Roots for the Future

The Landscape and Way Forward on Gender and Climate Change

IUCN

GGCA
Global Gender and Climate Alliance

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

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.

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Acknowledgements

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

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**). 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[1] 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.

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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.

5

INTO THE CITIES:

Developing and supporting resilient, sustainable, and gender-responsive urban environments

By Gotelind Alber and Kate Cahoon (Gender CC-Women for Climate Justice), with A.E. Boyer and Margaux Granat (IUCN)

CHAPTER CONTENT

ACRONYMS

ACCCRN	Asian Cities Climate Change Resilience Network
BRT	Bus rapid transit
CCMES	Climate Change Mitigation and Energy Strategy
CO$_2$	Carbon dioxide
COP	Conference of the Parties
DRR	Disaster risk reduction
EU-SILC	European Union Statistics on Income and Living Conditions
GGCA	Global Gender and Climate Alliance
GHG	Greenhouse gas
GIA	Gender Impact Assessments
ICLEI	International Council for Local Environmental Initiatives

IPCC	Intergovernmental Panel on Climate Change
LGMA	Local Government and Municipal Authorities Constituency
LPG	Liquefied petroleum gas
PAKLIM	Policy Advice for Environment and Climate Change
SDGs	Sustainable Development Goals
UCLG	United Cities and Local Governments
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization

Key messages

- Urban areas are expanding, and as major producers, consumers and greenhouse gas (GHG) emitters, urban communities and policy makers have an important role to play in contributing to climate change mitigation—with a particularly unique role in urban planning for low-emission development.
- Urban climate policies need to address and adopt a socially just outlook considering that cities are not merely a main producer of GHG emissions but also because cities exacerbate uneven development and urban inequality.
- While much progress has been made in addressing the nexus of climate change and gender equality in recent years, the focus has predominately been on rural areas, leaving considerable gaps when it comes to addressing the specific set of challenges in urban contexts.
- Many cities are developing and implementing strategies and systems for tackling climate change and its impacts, but most local governments have yet to pay attention to gender issues and integrate a gender-responsive approach to their climate policies and action plans.
- 'Cross-mainstreaming' of climate change and gender is an ongoing task for those involved in urban politics. While this is arguably a long-term endeavour that requires both a change of thinking and a gradual learning process, the aim of transforming maladapted cities into low-carbon, resilient, gender-just and inclusive communities is arguably a worthy one.
- The importance of including gender dimensions within city climate policies is not only to address social inequities, but also to fully unlock the potential of women and men to successfully address climate change.

5.0 Introduction

With a growing share of GHG emissions originating from urban areas[1]—estimated to be more than 70% of global energy-related carbon dioxide (CO_2) emissions—sustainable urban development and management are increasingly being recognised as important aspects to respond to the challenges of climate change.

Currently, 54% of the world's population lives in urban areas.[2] With population growth and rapid urbanisation, this figure is expected to increase to over 64% by 2050—representing an additional 2.5 billion people living in urban areas.[3] Much of this growth will take place in informal settlements in low-income Asian and African countries.[4] Stakes are particularly high for these city populations, especially for the some 360 million urban residents currently living in areas less than ten metres above sea level,[5] who are extremely vulnerable to the growing effects of climate change (e.g., flooding of low lying areas, and increasing temperatures within cities due to 'heat island' effects). As populations rapidly shift to cities in the coming century and urban growth and sprawl continues, the necessity of mitigation, adaptation and disaster preparedness at a local level will become strikingly apparent.

However, climate change does not impact everyone in cities, as elsewhere, the same way. Vulnerabilities are strongly linked to gender, age, race, and income. The inequity of wealth in cities, more specifically urban poverty, is a glaring consequence of rapid urbanisation—and reducing poverty, as opposed to exacerbating it, is a major factor in climate change discussions, especially as it relates to vulnerability. Poor urban citizens lack resources, knowledge and services to equip themselves for climatic variability and changes. Densely populated areas with informal or deficient housing, with inhabitants dependent on basic infrastructure and services, will feel the brunt of climate change as they will be more vulnerable, and thus their adaptive capacity even more severely constrained. Given that women and girls make up three-fifths of the world's one billion poorest people,[6] and are often amongst the poorest of the poor, women will disproportionately suffer due to their limited access to resources and services. Furthermore, the needs and priorities of those already in disadvantaged positions are often not recognised, or addressed.

While progress has been made in addressing the nexus of climate change and gender equality in recent years, the focus has predominately been on rural areas, leaving considerable gaps when it comes to addressing the specific set of challenges faced in urban contexts. It is therefore essential to begin recognising the persistent barriers that exacerbate gender inequalities and in turn, limit sustainable development and the potential of local authorities to effectively tackle climate change. Given that the impacts of climate change are frequently and directly felt in urban areas, cohesive, gender-responsive local and national policies are critical to respond to climate change and to reduce vulnerability, enabling more equitable and resilient lives and livelihoods in urban settings.

5.1 Urban challenges and opportunities

Cities around the world, with their dense populations, concentrated infrastructure, and expansive paved areas are particularly vulnerable to hotter days, extended droughts, sea level rise and storm surge, especially in coastal regions and along rivers. Coping with extreme weather events and disaster situations is thus of utmost importance for cities, and city planners and policy makers are well advised to draw up and implement strategies to build resilience and adapt to climate variability.

Aging infrastructure, much of which is in need of updating and upgrading, is a concern to cities formulating adaptation plans. Bridges, roads, buildings, and subway systems cannot be moved in a cost effective manner, and much of this fragile infrastructure could be exposed to stronger or more frequent climate change effects, such as storms or flooding. The failure of urban planners to adjust the existing building and city codes to prepare for the future will limit the ability for cities to adapt.[7] However, some countries, due to the lack of funds and resources, will be unable to adapt and will suffer more from extreme, and slow-onset, climatic events.

Aside from the physical damage caused by extreme weather events, city planners, local governance systems, and service providers will have to navigate accommodating more people and expanding infrastructure with an adaptive mindset in place. Rapid and unplanned urban growth, especially when accompanied by climate change, threatens sustainable and equitable development. Therefore, better city planning, socially inclusive and responsible development, and political cooperation and participation are required at all levels.

