collect water.<sup>157</sup>
  - Studies from Viet Nam found that stress factors were apparent at the household level. People interviewed in cities in the Mekong Delta referred to increased anxiety, fears or intra-household tension as a result of the dangers and damage associated with flooding and its impacts on livelihoods. Interviewees in the central provinces referred to food shortages and hunger potentially resulting from crop and income losses following destructive floods and typhoons.<sup>158</sup>
  - One study of anxiety and mood disorder<sup>1</sup> after Hurricane Katrina found the incidence was consistently associated with the following factors: age under 60 years; being a woman; education level lower than college completion; low family income; pre-hurricane employment status (largely unemployed and disabled); and being unmarried.<sup>159</sup>
  - The stresses of lost incomes and associated indebtedness can spill over into mental health problems, despair and suicide among men. There is some empirical evidence linking drought and suicide among men in Australia<sup>160</sup> and among poor male farmers in India.<sup>161</sup> This negative health outcome among Australian rural farmers has been linked to stoicism and poor health-seeking behaviour, which is an intrinsic element of rural masculinity.<sup>162,163</sup>
  - In the southwest region of Bangladesh, waterlogging (local increases in groundwater levels) has emerged as a pressing concern with health consequences. Women are often the primary caregivers of the family, shouldering the burden of managing and cooking food, collecting drinking water, and taking care of family members and livestock. Because of these responsibilities, women often spend time in waterlogged premises and other settings. Research reveals that waterlogging severely affects the health of women in affected communities. Women are forced to stay close to the community and drink unhygienic water, as tube wells frequently become polluted. Pregnant women have difficulty with mobility in marooned and slippery conditions and thus are often forced to stay indoors. Local health-care workers have reported that there are increasing trends of gynecological problems due to unhygienic water
- 
- <sup>1</sup> As defined by the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders; DSM-IV



use. Since men are often out of the area in search of work, they are frequently not as severely affected as their female counterparts. Waterlogging,

therefore, has given rise to differential health effects in women and men in coastal Bangladesh.<sup>164</sup>

#### Box 4: Empowering women in health

While fewer women than men have become doctors around the globe, there are greater numbers of female nurses. This presents an opportunity to empower women healthcare professionals in particular to lead on climate change adaptation, ensuring nurses and community workers are armed with knowledge and resources to safeguard the health and wellbeing of their communities. In Mozambique,

for example, as part of the ccGAP process, women's organisations came up with an idea to create Climate Change Health Kits for traditional healers and other healthcare workers that provided indigenous and essential plants for medicinal treatments to combat increasingly significant climate effects, such as citronella to ward off mosquitoes and moringa to purify water.

#### Gender-responsive adaptation examples and lessons for health

Adaptation actions in the health arena consider development approaches that focus on the whole consideration of public health and social protection, and in part, these overlap with adaptation strategies for disasters, such as enhancing early warning systems, ensuring access to fresh water for drinking

and hygiene, ensuring agriculture and food security for nutrition, reducing poverty and ensuring education to expand opportunities, and addressing psychosocial and mental health issues related to stress from disaster recovery, relocation, and forced migration. The World Health Organization (WHO) considered an array of different climate impacts and proposed gender-responsive adaptation actions, shown in Table 7.

**Table 7: Health impacts of climate change and gender-responsive adaptation actions**

Health impacts of climate change	Gender-responsive adaptation actions
Increase in infectious diseases	Collected data must be disaggregated by sex, age, socioeconomic status, education, ethnicity and geographical location, where appropriate; an understanding of gender and its implications for health and health-seeking behaviour should be incorporated into training of health professionals and development of health-sector responses.
Lack of availability of fresh water	Promote water-saving practices that take into account the different uses and roles related to water for women, girls and men; address salinisation and arsenic contamination of water, proposing specific actions that consider the different patterns of exposure and impacts on women and men; counter the social stigma attached to the effects of arsenic poisoning on women and men.
Mortality from extreme weather events	Provide safe shelters and homes for both women and men; training on gender-sensitive disaster risk reduction and early warning systems; promote programmes that facilitate men and women to seek help for psychosocial problems; empowerment of women to strengthen their capacity to question and change harmful behavioural norms that put them at risk in the case of extreme events.
Forced migration and disruption of human security	Build strong and supportive networks for both women and men; promote gender-sensitive training to eliminate violence against women, girls, and boys; capacity building within the health system to ensure early detection of domestic or sexual violence; involve women in management of shelters and distribution activities.
Lack of energy sources to sustain health	Identify gender-differentiated uses of energy, especially in poor areas; ensure shelters and homes have appropriate insulation, heating or cooling systems and ventilation to reduce impacts on health; develop appropriate low-cost alternative energies accessible to everyone. <sup>165</sup>
Increased health impacts (higher workload burden, increased anxiety, increased suicides)	Promote programmes that facilitate men and women to seek help for psychosocial problems; empower women to enhance their capacities to look after themselves and their families and specifically to use available social and other networks to cope with increased burdens and tensions.



## READ MORE!

### **SOLAR MARKET GARDENS IN BENIN: TRANSFORMING FOOD AND INCOME SECURITY FOR—AND BY—WOMEN FARMERS**

*Solar Electric Light Fund (SELF) with l'Association pour le Développement Economique, Social, Culturel, et l'Autopromotion (ADESCA); Global Village Energy Partnerships (GVEP) International, in partnership with the Social and Ecological Management (SEM) Fund, and ENERGIA*



## Box 5: Gender-sensitive social protection

Social protection programmes are critical to prevent irreversible losses in human capital due to climate-related shocks and protecting families' access to health and food—particularly for children, mothers and the elderly, and need to be considered as an adaptation strategy. Conditional cash transfer programs have proved successful to protect maternal and children's health. For example, conditional cash transfer programs in Colombia, Mexico and Nicaragua, in which families receive financial support on the condition that children attend school and receive vaccinations, as well as for pregnant women to receive pre-natal care, have decreased stunting by rates of 7%, 10% and

5.5% respectively.<sup>166</sup> Mexico's *Oportunidades*—a social protection programme, resulted in increased use of contraceptives by women, increased school enrolment for both girls and boys, and a decrease in diarrhoeal disease.<sup>167</sup> These programmes target the core of the vicious cycle of hunger and malnutrition that undermines maternal health, stunts children's physical and cognitive growth, impairs school performance and impedes progress towards gender equality and the empowerment of women. Given the critical role women play in children's health and nutrition, transfers should be delivered through gender-sensitive mechanisms.



### Promoting co-benefits for health and the environment

Adaptation and mitigation strategies have a potential for generating co-benefits by improving health in addition to reducing greenhouse gas (GHG) emissions. Addressing non-communicable diseases by promoting healthy lifestyles such as walking and cycling, eating more fruits and vegetables and less animal-based saturated fats, or using clean cook stoves are effective strategies for both reducing emissions and promoting health.<sup>168</sup> Women make over 80% of consumer decisions in the Organisation for Economic Co-operation and Development (OECD) countries,<sup>169</sup> for example, and may be more likely to make sustainable consumer choices. These differences are likely to be particularly important in

relation to choices of food, because decisions such as moderating meat and dairy consumption bring both large health benefits and substantial reductions in agricultural GHG emissions.<sup>170</sup>

Adapting to climate change requires incorporating strategies that strengthen and protect primary maternal and child health services, including promoting nutrition supplements; immunisations; breast feeding and healthy lifestyles, and provision of family planning and other sexual and reproductive health services. Providing access to reproductive services and improving child and maternal health through increased birth-spacing provides the opportunity for pursuing co-benefits for health and adaptation.<sup>171</sup>

## 3.3 Negative effects of adaptation initiatives on gender inequality and possible solutions

Adaptation strategies may reinforce inequitable, stereotypical, or otherwise harmful social and economic patterns—in other words, continue along the lines of ‘business as usual’. But adaptation strategies can also offer opportunities to ‘do development better’, enhancing the lives and livelihoods, the health and wellbeing, of women and

men all over the globe. Below are a series of tables (8-11) that analyse typical adaptation measures (e.g., related to infrastructure, ecosystem management, and productive and reproductive socioeconomic activities), their potential negative impacts from a gender perspective, and suggestions to transform the norm.

**Table 8: Gender-responsive adaptation measures: Managing infrastructure settlements<sup>172</sup>**

Managing infrastructure and settlements		
Measures	Possible negative impacts	Suggestions
Build breakwaters or seafronts, dikes and barriers against rising tides	<ul style="list-style-type: none"> <li>• May create job sources that favour hiring a male work force with no opportunities for women to work on jobs they would like to do and can do.</li> <li>• Ignorance of the impact on women's productive activities (hand digging for molluscs, among others), with no attention paid to the consequences of the impact.</li> <li>• Women have little participation in the development of infrastructure – i.e., in the design, planning, and management.</li> </ul>	<ul style="list-style-type: none"> <li>• Promote training and hiring of both women and men.</li> <li>• Ensure access to wage-earning productive activities to improve living conditions for families.</li> <li>• Include gender criteria in Environment Impact Assessments (EIAs).</li> <li>• Develop a network of women and local bodies and sectoral departments for efficient infrastructural management, in order to ensure protection of infrastructure from damage during calamities.</li> </ul>
Re-zone settlements and productive activities in coastal areas	<ul style="list-style-type: none"> <li>• Fishing policies and programmes focused mainly on the needs and interests of men, ignoring fisherwomen, assuming that women will be the recipients of the benefits distributed to men.</li> <li>• The lack of understanding of the role that women play within the fishing industry, along the value chain.</li> <li>• Tourism activities in coastal zones do not take into account the relationship between tourist and the local population and its impact on gender relations.</li> <li>• Jobs in the tourism sector reproduce the traditional forms around the sexual division of work (i.e., hiring women as chambermaids and cooks)</li> </ul>	<ul style="list-style-type: none"> <li>• Involve women in monitoring the effects of climate change, for example in coral ecosystems and in aquaculture.</li> <li>• Women trained in administration to ensure official resource and fishing permits.</li> <li>• Include women in strategies to adapt to the reduction of marine species, or managing new marine species.</li> <li>• Grant concessions and permits of marine coastal resources to groups of women.</li> <li>• Develop initiatives to recover and reforest mangroves.</li> <li>• Implement integrated coastal management policies that consider gender-sensitive risk management.</li> <li>• Involve women in coastal research through training on monitoring and data gathering methods.</li> </ul>

