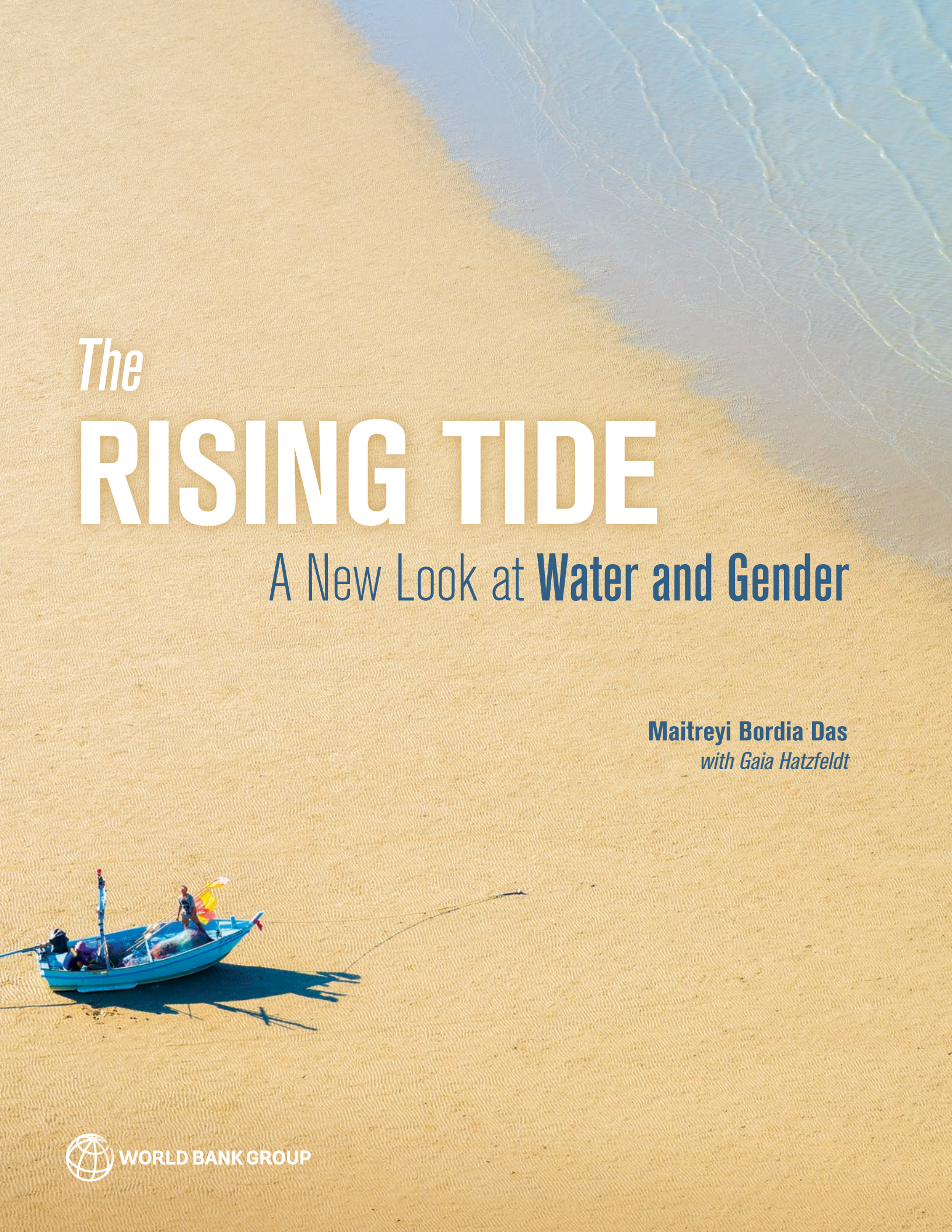


The RISING TIDE

A New Look at **Water and Gender**

Maitreyi Bordia Das
with Gaia Hatzfeldt

WORLD BANK GROUP

About the Water Global Practice

Launched in 2014, the Word Bank Group's Water Global Practice brings together financing, knowledge, and implementation in one platform. By combining the Bank's global knowledge with country investments, this model generates more firepower for transformational solutions to help countries grow sustainably.

Please visit us at www.worldbank.org/water or follow us on Twitter at https://twitter.com/search?q=%40WorldBankWater&src=tyah.

The RISING TIDE

A New Look at **Water and Gender**

Maitreyi Bordia Das
with Gaia Hatzfeldt

WORLD BANK GROUP

1818 H Street NW, Washington, DC 20433
Telephone: 202-473-1000; Internet: www.worldbank.org

Please cite the work as follows: Das, Maitreyi Bordia. 2017. “The Rising Tide: A New Look at Water and Gender.” World Bank, Washington, DC.

Cover photo: © David Bokuchava/Shutterstock.
Cover design: Kamila Galeza/Bill Pragluski, Critical Stages, LLC.

Contents

Boxes

Figures

Tables

Foreword

Issues of equity and inclusion are currently center stage on the world's policy agenda. Ensuring that nobody is left behind has been a cornerstone of recent global agreements and commitments, and closing gender gaps is among the most effective ways to make this ambition a reality. So how do we think about gender gaps in the broad canvas that water offers? The task, while daunting, is essential if we are to contribute to delivering the Sustainable Development Goals and the World Bank Group's commitment to end extreme poverty and boost shared prosperity.

The World Bank recently launched an exciting new initiative—the Global Water Security and Sanitation Partnership (GWSP). Inclusion is one of GWSP's five priority themes for the World Bank's Water Global Practice. That is because water belongs to everyone, yet many are excluded from its benefits and often from ownership and control of this critical resource. Ensuring that a project is inclusive requires better knowledge on the nature of water inequality and enhancing the capacity of practitioners and policy makers for better outcomes. Gender equality rests squarely within this broad commitment.

The World Bank Group also embarked on a new Gender Strategy, one that commits us to working toward closing gender gaps through four key objectives: improving human endowments; creating more and better jobs; increasing women's ownership and control of assets; and enhancing women's voice and agency, while engaging men and boys. The new strategy aims to help countries go the last mile in addressing long-standing challenges, such as maternal mortality, while tackling emerging challenges, such as aging populations, climate change, slowing economic growth, and the global jobs crisis.

In the context of these ambitious commitments, *The Rising Tide: A New Look at Water and Gender* reviews a vast body of literature and offers a framework for visualizing water as an asset, a service, and a space. It shows how water is an arena where gender relations play out in ways that often mirror inequalities between the sexes. And it examines how norms and practices related to water often exacerbate ingrained gender and other hierarchies. Informal institutions, taboos, rituals, and norms all play a part in maintaining these hierarchies and can even reinforce gender inequality.

The report's key message is clear—interventions in water-related domains are important in and of themselves and for enhancing gender equality more broadly. The report discusses examples of initiatives that have had intended and unintended consequences for gender equality, and makes the important point that gender inequality does not always show up where we might expect. The report underscores the importance of good diagnostics before designing actions.

Over the past 20 years, a rising tide of social, economic, and technological trends has lifted many boats, but still too many have been left behind. We believe this report will help those who want to advance social inclusion in water, close gender gaps, and lift those who all too often are left behind or left out.

Guangzhe CHEN
Senior Director, Water Global Practice

Caren Grown
Senior Director, Gender

Acknowledgments

This paper was written by Maitreyi Bordia Das with Gaia Hatzfeldt, under the guidance of Guangzhe CHEN, Senior Director, Water Global Practice. The formal peer reviewers were Kiersten Johnson (USAID), Aude-Sophie Rodella, Caroline van den Berg, and Emcet Tas (World Bank). Written comments also came from Louisa Gosling (WaterAid) and Erwin De Nys, Anders Jagerskog and Libbet Loughnan of the World Bank. The team is grateful for their advice and comments.

Valuable inputs early in the process or through discussions on successive drafts were received from World Bank colleagues Luis Andres, Christian Borja-Vega, Claire Chase, Tamoya Christie, Benedicte De La Briere, Caren Grown, Jing Guo, Sabrina Haque, Ede Ijjasz-Vasquez, Soumya Kapoor-Mehta, Toyoko Kodama, Aphichoke Kotikula, Craig Kullmann, Nishtha Mehta, Kristina Mikulova, Rosemary Rop, Vivek Srivastava, Chris Walsh and Martha Chen (WIEGO).

Esha Chatterjee and Zakia Nouri provided inputs to the larger review of the literature. Kamila Galeza conceptualized the graphics and designed the cover, in addition to providing valuable comments on various drafts. Alona Nesterova provided logistical assistance. Finally, Isabel Hagbrink and Martin Hall gave valuable advice on communications and Erin Barrett provided publications assistance.

Abbreviations

ADB	Asian Development Bank
AWWEE	Association of Women in Water, Energy and Environment
GP	Global Practice
GWSP	Global Water Security & Sanitation Partnership
ICT	information and communications technology
ILO	International Labor Organization
IWA	International Water Association
KP	Khal Panchayats
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MHM	menstrual hygiene management
PWWA	Pacific Water and Wastewater Association
SDG	Sustainable Development Goal
SEWA	Self-Employed Women's Association
STEM	science, technology, engineering, and mathematics
UN	United Nations
USAID	United States Agency for International Development
WASH	water supply, sanitation and hygiene
WHO	World Health Organization
WIEGO	Women in Informal Employment Globalizing and Organizing
WAAW	Working to Advance STEM Education for African Women

Summary

Main Messages

1. Water can be thought of as *an asset, a service, and a space*. It has distinct economic, as well as noneconomic and nonmonetary values. In many cases, the latter values are spiritual or social and the underlying norms and practices that play out are often deeply gendered.
2. Water is an arena where gender relations play out in ways that often mirror inequalities between the sexes. For instance, women's lower access to land is mirrored in their lower access to water-related natural resource assets.
3. Gender inequality in water, as elsewhere, reflects complexities that are not easily predicted. For example, not all women are disadvantaged, nor all men privileged. People have multiple identities based, among other things, on their ethnicity, race, caste, religion, socioeconomic status, location, disability status, and sexual orientation. The intersection of identities creates unique situations that require specific solutions.
4. Norms and practices related to water often exacerbate ingrained gender and other hierarchies. Informal institutions, taboos, rituals, and norms all play a part in cementing the status quo. Therefore, water often reflects, and even reinforces, gender inequality.
5. Interventions that balance gender relations in water-related domains can have a strong influence in furthering gender equality more broadly.
6. The nonmonetary, noneconomic values of water are important for policy and practice. That is because they influence the behavior of individuals and groups, particularly their response to water-related reforms or interventions.
7. Policies and programs can influence change. They are particularly effective when they improve the ability, opportunity, and dignity of those likely to be left out.