Box 1: Adaptation vs mitigation

Per capita emissions in cities can vary considerably even within a single country or region. The main influencing factors are the spatial structure of the city in terms of land use mix and density; the quality and location of infrastructure, such as public transport, the carbon intensity of local economic activities (i.e., if there is heavy industry in the area which uses large amounts of energy); the income of citizens; governance of the area; and the local climatic conditions. Because of this, different countries will approach sustainable development in different ways. For instance, developing countries, with populations that are the most affected by climate change but contribute the least to it, often focus on adaptation, or reactive, strategies. Developed countries, that emit significant amounts of GHG, have historically focused on both mitigation and adaptation climate change strategies—but there is a need for all countries and cities to increasingly pursue an integrated approach to mitigation and adaptation strategies in the future.

Adaptation

Adaptation strategically reduces exposure and sensitivity to climate change impacts and enhances coping capacity from its effects. It is evident that sensitivity and coping capacity are largely dependent on exposure and various social issues, including gender inequality. The less access to resources, infrastructure and services citizens have, the more difficult it is for them to ensure their sustained livelihoods in times of floods, droughts or disaster. For many adaptation activities, the border between enhancing resilience and development is fluid, as they involve measures to create formal jobs, improve mobility and facilitate care work.

Mitigation

Cities require a clear urban mitigation agenda, especially those that are located in industrialised countries. City planners are responsible for land use planning or other regulative powers, thereby deciding on structures and infrastructures that are very relevant for society's GHG emissions. Moreover, cities are often responsible for providing services such as public transport and energy supply, and can, for instance, increase the share of renewables in energy supply and enhance public transport facilities to allow for low carbon mobility.

While rapidly increasing urbanisation will require more infrastructure to be built to accommodate growing populations, there is an opportunity for cities to develop in sustainable, livable, and dynamic ways. As major cultural, economic, and innovation hubs, cities have a unique opportunity to both combat and cope with global climate change through urban mitigation and adaptation actions. Efficient urban planning and development are necessary as settlement densities change to become more compact. Planning should also involve design that avoids flood-prone areas, and options for low-emissions transport and decentralised renewable energy installations. Also, sustainable and efficient infrastructure will aid in delivering basic services to communities and ensure reliable water and septic systems.

Cities are not merely urban agglomerations; they are comprised of diverse populations with diverse needs. In most countries, urban local authorities have the right to democratic self-governance and are in charge of a large number of tasks to support and manage those needs. Many of these urban policy and planning tasks—especially in regards to housing, energy, transport, infrastructure, and waste and water management—contribute to, and will be affected by, climate change. Local government action is vital for responding to the challenges and also tapping into the opportunities connected with the necessary transition to sustainable development; especially since local governments are the level of authority closest to citizens placing them in a strong position to integrate social issues, including poverty alleviation and gender equality, within their climate agenda.

However, local governments' roles are shaped and sometimes limited by the specific multi-level setting in their national context. In most countries, local governments do have a range of options to reduce GHG emissions, enhance resilience and reduce disaster risks. Yet, of the approximately 68% of cities around the world that are pursuing adaptation planning, only 18% are working on implementation.[10] This can be caused by limitations in their political influence because of bureaucratic hierarchy and unclear arrangements for the division of labour between political levels, which can hinder progress of planning and implementation. Also, the lack of guidance, financial means, and qualified staff has proven to be a major barrier for local governments.

Despite these obstacles, many cities, especially in high-income countries, have been focusing on mitigation strategies for one or two decades. These cities, along with cities in developing countries, are now integrating adaptation strategies into city planning and management. The next crucial step is to integrate gender-sensitive responses into comprehensive climate change policy, which is currently missing from many cities' climate action policies.[11]

Box 2: How cities are responding to climate change

In the early 1990s, a small number of pioneering cities, including Heidelberg and Frankfurt in Germany and Toronto in Canada, adopted voluntary commitments to address climate change and started to draw up and implement climate action programs aimed at cutting GHG emissions. Local governments formed networks such as International Council for Local Environmental Initiatives (ICLEI)-Local Governments for Sustainability (founded as International Council for Local Environmental Initiatives in 1990), C-40, and the Climate Alliance of European Cities at regional levels in order to share information and experience, collaborate and provide mutual support. Subsequently, an increasing number of cities started to get active in climate policy.

New York City, USA

The New York City Government has long been dedicated to reducing the city's contribution to and preparing for the inevitable impacts of global climate change. In 2011, the Mayor's office published 'PlaNYC', which not only outlined a series of actions to meet the goal of reducing emissions by 30% by 2030, compared to 2005 levels, but also emphasised the importance of climate change adaptation and mitigation strategies while being a part of the larger solution.[12] After an economically devastating hurricane, Superstorm Sandy, hit the United States' Atlantic coastline in 2012, New York City's former Mayor, Michael Bloomberg, launched, A Stronger, More Resilient New York. This extensive adaptation strategy outlined some 250 initiatives to reduce city vulnerability to climate change effects, such as sea level rise and storm surge.[13] A majority of this USD 19.5 billion plan was dedicated to repairs and improvement of damaged city and private infrastructure.[14] This included improving transportation systems, such as subways, bus lines, roads, and bridges, which were extensively damaged from floods during and after Superstorm Sandy.[15] The rest of the budget, about 20%, was allocated to building floodwalls and improving natural coast protections, like swamplands and sand dunes.[16]

Box 2: How cities are responding to climate change (Cont.)

London, England

In 2010, prompted by persistent floods, droughts, and heat waves, London's Mayor Boris Johnson asked citizens to share ideas and expertise for adaptation strategies, famously stating: "Either we can grow gills, or we'll need to think of other ways of adapting."[17] Using a combination of citizen suggestions and a national climate change report from the Met Office Hadley Centre, the final report, Managing Risks and Increasing Resilience, identified the most vulnerable residents and infrastructures in London. The report purposed 34 adaptation initiatives focusing on flood risk management, expansion of urban parks and vegetation, and improvement of water and energy efficiency in older homes.[18] Additionally, in 2011, Mayor Johnson published, Delivering London's Energy Future: The Mayor's Climate Change Mitigation and Energy Strategy. Referred to as the CCMES, this plan focuses on strategies to reduce GHG emissions from the transport and energy sectors, support innovation and investment in energy, and promote efficient energy use in greater London.[19]

Quito, Ecuador

Approved by the Quito Metropolitan Council in 2009, the 'Quito Climate Change Strategy' came as result of the Clima Latino regional climate change conference in 2007.[20] Quito, which hosted the conference that year, was already feeling the impacts of climate change on a local level. Landslides, floods, droughts, and the melting Antisana glacier, led former Mayor Paco Moncayo to push for the climate strategy plan, which includes both mitigation and adaptation strategies, to be the center of the city's development agenda.[21] A 2013 case study on Quito reports that USD 350 million has been invested in adaptation strategies focusing on ecosystems and biodiversity, drinking water supplies, public health, infrastructure and power production, and climate risk management.[22]

Box 2: How cities are responding to climate change (Cont.)