**Table 8: Gender-responsive adaptation measures: Managing infrastructure settlements (Cont.)**

Managing infrastructure and settlements		
Measures	Possible negative impacts	Suggestions
Divert fresh water to areas where there is a water shortage (dykes, water transfer, or irrigation canals) or increase extraction from subterranean water reserves	<ul style="list-style-type: none"> <li>• Ignores women's requirements of fresh water needed for their productive and reproductive activities.</li> <li>• May lengthen and intensify women's productive and reproductive working day by placing water sources in distant zones.</li> <li>• Women are frequently deprived of opportunities to engage in income generating activities due to the amount of time invested in fetching water.</li> <li>• Privatising water means high prices, loss of supply, health problems, corruption, etc., making it harder for poor women and their families to have access to it.</li> </ul>	<ul style="list-style-type: none"> <li>• Use a gender approach when diagnosing and planning communities' fresh water requirements.</li> <li>• Ensure active participation of women in design, construction, and implementation of the water infrastructure that can cope with the impacts of climate change</li> <li>• Promote water conservation and market-based water allocation with active participation of women.</li> <li>• Introduce, promote and scale-up women-friendly innovative water technologies.</li> <li>• Build the capacity of women in the technical and maintenance aspects of water infrastructure (plumbing, service providers, supervisors, machinery work).</li> <li>• Improve treatment of water systems and access to grey water for secondary uses of water (watering fields, washing, cleaning living areas, etc.).</li> <li>• Document indigenous knowledge practices and coping strategies of women and men in response to water issues.</li> </ul>
Design of shelters (i.e., for cyclones, hurricanes and floods)	<ul style="list-style-type: none"> <li>• Women have little participation in the development of infrastructure – i.e., in the design, planning, and management.</li> <li>• Lack of understanding of the gender-differentiated access to use of and control over infrastructure facilities and services by men and women, which are linked to inequalities in social structure and within the household, property rights and culture and tradition.</li> <li>• Infrastructure projects do not consider the different needs of women, because it is incorrectly assumed that women and men will automatically benefit equally from new infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>• Employment opportunities in the construction and maintenance of infrastructure could create new opportunities for women in the building sector, and can lead to a greater role in ongoing infrastructure management through their participation in local government committees that are responsible for such planning and maintenance.</li> <li>• Capacity building of women regarding technical knowledge of infrastructure and local service providers.</li> <li>• Include gender aspects of infrastructure and the importance of addressing women's needs in different types of</li> </ul>

**Table 8: Gender-responsive adaptation measures: Managing infrastructure settlements (Cont.)**

Managing infrastructure and settlements		
Measures	Possible negative impacts	Suggestions
		<p>infrastructure in the curriculum of technical and engineering education.</p> <ul style="list-style-type: none"> <li>• Increase women's role as whistle blowers for monitoring and maintenance of infrastructure (early warning, embankment breach, river erosion, infrastructure breakage).</li> </ul>

**Table 9: Gender-responsive adaptation measures for ecosystems-based adaptation management**

Ecosystems-based adaptation and management		
Measures	Possible negative impacts	Suggestions
Introduce native and salt-tolerant plants and animals to protect/re-vegetate the coast	<ul style="list-style-type: none"> <li>• May have a negative effect on women's interests and needs in coastal zones, if varieties introduced affect resources specifically used by them.</li> <li>• May conceal women's knowledge and practices concerning environmental coastal resources by ignoring them in decision-making.</li> </ul>	<ul style="list-style-type: none"> <li>• Analyse gender relations associated with the use of, access to, management and control of coastal environmental resources.</li> <li>• Promote equitable inclusion of women and men when introducing varieties.</li> <li>• Create jobs with equitable participation of women and men.</li> </ul>
Introduce varieties of plants and crops tolerant to high temperatures	<ul style="list-style-type: none"> <li>• Usually require water and other resources used by women for reproductive work and household consumption.</li> <li>• May lengthen women's productive and reproductive working day.</li> </ul>	<ul style="list-style-type: none"> <li>• Analyse the impact of introducing new varieties and promote a more equitable distribution of reproductive work.</li> <li>• Utilise/engage local agricultural/users knowledge, women's and men's, to ensure indigenous crop varieties are used where possible.</li> <li>• Facilitate equitable access to and control of resources, as well as the distribution of their benefits (including productive resources, jobs, training and credit).</li> </ul>



**Table 9: Gender-responsive adaptation measures for ecosystems-based adaptation management (Cont.)**

Ecosystems-based adaptation and management		
Measures	Possible negative impacts	Suggestions
		<ul style="list-style-type: none"> <li>Encourage exchanges of knowledge and practices between women and men about managing species.</li> </ul>
Restore damaged ecosystems	<ul style="list-style-type: none"> <li>May worsen gender inequality by encouraging the voluntary (unpaid) work done by many women in rehabilitation and conservation activities.</li> <li>May reinforce traditional environmental work roles, for example, making women responsible for cooking, community meetings, children's and adolescents' environment education, without promoting non-traditional roles.</li> </ul>	<ul style="list-style-type: none"> <li>Promote joint responsibility and redistribution of reproductive work in families, to give women free time for other activities.</li> <li>Encourage paying women for their work on environment restoration.</li> <li>Train women and men on non-traditional activities related to rehabilitating ecosystems.</li> <li>Encourage leadership and women's effective participation in organisation and decision-making.</li> </ul>
Establish natural protected areas and biological corridors	<ul style="list-style-type: none"> <li>May prohibit productive activities that are sources of income for households, some of them poor and headed by women.</li> </ul>	<ul style="list-style-type: none"> <li>Utilise and pay for women's and men's knowledge about plant and animal species in natural protected areas and corridors.</li> <li>Analyse gender relations associated with the use of, access to, management and control of resources.</li> </ul>
Introduce herbicide-resistant varieties	<ul style="list-style-type: none"> <li>May use herbicides without considering gender specifics when chemicals and containers are handled. Impacts of using these can be different for women and men (e.g., women and children may be more vulnerable, especially during pregnancy and breastfeeding and through early development).</li> </ul>	<ul style="list-style-type: none"> <li>Analyse the production process, paying attention to the use of herbicides by people with access to chemicals and containers.</li> </ul>



**Table 9: Gender-responsive adaptation measures for ecosystems-based adaptation management (Cont.)**

Ecosystems-based adaptation and management		
Measures	Possible negative impacts	Suggestions
Introduce drought-tolerant varieties	<ul style="list-style-type: none"> <li>• May lengthen the productive or reproductive working day; for example, the growth period of plants may be extended.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider options that tend to have a bearing on reducing the length of women's working days.</li> <li>• Ensure that alternatives are helpful to local families' food security and do not damage health or the environment.</li> </ul>
Implement reforestation, afforestation, or reduce deforestation, as well as soil degradation strategies	<ul style="list-style-type: none"> <li>• Gender differentiated use, access to and control of forest resources, and of the gender inequities that are observed in many forest-related processes are ignored (e.g., participation, transparency, distribution of benefits, etc.).</li> <li>• May harm women's interests and needs if these practices affect or limit access to resources they specifically use.</li> <li>• Negatively impact the livelihoods of women and their families by overlooking or devaluing women as major forest stakeholders who manage, use, and benefit from the forest.</li> <li>• Contribute to marginalisation of women's expertise by lacking to include, respond to and build upon women's extensive knowledge of agroforestry practices, forest management and conservation techniques.</li> <li>• Reinforce traditional inequalities identified in many communities, including access to and control of land and economic resources, and participation and influence in decision-making.<sup>173</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Analyse gender relations associated with the use of, access to, management and control of forest resources.</li> <li>• Identify gender equality and women's rights issues that should be included in reforestation strategies, including a gap and opportunity analysis.</li> <li>• Recognise the legal, traditional and cultural barriers that prevent women from inheriting and controlling land.</li> <li>• Introduce innovative ways to overcome women's constraint to land tenure (i.e., registration of land under both the names of husband and wife-joint land ownership).</li> </ul>

**Table 10: Gender-responsive adaptation measures for productive activities**

Productive activities		
Measures	Possible negative impacts	Suggestions
Change crop irrigation; times, type and uses	<ul style="list-style-type: none"> <li>• May remove water sources for domestic use or place them further away.</li> <li>• May lengthen or intensify the productive and reproductive working day.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider women as water users, both domestically and for production such as growing crops and raising animals.</li> <li>• Analyse the use women can make of irrigated land to provide subsistence foods.</li> <li>• Promote technologies appropriate to the needs of women and give them the proper training.</li> <li>• Encourage equity in having access to irrigated land ownership.</li> </ul>
Substitute agriculture	<ul style="list-style-type: none"> <li>• May not take into account women's roles in agricultural activities, excluding them from new processes.</li> <li>• May raise obstacles to using, having access to, managing and controlling resources (land, credit, and training).</li> <li>• Extension agents are more likely to contact men rather than women, and gendered norms make it difficult for women farmers to seek out male extension agents.</li> </ul>	<ul style="list-style-type: none"> <li>• Revise the existing strategies that enable the flow of credit from public/commercial banks and financial institutions to support and increase women's access to credit.</li> <li>• Institutionalise alternative provisions to accommodate women, women's groups and cooperatives that are unable to provide the collateral needed for accessing agricultural credit.</li> <li>• Build community resilience on food security through the establishment of local climate-smart seed banks owned and managed by women.</li> </ul>

**Table 11: Gender-responsive adaptation measures for socioeconomic processes**

Socioeconomic processes		
Measures	Possible negative impacts	Suggestions
Migration and community destabilisation in areas affected by climate change	<ul style="list-style-type: none"> <li>• Socioeconomic and gender inequalities in access to job opportunities, education, health, housing and credit.</li> <li>• More households headed by women in societies that still exclude and discriminate against women heads of households.</li> <li>• More women in jobs traditionally considered as 'masculine,' where they are exploited, and poorly remunerated in irregular or seasonable jobs.</li> <li>• Increased incidences of harassment, sexual abuse and domestic violence during the migratory cycle.</li> </ul>	<ul style="list-style-type: none"> <li>• Promote the exercise of women's rights.</li> <li>• Encourage access by women and men to skilled and remunerated jobs.</li> <li>• Ensure women and men have access to labour protection systems.</li> <li>• Draw attention to the contribution migrant women and men make to their families and communities.</li> <li>• Develop support services for communities, families and individuals left behind (who remained in the community of origin) as a result of migration.</li> </ul>

## 3.4 Adaptation planning: National to community-based initiatives

As discussed in the policy-focused chapters of this publication, Parties to the UNFCCC have agreed substantial decisions related to adaptation (see, for example, in Box 6), providing mandates for gender-responsive approaches. In fact, to date, adaptation is the area with the most robust gender-sensitive language. This could be due in part to the following:

- The first decision, from UNFCCC COP7 in 2001, to integrate a gender-sensitive approach mandated that national adaptation programmes of action

be guided by gender equality—mandating the adaptation framework to follow a gender-sensitive approach since its outset, and

- Early research and approaches to raise awareness highlighted the linkages between gender and climate change and framed women predominantly in terms of their vulnerability to climate impacts.



### Box 6: Examples of decisions pertaining to gender-responsive adaptation action<sup>175</sup>

- **Decision 28/CP.7:** Guidelines for preparation of the national adaptation programmes of action: States that the preparation of NAPAs must be guided by gender equality.
- **Decision 1/CP.1:** The Cancun Agreements: Affirms that enhanced action on adaptation should follow a country-driven, gender-sensitive, participatory and fully transparent approach.
- **Decision 5/CP.17:** National Adaptation Plans (NAPs): Further reiterates that adaptation should follow a country-driven, gender-sensitive, participatory and fully transparent approach & should be based on and guided by gender-sensitive approaches. Additionally, the guidelines for the formulation of NAPs states that in developing NAPs, consideration would be given to the effective and continued promotion of participatory and gender-sensitive approaches.

Based on these above mandates as well as national legal frameworks, the discussion of adaptation planning should occur at every level of authority and decision-making where there will be impacts from climate change. The adaptation planning should be mutually supportive and beneficial from local levels to the national plans. The planning should engage every sector that will be impacted by climate change through an integrated and comprehensive approach, including water resources, agriculture and food security, coastal and terrestrial ecosystems and biodiversity, built environment, disaster risk management, and other economic and livelihood sectors. The gender aspects of planning are primarily two-fold: first, that women equally participate with men in planning and decision-making processes, and in complement, that actions should be based on gender-disaggregated data and knowledge of gender-differentiated risk.