Water encompasses every aspect of life, and since individuals have gender identities, the relationship between water and gender is salient to progress on water security and gender equality more broadly. Water is so intricately linked with social, economic, spiritual, and cultural systems that it becomes a theater for the play of social and gender relations.

The relationship between water and gender plays out in at least four critical ways.

First, the relationship between water and gender mirrors gender inequalities in various realms. These include, among others, ownership and control over assets, employment, wages, household division of labor, exposure to and management of risk, access to services, and decision making, all of which are often mirrored in water-related domains.

Second, water has unique noneconomic and nonmonetary values, such as in the spiritual and social realms, with underlying norms and practices that are often deeply gendered. Why does

this matter for policy and practice? It is important because such values have a bearing on the behavior of individuals and groups, especially their responses to water-related reforms or interventions, since belief systems often mediate human actions. For instance, people may actively boycott or passively reject a policy reform if it goes against their belief system.

Third, noneconomic, nonmonetary values of water are important not only because they may impede or enable behavior change, but also because they are often active instruments to solidify hierarchies and the status quo, such as through taboos, rituals, and norms. These affect men and women differently.

Fourth, the relationship between water and gender presents an opportunity, since water in many ways mirrors and even reinforces gender inequality. Therefore, it follows that interventions that equalize gender relations in water-related domains also influence gender equality overall. This makes the relationship between water and gender of interest to professionals working in water-related domains, and to those interested in social inclusion and gender equality more generally. Since water spills over to many different domains, interventions toward greater gender equality in water transcend water-related "sectors" and need to be embedded in other "sectors" as well, such as in agriculture, health, education, and information and communications technology, to name a few.

Why Water and Gender, and Why Now?

This is an opportune moment to reflect on the deep association between water and gender, because of large-scale shifts in global trends and patterns. Social and economic changes that would have been impossible to foresee even 20 years ago, globally and within most countries, seem to be unfolding right before our eyes. Poverty has declined; households have more assets than ever before; educational attainment has risen for males and females; the demographic transition is firmly in place (even while population is declining in some countries); and infrastructure-based services have improved across the board, including in water supply and sanitation. Women's status has advanced almost everywhere; more women are visible in public places; and there is greater awareness of different types of inequality and more spaces to discuss them. A new formulation of gender has taken root in many countries—away from the male-female binary, and broader than the more dated heteronormative formulation. The advent of social media has transformed modes of communication and new hopes and fears abound. This is a rising tide.

The proverbial tide has lifted many boats, but has left others behind. Individuals and groups who belong to certain ethnicities, religions, tribes, castes, races, disability statuses, locations, or sexual minorities have not been lifted by the rising tide. They have lower access to assets, such as land, water, and housing, and to services like education, health, and childcare, as well as water supply and sanitation, waterways, and other transport. They fare worse in the labor and credit markets and have lower access to physical, political, and social spaces. They are disproportionately affected by poor water governance and scarcity. Each of these has implications for water-related domains on the one hand

and social inclusion on the other, with gender equality being an important aspect of the progress toward social inclusion.

Given the shifts in global trends, there is increasing recognition about the importance of social inclusion more generally and the role of water in achieving it. The World Bank Group's Water Global Practice (GP) has made three important commitments over the past few years:

- Contributing to achieving the Sustainable Development Goals (SDGs)
- A new Gender Strategy (2016-23)
- The new Global Water Security and Sanitation Partnership (GWSP).

The framing in this paper is in keeping with Goal 6 of the SDGs, which covers water in broad terms. The framework is also aligned with Goal 5 on gender equality. Moreover, its underlying principle of social inclusion is squarely in keeping with the tenets of the Universal Declaration of Human Rights. Each of these global commitments underscores the importance of "leaving no one behind"—the rallying cry of Agenda 2030—which acknowledges exclusion based on gender as an important part.

The World Bank's Gender Strategy announced in 2015 has raised the bar for deepening gender equality in World Bank Group operations. This paper is part of the Water GP's commitment to further deepen its work on gender.

Finally, the new multi-donor trust fund, the GWSP, commits the Water GP to five priority themes. The theme of "inclusion" reflects a renewed commitment to address gender issues. GWSP aims to do this by furthering knowledge, deepening capacity, and making the World Bank's water portfolio more attuned toward social inclusion and gender.

What Does This Paper Do and Whom Is It For?

This paper adapts the framework for social inclusion developed by World Bank (2013) to build a "thinking device" to help visualize the relationship between water and gender. The device and this paper build on a small but solid body of literature that conceptualizes various aspects of the relationship between water and gender. It views water in all its forms and manifestations. Although daunting, it is essential for understanding the interplay between gender and water in its complexity and nuance. To our knowledge, this is one of the very few analyses that takes such a broad view of water and makes the connection to gender inequality. The intended audience for the paper comprises academics, policy makers, development practitioners, and private sector actors, to enable them to think about the complex and distinct ways in which water and gender interface with each other. The paper is expected to assist them in thinking about the design of policies and programs while keeping the nuance and evidence in mind. We also hope it is useful for engaged citizens looking to learn more about these issues.

It is likely that the ambition of the paper will raise legitimate expectations—that it will provide "answers" to questions about what should be done for greater gender equality and how.

The main aim of the paper is to enable broad and integrated thinking about water and gender. In doing so, it frames questions, challenges assumptions, and presents evidence. Indeed, one of its overarching messages is that to get the right answers, we first need to ask the right questions. The paper also reflects on how change toward gender equality can take place, who can drive it, and how. The conclusion indeed provides some pointers about where policy and programming can focus, but this is not a "how-to" piece. It is preceded by a series of "operationally relevant" resources and toolkits intended for World Bank teams to do a better job of integrating gender into their projects.

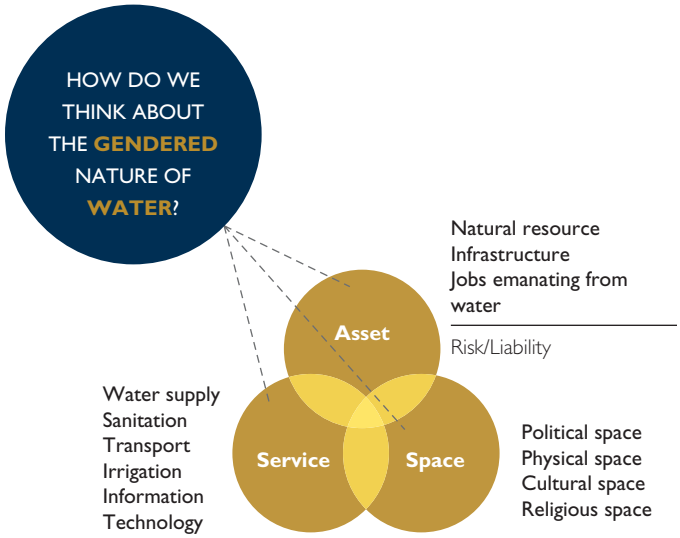
Assets, Services, Spaces: A Thinking Device

The thinking device in this paper sees water as manifesting in three ways—as an asset, a service, and a space—with each manifestation having gendered connotations. Assets arising from water become productive through infrastructure that processes natural resources or transports water, labor that renders assets productive, and technology that aids both. In that, assets are interlinked with employment. However, water can also be a *risk* when it is unexpectedly abundant or scarce, such as during floods or droughts. It can thus be thought of as a *liability* that has different implications for males and females. Climate change exacerbates these risks. The idea of services is slightly more straightforward. Water-related services comprise water supply, sanitation, and hygiene and include irrigation, waterways, and information and technology. In contrast, the idea of spaces is more complex to comprehend. But it is this idea that brings out the physical and esoteric dimensions of water. That is because although water certainly occupies physical space, it also carries cultural, social, political, and religious significance. Therefore, the idea of spaces is at once real and symbolic. Perhaps the most helpful use of the construct of "space" is to highlight the intangible aspects of water—that it is also rooted in belief systems that often dictate human behaviors. The paper also highlights change in behavior, which frequently lies at the heart of reforms related to water, and often depends on cognizance of the nonmonetary, noneconomic, esoteric values of water.

As figure S.1. shows, assets, services, and spaces are interrelated. Sometimes the same element can be an asset and a service and have implications for spaces. Take the example of technology. The infrastructure that supplies technology and the human capital that makes it productive are assets. Yet, technology is also a service when it interfaces directly with citizens. Further, in empowering individuals and freeing up their time, technology is linked to space. The assertion of rights arising from water may involve water bodies as assets, but may also constitute the assertion of political space. Finally, ownership and control of water-related assets confer status and power to individuals and groups. This then enables them to demand and secure services and spaces.

The paper uses the metaphor of a rising tide to highlight both opportunity and the danger that some boats may be left behind. It asks: how can the tide lift more boats? And for whom? World Bank (2013) argues that societies can realize social inclusion by improving

FIGURE S.1. A Thinking Device for Gender and Water



Source: Authors.

the "ability, opportunity and dignity of individuals and groups who are disadvantaged on the basis of their identity." It is clear that not all women are equally disadvantaged, nor all men equally privileged. Age, race, ethnicity, religion, location, socioeconomic status, and occupation all determine advantage and disadvantage. Moreover, every individual has multiple identities. Thus, an indigenous woman who is widowed and has a disability is likely to be far more disadvantaged than a rich widow in an urban setting. However, the latter is likely to have lower voice and status than a man from the same income decile living in the same area and heading a household. In other words, context matters a great deal and exclusion is relative. It is the intersection of multiple identities that intensifies disadvantage, often referred to in the literature on social exclusion as "intersectionality." Further, the construct of gender is not shorthand for women, and the interplay of gender and water does not mean that we need to address only female vulnerability.

Methodology and Process

One of the contributions of this paper is that it is firmly anchored in the literature on water and gender. It draws from a broad-based review, conducted in several stages. In addition, discussions on gender and water in various social media and online platforms were followed to ground the paper in the contemporary discourse on the subject. The review of the literature was supplemented with a series of consultations and discussions with a wide range of actors. They included World Bank staff, development partners, government counterparts from World Bank projects, civil society partners, and researchers.

Three themes dominate the vast literature on water and gender. First, analyses of barriers to water supply and sanitation are preponderant in the literature on services. Although these studies are often strong in data and methods, they usually lack a sound theoretical underpinning that would explain their gendered results. Regardless, when we use relevant results from these studies, and place them within the schema that this paper has developed, they acquire an added salience. The second strand of the empirical literature is on water and agriculture. This strand is empirically robust and theoretically grounded in the feminist and other traditions. The third strand focuses on collective action to secure water rights. It encompasses issues of participation, voice and agency, and decision making.