Semarang City, Indonesia

Semarang, a coastal city in Java with a population of two million, is committed to reduce both climate risks and GHG emissions, assisted by the Asian Cities Climate Change Resilience Network (ACCCRN), and an Indonesian-German Cooperation Program, Policy Advice for Environment and Climate Change (PAKLIM). The starting point for the integrated climate change program in 2010 was a vulnerability analysis based on citywide and community-based vulnerability assessments as well as an assessment of governance in relation to adaptation. Subsequently, a resilience strategy covering all relevant sectors was prepared. For implementation, a community-based, participatory approach is emphasised, in particular for decentralised infrastructure-oriented interventions such as rainwater harvesting, wastewater treatment, and water filtration systems aimed at enhancing the resilience of vulnerable groups. A number of strategies have been developed to achieve significant emissions reduction targets, including improving energy efficiency and developing an integrated waste management system.[23]

Cities alone may not be able to completely halt climate change, nor entirely prevent negative impacts. Because any action to address climate change will have a profound effect on residents, there is also the need for cities to be forward thinking and multidimensional in their approach, with a willingness to address social dimensions—including gender—in conjunction with climate actions.

Box 3: Local authorities' participation and influence in global negotiations

In recent years, there has been greater recognition of the important contributions of cities (and non-state actors) to address climate change. Yet, in the international forum created to address climate change, the United Nations Framework Convention on Climate Change (UNFCCC), climate change policy is almost exclusively negotiated by national governments, as local governments have merely had an 'observer' role along with civil society and other groups. The Local Government and Municipal Authorities constituency (LGMA) has therefore been active in lobbying for the mention of the local level in negotiating texts, in order to achieve greater acknowledgement and support. Beyond this, there is a need for a clear and effective division of labour among the various government levels, and the collaboration of actors at all levels that need to work together in a short time frame to guarantee long-term and wide-ranging action.

MEASURING GHG EMISSIONS FROM CITIES

The Global Protocol for Community-Scale Greenhouse Gas Inventories, introduced at the 20th UNFCCC Conference of the Parties (COP20) in 2014, is one of the many proposed global standards for a consistent and comparable way to measure GHG emissions from cities. This protocol uses a clear framework that builds on existing IPCC methodologies, which consists of two approaches for cities to calculate and report their greenhouse gas emissions. The first seeks to capture emissions from consumption and production activities taking place within city boundaries, including some emissions outside the city. The other breaks emissions into three scopes depending on where they physically occur. The first scope covers emissions from sources within the city boundaries, the second encompasses emissions from grid-supplied energy within the city boundaries, and the third scope captures emissions that occur outside the city as a result of activities within the city.[26] Like many of the proposed inventories for cities, this standard does have issues with potential for losses and inconsistencies that can lead to uncertainties in estimates.[27]

Box 4: Urban GHG inventories

The amounts of emissions of large cities are considerable and can exceed those of an entire country; for instance, yearly GHG emissions of New York City are larger than those of Cuba.[24,25] Thus, mitigation strategies for large cities are especially important.

In order to plan mitigation measures, compiling a GHG inventory is useful to analyse the quantity of GHG emissions generated and where these emissions are coming from. The primary goal of a GHG inventory is to gain a clear picture of the baseline situation, including a breakdown of emissions by sectors, and identify potential areas for mitigation actions. At a later stage, updated versions need to be produced to monitor progress, refine data, and present measurable results of emission reduction measures. In particular for large cities, the compilation of GHG inventories on a regular basis is indispensable due to the ever-changing and interdependent nature of the city's infrastructure, services and population. For smaller cities, compiling GHG inventories on a regular basis is also useful in order to systematically plan and monitor mitigation measures.

While there is a standard GHG inventory methodology for nations provided by the International Panel on Climate Change (IPCC), historically this has not existed for cities. The problem is that in most cases cities are not in full control of the sources of their emissions. For example, the majority of electricity is often 'imported' to a city from large power stations that are located outside of the city's boundaries. Therefore, the territorial approach upon which the IPCC methodology for nations is based has the potential to provide misleading results that do not fully take into account the carbon emissions resulting from activities within the city.

Thus, most urban GHG inventory methods and tools are instead based on the accounting of direct and indirect emissions from energy consumption within the city, thereby including the supply chains to the city. However, available methods may differ in certain details such as the system boundaries, calculation methods and emission factors.

5.2 Gender in urban climate policy

As highlighted in the previous section, a range of options exists for local governments to respond to climate challenges. Subsequently, growing numbers of cities are adopting climate policies, yet planning and implementing comprehensive mitigation and adaptation measures remains a challenging task—both in the Global North and the Global South. As it stands, existing policies have largely failed to recognise and address gender dimensions and remain largely gender-blind. This is despite the risk that poorly designed policies could serve to further exacerbate inequalities, while there is considerable potential for local governments to address social inequality and strengthen their climate actions through gender-responsiveness.

The need for addressing social dimensions in climate policy at various levels is now well recognised. Despite this, knowledge gaps and scarce financial resources tend to cause policy makers to hesitate when considering social, or more specifically gender issues in climate policy. One of the many causes of this is the lack of gender-disaggregated data, particularly at intra-household level, which can make it difficult to create a clear picture of the interlinkages between gender and climate-related issues in urban areas.

There is, however, a growing body of evidence that social and gender disparities exist, and, in cities, the divide between privileged and underprivileged can be as substantial as the global discrepancy between developed and developing nations. Therefore, as the world's population continues to move to cities the responsibility to address these social inequities will fall more at the local government level. Also, a considerable 'gender gap' continues to exist in leadership, decision-making, education, wages, and access to resources and finance in all parts of the world. This gap can be particularly apparent at the local level, where historically male-dominated sectors such as transportation and energy continue to neglect women's priorities and capabilities.

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Box 5: Women's participation in decision-making positions in local governments

Women are under-represented in decision-making at all levels, in both public entities and the private sphere. One of the consequences of this imbalance is a male bias in planning and decision-making, resulting in a failure to consider the different needs of women, which stem from their socially defined roles and responsibilities.