At the national level, the primary adaptation plans are known as NAPAs, but these are only developed by the Least Developed Countries (LDCs). Disaster risk reduction plans, conducted at the national level, which respond to agreements by 187 UN Member States, are another form of adaptation planning, where recommended actions can reduce risk from disasters, aid in post-disaster recovery, and build resilience to negative impacts from climate change and climate-related disasters.<sup>176</sup> Recognising the importance of understanding climate risks, many cities globally and regions, as well as countries, have begun to develop plans that look at the state of the climate, and plan for reducing risks and potential negative impacts.<sup>177</sup> Some of these are presented in brief in other chapters of this publication, including the multi-sectoral, multi-stakeholder approach many governments have undertaken by developing climate change gender action plans.



## National Adaptation Programme of Action (NAPA)

The UNFCCC requires that LDCs submit a NAPA in which the country describes its priorities and strategies in relation to coping with climate change. The UNFCCC itself does not require the NAPAs to include a gender perspective; however, it is advised to include a gender principle and hire gender specialists to work on mainstreaming gender in the NAPAs.<sup>178</sup> These recommendations are not enforced. Therefore, gender issues rarely get written into the project's main adaptation focus. While many countries have noted the increased levels of vulnerability experienced by women dealing with changing climates in their NAPA, few have targeted women as direct agents in climate change adaptation strategies.<sup>179</sup>

Gender perspectives are relevant to key points of the NAPA, including governance, information gathering, access to finance and technology, and NAPA implementation.<sup>180</sup> While all NAPAs have been completed as of this writing, the implementation and budget are entry points for gender mainstreaming in future NAPAs. Prior to implementation, a gender analysis of the NAPA can be undertaken, in order to review how climate change affects women and men differently, and to explore scaling up of specific innovations that promote gender equality and women's participation. Also, to ensure gender targets are being consistently met, a 'gender team' can be formed to create processes that monitor gender targets at all stages. Mainstreaming the NAPAs with a gender perspective contributed to successful progression towards the MDGs, and it is important as the SDGs emerge in 2015. The gender perspective further alleviates environmental pressures by utilizing the overlooked demographic of women as innovative and potent agents of change.<sup>181</sup>

The following steps for gender mainstreaming were adapted from "Mainstreaming Gender into the Climate Change Regime" (COP10, 14 December, 2004) and were supported by the United Nations Environment Programme (UNEP) Women's Assembly, held in Nairobi in October 2004:

- Analyse the effects of climate change from both a male and female perspective,
- Incorporate a female perspective when designing and implementing projects,
- Gender-sensitive criteria and indicators should be developed and applied,
- When collecting and presenting data, include women's statistics as well as men's,
- Capitalise on the talents and contributions of both women and men,
- Set targets for female participation in activities,
- Ensure that women are represented in 50% of all decision-making processes,
- Make women's equality, access to information, economic resources and education a priority,
- Focus on gender differences in capabilities to cope with climate change adaptation and mitigation, and
- Undertake a gender analysis of budget lines and financial instruments.

NAPAs must take into consideration economic aspects such as budgeting, not only for mitigation and adaptation initiatives but also for the development of the NAPA. Writing NAPAs implies the use of resources and these should be tied to gender-responsive processes. NAPAs must also be based on and include local development plans, insuring a bottom-up approach to the whole process, its review and approval, and must also guarantee the inclusion of gendered local knowledge. NAPAs must be tied



into disaster risk management plans. This implies a coordinated effort on the part of governments and the private sector, and all stakeholders. The links between sustainable development, disaster risk management and climate change mitigation and adaptation should be essential to NAPAS. The Oslo Policy Forum Report clearly states that there should not be “parallel agendas”, and development planning,

national budgeting for adaptation, institutional arrangements, public awareness, the poverty issue and peace and conflict issues should all be integrated into the agendas. This process must be construed to guarantee a gender perspective, which many governments have not yet been able to implement. Tying the budgeting process to the inclusion of a gender perspective could help to guarantee success.

### Box 7: Samoa: Integrating gender practice

Samoa offers a compelling example of integrating gender in practice at the country-level. Under the guidance of the Ministry of Environment, the Samoan NAPA used participatory multi-sector approaches with some gender consideration in the process, while the Ministry of Finance leads the World Bank Pilot Programme on Climate

Resilience, and the safeguard policies require the implementation of a gender monitoring framework, which involves the Ministry of Women, Community, and Social Development. Planning integration at all levels ensures that the administration and resourcing of the climate adaptation programme will be implemented with consideration of gender.<sup>182</sup>

NAPAs should stress the costs of adaptation, as well as the costs of not implementing adaptive measures, and reflect that in responsive budgets. There has to be specific and clear information as to the financing

process for adaptation initiatives. These initiatives have to be gender sensitive and the costs for this must be clearly stated.<sup>183,184</sup>



## Programmatic climate adaptation planning

To support the implementation of the NAPA, programmatic funding has been a source for ensuring that gender perspectives are used in the adaptation actions. For example, the Global Environment Facility (GEF) and United Nations Development Programme (UNDP) have provided early climate adaptation funding for regions that can demonstrate the added costs of climate change, such as the added costs for raising coastal roadways because of sea level rise or for water storage systems in places where climate change results in decreased rainfall and potential drought. The funding has requirements for incorporating gender in actions, and reporting on these requirements as part of the UNDP Gender Equality Strategy.<sup>185</sup> “Sixty-one percent of projects (218 of 355)...in 2012 reported having undertaken some work on gender equality and gender mainstreaming.”<sup>186</sup> Africa and the Asia Pacific regions had the highest number of projects reporting inclusion of gender (61 projects each), followed by Europe and the Commonwealth of Independent States (CIS) with 40 projects, Latin America and Caribbean with 35 projects, the Arab States with 15 projects, and six in other countries.<sup>187</sup> These projects target multiple sectors, with ecosystems and biodiversity as the predominant area of adaptation.<sup>188</sup>

Other organisations have implemented similar requirements with the funding support. The World Bank Climate Investment Funds currently distributes the largest amount of climate adaptation funding through the Pilot Programme for Climate Resilience (PPCR) in 18 countries, nine of which are small island states, and the reporting requires response on indicators for gender participation, incorporation into design and implementation, and sex-disaggregated data on the impact of the PPCR projects.<sup>189</sup>

Bilateral funding for adaptation activities from many countries (i.e., US, Finland, New Zealand) through their aid organisations has gender reporting requirements. Many of these are trying to synchronise reporting for MDGs, SDGs, and the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW).

## Disaster risk reduction planning

The activities included in DRR planning support adaptation directly for climate-related hazards, and also as a means of building resilience that aids in risk reduction for multiple hazards. Gender can be incorporated in DRR in the implementation of development activities, by ensuring equal access to educational opportunities for women who are at greater risk, in developing early warning systems which take gender and cultural livelihoods into account, by using gender-specific and -disaggregated data that identifies differential risk, and by utilising a gender perspective in decision-making processes when implementing risk management policies.

The United Nations International Strategy for Disaster Reduction (UNISDR) is involved in gender mainstreaming and lessons learned in the field and uses examples of women as powerful agents of sustainable change and as influential leaders.<sup>190,191</sup>

These lessons described in several UNISDR provide case studies can be used by development planners to capitalise on the significance of women’s input and their eminent potential for change. These risk reduction actions will further adaptation planning.



### READ MORE!

**STRENGTHENING INSTITUTIONAL CAPACITY FOR DISASTER RISK MANAGEMENT IN VIET NAM: ENSURING GENDER AND WOMEN'S CONCERNS SHAPE LEGISLATION AND PREPAREDNESS, INCLUDING FOR ADDRESSING CLIMATE CHANGE-RELATED RISKS**

*Ministry of Agriculture and Rural Development (MARD), with UNDP, UN Women, and OXFAM thanks to support from Australian Aid*



### READ MORE!

**ADAPTATION LEARNING PROGRAMME FOR AFRICA: EMPOWERING WOMEN THROUGH VILLAGE SAVINGS AND LOAN ASSOCIATIONS TO BUILD HOUSEHOLD RESILIENCE AND FURTHER PROMOTE GENDER EQUALITY (A CBA APPROACH)**

*CARE International*



## Community-based adaptation planning

Recognising the importance of local level community-based impacts, methods have been developed for community-based adaptation (CBA) planning that aids communities in identifying their greatest risks from climate change, the capacity to deal with the risk, and adaptation actions for each of the risk areas. Investment in adaptation projects at the early stages have targeted communities, largely as pilot projects, to gauge the usefulness and success of the interventions, and to determine best practices for transferring knowledge and capacity to other areas.<sup>192,193</sup> Most of the methods use participatory approaches that involve different stakeholders, often working with groups of gender and age separately, and the assessments consider differential risk to the various groups by age, sex, indigenous populations, race, ethnicity, and class or caste system.<sup>194,195,196,197</sup> The degree to which gender issues and differentiated risk emerges depends on the facilitators, location, and process, and gender-responsive adaptation actions.

## Ecosystem-based adaptation planning

It is accepted that healthy, well-functioning ecosystems enhance natural resilience to the adverse impacts of climate change and reduce the vulnerability of people to them. This means that nature based adaptation solutions are low-cost, efficient and sustainable options. As such, Ecosystem-based Adaptation (EbA) offers a valuable yet under-utilized approach for climate change adaptation, complementing traditional actions such as infrastructure development. For example, "floodplain forests and coastal mangroves provide storm protection, coastal defences, and water recharge, and act as safety barriers against natural hazards such as floods, hurricanes, and tsunamis, while wetlands filter pollutants and serve as water recharge areas and nurseries for local fisheries." Biodiversity and ecosystem services are used as part of an overall adaptation strategy to help people and communities adapt to the negative effects of climate change at local, national, regional, and global levels.



EbA recognises the importance of equity, gender, and the role of local and traditional knowledge in developing nature based adaptation actions. In addition to protection from climate change impacts, it provides other co-benefits such as clean water and food for communities, risk reduction options and benefits and other services crucial for livelihoods and human well-being. Appropriately designed ecosystem adaptation initiatives can also contribute to climate change mitigation by reducing emissions from ecosystem degradation, and enhancing carbon sequestration.<sup>201</sup>

EbA, as compared to other adaptation approaches, also pursues social benefits for the local community, especially vulnerable groups such as women, youth, and indigenous people. As such, it increases the ability of vulnerable groups to adapt and cope with climate impacts, through ensuring the contribution of natural resources to economic and social development. It enhances the capacity and agency of women, youth, and indigenous people to become agents of change and leaders within their communities. The following are examples of EbA projects that specifically targeted and benefited women.<sup>203,204</sup>

- Women in Bangladesh are generally economically dependent on their husbands. They are usually not involved in decision-making processes. The Strengthening Household Ability to Respond to Development Opportunity (SHOUHARDO)

community-led duck rearing initiative aimed to change this situation by educating women not only about agricultural techniques, but also about the risks and impacts of natural disasters. The end result was women's empowerment through increased livelihoods and improved food security especially during periods of heavy rain and flooding.

- Another example is that of the Maya Nut Institute, which works closely with women in Latin America. Since 2001, the Institute has helped over 600 rural and indigenous women to form autonomous businesses to produce and market Maya Nut products. These women also act as multipliers for other regions. This has resulted in increased household incomes as well as efforts to conserve rainforest areas from which the nuts are collected.

As with UNEP,<sup>205</sup> there are several aspects that need to be considered when designing EbA options. These are adapted below with specific reference to gender:

- Increasing public awareness and perception regarding climate change requires that special attention be paid to increasing knowledge and perceptions of climate change among marginalized groups, especially women. In particular, information needs to be given directly to women regarding the specific benefits they can reap from specific EbA options being implemented.