In terms of disciplinary perspectives, the literature on gender and water comes mainly from economics, anthropology, and geography. Feminist perspectives have made a strong contribution to much of the literature. Although many of the feminist contributions tend to be primarily theoretical and often radical in nature, several are also empirically grounded.

In development policy focus, the dominant fields are agriculture, land, and health. A strand of the literature that focuses on rainfall shocks comes from a social protection perspective, and new literature focuses on the impact of poor water supply and sanitation on education outcomes. Much of the empirical literature comes from South Asia (mainly Bangladesh, India, and Nepal), Africa, and the United States. Consequently, and because innovations in these countries are better documented, admittedly in English, this paper also contains a preponderance of evidence from South Asia and Africa. There is a strong body of feminist literature on social movements and collective action in Latin America, but, perhaps due to the progress in coverage of water and sanitation services and the declining importance of agriculture, much of the literature on gender and water from Latin America is dated. Finally, there is a marked shortage of robust impact evaluations across the board, although there are many case studies documenting process and change. We use these case studies rather sparingly, since most appear to lack a solid methodology.

Shaping the Tide to Lift More Boats

Just as many facets of "water writ large" reinforce gender inequality, it follows that water is a potent instrument to advance gender equality. The tide of progress has lifted many boats. How can we ensure that it lifts many more? How do we help policy and practice in thinking about what could work? As we emphasize the role of water in making a dent in gender inequality more broadly, project personnel may ask the following. "We are extending coverage to an entire area. Should that not lead to benefits across the board? Why emphasize gender inequality here?" Or, "our program deals with water supply. What does gender or social exclusion have to do with it?" These are important questions to address.

It also deserves underscoring that an area-based approach or indeed a household-based approach does not ensure that all members can or do participate. This is because there are significant inequalities in intra-community and intra-household dynamics that often impede the ability, opportunity, and dignity of those who may need the intervention the most. And interventions that focus on just one domain, such as better delivery of water supply, without attention to power relations and inequality, may not reach historically excluded groups, of which women may be one. Deficits in power and status arising from lack of assets in the form of land, boats, or tractors may also make those groups less likely to assert their rights on a new water supply project. In short, not just the design but the delivery of policies and programs matters for gender equality. The paper therefore highlights ways in which progress can be made in advancing gender equality in water-related domains, by following an integrated approach.

The Rising Tide: A New Look at Water and Gender is at once a contribution to the world of ideas and a reflection on the path to action. Using the metaphor of a rising tide that may leave some boats behind, the paper is forward looking and asks: how can the tide lift more boats?

It asks practitioners to start with the right diagnostic of the problem they intend to solve, and emphasizes that *what* policies do is as important as *how* they do it. Finally, it points out that interventions that enhance gender equality in water-related domains need to go beyond water-related "sectors" or ministries. Since water affects every aspect of life, the policies and programs need to be grounded in many and not just a few sectors or areas.

© Flore de Preneuf/World Bank

Chapter 1 Introduction

For Indigenous People, nature is everything, water is everything. We live close to the river and the trees because we draw our daily sustenance from them. Without them, we'd all die.

—Ayoreo woman in Paraguayan Chaco, as told to a World Bank team on video (World Bank 2016b)

Sometimes if I have no money to buy water, I have to close my business.

—Female street vendor, Nukuru, Kenya (Roever 2014)

How do we think about water and gender? It is like asking how we think about the whole world, because water literally encompasses every aspect of life, and individuals have gender identities. But the question is particularly important because the relationship between water and gender is salient to progress on water security and to gender equality more broadly. Water is so intricately linked with social, economic, spiritual, and cultural systems that it becomes almost a theater for the play of social and gender relations.

The relationship between water and gender plays out in at least four critical ways. *First*, this relationship mirrors gender inequalities in various realms, such as, inter alia, the ownership and control over assets, employment, wages, household division of labor, exposure to and management of risk, access to services, and decision making, which are often mirrored in water-related domains. *Second*, water has unique noneconomic and nonmonetary values, such as in the spiritual and social realms, with underlying norms and practices that are often deeply gendered. Why is this important for policy and practice? It is

important because such values have a bearing on the behavior of individuals and groups, especially their responses to water-related reforms or interventions, since belief systems often mediate human actions. For instance, people may actively boycott or passively reject a policy reform if it goes against their belief system. *Third*, noneconomic, nonmonetary values of water are important not only because they may impede or enable behavior change, but also because they are often active instruments to solidify hierarchies and the status quo, such as through taboos, rituals, and norms. These affect men and women differently. *Fourth*, on the positive side, the relationship between water and gender presents an opportunity, since water in many ways mirrors, and even reproduces, gender inequality. It follows that interventions that would equalize gender relations in water-related domains would also have a strong influence in enhancing gender equality overall. This makes the relationship between water and gender of interest not just to professionals working in water-related domains, but to those interested in social inclusion and gender equality more generally. A corollary of this is that interventions toward greater gender equality in water transcend water-related "sectors" and spill over to agriculture, health, education, and information and communications technology, to name a few.

This is an opportune moment to reflect on the deep association between water and gender, because of large-scale shifts in global trends and patterns. Social and economic changes that would have been impossible to foresee even 20 years ago, globally and within most countries, are a reality today. Poverty has declined; households have more assets than they ever did; educational attainment has risen for males and females; the demographic transition is firmly in place (although some countries are seeing a decline in their population); and infrastructure-based services have improved across the board and water supply and sanitation are no exception. Women's status has advanced almost everywhere; more women are visible in public places; and there is greater awareness of different types of inequality and more spaces to discuss them. A new formulation of gender has taken root in many countries—away from the male-female binary, and broader than the more dated heteronormative formulation. The advent of social media has transformed modes of communication and new hopes and fears abound. This is a rising tide.

The proverbial tide has lifted many boats, but has left others behind. Individuals and groups who belong to certain ethnicities, religions, tribes, castes, races, disability statuses, locations, or sexual minorities have not been lifted by the rising tide. They have lower access to assets, such as land, water, and housing, and to services like education, health, and childcare, but also water supply and sanitation, waterways, and other transport. They fare worse in the labor and credit markets and have lower access to physical, political, and social spaces. They are disproportionately affected by poor water governance and scarcity. Each of these has implications for water-related domains on the one hand and social inclusion on the other, with gender equality being an important aspect for progress toward social inclusion.

Given the shifts in global trends, there is increasing recognition about the importance of social inclusion more generally, and the role of water in achieving it. The Water Global

Practice (GP) of the World Bank Group has made three important commitments over the past few years: the Sustainable Development Goals, a new Gender Strategy (2016-23), and a new partnership called the Global Water Security and Sanitation Partnership (GWSP). The framing in this paper is in keeping with Goal 6 of the Sustainable Development Goals, which covers water in broad terms. The framework is also aligned with Goal 5 on gender equality. Moreover, its underlying principle of social inclusion is squarely in keeping with the tenets of the Universal Declaration of Human Rights. Each of these global commitments underscores the importance of "leaving no one behind"—the rallying cry of Agenda 2030—of which exclusion based on gender is acknowledged as an important part. The Gender Strategy of the World Bank (2015) has raised the bar for deepening gender equality in World Bank Group operations. In support of the Gender Strategy, the Water GP has developed an internal "follow-up note" that identifies actions that it can promote to close the gaps between females and males, toward the goal of improving outcomes in the priority areas identified in the strategy. The contribution of the follow-up note is twofold: it identifies the knowledge gaps that the Water GP should pay attention to and points to the way forward. This paper is part of the Water GP's commitment to deepen the agenda on gender. GWSP commits the Water GP to five priority themes, of which "inclusion" is one, with a push to better address gender issues. GWSP aims to do this by furthering knowledge, deepening capacity, and making the World Bank's water portfolio more attuned toward social inclusion and gender.

What Does This Paper Do and Whom Is It For?

This paper adapts the framework for social inclusion developed by World Bank (2013) to build a heuristic device[1] to help think through the relationship between gender and water. In colloquial terms, it is a "thinking device." The device and the paper within which it is situated build on a small but solid body of literature that conceptualizes different aspects of the relationship between gender and water. It views water in all its forms and manifestations—as an asset, a service, and a space, as will be described in more detail. That is indeed daunting, but also essential for understanding the interplay between gender and water in its complexity and nuance. To our knowledge, this is one of the very few analyses that takes such a broad view of water and makes the connection to gender inequality. The intended audience for the paper comprises academics, policy makers, development practitioners, and private sector actors, to enable them to think about the complex and nuanced ways in which water and gender interface with each other. The paper is expected to assist them in thinking about the design of policies and programs while keeping the nuance and evidence in mind.

It is likely that the ambition of this paper will fire legitimate expectations—that it will provide "answers" to questions about what should be done for greater gender equality and how. The main aim of the paper is to enable broad and integrated thinking about water and gender. In doing so, it frames questions, challenges assumptions, and presents evidence. The final exhortation is to start by asking the right questions. That being so, the paper also reflects on how change toward gender equality can take place, who can drive it, and how.

The conclusion indeed provides some pointers about where policy and programming can focus, but this is not a "how-to" piece. It is preceded by a series of "operationally relevant" resources and toolkits intended for World Bank teams to do a better job of integrating gender into their projects. These resources are an addition to the already vast set of resources that assist practitioners in various ways. In that respect, the paper is a view from a distance.

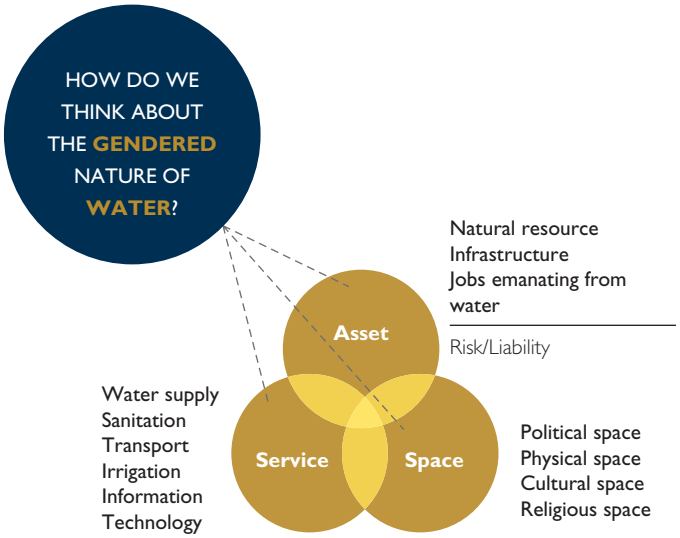
Assets, Services, Spaces: A Thinking Device

Defining social exclusion in terms of social identity and as being about adverse terms for certain individuals and groups that are marked and differentiated by their identity, World Bank (2013) went on to ask—inclusion in what? The answer was: in markets, services, and spaces. Markets comprise land, labor, credit, and housing; services include education, health, transport, childcare, water supply, sanitation, and information and technology. Finally, the idea of "spaces" comprises physical spaces, like cities, schools, and clubs, as well as social, political, and religious spaces. This paper adapts this framework to the relationship between water and gender.