According to a report by United Cities and Local Governments (UCLG), women make up less than 5% of mayors and average 20% of city councilors worldwide.[28] UCLG also reports that female mayors head only 16% of the world's capital cities, and of the world's 34 megacities—defined as having more than ten million residents—only three have female mayors.[29]

In most countries, the representation of women in decision-making at the local level does not exceed their representation at the national level, except in countries where a quota system is in place, such as India or Rwanda.[30]

Undoubtedly, climate policies need to address and adopt a socially just outlook considering that cities are not just a main producer of GHG emissions, contributing to the impending climate change, but because cities also are, unchecked, exacerbating uneven development and urban inequality.[31] Using gender as a category for analysis in climate surveying can reveal the extent of this inequity and injustice, which prevents women from engaging actively in climate issues, of which they are often disproportionately affected. Internationally, organisations like the Global Gender and Climate Alliance (GGCA) and its members have made important contributions to the UNFCCC toward more gender-responsive policies, including several decisions stating the need for women's participation in almost every UNFCCC thematic area.[32]

However, policies that do consider the interlinkages between gender and climate change in urban areas, are likely to be both more equitable and effective in their implementation. This is not only true for cities in middle- and low-income countries where gender disparities are striking, but also in high-income countries. This is highlighted in a recent Swedish study that investigated gendering local adaptation.[33] While the Scandinavian countries are arguably renowned for their achievements in terms of gender equality, the authors argue that the gender-differentiated distribution of impacts of and responses to climate change in industrialised countries are nevertheless sufficiently serious to warrant more attention than they have so far received. Another Swedish study has looked at the gendered dimensions of climate change responses

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in Swedish municipalities[34] and found indications that gender awareness is an important influence on how municipalities respond to climate change. Initial findings suggest that there could be a positive relationship between gender awareness and the quality of the communities' climate change policies and practice, which provides interesting impulses for future research priorities and policy developments.

'Cross-mainstreaming' of climate change and gender is an ongoing task for all actors involved in urban politics. While this is arguably a long-term endeavour that requires both a change of thinking and a gradual learning process, the aim of transforming maladapted cities into low-carbon, resilient, gender-just and inclusive communities is arguably a worthy one.

The widely touted co-benefits of climate policy, including improved air quality and health, creation of jobs, livability, accessibility, and enhanced resilience can be maximised with urban climate policies that integrate social components such as poverty alleviation and gender equality in their approach. With gender mainstreamed into procedural processes, gender actions will no longer be considered an 'add-on,' but rather as a crucial component for optimal climate policy and sustainable, equitable and resilient urbanisation.

5.3 Developing climate-resilient and gender-responsive cities

Much of the momentum for sustainable urbanisation originates from subnational and local authorities themselves. It is therefore crucial that climate policy takes a broad approach, tackling all relevant sectors, particularly when mitigation and adaption measures are required. In addition to the mainstreaming of climate considerations, however, the gender dimensions of climate change also need to be integrated into the planning of local mitigation and adaptation actions at all stages of the policy process. Many of the insights gained from rural research and action can be applicable also in urban contexts, yet there are also a number of specific gender-related challenges in urban areas that need to be addressed. This is particularly true in light of rapidly growing urban populations and the considerable scope for gender-responsive climate action by local governments.

The following section discusses the options for urban climate policy in relevant sectors, the gendered dimensions of each, and how urban policies can integrate both for an enhanced gender-responsive approach and overall stronger outcomes. In an effort to present key issues, the following sections are organised by sector, which still very much overlap and intersect; this is not an exhaustive list of urban issues but has been chosen as relevant to the current conversation and available information, while also aligning with areas discussed in other chapters of this publication.

Urban planning for resilience

Sustainable urban development and planning offers a unique opportunity for cities to work towards low-carbon development while enhancing adaptation and resilience. It can shape urban spaces that allow people to socialise but can, in contrast, exacerbate disparities and exclusion, thus is also highly relevant for considering and responding for social and gender equality. Yet, most cities face conflicts of interest among the social, economic, and environmental dimensions of spatial planning and development.[35]

In low- and middle-income cities, spatial planning policies are usually overtaken by informal rapid population growth and constrained city budgets. As mentioned, in high-income countries, spatial strategies are often based on policies that limit over-development and sprawl and that are adequate to combat climate change. However, these must be carefully implemented since they might elevate housing prices and cause gentrification movements.[36,37] Likewise, densification has also been related to unequal distribution of domestic living space,[38] and increased exposure to air pollutants that directly impact women, particularly if compact urban areas is not complemented by an expansion of public transport and ventilation spaces within the households.[39] Compact city policies may also unequally affect security and access to facilities and public space, deepening spatial inequalities among vulnerable social groups. Some evidence shows that taxing new developments to cover infrastructure projects is less of a burden for low-income groups than the use of other instruments applied in spatial planning.

One of the priorities for gender-responsive urban climate policy and planning is building resilience. Technical measures for adaptation, such as improving physical infrastructure, are necessary, but they should not be prioritised over building resilience among communities and neighbourhoods, in particular for cities in middle and low-income countries. This requires a change of perspective. Rather than focusing solely on 'top down' technical responses to expected climate variations, policies must address social relations and give more attention to approaches which include efforts to enhance the livelihoods of citizens through improved food security, housing, and basic infrastructure for energy, mobility, water and sanitation. Additionally, in order to understand gender-related dimensions, a differentiated analysis is useful, for example Risk and Vulnerability Assessments which look not only at neighbourhoods but are able to capture disparities between households.[40]

Both in adaptation and mitigation, a pro-poor approach is required, but is not sufficient on its own. Other gender disparities need to be addressed, as well, in particular the 'care economy' and the informal economy.

Mitigating climate change requires a multidimensional approach that combines climate policy with existing clean air policies to work towards more livable and efficient cities. This involves changing and improving infrastructure, social structures, and public services, rather than only relying on mitigation technologies.

Box 6: Gender mainstreaming in urban transport planning in Vienna

Vienna's gender mainstreaming strategy is based on five principles: gender-sensitive language; gender-specific data collection and analysis; equal access to and utilisation of services; equal involvement of women and men in decision-making; and equal treatment integrated into steering processes.

The city adopted guidelines for a "safe city" and carried out community-based participatory gender-sensitive planning for public spaces, public and private buildings, throughout several districts. A number of guidebooks and a gender equality monitoring report are available.[41]

As part of the strategy, the Department for Gender Mainstreaming assessed who benefits from funds and services, and addresses the question of whether the distribution of resources undermines or enhances gender equality, as well as gender-sensitive transport planning, and gender mainstreaming in urban development and urban planning.

Energy

Energy—which in 2010 accounted for 35% of total global GHG emissions[42]—is typically the priority sector around which mitigation programmes are developed. For cities, which are estimated to produce 71-76% of energy-related GHG emissions[43], this is of utmost concern. Urban development and planning can help progress cities towards becoming more compact, energy efficient and climate-friendly. This can be done with sites in cities allocated for decentralised, renewable energy installations, in addition to options for co-generation, and the promotion of green power—without charging costs to the consumers, specifically from low-income households. With its reach in many sectors, energy is central to climate responses in urban contexts and is indeed far from being gender-neutral.