- Local and gender based experiences regarding the ability of natural resources to contribute to livelihoods, health and other aspects must be assessed and should be a part of any EbA design. Generally, this aspect has been missing, with the result that women are not aware of the benefits that they can directly achieve from options. Furthermore, the knowledge that women have as managers of natural resources can provide important insights into the design of effective strategies.
- Roles and responsibilities of communities and other actors differ in implementation of EbA. Therefore, the roles of women must be clearly defined from the beginning of the project conceptualisation through to implementation.
- Effective planning for EbA needs to be based on local needs assessment and specific gender analysis. Currently this also seems to be missing from a majority of EbA options and communities are not analysed according to this aspect when designing the project.
- An extremely important aspect is to use gender-responsive tools and strategies in vulnerability and

impact assessments in addition to planning and implementing EbA approaches. This will highlight how gender is currently accounted for in practices and ensure gender equality in future projects.

- Specific capacity building activities designed for women must be a part of EbA design to ensure their access to information and education.
- Special attention has to be given to land security issues, including the needs, tenure and access of women.
- A participatory and decentralised approach in the planning phase that specifically includes women will not only establish a sense of ownership but will also ensure the sustainability of the project.

Because economic resilience is an integral aspect of EbA, it is necessary that women's needs and options are assessed for this and activities are designed in such a way to include and empower women economically.



## 3.5 Moving forward

Humankind is experiencing an unprecedented increase and intensity of disasters associated with climate change. Reducing the vulnerability and enhancing the resilience of poor and marginalized people to current climate variability and future climate change has become a central concern for development. However, as this chapter has clearly stated, it is fundamental to acknowledge that adaptation necessities vary significantly between regions, countries, sectors and ecosystems.

Adaptation policies, initiatives and funding requirements need to recognise the fact that, as stated by the IPCC, “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.”<sup>206</sup> Consequently, conducting gender analyses related to hazards, risks and vulnerabilities is imperative—not optional—in any adaptation efforts.

Dealing with climate impacts requires constructive adaptation planning and intervention that is cognisant of the consequences of these actions on women and men, of all ages in all their diversity, and therefore employs gender analyses, evaluation, monitoring and accountability mechanisms. Every adaptation initiative should be developed inclusively, with regard to gender, class, age, urban/rural characteristics, challenges and (dis)abilities, ethnicity/race, and diverse knowledge systems (e.g., indigenous knowledge).

Successful adaptation measures will advance gender equality at multiple levels—hyphenate gender-responsive resources, policies, and support from the

international community and national governments, as well as the participation of, inputs from, and implementation in local communities. Legally binding policy frameworks and conventions for ensuring gender equality, and interlinked agreements on the environment and climate change that include gender considerations and require specific related actions, provide a mandate for incorporating gender equality in climate change adaptation and for ensuring that women and gender equality concerns are integrated within climate change decision making at all levels. Gender-responsiveness is now recognised as of great importance. Never before in history have all the pieces been in place to ensure gender-responsive adaptation: there is a strong and explicit international mandate (i.e., UNFCCC, SDGs), all the major financing mechanisms associated with climate change have gender directives, and scientific evidence has proven that gender equality not only enhances the effectiveness and efficiency of adaptation initiatives, but it is the smart thing to do.

Climate change will have significant impacts on lives and livelihoods, and it is essential to engage in adaptation planning in multiple sectors to reduce impacts. Within each sector and at all levels, gender must be mainstreamed through resources, training, and planning. There are many types of adaptation actions and best practices that have been demonstrated to improve socioeconomic conditions, reduce poverty, and build resilience. Frameworks, such as the ccGAP methodology, from the top levels to local actions have been provided to ensure that activities are not ad hoc and become systematically and thoughtfully implemented.



Despite the considerable work that has already been done, it is important to find ways to build on the gains made and to translate the experiences, lessons learned and good practices into methodical, effective and sustainable gender mainstreaming results across all areas of adaptation. Some considerations for progress are:

- *Activate full participation and engagement of women:* In all decision-making and activities concerning adaptation, this is essential. Meeting the challenges of climate change and achieving the SDGs solely on the contribution of men will not suffice; women's input doubles the impact of adaptive actions. Women are agents of change, actors and contributors at all levels. Full understanding of roles, contributions and knowledge of women, as well as men, in relation to adaptation is an essential starting point.
- *Ensure international development policies are rooted at national and subnational levels:* Although there is a mandate to mainstream gender-responsive climate change adaptation measures, implementation of these international commitments is still slow at national and subnational levels. More countries need to develop national policies and strategies that complement the mandates, knowledge, and lessons learned from adaptation planning and measures. Adaptation planning and decision-making need to be supported by ministerial levels—particularly with the participation of ministries of environment and they need to be developed at all levels.
- *Implement monitoring and reporting procedures to strengthen gender equality outcomes:* Particular efforts are needed to strengthen attention to gender equality in outcomes related to adaptation, such as national reports, strategies, platforms and action plans. This requires efforts to establish an enabling environment for full implementation of policy commitments, through, for example, policy guidance, capacity building and improved attention to consultation with, participation of, and leadership development of women as well as men.
- *Disseminate information on adaptation policy, data, and responses:* Information is key to accelerating implementation of global policy commitments in relation to adaptation. Information on existing policy commitments, such as those under the UNFCCC, must be widely disseminated and well known if they are to have any impact on the ground. In addition, it is important to ensure data is available from regional, sub-regional, national and local levels, to both support evidence-based policy-making and to facilitate effective follow-up to such policies.
- *Support programmes and actions through links with both multilateral and bilateral financing mechanisms:* Financing through bilateral aid and donor organisations have come with requirements that gender is considered in the projects. The ways in which gender is considered needs further refinement and training for effective implementation, but it must also be an essential component of global adaptation financing mechanisms. Although the UNFCCC and the Parties have designated these funds under the convention articles, there is not yet a prescribed operating procedure for ensuring gender equality and social safeguards for the distribution of these funds. Gender can effectively be addressed in the implementation of climate adaptation funding mechanisms. For example, funds from the European Investment Bank (EIB) require environmental and social safeguards analysis, and these specifically align with the MDGs and identify impacts on indigenous groups, women, children, and vulnerable groups. The World Bank



Safeguard Policies identify human rights as a key consideration, in addition to poverty reduction and environmental protection.

- *Develop awareness, commitment and capacity to embrace a gender-responsive approach into all adaptation dimensions of work:* Women can be marginalized if their contributions and potential are not recognised and all of the attention is focused on men. The inputs of external actors can unintentionally perpetuate, or even exacerbate, the existing differences and inequalities between women and men. Initiatives that provide training, credit and other resources, and focus on development of new skills, must be explicitly targeted toward women as well as men to ensure the development of women's capabilities and foster greater recognition of their potential.
- *Provide opportunities for empowering women and advancing gender equality:* It is important to recognise that development and equality-promoting opportunities can arise in the context of climate change. Unique possibilities for empowering women and advancing their situation and position within their households and communities can arise if women are perceived as full contributors and targeted and involved as full partners in all adaptation initiatives. Gender stereotypes can be

challenged as women take on new roles and learn new skills, both in the household and community, and especially as gender roles are adjusted to new realities. This can lead to changes in attitudes and practices over the long-term, with significant benefits for women and girls, and societies.

Regardless of the results of global negotiations on climate change, most communities around the world will face impacts from climate change and will need to adapt in order to survive. Implementing gender-responsive adaptation planning and measures will help to ensure that unequal and negative impacts will be minimised. Climate resilient and adaptive communities and governments will necessarily be those that adopt strategies that strengthen and support whole populations in reducing climate risks and sociocultural inequalities.



# REFERENCES

1. IPCC. (2014). Summary for policymakers. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1-32.
2. IPCC. (2007). Summary for Policymakers. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Solomon, S., Qin, D., Manning, M., Chen, Z., Marquis, M., Averyt, K.B., Tignor, M. and Miller, H.L. (eds.)).
3. UNDP. (2014). *Human Development Report 2014. Sustaining Human Progress: Reducing Vulnerabilities and Building Resilience*. New York: UNDP.
4. Gilligan, M.K. (2015). *Assessing household vulnerability in Uganda: A socio-ecological systems approach* (Master's thesis). Bard College Center for Environmental Policy, Annandale-on-Hudson, NY.
5. Brooks, N. & W.N. Adger. (2005). Assessing and enhancing adaptive capacity. *Adaptation Policy Frameworks for Climate Change*, B. Lim, E. Spanger-Siegfried, I. Burton, E.L. Malone and S. Huq, Eds., Cambridge University Press, New York, 165-182.
6. Brooks, N. & W.N. Adger. (2005). Assessing and enhancing adaptive capacity. *Adaptation Policy Frameworks for Climate Change*, B. Lim, E. Spanger-Siegfried, I. Burton, E.L. Malone and S. Huq, Eds., Cambridge University Press, New York, 165-182.
7. Aguilar, L. (2009). *Training manual on gender and climate change*. Washington, DC: GGCA, IUCN, & UNDP.
8. IUCN. (2013). *The Environment and Gender Index (EGI) 2013 pilot*. Retrieved from <http://genderandenvironment.org/wp-content/uploads/2014/12/The-Environment-and-Gender-Index-2013-Pilot.pdf>
9. IUCN. (2015, March). *Women in environmental decision making in the Philippines: An Environment and Gender Index (EGI) country case study*. Retrieved from [https://portals.iucn.org/union/sites/union/files/doc/egi\\_country\\_case\\_study\\_-\\_philippines\\_march\\_2015.pdf](https://portals.iucn.org/union/sites/union/files/doc/egi_country_case_study_-_philippines_march_2015.pdf)
10. FAO. (2007). *Gender and Food Security: Agriculture*. Retrieved from <http://www.fao.org/Gender/en/agri-e.htm>
11. Oxfam. (2014). *The G20 and Gender Equality. Briefing Paper 183*. Heinrich Böll Stiftung North America and Oxfam.
12. Aguilar, L. (2009). *Training manual on gender and climate change*. Washington, DC: GGCA, IUCN, & UNDP.
13. Queensland Government: Disaster Management. (2015, September 4). Disaster management phases. Retrieved from [http://www.disaster.qld.gov.au/About\\_Disaster\\_Management/Management\\_Phases.html](http://www.disaster.qld.gov.au/About_Disaster_Management/Management_Phases.html)
14. Enarson, E. (2000, September). *InFocus Programme on Crisis Response and Reconstruction: Gender and natural disasters* (Working Paper No. 1). Retrieved from [http://www.ilo.org/wcmsp5/groups/public/---ed\\_emp/---emp\\_ent/---ifp\\_crisis/documents/publication/wcms\\_116391.pdf](http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_crisis/documents/publication/wcms_116391.pdf)
15. UNISDR. (n.d.). Climate change adaptation. Retrieved from <http://www.unisdr.org/we/advocate/climate-change>
16. Venton, P. & La Trobe, S. (2008, July). *Linking climate change adaptation and disaster risk reduction*. Retrieved from [http://www.preventionweb.net/files/3007\\_CCAandDRRweb.pdf](http://www.preventionweb.net/files/3007_CCAandDRRweb.pdf)