The thinking device in this paper sees water as manifesting in three ways—as an asset, a service, and a space—with each manifestation having gendered connotations. Assets arising from water become productive through infrastructure that processes natural resources or transports water, labor that renders assets productive, and technology that aids both, in that assets are interlinked with employment. However, water can also be a *risk* when it is unexpectedly abundant or scarce, such as during floods or droughts. It can thus be thought of as a *liability* that has different implications for males and females. Climate change exacerbates these risks. The idea of services is slightly more straightforward. Water-related services comprise water supply, sanitation, and hygiene; but they also include irrigation, waterways, and information and technology. In contrast, the idea of spaces is more complex to comprehend; yet, it is this idea that brings out the physical and esoteric dimensions of water. Water certainly occupies physical space, but it also carries cultural, social, political, and religious significance. Therefore, the idea of spaces is at once real and symbolic. Perhaps the most useful use of the construct of "space" is to highlight the intangible aspects of water, that it is also rooted in belief systems that often dictate human behaviors.

Figure 1.1. shows that assets, services, and spaces are interrelated. It is difficult to place them in mutually exclusive categories. Sometimes, the same element can be an asset and a service and have implications for spaces. Take the example of technology. The infrastructure that supplies technology and the human capital that makes it productive are assets. Yet, technology is also a service when it interfaces directly with citizens. Further, in empowering individuals and freeing up their time, technology is linked to space. The assertion of rights arising from water may involve water bodies as assets, but may also constitute the assertion of political space. Finally, ownership and control of water-related

FIGURE 1.1. A Thinking Device for Gender and Water



Source: Authors.

assets confer status and power to individuals and groups. This then enables them to demand and secure services and spaces.

This paper uses the metaphor of the rising tide to highlight both opportunity and the danger that some boats may be left behind. How can this tide lift more boats? And for whom? World Bank (2013) argues that societies can realize social inclusion by improving the "ability, opportunity and dignity of individuals and groups who are disadvantaged on the basis of their identity." It is clear that not all women are equally disadvantaged, nor all men equally privileged. Age, race, ethnicity, religion, location, socioeconomic status, and occupation all determine advantage and disadvantage. Moreover, all individuals have multiple identities. Thus, an indigenous woman who is widowed and has a disability is likely to be far more disadvantaged than a rich widow in an urban setting. However, the latter is more likely to have lower voice and status than a man from the same income decile living in the same area and heading a household. In other words, context matters a great deal and exclusion is relative. It is the intersection of multiple identities that intensifies disadvantage, often referred to in the literature on social exclusion as "intersectionality." Further, the construct of gender is not shorthand for women and the interplay of gender and water does not mean that we need to address only female vulnerability.

Methodology and Process

One of the contributions of this paper is its grounding in the literature on water and gender. It draws from a broad-based review of the literature since 1990. This cutoff year was chosen because it signifies the runup to the Fourth World Conference on Women, in Beijing, just prior to which a substantial body of research was produced on gender and development. The review for this paper was conducted in several stages. The steps are laid out in appendix A. Overall, this work is informed by a review of more than 380 knowledge products. A subset of the larger review is cited in this paper, but a longer bibliography is available upon request. The most important benefit of this laborious review process was our understanding of the strands of literature and discourses on the issue of water and gender. In addition, discussions on gender and water in various social media and online platforms were followed to ground the paper in the contemporary discourse on the subject. The review of the literature was supplemented with a series of consultations and discussions with a wide range of actors. They included World Bank staff, development partners, government counterparts from World Bank projects, civil society partners, and researchers.

The literature on gender and water is clearly vast, as evidenced by the results of our review. This is unsurprising given the breadth of the subject. Three themes dominate the empirical literature. First, analyses of barriers to water supply and sanitation are preponderant in the literature on services. Although they are often strong in data and methods, the analyses usually lack a sound theoretical underpinning that would explain their gendered results. Regardless, when we use relevant results from these studies, and place them within the schema that this paper has developed, they acquire an added salience. The second strand of the empirical literature is on water and agriculture. This strand is empirically robust and theoretically grounded in the feminist and other traditions. The third strand focuses on collective action to secure water rights. It encompasses issues of participation, voice and agency, and decision making.

In terms of disciplinary perspectives, the literature on gender and water comes mainly from economics, anthropology and geography. Feminist perspectives have made a strong contribution to much of the literature. Although many feminist contributions tend to be primarily theoretical and often radical in nature, a large number are also empirically grounded. In terms of development policy focus, agriculture, land, and health are the dominant fields. A strand of the literature that focuses on rainfall shocks comes from a social protection perspective and new literature focuses on the impact of poor water supply and sanitation on education outcomes. Much of the empirical literature comes from South Asia (mainly Bangladesh, India, and Nepal), Africa, and the United States. Consequently, and because innovations in these countries are better documented, admittedly in English, this paper also contains a preponderance of evidence from South Asia and Africa. There is a strong body of feminist literature on social movements and collective action in Latin America, but, perhaps due to the progress in coverage of water and sanitation services and the declining importance of agriculture, much of the literature on gender and water from Latin America is dated. Finally, there is a marked shortage of robust impact evaluations across the board, although case studies documenting process and change are copious. We use these case studies rather sparingly, since most appear to lack a solid methodology.

Roadmap of the Paper

The paper is divided into six chapters. This chapter lays out the motivation and framing of the paper. It introduces the chapters that ensue through a glimpse of the thinking device. Chapter 2 discusses water as an asset, chapter 3 as a service, and chapter 4 as a space. The question of how the rising tide can lift many more boats—in which diverse, gendered individuals and groups travel—is the subject of chapter 5. It is intended to provide examples of initiatives that have directly addressed gender or those that have had incidental and unexpected gendered outcomes. Chapter 6 concludes and provides pointers to where to intervene and how.

Note

1. Scott and Marshall (2009, 267) define a heuristic device as a "procedure which involves the use of an artificial construct to assist in the exploration of social phenomena. It usually involves assumptions derived from extant empirical research. ...(It) is, then, a form of preliminary analysis. (and) is usually employed for analytical clarity, although it can also have explanatory value as a model."

© UN Photo/Logan Abassi

Chapter 2 Water as an Asset

Water is an asset in several ways, but it can also be a liability or risk, in that extreme events related to water, such as floods and droughts, have gendered ramifications. Assets arising from water as a natural resource become productive through *infrastructure* that processes or transports water, *labor* that renders assets productive, and *technology* that aids both. Tourism boosts economies and often relies on water as a natural resource or arena for sports. Infrastructure that processes water in different ways is also an asset on its own. Hydropower dams, for instance, are national or local assets that turn water into power. Reservoirs, irrigation systems, treatment plants, sewerage systems, and waterways are other examples of water-related infrastructure. These can be public or private assets and are often important sources of employment. A large body of global experience on "doing infrastructure" by ensuring that its benefits are shared has accumulated worldwide. For example, social safeguards in most hydropower projects try to ensure that women gain employment during the construction phase. Not just large infrastructure, but smaller infrastructure, such as handpumps, water conservation structures, and toilets, are assets that are owned by the community or individual households. Moveable assets, such as boats, fishing equipment, ferries, and tools and implements that enable the smooth application of water assets to productive use are all assets in their own right. Ownership, control, and decision making about assets in general are deeply gendered, and water-related assets are no exception, as this chapter illustrates.

In practice, water and land are almost inseparable as natural resource assets, especially in rural areas. Individuals and households do not think conceptually about their lived realities, such as whether the body of water on their land is a separate entity, unless they are seeking

legal action, in which case it is sometimes possible to separate the two (Hodgson 2004). Land encompasses water, forests, arable land, nontimber forest products, fish, and other assets. These may be tradable and are often the foundation of status and power, or may simply be usufruct and enforced by formal or informal rules and relationships.[1] The conflation of land and water is perhaps truer in rural areas, where bodies of water are located on or along public or private lands. Rivers, ponds, tanks, irrigation systems, canals, and aquifers may well be public goods and fall within regimes of common property, or be state owned, but they may equally run the risk of being captured by large landowners and elites. For instance, large or upstream landholders may block water from flowing downstream. Countries that have large rural populations and areas are also often agrarian societies, where land and water can be highly contested resources. The urban reality is different. Larger bodies of water, such as ponds or lakes, located within city precincts are often designated as public property and complex systems of land zoning may separate land assets from water assets. For instance, in urban areas, private water assets could be in the form of household-level water systems such as piped water into the home and storage tanks; among wealthier households, they may be in the form of swimming pools or privately-owned water systems.

A significant body of literature focuses on women's exclusion from property, such as land, especially in developing countries, and that this forms the basis of their disadvantage. Property rights regimes are heterogeneous across the world. There is often a disjuncture between de facto and de jure rights that women, indigenous people, those with disabilities, or groups considered in some way "inferior" enjoy (see, for instance, Benda-Beckmann et al. (1997) for examples of regimes as applied to water rights). However, ownership and control of assets related to land and water can attenuate the negative effects of water scarcity, low wages, and other forms of disadvantage (Deininger, Goyal, and Nagarajan 2010). Such ownership is often the basis on which individuals and households claim other benefits. For instance, women may be less likely to receive extension services, information, or technology for irrigation, since women are less likely to own land and other assets, or may be holders of small plots. The same is true of credit. Individuals without assets lack the collateral that would enable them to receive loans. These disadvantages can be addressed if policy and programs specifically address persons without assets, such as through group lending and other microfinance initiatives or by targeting information and extension services to smallholders and women, who often work on farms without owning them.

Decisions about and control over water-related assets are related to prevalent laws and norms and can have important gendered implications. Benda-Beckmann et al. (1997) give the example of the Andes, where women can participate in the construction of irrigation systems and so establish their rights to the irrigation water. These rights can be passed down to their daughters even if they are not linked to rights to the land, but men dominate the written registration process and decision-making bodies. By contrast, in Tanzania, local laws prevent women from operating water infrastructure facilities (Benda-Beckmann et al. 1997).