Options for action include:

- Improving energy efficiency in buildings (which account for 19% of global GHG emissions, when emissions from electricity and heat production are attributed to this sector),[44]
- Improving electrical devices,
- Improving heating and cooling systems,
- Enhancing energy efficiency in public facilities,
- Improving co-generation of power including heating and cooling,
- Switching to fuels with lower GHG emissions, e.g., from coal to natural gas, and
- Increasing the share of renewable energy, e.g., through decentralised installations, or integration of solar energy in buildings.

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To this end, cities making investments in clean energy and energy efficiency, can organise public awareness campaigns to bring about behavioural change, for instance to encourage citizens to save energy, they can offer advice and subsidies for energy efficiency and renewable energy installations, and in some countries, they can even introduce regulations requiring higher energy standards or solar energy.

From a gender perspective, it is important within this sector that gender-sensitive energy policy address both affluence and poverty—i.e., by developing strategies to reduce energy consumption through energy efficiency and sufficiency while at the same time improving access and affordability for underprivileged groups. Electricity provides income-generating opportunities for women, saves them time, improves access to information, and allows them to power productive technology, such as washing machines, food processing and preservation methods, and craft production.

Energy poverty is a widespread problem that strongly affects women, even in high- and middle-income countries. According to the World Health Organization (WHO), in some European countries, up to 30% of the population suffers from fuel poverty, which means that they cannot afford sufficient fuel for heating to maintain an adequate indoor temperature.[45] As women have lower incomes and assets, they are very likely to constitute the majority of this group, in particular single mothers and elderly women. The European Union Statistics on Income and Living (Eurostat EU-SILC) database, for example, provides recent sex disaggregated data—single male, and single female households—about the ability to keep the home warm for European countries.[46]

In low-income countries this problem is more common and severe. Even in cities, many women lack modern energy services and have to rely on traditional biomass such as fuelwood charcoal for cooking. Moreover, many cities in the developing world do not have access to an extensive and reliable electricity grid at all, and if there are electricity cuts, they often put private households at a disadvantage. Communities in these areas rely on traditional biomass such as firewood or charcoal for many energy needs.

As for programs targeting households, intra-household dynamics need to be taken into consideration, in particular with respect to who is using energy for what purposes, and who is responsible for investments and purchasing equipment. Programme design could therefore analyse consumption habits, behavioural patterns, work patterns, including, in particular, care roles and responsibilities—with a specific aim to address, instead of reinforce, gender stereotypes and ensure women's work burden is not exacerbated. Information, education and training are also key issues, as is how and to whom incentives may be provided.

Box 7: Energy access

Over 12% of urban populations around the world still use solid fuels for cooking and heating needs.[47] While biomass use is more concentrated in rural areas—with over 60% usage[48]—and improving access to clean energy does not necessarily reduce GHG emissions, reducing the use of inefficient and polluting biomass is still essential for improving livelihoods of poor urban communities, especially women. Technologies like solar water heaters, biogas digesters, improved cookstoves, kerosene, and liquefied petroleum gas (LPG) can be implemented at the household and community level to replace traditional biomass fuels. However, affordability of technology and access to electricity are limiting factors to energy access in both poor rural and urban communities (read more in Chapter 4.1).

Transport

Transport, although one of the sectors where energy is used, is usually treated separately because of its specific characteristics and mitigation options. The transportation sector accounts for 14% of global GHG[49] emissions and is projected to grow substantially, particularly in developing countries. Improved transport policy, with a decreased dependency on private vehicle transport, can have a significant impact on the mitigation of GHGs, especially in dense urban areas where public transport can be efficiently used. To achieve GHG emissions cuts, cities can improve the infrastructure for non-motorised transport, expand and enhance public transport, and at the same time discourage individual motorised transport. Short-term technical measures include cleaner vehicles, improvements of the vehicle fuel economy, and of the efficiency of freight systems. More fundamental policies to influence mobility demand, in the mid- and long-term, include urban development, in particular avoiding urban sprawl and fostering transit-oriented development by concentrating new developments along existing public transport lines.

The gender dimensions for mitigation within the transport sector have clearly been identified given extensive evidence on gender-differentiated travel patterns, purposes, and the type of transport used (i.e., percentage of users per mobility type, such as walking, biking, public transport, and motorized individual transport). Women also tend to have more complex trip patterns, prompting the need for adequate public transport services accommodating not only commuter trips from home to the workplace and back, but also trips that involve shopping, bringing children to school, and looking after elderly family members. Women travel for more diverse reasons and are using sustainable transport modes more often than men,[50] either because they chose to do so or cannot afford private transportation. Statistics from the transport sector, for example, in high, middle, and low-income countries show that

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men are more likely to use cars for travel to work and for leisure, while women tend to work closer to, or at home, and make more trips for family care, largely relying on public transport.[51,52,53]

However, for those that do choose public transport options, there is an increased instance of sexual assault.[54] The lack of safe transportation options is constraining to women's mobility and can even lead

girls and women to drop out of school, or dismiss economic ventures and employment.[55] However, measures to improve women's access to private transportation are not necessarily conducive to climate mitigation policy. Thus, focus should instead be placed on creating accessible, affordable, and safe public transport policy and systems taking into consideration influence on social inclusion or exclusion.[56]

Box 8: Safety on urban public transport systems

Auditing safety in urban areas is becoming increasingly popular in an attempt to provide alternatives to dimly-lit roads, dark, empty bus stations, and deserted parking lots, which pose significant threats to vulnerable people, particularly to women. There are several safety measures being taken around the world to reduce risk and offer environmental and social co-benefits with implementation. For example, Jagori, an Indian not-for-profit organisation, started conducting safety audits in 2007 and has so far audited seven cities in India with plans to expand to Bogotá and Jakarta in order to improve the safety and reduce risks in public transportation.[57] In Bogotá measures to include gender considerations in the development of its bus rapid transit (BRT) system, TransMilenio, were implemented which provided reserved seats and separate doors for vulnerable

people. In addition, an anti-sexual harassment campaign and new security program to reduce the assaults on women in public transport was initiated.[58] In Montreal, Canada the 'Between Two Stops' initiative enables women to get off the bus between two stops at night so they can be closer to their destination, which increases safety, mobility, autonomy, and empowerment of women, while encouraging the use of public transit.[59] Additionally, Kathmandu, Mexico City, and cities in Japan, Brazil, Egypt, Russia, and Iran have taken steps to introduce women and children-only buses and subway cars to decrease instances of sexual harassment.[60] However, with ever-growing populations, these initiatives are not enough and many cities still report high rates or harassment on public transit, prompting the need for more awareness towards women's safety in development planning.[61]

These are issues cities should address when working towards accessible, affordable and safe transport for all, in order to tap the potential to contribute to both GHG emissions reductions and gender equality. Potential measures regarding public transport include enhancing the infrastructure (e.g., introducing or expanding bus rapid transit systems) as well as introducing tariff systems that respond to the needs of women and address safety issues by offering well-designed and well-lit bus stops, and once the systems are in place, ensuring equitable access to newly created jobs.