17. UNISDR. (2007). *Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters*. Retrieved from <http://www.unisdr.org/we/inform/publications/1037>
18. IUCN. (2013, November). *Loss and damage: An IUCN discussion paper for UNFCCC COP19*. Retrieved from [https://cmsdata.iucn.org/downloads/iucn\\_loss\\_and\\_damage\\_discussion\\_paper\\_unfccc\\_cop19.pdf](https://cmsdata.iucn.org/downloads/iucn_loss_and_damage_discussion_paper_unfccc_cop19.pdf)
19. UNISDR. (2007). *Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters*. Retrieved from <http://www.unisdr.org/we/inform/publications/1037>
20. UNISDR. (2011). *Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters. Midterm review 2010-2011*. p.44. Retrieved from [http://www.unisdr.org/files/18197\\_midterm.pdf](http://www.unisdr.org/files/18197_midterm.pdf)
21. UNISDR. (2011). *Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters. Midterm review 2010-2011*. Retrieved from [http://www.unisdr.org/files/18197\\_midterm.pdf](http://www.unisdr.org/files/18197_midterm.pdf)
22. Gupta, S. & Leung, I. (2011). *Turning good practice into institutional mechanisms: Investing in grassroots women's leadership to scale up local implementation of the Hyogo Framework for Action*. Huairou Commission and Groots International. Retrieved from: [http://www.unisdr.org/files/18197\\_201guptaandleung.therooleofwomenasaf.pdf](http://www.unisdr.org/files/18197_201guptaandleung.therooleofwomenasaf.pdf)
23. UNFCCC. (n.d.) Warsaw international mechanism for loss and damage. Retrieved from [http://unfccc.int/adaptation/workstreams/loss\\_and\\_damage/items/8134.php](http://unfccc.int/adaptation/workstreams/loss_and_damage/items/8134.php)
24. IUCN. (2013, November). *Loss and damage: An IUCN discussion paper for UNFCCC COP19*. Retrieved from [https://cmsdata.iucn.org/downloads/iucn\\_loss\\_and\\_damage\\_discussion\\_paper\\_unfccc\\_cop19.pdf](https://cmsdata.iucn.org/downloads/iucn_loss_and_damage_discussion_paper_unfccc_cop19.pdf)
25. Ritter, N. (2013). *Loss and damage, women and men: Applying a gender approach to the emerging loss and damage agenda*. CDKN, ICCCAD, Germanwatch, MCII and United Nations University.
26. IUCN. (2013, November). *Loss and damage: An IUCN discussion paper for UNFCCC COP19*. Retrieved from [https://cmsdata.iucn.org/downloads/iucn\\_loss\\_and\\_damage\\_discussion\\_paper\\_unfccc\\_cop19.pdf](https://cmsdata.iucn.org/downloads/iucn_loss_and_damage_discussion_paper_unfccc_cop19.pdf)
27. IUCN. (2013, November). *Loss and damage: An IUCN discussion paper for UNFCCC COP19*. Retrieved from [https://cmsdata.iucn.org/downloads/iucn\\_loss\\_and\\_damage\\_discussion\\_paper\\_unfccc\\_cop19.pdf](https://cmsdata.iucn.org/downloads/iucn_loss_and_damage_discussion_paper_unfccc_cop19.pdf)
28. UNISDR. (2015). *Sendai framework for disaster risk reduction 2015-2030*. Retrieved from [http://www.preventionweb.net/files/43291\\_sendaiframeworkfordrren.pdf](http://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf)
29. UNISDR. (2015). *Sendai framework for disaster risk reduction 2015-2030*. Retrieved from [http://www.preventionweb.net/files/43291\\_sendaiframeworkfordrren.pdf](http://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf)
30. UNISDR. (2015). *Issue Brief. Mobilizing women's leadership in disaster risk reduction high level multi-stakeholder partnership dialogue*. Retrieved from: <http://www.wcdrr.org/uploads/Mobilizing-Women%E2%80%99s-Leadership-in-Disaster-Risk-Reduction.pdf>
31. Pirard, P., Vandentorren, S., Pascal, M., Laaidi, K., Le Tertre, A., Cassadou, S., & Ledrans, M. (2005). Summary of the mortality impact: Assessment of the 2003 heat wave in France. *Euro Surveill*, 10(7), 153-156. Retrieved from <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=554>
32. Ikeda, K. (1995). Gender Differences in Human Loss and Vulnerability in Natural Disasters: A Case Study from Bangladesh. *Indian Journal of Gender Studies*, 2(2), 171-193. New Delhi, India: Sage Publications.
33. World Bank. (2011). *Gender & climate change: Three things you should know*. Retrieved from <http://documents.worldbank.org/curated/en/2011/01/17497304/gender-climate-change-three-things-know>  
Davis, I., Peiris De Costa, K., Alam, K., Ariyabandu, M.M., Bhatt, M.R., Schneider- Sliwa, R. & Balsari, S. (2005). *Tsunami, Gender, and Recovery: Special Issue for International Day for Disaster Risk Reduction*. South Asia Disasters.



34. Neumayer, E. & Plümper, T. (2007, January). *The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981-2002*. London: Department of Geography and Environment, London School of Economics and Political Science (LSE).
35. Neumayer, E. & Plümper, T. (2007, January). *The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981-2002*. London: Department of Geography and Environment, London School of Economics and Political Science (LSE).
36. Mehta, M. (2007, April). *Gender matters: Lessons for disaster risk reduction in South Asia*. Retrieved from [http://gender-climate.org/wp-content/uploads/docs/publications/16\\_icimod-gender\\_matters\\_lessons\\_for\\_disaster\\_risk\\_reduction\\_in\\_south\\_asia.pdf](http://gender-climate.org/wp-content/uploads/docs/publications/16_icimod-gender_matters_lessons_for_disaster_risk_reduction_in_south_asia.pdf)
37. Bradshaw, S. (2010). Feminisation or de-feminisation? Gendered experiences of poverty post-disaster. In S. Chant (Ed.), *The international handbook of gender and poverty: Concepts, research, policy* (pp. 627-632). Northampton, MA: Edward Elgar.
38. Bradshaw, S. (2004). *Socio-economic Impacts of Natural Disasters: a Gender Analysis*. Santiago de Chile: United Nations.
39. Burón, C. (2007). *Gestión de riesgo: Una nueva visión de los desastres*. Retrieved from <http://www.sld.cu/sitios/desastres/n3.php?p=administración>
40. Enarson, E. (2000, September). *InFocus Programme on Crisis Response and Reconstruction: Gender and natural disasters* (Working Paper No. 1). Retrieved from [http://www.ilo.org/wcmsp5/groups/public/---ed\\_emp/---emp\\_ent/---ifp\\_crisis/documents/publication/wcms\\_116391.pdf](http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_crisis/documents/publication/wcms_116391.pdf)
41. Sánchez del Valle, R. (2000). *Local risk management in Central America: Lessons learnt from the FEMID project*. Retrieved from <http://www.crid.or.cr/digitalizacion/pdf/spa/doc12912/doc12912-9.pdf>
42. WEDO, ABANTU for Development in Ghana, ActionAid Bangladesh, & ENDA Senegal. (2008, May). *Gender, climate change and human security: Lessons from Bangladesh, Ghana and Senegal*. Retrieved from <http://www.wedo.org/wp-content/uploads/hsn-study-final-may-20-2008.pdf>
43. Meyreles, L. (2000). *Huracán Georges en la República Dominicana: Sociedad civil y participación local*. Asociación de Investigación y Estudios Sociales (ASIES). Guatemala.
44. IUCN. (2013). *The Environment and Gender Index (EGI) 2013 pilot*. Retrieved from <http://genderandenvironment.org/wp-content/uploads/2014/12/The-Environment-and-Gender-Index-2013-Pilot.pdf>
45. Anderson, C. (2002). *Gender matters: Implications for climate variability and climate change and for disaster management in the Pacific Islands*. InterCoast Network: International Newsletter of Coastal Management, No. 41, Winter 2002, p.24-25.
46. World Bank. (2011). *Gender & climate change: Three things you should know*. Retrieved from <http://documents.worldbank.org/curated/en/2011/01/17497304/gender-climate-change-three-things-know>
47. CEDAW Economic and Social Council. (2008). *Commission on the Status of Women: Report on the fifty-second session (25 February-7 and 13 March 2008)*. Retrieved from <http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/290/62/PDF/N0829062.pdf?OpenElement>
48. Gilligan, M.K. (2015). *Assessing household vulnerability in Uganda: A socio-ecological systems approach* (Master's thesis). Bard College Center for Environmental Policy, Annandale-on-Hudson, NY.
49. World Health Organization. (2015). *Key facts from JMP2015 report*. Retrieved from [www.who.int/water\\_sanitation\\_health/monitoring/jmp-2015-key-facts/en/](http://www.who.int/water_sanitation_health/monitoring/jmp-2015-key-facts/en/)



50. Schuster-Wallace, C.J. & Sanford R. (2015). Water in the world we want. United Nations Institute for Water, Environment, and Health and United Nations Office for Sustainable Development. Retrieved from <http://inweh.unu.edu/wp-content/uploads/2015/02/Water-in-the-World-We-Want.pdf>
51. UNDP. (2015). Post-2015 sustainable development agenda. Retrieved from <http://www.undp.org/content/undp/en/home/mdgoverview/post-2015-development-agenda.html>
52. Kevany, K., & Huisinigh, D. (2013). A review of progress in empowerment of women in rural water management decision-making processes. *Journal of Cleaner Production*, 60, 53-64.
53. Haule, L. (2012). *Training of facilitation team on water resources management: Module 1- Participatory planning, stakeholder participation and gender mainstreaming an integrated water resources management*. IUCN and Natural Resources and Pangani Basin Water Board.
54. Figueiredo, P., & Perkins, P. E. (2013). Women and water management in times of climate change: Participatory and inclusive processes. *Journal of Cleaner Production*, 60, 188-194.
55. Figueiredo, P., & Perkins, P. E. (2013). Women and water management in times of climate change: Participatory and inclusive processes. *Journal of Cleaner Production*, 60, 188-194.
56. Sorenson, S. B., Morssink, C., & Campos, P. A. (2011). Safe access to safe water in low income countries: Water fetching in current times. *Social Science & Medicine*, 72, 1522-1526.
57. Kevany, K., & Huisinigh, D. (2013). A review of progress in empowerment of women in rural water management decision-making processes. *Journal of Cleaner Production*, 60, 53-64.
58. UN-Water. (2012). *The United Nations World Water Development Report: Vol 1. Managing water under uncertainty and risk (Report No. 4)*. Retrieved from <http://unesdoc.unesco.org/images/0021/002156/215644e.pdf>
59. Jalal, I. (2014, December). *ADB Briefs No. 24. Women, water, and leadership*. Asian Development Bank. Retrieved from <http://www.adb.org/sites/default/files/publication/150953/women-water-and-leadership.pdf>
60. Duncan, K. (2007). Global climate change and women's health. *Women and Environments International Magazine*, (74/75).
61. MAAS. (2004). *Devastating floods hit Bangladesh: Looking for help from NGOs*. Retrieved from <http://www.undpi.org/index.php?name=News&file=article&sid=146>
62. Sorenson, S. B., Morssink, C., & Campos, P. A. (2011). Safe access to safe water in low income countries: Water fetching in current times. *Social Science & Medicine*, 72, 1522-1526.
63. Sorenson, S. B., Morssink, C., & Campos, P. A. (2011). Safe access to safe water in low income countries: Water fetching in current times. *Social Science & Medicine*, 72, 1522-1526.
64. Anderson, K., Clow, B., & Haworth-Brockman, M. (2013). Carriers of water: Aboriginal women's experiences, relationships, and reflections. *Journal of Cleaner Production*, 60, 11-17.
65. Figueiredo, P., & Perkins, P. E. (2013). Women and water management in times of climate change: Participatory and inclusive processes. *Journal of Cleaner Production*, 60, 188-194.
66. UN-Water. (2012). *The United Nations World Water Development Report: Vol 1. Managing water under uncertainty and risk (Report No. 4)*. Retrieved from <http://unesdoc.unesco.org/images/0021/002156/215644e.pdf>
67. Jalal, I. (2014, December). *ADB Briefs No. 24. Women, water, and leadership*. Asian Development Bank. Retrieved from <http://www.adb.org/sites/default/files/publication/150953/women-water-and-leadership.pdf>