This chapter shows that women's interface with the gamut of infrastructure is usually as users of services, rather than decision makers.

Jobs from Water: Assets for Employment

Water assets are intimately connected with jobs, since human labor makes water-related assets productive. Scanning the International Standard Industrial Classification of All Economic Activities at the one-digit level gives an indication of the importance of water in almost every industry cluster, of which some, like agriculture and water supply, are the most obvious (UN Statistics Division 2008). Others, such as manufacturing and services, are also closely connected with some aspect of water. However, men's and women's representation in occupations within each industry group varies greatly. This is part of the overall structure of the labor market, where occupational sex segregation and wage differentials are the norm in almost all economies.

Not only is agriculture the largest user of water, it is also the largest employer of women in low-income and lower-middle-income countries. Agriculture is dependent on water, through rainfall or irrigation. Globally, in 2015, one-fourth of all economically active women were engaged in agriculture. Although women's assignment to agriculture has decreased over the past two decades, it is still the most important source of employment for women in low-income and lower-middle-income countries. In Southern Asia and Sub-Saharan Africa, for example, over 60 percent of all employed women are engaged in agriculture (ILO 2016). This may be an underestimate, since women who work on family farms do not always report themselves as being employed. Furthermore, agriculture constitutes an important source of women's unpaid work. A host of norms and practices assign men and women to different tasks within agriculture. Women are more likely to work in rice cultivation and less so in wheat. Such practices vary widely even within countries.

Fisheries constitute a subgroup of agriculture where women play an important role. Women account for almost half of the fishing workforce; about 56 million jobs in the harvest and postharvest subsectors are held by women (World Bank 2012a). Contrary to the conventional portrayal of men as fishers and women as fish sellers and processors, the reality is more complex. In many countries (for example, Benin, Cambodia, the Republic of Congo, Mali, and Thailand), women own boats and may even hire men as crew. Female fish buyers sometimes finance fishing trips in return for a guaranteed supply of the fish caught. In contrast, in Papua New Guinea, women cannot go fishing in the "Mona" (the traditional Mona canoe used for fishing). "Women are not allowed to cross over the Mona or get into the canoe. The act of crossing over the canoe brings bad luck to the fishermen. Women can go fishing but stand in the water and use lines to try and catch fish; they can collect shells."[2] In some parts of South Asia, fishing is associated with certain castes, with clear roles for men and women. Box 2.1 describes the gendered nature of Bangladesh's shrimp industry.

In addition to agriculture and fisheries, women have different levels of participation and employment trajectories in other water-related jobs as well. For example, water-related

BOX 2.1. The Gendered Nature of Bangladesh's Shrimp Industry

Shrimp plays an important role in Bangladesh's economy. It is the second largest foreign currency earner, following the garment industry. A value chain analysis found the shrimp industry to be deeply segmented by sex, with a clear separation of roles and time use between women and men. Women and girls make up 62 percent of processing and exporting work and 39 percent of fry catching, but they are conspicuously absent from all other parts of the shrimp value chain. There are no recorded women working in areas such as transport or retail and wholesale, and female intermediaries and farmers are largely excluded from the value chain.

An analysis of wage differentials between men and women across the shrimp value chain shows that women earn consistently less than men, even for the same tasks performed. For example, women earn 64 percent of what men earn in catching and sorting fry. In shrimp farming—including pond repair, day labor, and maintenance—women earn around 82 percent of men's wages for the same tasks. Although women are well represented in shrimp processing, here too, they earn significantly less than their male counterparts. Women's earnings range from 60 to 83 percent of men's earnings for tasks such as cooking, packing, refrigerating, and de-heading.

Women's lower wages are linked to the nature of their contracts. When they are engaged in the chain of fry catching, farming, and processing, women's work is usually seasonal, temporary, or casual. By contrast, men far outnumber women in permanent work. Even in processing, a female dominated link in the chain, only 8 percent of women have permanent jobs, compared with 36 percent of men.

Women's participation in the shrimp industry is underpinned by social norms and sanctions that prescribe the types of occupations in which women can and cannot engage. Their limited mobility and constraints on engaging with men outside their community prevent them from being intermediaries in the purchase and sale transactions. Similarly, social expectations that women should not enter bodies of water bar them from catching shrimp fry that are caught in the surf. These norms contribute to occupational sex segregation within the industry, and to women's lower wages as a result.

Source: Gammage et al. 2006.

utilities oversee large infrastructure assets that administer the storage and distribution of water or administer waterways. Utilities are institutional assets and a source of employment in technical and managerial professions. These entities are often deeply gendered. In that respect, they are no different from other utilities that provide infrastructure services, such as transport or power companies. Each of these reflects the sex segregation in the overall labor market, as well as the paucity of trained female workers, and the two may be mutually reinforcing.

According to a 2014 report by the International Water Association on human resource capacity in 15 developing countries in the water supply, sanitation, and hygiene (WASH) sector, an average of only 17 percent of staff in the water and sanitation sector are female. Especially in technical fields in the public and private water sectors, female professionals are significantly underrepresented (IWA 2014).

Underrepresentation of women in water-related technical roles reflects their overall exclusion from such jobs. Women are underrepresented in science, technology, engineering, and mathematics (STEM) jobs and educational programs, although female participation in tertiary education surpasses male participation in half the developing countries (and in most developed countries) (UN 2015). In the United Kingdom and Canada, for instance, less than 50 percent of women graduates with a STEM degree go on to work in STEM-intensive occupations (Women's Engineering Society 2014; Council of Canadian Academies 2015). In research, female engineering faculty lag far behind their male colleagues in numbers, salary, rank, and tenure in most countries, and the numbers drop even more significantly for women working in the fields of engineering and technology. Social and institutional barriers, gender stereotyping, lack of female role models, and a so-called "engineering culture" that is traditionally male dominated contribute to the absence of women in these fields (Udas and Zwarteveen 2010).

Women are not just underrepresented in technical jobs; they are overrepresented in unpaid work. Whereas the literature on gender and water supply and sanitation focuses heavily on the time and health burdens of carrying and managing water for domestic purposes, such activities also contribute to women's share in unpaid work. Fetching water is primarily women's responsibility in most contexts, especially those that lack piped water within the home, and could result in several hours spent doing unpaid work. A recent World Bank report on Niger, where water scarcity, high levels of poverty, and ongoing conflict multiply the burden on households, confirms that women are the main collectors of water, although men and boys also contribute (Rodella, Sanoh, and Maiga 2017). However, with increased coverage of infrastructure-based services such as water and sanitation, smaller families, and greater employment opportunities, women's unpaid work in tasks such as collecting water has seen a decline (UN 2015).

If women's time spent on unpaid work like fetching water was to be reduced, would they enter paid employment? It is almost a truism to say that if development frees up women's time in fetching water and firewood and having to go outside the house for toilet needs, they would enter the labor market and make more productive use of their time. By implication, this would contribute to economic growth. This demonstrates the instrumental value of investing in better water and sanitation services (Glick 2004; Morrison 2007). There is no debate on the value of providing better water and sanitation in terms of its moral imperative and role in overall progress in better health and education. It is still worth putting to the test the truism that freeing women from water carrying would lead to their engagement in productive work.

Several factors at the individual, household, and community levels affect women's ability to enter paid employment. A woman may have little control over her time allocation, such that her freed up time would be reallocated to other household or outside tasks. Cultural understandings of gender roles and mobility may restrict women from entering the labor force, even if time is not a constraint. A gamut of social, economic, and geographic factors, such as a household's economic situation, education, and access to childcare, influence whether freed up time is used for productive activities. The availability of suitable jobs would determine whether a household would allocate female labor to them.

The extant evidence supporting the relationship between improved infrastructure and women's productive employment is thin. A study of a water supply program in Benin, in which boreholes were constructed with the aim of reducing women's workload, showed that although time in collecting water was indeed saved, it was reallocated to work on their husbands' fields and not to their own economic activities (Saskia 2008, in Sinha, n.d.). In Lesotho, for women whose husbands were away working in mines in South Africa, their time in fetching water was saved following a large-scale infrastructure project. However, the women did not take up income-generating work, for fear that their returning husbands would retaliate against their breadwinning roles (Cairns, Workman, and Tandon 2017). Evidence from Pakistan shows that in households with water technology, women do not engage in more market-based work, but rather spend more time on leisure activities (Ilahi and Grimard 2000). The prevailing assumption is that improvements in infrastructure free up the time women spend on domestic chores and enable them to participate in off-farm work. However, an empirical study based on rural household and community data from national consumption surveys in nine countries found no relationship between improved water infrastructure and women's engagement in paid employment. The study found that, in some countries, the reduced time women spent in collecting water led to more leisure time for them and improvement in their children's school attendance (Koolwal and van de Walle 2013). These findings suggest that although infrastructure certainly saves time for women by making it easier for them to undertake the activities that were more onerous before the advent of such infrastructure, the time so saved may not necessarily benefit all women, or necessarily translate into paid employment.

Not Just an Asset: Water as a Liability and Risk

If water is conceptualized as an asset, the flip side is that water can also be a risk or liability. Extreme events related to water include droughts and floods. Bodies of water may also constitute a liability that can have gendered implications and impacts, as this chapter demonstrates. A large swathe of literature looks at the impacts of rainfall variability—scarcity or abundance—on a host of gendered outcomes. Above or below average rainfall can cause variegated shocks at the household, community, and even national levels, especially in rainfall-dependent areas. Rainfall shocks could take the form of droughts or floods, be long term or short term, chronic or idiosyncratic. The gendered impacts are felt

inter alia through employment, wages, health, schooling, marriage, migration, violence, and other unexpected channels. Yet, and like other aspects of the gender-water interface, the gendered risks and impacts of water-related variability and extreme events are also highly contextual.

The gender differences in the pattern of mortality due to or during floods vary across countries and contexts. Zagheni, Muttarak, and Striessnig (2015) use cause-of-death data over 1995-2011 in 63 countries and territories to analyze patterns of mortality related to meteorological disasters. They find that mortality rates for men are consistently higher than those for women across all age groups, and that the differential by sex is larger for adults than for young children or the elderly. However, their sample does not include countries in Africa or South Asia. Doocy et al.'s (2013) historical review of the human impact of floods indicates that although males are more likely to die in developed countries, developing countries have higher levels of mortality among females. This finding is borne out by a study from Nepal conducted a month after the floods in Sarlahi district in 1993. The study shows that fatality rates (due to floods) were 13.3 per 1,000 for girls and 9.4 per 1,000 for boys, and 6.1 per 1,000 for women and 4.1 per 1,000 for men. Lower socioeconomic status before floods and living in homes made of thatch exacerbated the risk of mortality (Pradhan et al. 2007).