Migration, settlements and housing

Land and housing are economic resources that also have power dimensions, bringing social benefits, such as the improved status of those who own, control, or have access to them. While it is clear that climate change has the potential to exacerbate existing inequalities in a variety of ways, in cities this might involve the expansion of informal urban settlements stemming from rural-urban migration due to climate change impacts and other problems in rural regions. Furthermore, studies have highlighted that in some regions rural-urban migration is already linked to climate impacts in rural areas, with increasing food and water scarcity expected to further accelerate the rural-urban drift in developing countries.[62]

Box 9: Housing

The poorest urban inhabitants are often women, crowded together in areas and housing that is most exposed to climate hazards. They are also often without resources or information to build their resilience, or adapt to the impacts—a result of socially constructed gender roles and ongoing discrimination:

- In the largest slum in South East Asia in Tondo district of Manila, an area prone to typhoons and flooding, 80% of adult slum dwellers are women.[73]
- 60% of the population of Nairobi live in slums, with women in these slums being five times more likely to be unemployed than men.[74]
- 40% of the poorest households in urban areas are headed by women.[75]

The migration of women into these areas has resulted in a relatively high rate of women-headed households among the urban poor, further exacerbating poverty conditions for women and their families based on the social structures and barriers present. In Kenya, for example, where women head 70% of all squatter households, over 25% of women slum dwellers migrated from their rural homes because of land dispossession. Rural women who migrate into urban areas face unique challenges associated with coming from poor families with a lack of education or skills, and who find themselves in poorly paid jobs, or working in the informal sector. These women often face security risks, especially those from ethnic minority groups, who are not equipped with the linguistic skills of the dominant language of the area. Similar observations have been made in the Philippines where women from fishing communities, who were grappling with the harsh impacts of climate change, migrated locally into cities to work as domestic helps for affluent families, creating an additional set of locally-specific challenges. However, responding to housing issues in low- and middle-income countries, means upgrading informal settlements in collaboration with slum-dwelling groups—rather than merely relocating slums to remote areas where the exclusion of marginalised groups, particularly women, might be exacerbated by a lack of opportunities for livelihoods and access to jobs.

Box 10: Urban heat islands and green spaces

Urbanisation poses a substantial threat to city populations. Increasing average temperatures lead to a more intense 'heat island' effect, meaning metropolitan areas are significantly warmer than the surrounding rural or less-developed areas due to human activities and infrastructure. This heat can increase the amount of fatalities and health issues in cities during extreme heat events and contributes to water and air pollution.[63,64] One way to combat these effects is the implementation of urban 'green spaces.' Green spaces also provide outdoor areas for recreation and leisure time and the increased vegetation improves the air quality and increases heat absorption of urban heat islands. There is mounting evidence that green spaces and biodiversity offer health benefits to city dwellers, but they also offer protection against hazards and build resilience of the surrounding environment.[65,66,67,68] It is important to identify design features that are sustainable, provide health benefits and promote the 'greening' of cities—which can include cleaning, removal of debris and toxins, planting grass and trees, and installation of infrastructure from natural materials.

Displacement resulting from the interlinkages of climate change impacts and conflicts often lead to women suffering a substantial loss of material assets, networks, and family members, forcing them to migrate to urban areas.[76] Unfortunately, the new urban inhabitants are met with settlements in cities that are particularly exposed to climate-related risks such as flooding, landslides and heat waves and very often lack basic services such as clean water and sanitation. This generally reduces their ability to respond and adapt in difficult circumstances to the effects of climate change. To ensure women's rights to land and property are not limited by social norms and traditional practices, governments need to put in place effective land reform campaigns, which will provide pro-poor and gender-responsive policies and programmes.[77]

The gender dimensions of climate-related migration are also evident during or directly after a climate disaster when movement in and out of cities can dramatically change demographics in urban and rural areas. In the case of New Orleans, after Hurricane Katrina, it was primarily men who returned to the city to undertake rebuilding, resulting in the prolonged absence of women and children in cities. This migration can place additional burden on the families of migrating men leaving them vulnerable to harassment, sexual violence, and potentially economic hardship.[78]

Water management

Cities are impacted by precipitation and storm-induced risks that result in a surplus of rain in a short timeframe, leading to inland flooding and landslides. They can also be impacted by lack of precipitation, which can result in drought, water shortages, crop failures and food price increases. Therefore, water, and its management, is relevant in the context of both adaptation and mitigation. Issues such as sea level rise, drainage, and wastewater are crucial when considering adaptive measures. Yet, mitigation responses, for example through energy efficiency improvements in the water supply system and side management—including water saving measures that subsequently lead to energy savings—also need to be considered.

Twenty-seven percent of urban populations in the developing world do not have piped access to water.[79] While water infrastructure is improving, more people are moving from rural to urban areas, undermining any progress made.[80] Changes in supply and demand of potable water will mean more stress placed on water supplies to the urban poor. In addition, saltwater intrusion from sea level rise threatens freshwater supply in cities along the coast, leaving populations without a reliable source of drinking water. Many urban residents are forced to buy water in small quantities for high prices from private suppliers or spend significant time collecting water from wells. Women and girls typically take responsibility for fetching water when supply is poor, and this can take hours out of their day, reducing time for education, employment, childcare and rest.[81] Because women tend to spend more time than men in the home and neighbourhood, they are also more directly exposed to environmental hazards of poor sanitation—with risk of disease caused by poor drainage, contact with human faeces, and decomposing rubbish.