68. Gilligan, M.K. (2015). *Assessing household vulnerability in Uganda: A socio-ecological systems approach*. (Master's thesis). Bard College Center for Environmental Policy. Annandale-on-Hudson, NY.
69. Uganda Bureau of Statistics & ICF International Inc. (2012, August). Uganda demographic and healthy survey 2011. Retrieved from <http://www.dhsprogram.com/pubs/pdf/FR264/FR264.pdf>
70. The World Bank Water and Sanitation Program and IRC International Water and Sanitation Centre. (2001, January). *Linking sustainability with demand, gender and poverty: A study in community-managed water supply projects in 15 countries* (B. Gross, C. Van Wijk, & N. Mukherjee, Authors). Retrieved from [https://www.wsp.org/sites/wsp.org/files/publications/global\\_plareport.pdf](https://www.wsp.org/sites/wsp.org/files/publications/global_plareport.pdf)
71. Jalal, I. (2014, December). *ADB Briefs No. 24. Women, water, and leadership*. Asian Development Bank. Retrieved from <http://www.adb.org/sites/default/files/publication/150953/women-water-and-leadership.pdf>
72. Aguilar, L., & Rogers, F. (2012, February). *Climate change gender action plan for the Government of Nepal (ccGAP: Nepal)*. IUCN Global Gender Office.
73. ADB. (2000). *Small towns water supply and sanitation sector project: Gender and development*. Asian Development Bank. Loan 1755-Nep.
74. United Republic of Tanzania: Vice President's Office Division of Environment. (2013, March). *National strategy on gender and climate change* (L. Aguilar & F. Rogers, Authors). IUCN Global Gender Office.
75. *Program for mainstreaming gender in climate change efforts in Jordan*. (2010, November). IUCN Global Gender Office.
76. Convention on Biological Diversity (CBD). (2007). *International Day for Biological Diversity: Climate Change and Biological Diversity*. Secretariat of the Convention on Biological Diversity.
77. KIT, Agri-ProFocus, & IIRR. (2012). *Challenging chains to change: Gender equity in agricultural value chain development*. Retrieved from [http://agriprofocus.com/upload/131017-chachacha\\_Eng\\_web\\_2.compressed1415291181.pdf](http://agriprofocus.com/upload/131017-chachacha_Eng_web_2.compressed1415291181.pdf)
78. KIT, Agri-ProFocus, & IIRR. (2012). *Challenging chains to change: Gender equity in agricultural value chain development*. Retrieved from [http://agriprofocus.com/upload/131017-chachacha\\_Eng\\_web\\_2.compressed1415291181.pdf](http://agriprofocus.com/upload/131017-chachacha_Eng_web_2.compressed1415291181.pdf)
79. Schmidhuber, J., & Tubiello, F. N. (2007). Global food security under climate change. *PNAS*, 104 (50), 19703-19708. <http://dx.doi.org/10.1073/pnas.0701976104>
80. FAO. (2008). *The state of food and agriculture*. Rome: FAO.
81. Tirado, M.C., Cohen, M.J., Aberman, N., Meerman, J., & Thompson, B. (2010). Addressing the challenges of climate change and biofuel production for food and nutrition security. *Food Research International*, 43, 1729-1744. <http://dx.doi.org/10.1016/j.foodres.2010.03.010>
82. Tirado, M. C., Crahay, P., Mahy, L., Zanev, C., Neir, M., Msangi, S., . . . Müller, A. (2013). Climate change and nutrition: Creating a climate for nutrition security. *Food Nutrition Bulletin*, 34 (4), 533-547.
83. Myers, S. S., Zanolatti, A., Kloog, I. ., Huybers, P., Leakey, A. D.B., Bloom, A. J., . . . Usui, Y. (2014). Increasing CO2 threatens human nutrition. *Nature*, 510, 139-142. <http://dx.doi.org/10.1038/nature13179>
84. World Food Programme. (2009). *WFP gender policy*. Retrieved from <https://www.wfp.org/content/wfp-gender-policy>
85. Dentan, F. & Parikh, J. (2002). *Thematic paper. Gender and climate change at COP8: A forgotten element*. In IRADe. (2002). *Gender and climate change*. Retrieved from [http://www.irade.org/Microsoft%20Word%20-%20cop\\_8gender\\_final.pdf](http://www.irade.org/Microsoft%20Word%20-%20cop_8gender_final.pdf)



86. World Health Organization. (2008). Protecting Health from Climate Change. Retrieved from [http://www.who.int/world-health-day/toolkit/report\\_web.pdf](http://www.who.int/world-health-day/toolkit/report_web.pdf)
87. Tirado, C. (2013). Gender-sensitive strategies to address the challenges of climate change on health and nutrition security. In B. Cela, I. Dankelman, & J. Stern (Eds.), *Powerful synergies: Gender equality, economic development and environmental sustainability* (pp. 109-118). UNDP. Retrieved from [http://www.undp.org/content/dam/undp/library/gender/f\\_PowerfulSynergies2013\\_Web.pdf](http://www.undp.org/content/dam/undp/library/gender/f_PowerfulSynergies2013_Web.pdf)
88. Haule, L. (2012). *Training of facilitation team on water resources management: Module 1- Participatory planning, stakeholder participation and gender mainstreaming an integrated water resources management*. IUCN and Natural Resources and Pangani Basin Water Board.
89. Haule, L. (2012). *Training of facilitation team on water resources management: Module 1- Participatory planning, stakeholder participation and gender mainstreaming an integrated water resources management*. IUCN and Natural Resources and Pangani Basin Water Board.
90. World Bank. (2011a). *World development report 2012: Gender equality and development*. Retrieved from <http://tinyurl.com/7oy793r>
91. KIT, Agri-ProFocus, & IIRR. (2012). *Challenging chains to change: Gender equity in agricultural value chain development*. Retrieved from [http://agriprofocus.com/upload/131017-chachacha\\_Eng\\_web\\_2.compressed1415291181.pdf](http://agriprofocus.com/upload/131017-chachacha_Eng_web_2.compressed1415291181.pdf)
92. World Bank. (2011a). *World development report 2012: Gender equality and development*. Retrieved from <http://tinyurl.com/7oy793r>
93. World Bank. (2011b). *Africa's future and the World Bank's support to it*. World Bank Africa Region. <http://tinyurl.com/88hjkzk>
94. Haule, L. (2012). *Training of facilitation team on water resources management: Module 1- Participatory planning, stakeholder participation and gender mainstreaming an integrated water resources management*. IUCN and Natural Resources and Pangani Basin Water Board.
95. Oslo Policy Forum Report. (2008). *Changing the way we develop: Dealing with disasters and climate change*. Norway: Norwegian Ministry of Foreign Affairs, Prevention Consortium & UNDP.
96. Aguilar, L. (2009). *Training manual on gender and climate change*. Washington, DC: GGCA, IUCN, & UNDP.
97. FAO. (1999). *Gender dimensions in biodiversity management and food security: Policy and programme strategies for Asia*. India: FAO Regional Technical Consultation.
98. WHO. (2010). *Gender, climate change, and health*. Retrieved from <http://www.who.int/globalchange/GenderClimateChangeHealthfinal.pdf?ua=1>.
99. KIT, Agri-ProFocus, & IIRR. (2012). *Challenging chains to change: Gender equity in agricultural value chain development*. Retrieved from [http://agriprofocus.com/upload/131017-chachacha\\_Eng\\_web\\_2.compressed1415291181.pdf](http://agriprofocus.com/upload/131017-chachacha_Eng_web_2.compressed1415291181.pdf)
100. Tirado, M.C., Hunnes, D., Cohen, M.J., & Lartey, A. (2015, March). Climate change and nutrition in Africa. *Journal of Hunger & Environmental Nutrition*, 10(1): 22-46. <http://dx.doi.org/10.1080/19320248.2014.908447>
101. Tirado, C. (2011). Enhancing women's leadership: To address the challenges of climate change on nutrition security and health. Retrieved from [http://unsctn.org/files/NutCC/Paper\\_Enhancing\\_Women\\_leadership\\_final.pdf](http://unsctn.org/files/NutCC/Paper_Enhancing_Women_leadership_final.pdf)