Rainfall shocks are income shocks that trigger a range of household-level coping strategies and policy responses. Most countries have a system of social safety nets that come into effect when disaster strikes. Bangladesh is a successful case in point. When the country institutionalized and expanded its longstanding workfare program—the Employment Generation Program for the Poorest—in 2008-09, it also put in place quotas for female participants so they could tide over income variability. The program created conditions for women to participate, while also creating incentives for program administrators to meet the targets (World Bank 2009). Similarly, the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in India, which succeeded a drought relief program, attracted many female participants, partly due to an active social movement that preceded the announcement of the Act. In a recent study, Mahajan (2017) analyzes the effects of rainfall shocks on the agricultural wages of men and women in India. Overall, she finds no effect of such shocks on the gender wage gap. Yet, in rainfed rice-growing regions in India, compared with men, women have greater loss in wages, thus increasing the gender wage gap during low rainfall years. This is likely because there is greater demand for women in the cultivation of crops that are severely affected by rainfall variability.

The relationship between rainfall shocks and gender-based violence has been put to the empirical test. Abiona and Koppensteiner (2016) find that rainfall shocks substantially increase the likelihood of domestic violence in Tanzanian households. Their estimates show that the overall effects are driven by droughts rather than floods, and are more pronounced for poorer households. They also find that a range of "female empowerment" variables attenuate the incidence of domestic violence. The variables include female household headship and female inheritance rights. A study in India finds that "dry shocks" are linked to

reported increase in dowry deaths as well as in domestic violence. In addition, such shocks increase dowry payments but lower the likelihood of sexual harassment (Sekhri and Storeygard 2014). There is additional anecdotal evidence on the risks to women and girls after natural disasters, especially when they have been rendered homeless and are housed in camps or other temporary dwellings while their communities have been broken up, leaving them more vulnerable.

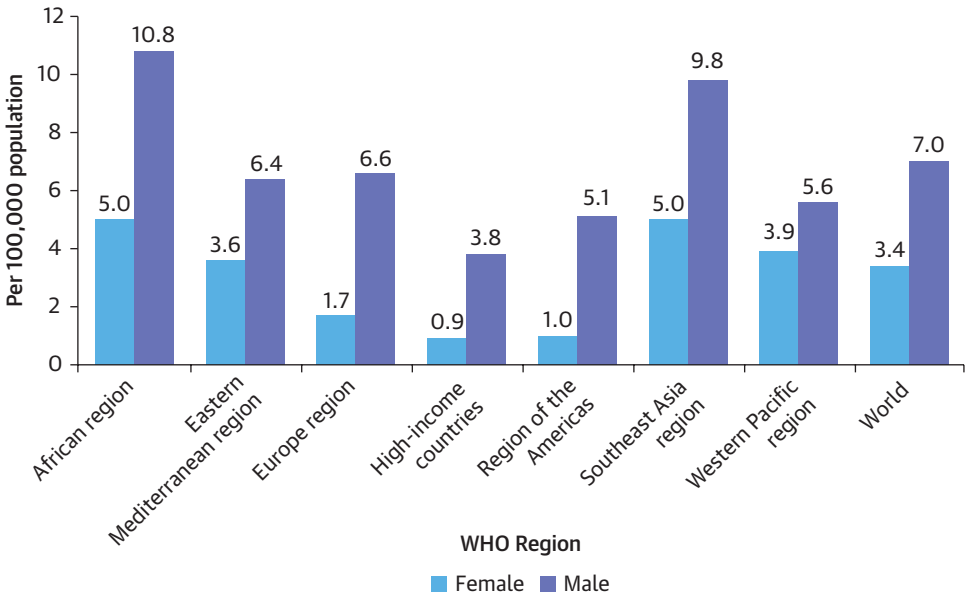
The importance of a nuanced and context-specific examination of the gendered impacts of water-related events needs to be repeatedly underscored. Take the case of marriage markets, which often operate under specific norms and informal rules. Corno, Hildebrandt, and Voena (2016) look at the effects of rainfall variability on age at marriage in Sub-Saharan Africa and India. They find that in Africa, drought increases the likelihood of early marriage; in India, drought lowers that likelihood. The authors attribute the two opposing impacts to the nature of traditional marriage payments (bride price in Africa and dowry in India), and underscore the cultural and social mores that underpin household responses to rainfall shocks and the economic hardship they bestow.

Sex of the household head is often a predictor of gendered outcomes. Various analyses focus on female headship to understand the channels through which gendered outcomes obtain in many areas. Nevertheless, female-headed households are a highly diverse group, sometimes richer and of high status, and at other times disadvantaged and poorer. A study from South Africa shows that single headship of a household in general makes it more vulnerable in times of rainfall variability. Further, households headed by widows, never-married women, and women with a nonresident spouse (for example, "left-behind" migrant households) are especially vulnerable. The results are more significant in areas that tend to rely on rainfed agriculture (Flatø, Muttarak, and Pelser 2017).

Not just water-related events, but also bodies of water can be harbingers of risk; here too, gender inequality can play out in a complex manner. Drowning is a case in point. According to WHO (2014), drowning is the third leading cause of unintentional injury death worldwide, and accounts for 7 percent of all injury-related deaths. Figure 2.1 shows that overall, males are at higher risk of drowning and have twice the mortality rate of females. Males are more likely than females to be hospitalized for nonfatal drowning. This is likely due to increased exposure to water and riskier behavior, such as swimming alone, drinking alcohol, and participating in activities like boating. Here, gender inequality plays out in unexpected ways. Although males are more likely to die due to drowning, it may well be the case that females are less likely to learn to swim or, in cultures where there is greater control on the mobility of females, women and girls may not be allowed to go out near bodies of water.

Being able to swim does more than mitigate against the risk of drowning. It also confers the opportunity for recreation, some types of jobs, health and fitness, and competitive sports. The ability to swim is also dependent to a large extent on cultural norms around females' relationship with water. It is tied up with the segregation of females in public places

FIGURE 2.1. Males Are More Likely to Die from Drowning



Source: WHO 2014.

and constraints on their physical mobility in general. Lack of appropriate swimwear also sometimes hinders women and girls from learning how to swim.

In Bangladesh, drowning, not infectious disease, is the leading cause of death among children younger than age 17 years, with children ages 1 to 4 years at highest risk (Rahman et al. 2005). A survey of "naturally acquired" swimming ability among Bangladeshi children found that males were more likely to have acquired swimming ability through "natural" means, such as relatives and friends, than females were (Rahman et al. 2014). Children ages 1 to 4 years clearly cannot save themselves from drowning, but parents, especially mothers, who are the primary caregivers, can be trained to save lives. Thus, as evidenced by the example of drowning and swimming, gender inequality plays out in unexpected ways. Although males are more likely to die due to drowning, they are also more likely to be able to swim and have fewer restrictions on their mobility.

This chapter underscores the importance of water as an asset, but also its flip side—water as a risk or liability. Water as an asset becomes productive through various channels; labor and infrastructure are the primary mechanisms. Hence, the importance of water in jobs cannot be emphasized enough. Each of these manifestations of water has differential implications for males and females. Yet, assets are closely related to services and spaces. The next chapter discusses the value of water as a service and its implications for gender inequality.

Notes

1. Mwangi and Markelova (2008, 17) summarize Schlager and Ostrom's (1992) conceptualization as rights over land and other resources as being a "bundle of rights." "These bundles comprise access (the right to enter a defined physical area and enjoy non-subtractive benefits); withdrawal (the right to obtain resource units or products of a resource system, for example, catch fish, divert water); management (the right to regulate internal use patterns and transform the resource by making improvements); exclusion (the right to determine who will have access rights and withdrawal rights, and how those rights may be transferred); and alienation (the right to sell or lease management and exclusion rights). Even without complete ownership (that is, the right to alienate), individuals and groups may still have access to resources that make significant contributions to their livelihoods....."

2. This comment is from focus group discussions with male youths, conducted in Hangan, Papua New Guinea, as part of the World Development Report (World Bank 2012b).