One study looking at urban areas in India noted "relatively less is known about how women's participation unfolds in the urban context [compared to rural areas] where the poor are faced with a different set of challenges."[82] However, attention to gender issues in the design and implementation of urban water and sanitation programs can bring wide health, social and economic benefits to women and their communities. For example, women's groups in the Tiruchirapalli district in India improved access to water and sanitation services by installing water facilities and individual toilets in slums and informal housing communities to address the poor sanitation conditions.[83]

Disasters

Disaster risk reduction (DRR) is one of the priorities for adaptation for many cities, as populations, especially in developing countries in low-elevation coastal zones are particularly vulnerable to sea level rise and extreme weather associated with climate change. Risk assessment in times of climate change is one of the first steps cities use to undertake in order to prepare a new, or revise an existing, DRR strategy. These strategies usually include improving early warning systems, building capacity and training, strengthening disaster preparedness for effective responses, and reducing underlying risk factors. The latter should involve a broad set of measures to build resilience, in particular for the poor, including measures in the various sectors mentioned above.

Rape, domestic violence, and gender-based violence are common post-crisis and disaster situations, placing women and girls in especially vulnerable positions. Income insecurity is also a concern as women more often work in informal sectors that are disrupted post-disaster.[84] Subsequently, more women than men die as a result of natural disasters.[85] This is especially prevalent in countries where women have low social status and little access to resources. In many areas, women have little access to early warning systems for weather events and post-disaster services due to social norms.[86]

> **Through empowerment and involvement of women in DRR and management, the devastating impacts of climatic disasters can be curbed. This is a field of action where much guidance on the integration of gender is available; a range of resources are provided by the Gender and Disaster Network, Federation of Red Cross and Red Crescent Societies, and Oxfam, for example. Furthermore, the Hyogo Framework for Action and the current Sendai Framework for Disaster Risk Reduction provide gender-sensitive guidance and tools (Chapter 3 on DRR).**

Consumption

The top 25 cities in the world create more than half of the world's financial wealth but globally, cities today also account for 75% of global energy consumption and 80% of GHG emissions.[87] Simultaneously, cities, in particular in the developing world, are the hubs of consumption, and often of over-consumption. In general, carbon footprints of individuals and households are directly correlated with income and spending—those who are well-off live in larger dwellings, own more energy-consuming devices, drive larger motorised vehicles and consume more goods and services, thus having a relatively large carbon footprint. This has a clear correlation with cities in the increasing incidence of poverty and exclusion, particularly on women and girls. Consumption-based carbon footprints have also a gender dimension, firstly, because of the gender income gap, and secondly, because of differing preferences and attitudes—largely a product of socialised gender roles.

Due to rapid rate of development in the last decades, per capita variations do not necessarily replicate the distinction between industrialised and developing countries. Indeed, within high-income countries, a larger proportion of citizens live in affluence compared to those in middle and low-income countries, where poverty is more widespread, sometimes affecting the majority of the population. While extensive changes are arguably required at the level of industry and production, and not just at consumer-level, recognising that dynamics related to consumption are frequently shaped by notions of masculinity, femininity and other markers of 'status', can nevertheless be relevant for tackling the drivers of climate change.[88]

Box 11: 1 Million Women

An Australian climate change mitigation initiative, 1 Million Women, founded in Sydney, is tapping into women's decision-making power to reduce consumption and waste, contributing to energy savings, and thus reducing carbon emissions. This campaign aims to inform members that it is possible to take small steps in our daily lives to make differences that combat climate change. By mid-2015 the organisation has engaged with over 202,000 members who pledged to reduce their emissions by being climate-conscious in their daily consumption and management of waste. The aim of the initiative is to reach the target of one million women members, which has the potential to reduce over one million tonnes of CO_2-equivalent—commensurate with taking 240,000 cars off the road for a year.[89]

READ MORE IN CHAPTER 7!

TAKING ACTION ON CLIMATE CHANGE IN AUSTRALIA: 1 MILLION WOMEN ARE SAVING ENERGY, REDUCING WASTE, CUTTING POLLUTION AND LEADING CHANGE
1 Million Women

Waste management

In 2010, waste and wastewater accounted for about three percent of global GHG emissions.[90] In many countries, local governments are in charge of managing waste, in particular solid waste from households. The amount of waste produced is increasing in many countries, and the share of solid waste recycled at the municipal level is still low at around 20% globally.[91] While there are elaborate waste management systems in place in most cities in high-income countries, these are lacking in middle and low-income countries, and often use funding from the private sector as public funds are decreasing for waste management for organised and formal collection, transportation, treatment, processing, separate collection, recycling, composting and disposal of waste. Instead, there is often a large informal sector involving a high share of women who make their living from waste collection and/or recycling.

The informal 'waste-pickers'—who make a living collecting, sorting, recycling and selling valuable materials others have thrown away—perform 50-100% of ongoing waste collection in most cities in developing countries, at no cost to the municipal budget.[92] But despite waste-pickers contribution in their cities in many ways, they often live and work in difficult, dirty, and unhealthy circumstances, and suffer from extreme poverty and very low social status—and women can bear the brunt of this activity and thus marginalization. With waste picking being a viable livelihood option in many urban environments, participants in cities on every continent report that the privatisation of waste collection is the biggest threat to their income and economic empowerment.[93] However, there are successful examples of cities that have contractual arrangements with waste-pickers, such as in Kampala, Uganda and in Cartagena, Colombia, where a judicial order helped the city integrate waste-pickers into the public waste management system.[94]

READ MORE IN CHAPTER 7!

LIFE OUT OF PLASTIC IN PERU: WOMEN INNOVATING NEW WAYS TO CLEAN UP PERU'S COASTS

L.O.O.P. with support from Conservamos Por Naturaleza and the Ministry of Environment in Peru

Box 12: Women's role in waste management and recycling

Considerable differences in the gendered distribution of labour exist in waste management and recycling. While not an exclusively urban issue, studies have shown health issues stemming from waste collection tend to be concentrated in densely populated areas, with particularly severe impacts for women's health and reproduction.

A recent study on women and their role in processing electronic waste, or e-waste, revealed that women in India's Dalit caste, for example, are at the bottom of the e-waste recycling hierarchy and are thus disproportionately affected by its risks.[95] As part of a growing informal workforce, they are usually poorly outfitted to do their jobs and are forced to use low-tech tools to extract the precious metals and reusable components of e-waste, and are burdened with the most undesirable and dangerous tasks, including using acid baths to reclaim precious metals. The study explores the consequences of this gendered division of labour, highlighting that while many women choose waste work because it is stable offering enough income to support a family with flexible hours that permit women to care for their children, the health concerns stemming from e-waste pose a particular risk for women's morbidity/mortality, and fertility, as well as the health of their children. Of the 14 general types of hazardous chemicals commonly found in e-waste, more than half are said to affect women's general reproductive and endocrine functions.