102. Wade, S. (2013). *Sustainable agriculture, food security, soil protection and restoration, and women's access to land in the rural community of Keur Moussa, Senegal*. Retrieved from <http://africanclimate.net/fr/node/7504>
103. KIT, Agri-ProFocus, & IIRR. (2012). *Challenging chains to change: Gender equity in agricultural value chain development*. Retrieved from [http://agriprofocus.com/upload/131017-chachacha\\_Eng\\_web\\_2\\_compressed1415291181.pdf](http://agriprofocus.com/upload/131017-chachacha_Eng_web_2_compressed1415291181.pdf)
104. International Fund for Agriculture Development (IFAD). (2005). *Gender and desertification: Expanding roles for women to restore drylands*. Rome: IFAD. Retrieved from [http://www.ifad.org/pub/gender/desert/gender\\_desert.pdf](http://www.ifad.org/pub/gender/desert/gender_desert.pdf)
105. GTZ, & OSS. (2007). *Climate change adaptation & the fight against desertification* (Introductory note No. 1, 2nd edition). Retrieved from [http://www.fao.org/fileadmin/templates/great\\_green\\_wall/docs/Introductory\\_note\\_1\\_Climate\\_change\\_fight\\_desertification\\_OSS\\_GTZ.pdf](http://www.fao.org/fileadmin/templates/great_green_wall/docs/Introductory_note_1_Climate_change_fight_desertification_OSS_GTZ.pdf)
106. World Bank. (2012). Overview and technical summary. *Adaptation to a changing climate in the Arab countries: A case for adaptation governance and leadership in building climate resilience*. Retrieved from [http://www-wds.worldbank.org/external/default/WDSPContentServer/WDSP/IB/2013/06/11/000445729\\_20130611114245/Rendered/PDF/734820PUB0REV1000PUBDATE01101602012.pdf](http://www-wds.worldbank.org/external/default/WDSPContentServer/WDSP/IB/2013/06/11/000445729_20130611114245/Rendered/PDF/734820PUB0REV1000PUBDATE01101602012.pdf)
107. GTZ, & OSS. (2007). *Climate change adaptation & the fight against desertification* (Introductory note No. 1, 2nd edition). Retrieved from [http://www.fao.org/fileadmin/templates/great\\_green\\_wall/docs/Introductory\\_note\\_1\\_Climate\\_change\\_fight\\_desertification\\_OSS\\_GTZ.pdf](http://www.fao.org/fileadmin/templates/great_green_wall/docs/Introductory_note_1_Climate_change_fight_desertification_OSS_GTZ.pdf)
108. GTZ, & OSS. (2007). *Climate change adaptation & the fight against desertification* (Introductory note No. 1, 2nd edition). Retrieved from [http://www.fao.org/fileadmin/templates/great\\_green\\_wall/docs/Introductory\\_note\\_1\\_Climate\\_change\\_fight\\_desertification\\_OSS\\_GTZ.pdf](http://www.fao.org/fileadmin/templates/great_green_wall/docs/Introductory_note_1_Climate_change_fight_desertification_OSS_GTZ.pdf)
109. Verner, D. [ed.]. (2012). *MENA Development Report. Adaptation to a changing climate in the Arab countries: A case for adaptation governance in building climate resilience*. Retrieved from [https://www.aub.edu.lb/ifi/public\\_policy/climate\\_change/cc\\_events/Documents/world\\_bank\\_climate\\_change\\_flagship\\_report/20111027cc\\_wb\\_flagship\\_report\\_technical\\_summary.pdf](https://www.aub.edu.lb/ifi/public_policy/climate_change/cc_events/Documents/world_bank_climate_change_flagship_report/20111027cc_wb_flagship_report_technical_summary.pdf)
110. Leisinger, K.M., & Schmitt, M. (1995). *Survival in the Sahel: An ecological and developmental challenge*. Addis Ababa: International Service for National Agricultural Research
111. FAO. (2014). Gender and land rights database: Gender and land statistics. Retrieved September 17, 2015, from <http://www.fao.org/gender-landrights-database/data-map/statistics/en/>
112. International Fund for Agriculture Development (IFAD). (2005). *Gender and desertification: Expanding roles for women to restore drylands*. Rome: IFAD. Retrieved from [http://www.ifad.org/pub/gender/desert/gender\\_desert.pdf](http://www.ifad.org/pub/gender/desert/gender_desert.pdf)
113. International Fund for Agriculture Development (IFAD). (2005). *Gender and desertification: Expanding roles for women to restore drylands*. Rome: IFAD. Retrieved from [http://www.ifad.org/pub/gender/desert/gender\\_desert.pdf](http://www.ifad.org/pub/gender/desert/gender_desert.pdf)
114. Haddad, F. (2013). Gender mainstreamed in improved pastoralism: Experiences in 'securing rights and restoring lands for improved livelihoods' project. IUCN West Asia. Retrieved from [https://cmsdata.iucn.org/downloads/gender\\_en\\_1.pdf](https://cmsdata.iucn.org/downloads/gender_en_1.pdf)
115. International Fund for Agriculture Development (IFAD). (2005). *Gender and desertification: Expanding roles for women to restore drylands*. Rome: IFAD. Retrieved from [http://www.ifad.org/pub/gender/desert/gender\\_desert.pdf](http://www.ifad.org/pub/gender/desert/gender_desert.pdf)
116. IPCC. 2007. *Climate change 2007: Synthesis report. Contribution of Working Groups I, II, and III to the Fourth Assessment Report of the IPCC*. Retrieved from [https://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4\\_syr\\_cover.pdf](https://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_cover.pdf)



117. IPCC. (2014). *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. Retrieved from <http://www.ipcc.ch/report/ar5/syr/>
118. IPCC. (2007). *Climate change 2007: Impacts, adaptation and vulnerability: Contribution of the Working Group II to the 4th Assessment Report of the IPCC*. Cambridge: Cambridge University Press.
119. FAO. (2014). The state of world fisheries and aquaculture. Retrieved from <http://www.fao.org/3/a-i3720e.pdf>
120. FAO. (2015). *Women in the fishery sector*. Retrieved from [www.fao.org/Gender/en/fish-e.htm](http://www.fao.org/Gender/en/fish-e.htm)
121. CIDA. (n.d.). *Coastal zone management & equality between women and men*. Retrieved from [http://www.acdi-cida.gc.ca/INET/IMAGES.NSF/vLUIImages/Policy/\\$file/12zones.pdf](http://www.acdi-cida.gc.ca/INET/IMAGES.NSF/vLUIImages/Policy/$file/12zones.pdf)
122. IUCN. (2015, July). *EGI factsheet: gender in national environmental policy and programming*. Retrieved from [https://portals.iucn.org/union/sites/union/files/doc/gender\\_in\\_environmental\\_policy\\_and\\_programming\\_0.pdf](https://portals.iucn.org/union/sites/union/files/doc/gender_in_environmental_policy_and_programming_0.pdf)
123. IUCN. (2015, July). *EGI factsheet: gender in national environmental policy and programming*. Retrieved from [https://portals.iucn.org/union/sites/union/files/doc/gender\\_in\\_environmental\\_policy\\_and\\_programming\\_0.pdf](https://portals.iucn.org/union/sites/union/files/doc/gender_in_environmental_policy_and_programming_0.pdf)
124. The World Bank Group. (2010). *Mozambique: Economics of adaptation to climate change*. Washington, DC: World Bank.
125. Cheung, W.W.L., Lam, V.W.Y., Sarmiento, J.L., Kearney, K., Watson, R. & Pauly, D. (2009). Projecting global marine biodiversity impacts under climate change scenarios. *Fish and Fisheries*. 10(3): 235-251.
126. Westlund, L., Poulain, F., Bage, H., & van Anrooy, R. (2007). *Disaster response and risk management in the fisheries sector*. Rome, Italy: FAO.
127. MacAlister, E. (2002). *The role of women in fisheries*. Retrieved from [http://ec.europa.eu/fisheries/documentation/studies/role\\_of\\_women/summary\\_en.pdf](http://ec.europa.eu/fisheries/documentation/studies/role_of_women/summary_en.pdf)
128. FAO. (2015). *Angling for gender equality in the seafood industry*. Retrieved from <http://www.fao.org/gender/gender-home/gender-news/gender-newsdet/en/c/287815/>
129. Kolbeinsdottir, L., Pombo, M.H., & Pedro, R. (2012). *Consultancy report: Gender-specific impacts of climate change on fisheries livelihood in Mozambique*. FAO and GEST.
130. Aguilar, L. (2004). *Gender makes the difference: Fisheries and aquaculture in coastal zones*. IUCN. Retrieved from [https://portals.iucn.org/union/sites/union/files/doc/gender\\_makes\\_the\\_difference\\_fisheries\\_and\\_aquaculture\\_in\\_coastal\\_zones.pdf](https://portals.iucn.org/union/sites/union/files/doc/gender_makes_the_difference_fisheries_and_aquaculture_in_coastal_zones.pdf)
131. Women's Aquatic Network, Inc. (2015). Homepage. Retrieved from <http://womensaquatic.net>
132. Chando, C. (2002). *Gender roles in fishery planning and projects: The case study of coast region In Tanzania*. (Thesis). Department of Social Science and Marketing. Norwegian College of Fishery Science University of Tromsø Norway.
133. Kolbeinsdottir, L., Pombo, M.H., Pedro, R. (2012). *Consultancy Report: Gender-specific Impacts of Climate Change on Fisheries Livelihood in Mozambique*. FAO and GEST.
134. Khan, A.E., Ireson, A., Kovats, S., Mojumder, S.K., Khusru, A., Rahman, A., & Vineis, P. (2011, April). Drinking water salinity and maternal health in coastal Bangladesh: Implications of climate change. *Environ Health Perspective* 119:1328-1332.
135. Rakova, U. (2014, August). [Personal communication with L. Aguilar during the Global Summit on Women and Climate Change, Global Green Grants Fund and International Network of Women Funds].
136. Guyana Mangrove Restoration project. (2015). Momentum for Change project submission for Women for Results Pillar.



137. Mangroves for the Future. (2015). *Applying gender integrated planning in the MFF programme*. Retrieved from <https://www.mangrovesforthefuture.org/news-and-media/events/asia-region/2015/applying-gender-integrated-planning-in-the-mff-programme-mff-internal-training-workshop/>
138. Chando, C. (2002). *Gender roles in fishery planning and projects: The case study of coast region in Tanzania*. (Thesis). Department of Social Science and Marketing. Norwegian College of Fishery Science University of Tromsø Norway.
139. WHO. (2010). *Gender, climate change, and health*. Retrieved from <http://www.who.int/globalchange/GenderClimateChangeHealthfinal.pdf?ua=1>.
140. WHO. (2010). *Gender, climate change, and health*. Retrieved from <http://www.who.int/globalchange/GenderClimateChangeHealthfinal.pdf?ua=1>.
141. Prüss-Üstün, A., Bos, R., Gore, F., & Bartram, J. (2008). *Safer water, better health: Costs, benefits and sustainability of interventions to protect and promote health*. Geneva: World Health Organization.
142. WHO. (2009). *Global health risks: Mortality and burden of disease attributable to selected major risks*. Geneva: World Health Organization.
143. Arnell, N.W. (2004). Climate change and global water resources: SRES emissions and socio economic scenarios. *Global Environmental Change – Human and Policy Dimensions*, 14:31–52.
144. WHO. (2003). *Climate change and human health – Risks and responses*. Retrieved from <http://www.who.int/globalchange/climate/en/ccSCREEN.pdf>
145. WHO. (2010). *Gender, climate change, and health*. Retrieved from <http://www.who.int/globalchange/GenderClimateChangeHealthfinal.pdf?ua=1>.
146. WHO. (2010). *Gender, climate change, and health*. Retrieved from <http://www.who.int/globalchange/GenderClimateChangeHealthfinal.pdf?ua=1>.
147. Tirado, C. (2013). Gender-sensitive strategies to address the challenges of climate change on health and nutrition security. In B. Cela, I. Dankelman, & J. Stern (Eds.), *Powerful synergies: Gender equality, economic development and environmental sustainability* (pp. 109-118). UNDP. Retrieved from [http://www.undp.org/content/dam/undp/library/gender/f\\_PowerfulSynergies2013\\_Web.pdf](http://www.undp.org/content/dam/undp/library/gender/f_PowerfulSynergies2013_Web.pdf)
148. WHO. (2012). *Atlas of climate and health*. Geneva, Switzerland: WHO & WMO.
149. Brody, J., Demetriades, J., & Esplen, E. (2008, June). *Gender and climate change: Mapping the linkages. A scoping study on knowledge and gaps*. Retrieved from [http://www.bridge.ids.ac.uk/sites/bridge.ids.ac.uk/files/reports/Climate\\_Change\\_DFID.pdf](http://www.bridge.ids.ac.uk/sites/bridge.ids.ac.uk/files/reports/Climate_Change_DFID.pdf)
150. WHO. (2008). Protecting health from climate change: World health day 2008. Geneva, Switzerland: WHO.
151. Rogerson, S.J., Hvid, L., Duffy, P.E., Leke, R.F., & Taylor, D.W. (2007, February). Malaria in pregnancy: Pathogenesis and immunity. *Lancet Infectious Diseases*, 7(2): 105-1-7.
152. WHO. (2012). *Atlas of climate and health*. Geneva, Switzerland: WHO & WMO.
153. WHO. (2010). *Gender, climate change, and health*. Retrieved from <http://www.who.int/globalchange/GenderClimateChangeHealthfinal.pdf?ua=1>.
154. Neumayer, E. & Plümper, T. (2007, January). *The gendered nature of natural disasters: The impact of catastrophic events on the gender gap in life expectancy, 1981-2002*. London: Department of Geography and Environment, London School of Economics and Political Science (LSE).