© Dominic Chavez/World Bank

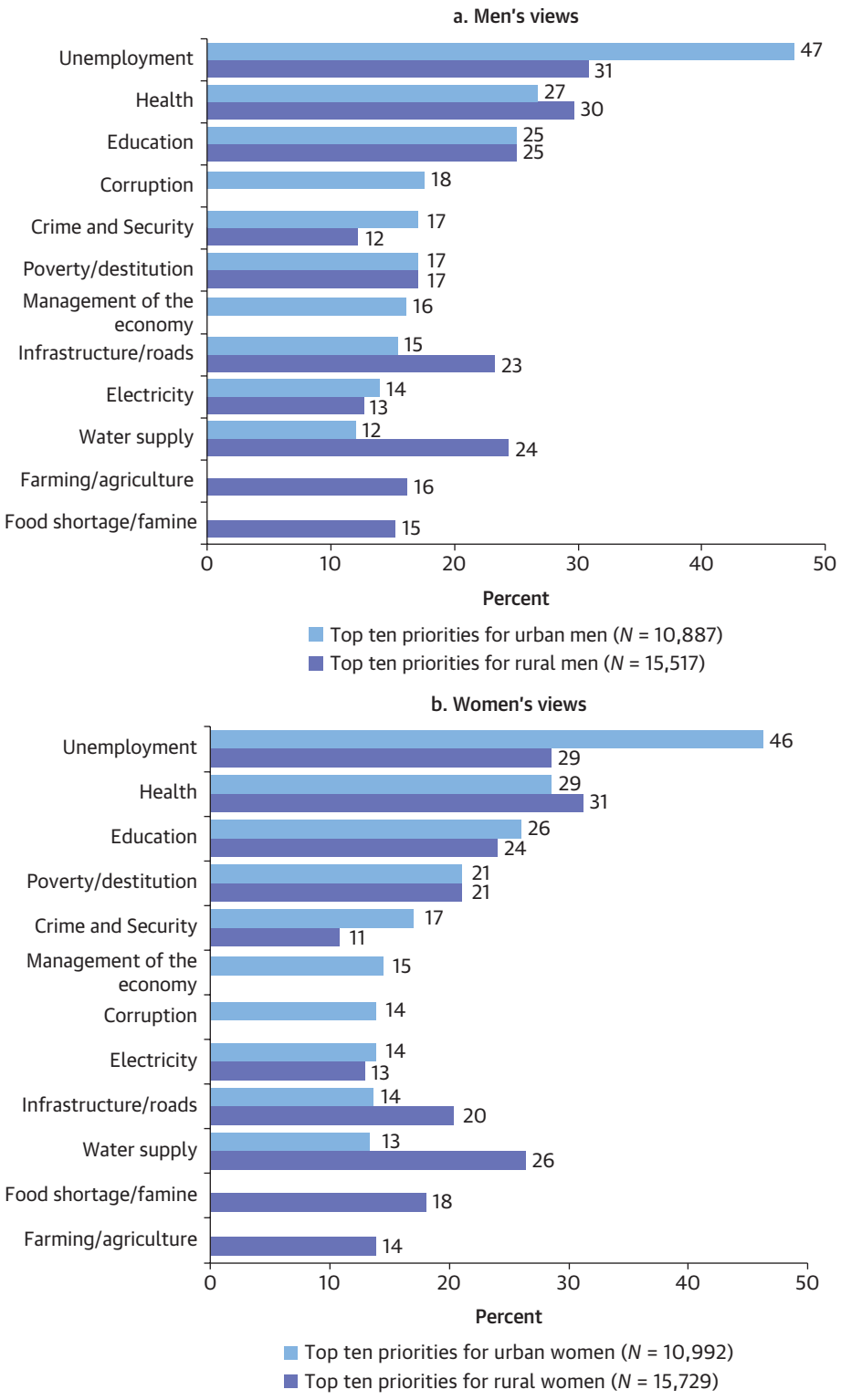
Chapter 3 Water as a Service

Water as a service is relatively easier to comprehend. A large part of the literature on gender and water focuses on services. The majority of the empirical work is related to water supply and sanitation, with a strong body of work on irrigation as well. However, water-related services encompass a wide range, from water supply and sanitation for domestic and other uses, to irrigation, waterways, and information and technology services. This chapter lays out gender differentials in access to water services and shows that gender inequality may not always manifest in expected ways. The chapter outlines the pathways through which, and conditions under which, inequality shows up.

Do Men and Women Think of Water-Related Services Differently?

The conventional wisdom suggests that women would rate water issues as being of higher priority than men would (Tarfasa and Brouwer 2013; Mukherjee 2001). However, the evidence is mixed. Take the case of willingness to pay for water supply and sanitation. Some studies show that men have a higher willingness to pay for services (Van Minh et al. 2013; Twerefou et al. 2015); others show that women do (Mezgebo and Ewnetu 2015), or that there is no difference (Kaliba, Norman, and Chang 2003). The Afrobarometer 2016 surveyed respondents in 36 countries on a range of issues, including water supply. Figure 3.1 shows that there are significant differences in the importance of water supply as a problem in rural and urban areas for men and women, respectively. But there is remarkable alignment between men and women *within* urban and rural areas. In the case of rural men's responses, water supply is fourth in the list of all responses, but ranks tenth in urban men's responses.

FIGURE 3.1. Men's and Women's Views of the Top Problems Facing the Country That the Government Should Address



Source: Afrobarometer 2016.

Only 12 percent of urban men's responses mention water supply as a problem. This finding is remarkably similar to urban women's responses, where water supply also ranks tenth. For rural women, water supply ranks third. Thus, the urban-rural differences in the importance of water supply and sanitation are greater than the gender differences. Calculations from the Afrobarometer 2016 data show that men's and women's perceptions of going without clean water for household use or the location of the water source or toilets are very similar.

The Afrobarometer Survey also asked respondents how the government was handling the water and sanitation situation. Just over two-fifths of the respondents are satisfied with the performance of their government (table 3.1). Here too, men's and women's responses are remarkably congruent, indicating that overall there are no differentials in the way they perceive the state's performance in the water sector. However, there is variation by country.

Men's and women's satisfaction with their water security may be congruent in the aggregate in Africa, but this congruity is rather contextual. Several studies indicate that women and men have different attitudes and priorities about water-related issues (see, for instance, Robinson, Robinson,

TABLE 3.1. Over Two-Fifths of African Respondents Say Their Government Is Handling the Water and Sanitation Situation Well

Response	Male (%)	Female (%)	Total (%)
Very badly	26.1	25.4	25.8
Fairly badly	28.2	28.2	28.2
Fairly well	33.5	33.1	33.3
Very well	8.1	8.0	8.1
Don't know/haven't heard enough	1.8	2.9	2.4
Not asked in this country	2.2	2.2	2.2

Source: Based on Afrobarometer Survey 2016.

TABLE 3.2. Men Cite Water Quality and Women Cite Control and Convenience as Reasons for Installing a Private Tube Well

(percentage of households that have installed private tube wells)

Resource	2000		2002	
	Male (n = 876)	Female (n = 840)	Male (n = 265)	Female (n = 280)
Safe drinking water	61.2	42.7	70.3	31.1
Convenience	24.0	32.0	18.0	32.3
Can control one's own water supply	10.5	23.8	11.5	36.7
Other	4.3	1.6	0.3	0.0

Source: Caldwell et al. 2006.

and Hawkins (2005) and Anastasiadis et al. (2014) for wastewater; Su et al. (2017) for drought and climate change; and França Doria (2010) for water quality). A panel survey in Bangladesh sought to track the change in information about and responses to arsenic contamination in water. The results show that although information about arsenic had increased among men and women, private (mostly shallow) tube wells were still the preferred water source. When asked why they had installed private tube wells, there were major differences in women's and men's responses. Men indicated that tube wells were a safe water source; women wanted more control over household water needs and acted in favor of convenience (Caldwell et al. 2006) (table 3.2).

How Water as a Service Affects Men and Women

Regardless of preferences and priorities, the availability of water for household and other uses and sanitation affects males and females differentially. Table 3.3 shows ways in which water supply and sanitation services affect females across the lifecycle. Women's reproductive roles, combined with societal expectations, are often responsible for differential needs. Das Gupta (1995) argues that a woman's place in the lifecycle can determine how much power and access she has in various domains of her life. Table 3.3 shows that females at different stages of the lifecycle have different needs and the availability of water and sanitation affects them in different ways. Clearly, females in each stage are highly heterogeneous. Class, caste, ethnicity, religion, occupational status, earnings, and other markers confer greater or lesser vulnerability or agency, within each point in the lifecycle. Not only *place in the lifecycle*, but also *lifecycle events and transitions*, such as menarche, marriage, pregnancy, motherhood, lactation, starting a job, and widowhood, have implications for the ability, opportunity, and dignity of females. The table lays out the channels through which effects could obtain. It bears mention however that women in general are highly heterogeneous and socioeconomic status, location, occupational status, and social norms matter a great deal.

TABLE 3.3. Water Supply and Sanitation Services: Illustrative Effects on Females across the Lifecycle

Place in the lifecycle	Issues related to water supply and sanitation	Implications for well-being
Prenatal and neonatal (first 1,000 days)	• Water quality and adequacy • Hygiene of mother and child	• Increased neonatal mortality in water stressed areas • Decreased likelihood baby is washed, increased susceptibility to diseases with implications for health over the lifetime • In contexts of son preference and daughter neglect, scarce resources like water may be diverted
Pre-school and primary age	• Water quality and adequacy • Hygiene, sanitation, and information for the family, especially the mother	• Where females have higher likelihood of fetching water, children's participation in school is affected, as they help with domestic chores • Health and nutrition of children (stunting, diarrhea, susceptibility to disease, environmental enteric dysfunction) • Safety (drowning)
Secondary and higher	• Water quality and adequacy • Menstrual hygiene • Privacy	• Health (as above, plus urinary tract infections; arsenicosis, which has specific effects on women's lives and other forms of contamination; problems with back and neck) and nutrition • Human capital accumulation • Safety (risk of harassment and violence) • Dignity, self-respect, and agency
Working and childbearing age	• Water quality, adequacy, predictability • Pricing and affordability • Ability/permission to access available services • Hygiene of birth attendant/hospital-acquired infection during childbirth • Privacy • Voice and participation in decision making	• Maternal and other health, including mortality • Drudgery and physical impact of water collecting, where females are the main fetchers of water • Safety (harassment and violence) • Jobs and occupational assignment to different roles • Empowerment and status • Dignity and self-respect
Elderly	• Water quality and adequacy • Menopausal hygiene • Toileting needs of the elderly • Physical access to services	• Health • Dignity and self-respect • Pressure on mostly female caregivers

Source: Authors.

A large body of evidence indicates that women are for the most part responsible for obtaining water for domestic use. The average time spent fetching water in Sub-Saharan Africa is greater than the global average. For example, in Niger, the average female, whether woman or girl, spends about 13 days a year traveling to a water source and back. In rural areas, the time spent fetching water is especially high (Rodella, Sanoh, and Maiga 2017). In the Republic of Yemen, females comprise about 84 percent of household members who fetch water. In addition, most households that collect water from nonnetworked sources reside in rural areas (World Bank 2017b).

The differential needs of women and girls become pronounced when they are menstruating. In Nigeria, about one-quarter of women seem to lack the requisite privacy for toileting needs. But there is a high degree of variation. For example, 85 percent of women in Lagos

reported having everything they need to manage their menstruation; only 37 percent in Kaduna State did. There are differences across urban and rural areas too. About 88 percent of women in Nigeria have no handwashing facility on their premises; 92 percent of rural women report this to be the case (World Bank 2017c). Similar conditions obtain for women in many other countries across Africa and Asia. Where women need to go out in the open for their toilet needs, they also face increased risk of harassment and assault. They may be more prone to urinary tract and vaginal infections.

Lack of appropriate toilet facilities can affect women's participation in education and employment. Lack of appropriate toilet facilities and adequate water are among the reasons why post-pubescent girls drop out of school and women miss days from work. Further, a large proportion of females do not have information about, or access to, sanitary pads. A recent survey in Bangladesh found that only 23 percent of women use appropriate menstrual materials. The survey also found a high level of misinformation about menstruation, with three-quarters of students believing that activities such as going out, cooking, and eating certain types of food are forbidden during menstruation. Moreover, only 6 percent of schools provide education on menstrual hygiene management, and only 36 percent of women had prior knowledge about menstruation before their first period (World Bank 2017a). A meta-analysis of 138 studies on the status of menstrual hygiene among adolescent girls in India found that a quarter of the girls did not attend school during menstruation because of the lack of adequate toilets. Only around 50 percent of the respondents considered menstruation "normal," and premenarche awareness varied by region (Van Eijk et al. 2016).