Urban agriculture

As climate change impacts food yields in rural areas, increased food production in cities will become an increasingly pertinent discussion. Urban agriculture has potential to improve food security for urban populations, provide nutritious food to the urban poor, and offer opportunities for families to earn additional income. Women play an especially critical role in household food production through cultivation of small-scale vegetable gardens and the raising of animals. Women's role in feeding urban populations through subsistence farming has largely been ignored by city officials who favour more industrialized food production that has traditionally been headed by men.[96] A study from Hyderabad, India on gender dimensions of urban and peri-urban farming suggests that women's roles in urban farming are a crucial element in urban food production and food security, and that resources must be focused on gender-equitable access to land, education, and capacity building to contribute to economic growth and social progress.[97]

Finance

New infrastructure affords opportunities for cities to take climate change mitigative and adaptive strategies into account and plan with a more resilient mindset. While the initial investment for climate change adaptation in cities can be staggering, many estimates for investment fail to consider returns on investment through avoided infrastructure costs as well as energy savings and lower fuel costs. Also, they fail to include the benefits of avoided health care or emergency response costs for populations living in these areas. A more complete calculation of costs and benefits would encourage cities to take more decisive action to simultaneously address climate change and social issues.

Climate finance is available to help cities to "shift all resource flows towards low-carbon, climate resilient options."[98] In 2009, the World Bank estimated that future climate adaptation and mitigation funding through the UNFCCC and other sources would be capped at USD 100 billion each year.[99] While this is a large sum of money, the World Bank also estimated that adaptation and mitigation strategies could cost up to USD 275 billion per year.[100] However, a study of the approved climate financing in developing countries by multilateral climate funds from 2010-2014, found that only USD 842 million has been explicitly used for urban projects in support of low-emission and climate-resilient development. This equates to only a little over one in every ten dollars spent on climate finance over the past five years, specifically designated for urban projects. The majority of this financing is supporting transportation systems in fast-growing middle-income countries with very little dedicated toward adaptation projects.[101]

Women, in their roles as consumers and household managers, would particularly benefit from household-scale energy-efficiency projects and public transit projects. Such small-scale labour-intensive projects are often not funded under mechanisms relying on market forces, because transaction costs constrain economic viability. This impacts women's ability to access markets and financing for projects and therefore women are less likely to benefit from climate financing, particularly larger scale finance from multilateral finance mechanisms.[102] (Read more about gender in climate financing ahead in Chapter 6.)

5.4 Moving forward

Without purporting to be an exhaustive account of the gender-related challenges or considerations specific to urban areas, this chapter touches upon key issues related to various sectors and discusses some important interlinkages between them, illustrating a need for gender-responsive urban climate policies that address human settlements and work towards low-carbon development, mitigation, adaptation, and resilience.

The importance of urban development in climate change policy is already recognized by international commitments at UNFCCC and in the Sustainable Development Goals (SDGs), especially Goal 11, which indicates an effort to, "Make cities and human settlements inclusive, safe, resilient and sustainable."[103] To meet this and other relevant SDGs—including addressing poverty, achieving gender equality, and taking action against climate change—city planners and local governments must engage in creating gender-responsive climate change strategies that are mainstreamed across crucial urban planning sectors. This includes developing an internationally accepted standard for quantifying GHG emissions from cities and urban areas, addressing gender specific priorities, needs and issues in sectors, ensuring gender inclusive language is integrated throughout urban policies and procedures and promoting sustainable, adaptive, and resilient growth. A strong financial backing is required for sustainable urban planning as current funding streams are falling short of enabling planning and action that is prompting safe and prosperous urban environments that are resilient to climate change. These strategies are especially important as populations continue to shift toward urban centres, expanding urban sprawl and leaving poorer populations, particularly women, in potentially dangerous, disadvantaged and vulnerable positions if gender is not considered and included. While actions taken will vary according to context, it is recommended that cities indicate their commitment to gender-responsive action on climate change at the local level.

A range of existing methods and tools can be applied by cities to assess and improve their climate policies—particularly to be inclusive and gender-responsive. Policy makers faced with the task of considering how to integrate these could address the following aspects:

1. The gender balance in planning and decision-making bodies should be improved. The equal and meaningful participation of women and men needs to be ensured in processes and consultations with stakeholders. For this purpose, it is advisable to build a climate change team of local government officials that also involves the departments in charge of social and gender issues.

2. For climate policies to be effective, they must respond to the needs of citizens. This means that community-based participatory processes are required. This is particularly true for adaptation and resilience, and there are well-documented methodologies available, such as community-based adaptation.

It is important to note that the unequal power relations between men and women and the prevailing traditional gender roles often lead to the unequal representation and participation

of women and men at a community and neighbourhood level. Special provisions and arrangements are therefore necessary to ensure the equal participation of women and to enable them to articulate their needs, preferences and opinions. However, gender balance and equal participation alone do not necessarily result in gender awareness. Thus, specific gender expertise is necessary to integrate a gender-sensitive approach in urban climate policy processes.

3. Local governments can make use of Gender Impact Assessments (GIA) when prioritising, designing or adjusting interventions. These assist in revealing relevant inherent gender issues in initial planning stages by assessing the impact of planned programs and projects on women and men, as well as on gender relations. It is then possible to assess whether the planned programs and projects support or impede the attainment of gender equality.

4. A gender-sensitive approach to urban climate policy requires the application of gender budgeting in order to create enabling policy frameworks, build capacity and strengthen monitoring mechanisms to support accountability to women and improve gender equality. Some cities already apply this tool in certain sectors, and gender budgeting in the field of urban climate policy can specifically assist local governments in monitoring the allocation of resources and analysing gender-differentiated impacts. It helps to determine if public spending reaches women to the same extent as men and whether gender equality is promoted.

These tools can be used to address issues of equitable rights, governance, and access to decision-making, and are applicable throughout all sectors in urban environments. They have particular opportunities for progressing political and physical structures to support enhancing gender dimensions in urban policy, planning, and development. However, since the consideration of gender within urban climate policy is relatively new, research on adaptation, mitigation, and resilience in urban areas should expand to ensure gendered preferences are considered in the policy making process, with a focus on gendered differences in accessing information, technology, and financing. Cities have the potential, and seemingly the political will, to be leaders in addressing climate change issues and social inequities in adaptation and mitigation planning. As urban environments rapidly develop, integrating new resilient infrastructure and gender-responsive approaches will support a more comprehensive realization of the commitments toward and need for cities to be low-carbon, sustainable, equitable, inclusive, and gender-just as they progress in combating climate change.

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