155. WHO. (2010). *Gender, climate change, and health*. Retrieved from <http://www.who.int/globalchange/GenderClimateChangeHealthfinal.pdf?ua=1>.
156. WHO. (2010). *Gender, climate change, and health*. Retrieved from <http://www.who.int/globalchange/GenderClimateChangeHealthfinal.pdf?ua=1>.
157. Few, R. & Tran, P.G. in WHO (2010). Climatic hazards, health risk and response in Vietnam: Case studies on social dimensions of vulnerability. *Global Environmental Change*, 20:529–538.
158. Galea, S., Brewin, C.R., Gruber, M., Jones, R.T., King, D.W., King, L.A., McNally, R.J., Ursano, R.J., Petukhova, M., & Kessler, R.C. (2007). Exposure to hurricane-related stressors and mental illness after Hurricane Katrina. *Archives of General Psychiatry*, 64:1427–1434.
159. Nicholls, N., Butler, C.D., & Hanigan, I. (2006). Inter-annual rainfall variations and suicide in New South Wales, Australia, 1964-2001. *Int J Biometeorol*, 50:139-43.
160. Nagaraj, K. (2008). Farmers' suicides in India: Magnitudes, trends and spatial patterns. Madras Institute of Development Studies. Retrieved from [http://www.macrosan.org/anl/mar08/pdf/farmers\\_suicides.pdf](http://www.macrosan.org/anl/mar08/pdf/farmers_suicides.pdf)
161. Alston M., & Kent J. (2008, March). The big dry: The link between rural masculinities and poor health outcomes for farming men. *Journal of Sociology*, 44:133–147.
162. Alston M. (2010, May). Rural male suicide in Australia. *Social Science & Medicine*, 74(4):515-522. <http://dx.doi.org/10.1016/j.socscimed.2010.04.036>
163. Neelormi S., Adri, N., & Ahmed, A.U. (2009). Gender dimensions of differential health effects of climate change induced water-logging: A case study from coastal Bangladesh. *Earth and Environmental Science*, 6:142001–142036.
164. WHO. (2010). *Gender, climate change, and health*. Retrieved from <http://www.who.int/globalchange/GenderClimateChangeHealthfinal.pdf?ua=1>.
165. UNSCN. (2010). Progress in nutrition: 6th report on the world nutrition situation. Retrieved from [http://www.unscn.org/files/Publications/RWNS6/report/SCN\\_report.pdf](http://www.unscn.org/files/Publications/RWNS6/report/SCN_report.pdf)
166. Samson, M. (2013). *How are countries using social protection to benefit the poor?*. In Solheim, E. (2013). Development co-operation report 2013: Ending poverty. OECD. <http://dx.doi.org/10.1787/dcr-2013-en>
167. Tirado, C. (2011). Enhancing women's leadership: To address the challenges of climate change on nutrition security and health. Retrieved from [http://unscn.org/files/NutCC/Paper\\_Enhancing\\_Women\\_leadership\\_final.pdf](http://unscn.org/files/NutCC/Paper_Enhancing_Women_leadership_final.pdf)
168. Women and the world economy: A guide to womenomics. (2006, April). *The Economist*.
169. WHO. (2012). *Atlas of climate and health*. Geneva, Switzerland: WHO & WMO.
170. Smith, K.R., Woodward, A., Campbell-Lendrum, D., Chadee, D.D., Honda, Y., Liu, Q., Olwoch, J.M., Revich, B., & Sauerborn, R. (2014). Human health: Impacts, adaptation, and co-benefits. In *Climate change 2014: Impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press.
171. Revised from: Aguilar, R., Araujo, A., Kring, E., Quesada, A., & Zuniga, P. (2008). *Guia: Recursos de genero para el cambio climatic*. Mexico: UNDP.
172. Quesada-Aguilar, A. (2013). *From research to action, leaf by leaf*. New York. USA: WEDO- REDD+SES.



173. WEDO. (2014). *UNFCCC decisions and conclusions: Existing mandates and entry points for gender equality. Technical guide for COP20, Lima, Peru*. New York, USA.
174. Burns, B. & Patouris, J. (2014). *UNFCCC Decisions and Conclusions: Existing Mandates and Entry Points for Gender Equality*. WEDO. Retrieved from <http://www.wedo.org/wp-content/uploads/GE-Publication-ENG-Interactive.pdf>
175. UNISDR. (2015). *Sendai Framework for Disaster Risk Reduction, 2015-2030*. Retrieved from <http://www.preventionweb.net/files/resolutions/N1514318.pdf>.
176. ICLEI. (2015). *Climate resilient cities*. Retrieved from <http://www.iclei.org/our-activities/our-agendas/resilient-city.html>
177. Dankleman, I. (2008). *Mainstreaming gender in climate change policies: Urgencies, challenges and perspectives*. Paper presented at Third Global Congress of Women in Politics and Governance organized by CAPWIP on the theme of gender and climate change, Manila, Philippines.
178. Aguilar, L. (2009). *Training manual on gender and climate change*. Washington, DC: GGCA, IUCN, & UNDP.
179. WEDO, ABANTU for Development in Ghana, ActionAid Bangladesh and ENDA Senegal. (2008). *Gender, climate change and human security: Lessons from Bangladesh, Ghana and Senegal*. Retrieved from <http://www.wedo.org/wp-content/uploads/hsn-study-final-may-20-2008.pdf>
180. Aguilar, L. (2009). *Training manual on gender and climate change*. Washington, DC: GGCA, IUCN, & UNDP.
181. World Bank. (2015). *PPCR results framework and monitoring and reporting toolkit. Pilot programme for climate resilience (PPCR)*. Retrieved from <http://www.climateinvestmentfunds.org/cif/node/12507>
182. Oslo Policy Forum Report. (2008). *Changing the way we develop: Dealing with disasters and climate change*. Norway: Norwegian Ministry of Foreign Affairs, Prevention Consortium, & UNDP.
183. Aguilar, L. (2009). *Training manual on gender and climate change*. Washington, DC: GGCA, IUCN, & UNDP.
184. UNDP. (2008). *Empowered and equal: Gender equality strategy 2008-2011*. Retrieved from <http://www.undp.org/content/dam/aplaws/publication/en/publications/womens-empowerment/gender-equality-strategy-2008-2011/0601.pdf>
185. Daniels, C. (2013). *Gender in action: 2012 gender report on UNDP supported GEF financed projects*. New York: GEF & UNDP.
186. Daniels, C. (2013). *Gender in action: 2012 gender report on UNDP supported GEF financed projects*. New York: GEF & UNDP.
187. Daniels, C. (2013). *Gender in action: 2012 gender report on UNDP supported GEF financed projects*. New York: GEF & UNDP.
188. World Bank. (2015). *PPCR results framework and monitoring and reporting toolkit. Pilot programme for climate resilience (PPCR)*. Retrieved from <http://www.climateinvestmentfunds.org/cif/node/12507>
189. UNISDR. (2008). *UNISDR briefing note 1—Climate change and disaster risk reduction*. Geneva, Switzerland: UNISDR.
190. UNISDR. (2015). *Making development sustainable: The future of disaster risk management global assessment report on disaster risk reduction*. Geneva, Switzerland: United Nations Office for Disaster Risk Reduction (UNISDR).
191. Daniels, C. (2013). *Gender in action: 2012 gender report on UNDP supported GEF financed projects*. New York: GEF & UNDP.
192. World Bank. (2015). *PPCR results framework and monitoring and reporting toolkit. Pilot programme for climate resilience (PPCR)*. Retrieved from <http://www.climateinvestmentfunds.org/cif/node/12507>



193. Macchi, M. (2011). *Framework for community-based climate vulnerability and capacity assessment in mountain areas*. Retrieved from [http://www.climateadapt.asia/upload/events/files/4df5851ac678bicimod-framework\\_for\\_community-based\\_climate\\_vulnerability\\_and\\_capacity\\_assessment\\_in\\_mountain\\_areas.pdf](http://www.climateadapt.asia/upload/events/files/4df5851ac678bicimod-framework_for_community-based_climate_vulnerability_and_capacity_assessment_in_mountain_areas.pdf)
194. International Institute for Sustainable Development (IISD). (2012). *CRiSTAL 5.0 user's manual: Community-based risk screening tool—Adaptations and livelihoods*. Retrieved from [https://www.iisd.org/pdf/2012/cristal\\_user\\_manual\\_v5\\_2012.pdf](https://www.iisd.org/pdf/2012/cristal_user_manual_v5_2012.pdf)
195. Asian Development Bank. (2011). *Community-based climate vulnerability assessment and adaptation planning: A Cook Islands pilot project*. Retrieved from [http://www.preventionweb.net/files/27076\\_climatechangeassessmentcoo.pdf](http://www.preventionweb.net/files/27076_climatechangeassessmentcoo.pdf)
196. IFRC. (2015). *Vulnerability and capacity assessments*. Retrieved from <http://www.ifrc.org/vca>
197. Rizvi, A.R., Baig, S., & Verdone, M. (2015). *Ecosystems based adaptation: Knowledge gaps in making an economic case for investing in nature based solutions for climate change*. Gland, Switzerland: IUCN.
198. World Bank. (2009). *Convenient solutions to an inconvenient truth: Ecosystems based approaches to climate change*. Washington, DC: The World Bank, Environment Department.
199. Rizvi, A.R., Baig, S., & Verdone, M. (2015). *Ecosystems based adaptation: Knowledge gaps in making an economic case for investing in nature based solutions for climate change*. Gland, Switzerland: IUCN.
200. Rizvi, A.R., Baig, S., & Verdone, M. (2015). *Ecosystems based adaptation: Knowledge gaps in making an economic case for investing in nature based solutions for climate change*. Gland, Switzerland: IUCN.
201. UNEP. (2013). *UNEP Policy Series: Ecosystem Management: The social dimension of ecosystem-based adaptation* (Policy Brief No. 12). Retrieved from [http://www.unep.org/ecosystemmanagement/Portals/7/Documents/policy\\_series\\_12-small\\_Nov\\_2013.pdf](http://www.unep.org/ecosystemmanagement/Portals/7/Documents/policy_series_12-small_Nov_2013.pdf)
202. CARE Bangladesh. (2010). Chameli Begum's story of livelihood adaptation: Duck rearing in the face of climatic vulnerability. Retrieved from [http://www.careclimatechange.org/files/stories/Chameli\\_Begum\\_Duc\\_%20Rearing.pdf](http://www.careclimatechange.org/files/stories/Chameli_Begum_Duc_%20Rearing.pdf)
203. Maya Nut Institute. (2013). *Finding balance between people, food and forests: Empowering communities for ecosystem resilience and food security*. Retrieved from <http://mayanutinstitute.org/>
204. UNEP. (2013). *UNEP Policy Series: Ecosystem Management: The social dimension of ecosystem-based adaptation* (Policy Brief No. 12). Retrieved from [http://www.unep.org/ecosystemmanagement/Portals/7/Documents/policy\\_series\\_12-small\\_Nov\\_2013.pdf](http://www.unep.org/ecosystemmanagement/Portals/7/Documents/policy_series_12-small_Nov_2013.pdf)
205. IPCC. (2014). *Climate change 2014: Impacts, adaptation and vulnerability. Summary for policymakers*. Retrieved: [https://ipcc-wg2.gov/AR5/images/uploads/WG2AR5-SPM\\_FINAL.pdf](https://ipcc-wg2.gov/AR5/images/uploads/WG2AR5-SPM_FINAL.pdf)
206. European Investment Bank. (2015). *Environmental and social safeguards*. Retrieved from <http://www.eib.org/infocentre/press/news/all/environmental-and-social-safeguards.htm>
207. World Bank. (2015). *Safeguard policies*. Retrieved from <http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTSAFEPOL/0,,contentMDK:23673401~pagePK:64168445~piPK:64168309~theSitePK:584435,00.html>