The existence of a separate toilet is not enough to ensure usage by women and girls. Privacy, cleanliness, safety, and availability of water matter. A survey of 62 primary schools in rural western Kenya found that 84 percent of the schools had separate latrines for girls, but 77 percent of these did not have a lock and only 13 percent had water in or near the latrine. Furthermore, only 10 percent of schools reported always providing sanitary pads to girls. Disposal arrangements for used sanitary pads were not adequate in most schools (Alexander et al. 2014). These findings underscore the importance of toilets as "package deals" to ensure usage, especially by female students, employees, and even women in public places. Women and girls with disabilities face additional challenges due to limitations in mobility. Even where there are water and sanitation facilities for females, they may not be accessible for females with disabilities, thus intensifying the context of their disadvantage.

Although females are disproportionately affected by lack of appropriate and adequate toilet facilities, gender inequality does not always play out in expected ways. Nigeria and India present two cases in point. In Nigeria, among households where at least one member reported not using the toilet, adult women were three times less likely to use the household's latrine than were adult men. Fear of contracting disease was the main reason women refrained from using the toilet (World Bank 2017c). India presents a different picture. A Sanitation Quality Use Access and Trends survey in villages in five states in northern India

(Haryana, Rajasthan, Uttar Pradesh, Madhya Pradesh, and Bihar) showed that owning a toilet does not automatically lead to the elimination of open defecation. Among all the households in the sample, 40 percent that had access to a toilet reported that at least one member of the household still defecated in the open. The proportion was highest in the state of Rajasthan, where over 57 percent of households reported at least one person defecating in the open, although they owned a toilet. In all the states, over 25 percent of the men with access to a latrine reported defecating in the open, compared with 16 percent of the women (Coffey et al. 2014).

Prima facie, based on table 3.4, it may appear that males bear the disproportionate burden of inadequate toilet facilities. When asked why they defecate in the open despite having a toilet in the home, a majority (74 percent) of men said they preferred to do so. Further, households are likely to prefer that women—especially women in their reproductive years—use available toilets in the home, and have less need or chance to go outside the home. These findings are related to the fact that in some cultures, including many parts of India, households tend to keep strict control over female mobility for various reasons, including to maintain control over female sexuality, enhance the family's social status, and protect women from potential harassment and assault.

Policy and research on the gender implications of water supply focus primarily on water for domestic use, with scant attention to the needs of small and micro business owners. Women are overrepresented as owners of small and micro businesses in the urban informal economy, and their businesses often rely on water supply. Adequate, predictable, and affordable water for these entrepreneurs, especially in the informal economy, is critical to their survival and growth. The Informal Economy Monitoring Study, coordinated by Women in Informal Employment Globalizing and Organizing (WIEGO), assessed the working conditions of informal workers in 10 cities in Asia, Africa, and Latin America. The study shows that women-owned micro businesses rely on water for multiple purposes. Female street vendors use water to prepare and cook the food that they sell; market vendors need water to wash their products, such as fruit, vegetables, or flowers. Water is also an important input for services in the informal sector, such as laundry services and hair cutting and styling. Owners of small businesses need water to clean their workplaces, which could be their homes or stalls. Waste pickers need water to clean reclaimed waste products, such as plastic or glass,

TABLE 3.4. Male Family Members Are More Likely to Defecate in the Open in Northern India
(percentage of those who have a toilet in the home)

State	Men who defecate in the open	Women who defecate in the open	Households with at least one member who defecates in the open
Uttar Pradesh	24.8	13.9	38.5
Bihar	26.4	18.1	43.8
Haryana	19.1	12.0	34.9
Madhya Pradesh	30.1	20.8	41.9
Rajasthan	33.6	27.1	57.4
Full Sample	25.1	16.6	40.1

Source: World Bank 2016a, based on Sanitation Quality Use Access and Trends survey by the Research Institute for Compassionate Economics.

before bundling or processing them (Chen 2014; Roever 2014; Dias and Samson 2016). Another study of female micro businesses in rural Gujarat, India, shows that when an improved water supply source does not work, entrepreneurs tend to suffer greater economic loss than non-entrepreneurs (Sijbesma et al. 2009). Thus, there are important implications of unpredictable, irregular, and inadequate water supply for female-owned small and micro businesses, in turn having an impact on poverty and possibly the local economy.

"We cannot operate properly without water because we need water to wash our hands and our products. I have to pay people to go and buy water and transport it for me to my site. This costs me a lot of money."

Street Vendors, Durban, South Africa (in Roever 2014)

Water quality can be compromised in several ways, and affects males and females differently. First, the most obvious form of inequality arises when children get sick with water borne diseases and the caregiving burden of the mother increases commensurately. Second, women are more likely to be responsible for water purification at the household level. In some cases, women's groups are assigned the responsibility for the treatment of communal water sources.[1] Third, contaminated water has differential health impacts on males and females. Women are more likely to handle water in the domestic realm and are hence susceptible to disease; men who work in water-related jobs are also prone to disease. It is difficult to point to the exact gender differentials in disease exposure, although pregnant and lactating women are more susceptible, and pass diseases to their children.[2]

Some forms of water contamination can have indirect, gendered effects on human capital accumulation. Take the case of salinity in water in the Sundarbans along the eastern coastline of India. Komatsu and Joseph (2016) look at the increased burden of water collection on schooling, using data from household surveys in the Sundarbans in West Bengal, India, and Bangladesh. They find that young girls in households affected by greater salinity in the water in rivers and ponds are 11.8 percent less likely to attend school even if they are not in charge of collecting water. If salinity in the water goes up, the girls are 5.3 percentage points more likely to be responsible for water collection and skip school. As girls grow older, the negative effects of salinity and poor quality drinking water seem to increase. By age 16, saline water and lack of access to improved water sources increase the chances of girls dropping out of school and becoming responsible for water collection by 33.7 percent, versus 15.9 percent if the water is not saline and improved water sources are available. In contrast, for boys, there is little difference among the households with different water quality and water sources.

Information and technology as services are intrinsic to better outcomes. We distinguish between *assets* that are based on new technology, such as motorized boats for fishing, and information about technology as a *service*. Access to technology and its adoption are often deeply gendered, and depend to a large extent on whether and how males and females are targeted in their adoption. Technology can be an enabler and, therefore, an instrument of social inclusion and gender equality. But technology can also be a disabler, in that it is often restricted to a few. Women and small landowners may be excluded from information about new technologies and products. This is especially true of services related to farming and irrigation. Female farmers tend not to report themselves as working and/or are overrepresented as smallholders. A study from Malawi reports that although a significant proportion of women were engaged in full-time farming, most had small holdings, which may have

impacted their access to new technologies and resources. Only 25 percent of the female farmers were heads of their household, and it is likely that extension agents offered trials of new technology based on the size of the holding, thus excluding female farmers (Gilbert, Sakala, and Benson 2013).

Yet, the evidence shows that women are not always left behind. A study from rural West Nepal conducted focus group discussions with female drip irrigation users and non-users. Women were the primary cultivators of vegetables. The study found that drip technology could save on average 58 percent of the time spent on farming vegetables (Upadhyay 2004). Van Koppen, Hope, and Colenbrander (2013) surveyed 2,429 households in Ghana and Zambia, to gauge the adoption of small-scale private irrigation technologies, by household headship, labor availability, and ownership of sub-units of plots by gender. They found that households headed by women adopted the technology at two-thirds the rate of households headed by men. This rate was higher when female-headed households were also landowners. In Zambia, married women were more often decision makers on irrigated plots than on rainfed plots, even if the land belonged to their husband. According to the authors, the findings show that women are not always marginalized from small-scale irrigation, and female-headed households are increasingly adopting mechanized technologies.

Exclusion from information is one of the ways in which gender inequality is perpetuated and water-related information is no exception. Mustafa et al. (2015), in an analysis of the early warning system set up after floods in Pakistan in 2010, show ways in which the system excludes women and transgender people (hijras). For instance, the early warning system uses a language and medium that women and other excluded groups cannot access, such as technical Urdu and television announcements. Women, especially in poor households, often do not have access to televisions or time to watch. And poor women are less likely to comprehend information that is disseminated in overly technical terms. Minority linguistic groups cannot access information in the language of the majority. Yet there is evidence that women responded to the post-flood situation in ways that would be considered contrary to norms and practices, by taking on additional (sometimes male) roles in reconstruction (Drolet et al. 2015).

Men and women with disabilities face communication and mobility challenges, as Ndesamburo, Flynn, and French (2012) show. Women often lack the legal knowledge they need to assert their rights over property, as well as resources that could help them. In addition, women may not have the networks that could enable them to access the benefits of policy and programs. And large infrastructure construction projects, such as hydropower projects or reservoirs, carry significant social risks, such as the exclusion of women and sexual minorities from information and benefits. There is a strong body of resource material to help project teams ensure that the groups most at risk of being excluded are consulted, informed, and have the ability to assert their rights to receive the benefits.

Finally, water is an important means of transport for populations living near bodies of water. Unfortunately, the literature on waterways and their gendered implications is thin,

although waterways are often the only form of transport connecting people to trade, jobs, schooling, and health care. The case of the World Bank Rural Infrastructure Inland Waterway Project in Vietnam (Ngoc Uyen 2003) is instructive in the situational analysis and the ways in which gender issues can be integrated into a waterways project. More research on the effects of waterways on women's and men's lives would help to provide a better understanding of this sector, which is considered largely gender neutral.

This chapter shows that even when men's and women's perceptions about the importance of water supply and sanitation are congruent, men and women have differential needs and levels of access. Blanket statements about the poor access of females as a whole do not hold and context matters greatly. Policy, research, and advocacy would do well to keep this nuance in mind while designing policies and programs.

Notes

1. For instance, in rural India, where most drinking water needs to be treated, the Anganwadi (rural mother and childcare center) worker, accredited social health activist, or women's self-help groups are assigned responsibility for treating drinking water sources, like ponds, tanks, or lakes, by the district administration, despite the fact that this is not part of the terms of reference for their jobs.

2. Diseases that arise from contaminated water may have gendered effects. The case of arsenicosis deserves special mention. The skin legions caused by the disease can have serious implications for the marriageability of women and girls.

Chapter 4 Water as a Space

The idea of water as a space brings out its physical and esoteric dimensions. It is evident that water occupies physical space, but water is also a marker of social, political, and religious spaces. Perhaps more than any other natural resource that interfaces with human beings, water has a complex ritual and spiritual significance in most cultures. Water is used in ritual ablutions in practically every religion. World Bank (2013, 12) points out that, "physical spaces have a social, political and cultural character that solidifies systems and processes of exclusion." Thus, the practices and rituals surrounding water often serve to keep hierarchies and norms in place. Water is therefore often also an instrument for solidifying and reinforcing gender inequalities through norms, practices, taboos, and stigmas. In short, water is a critical space for the play of social and gender relations. We could go as far as to say that water is often the space for the play of gender politics.

Why is the noneconomic, religious, social, and political value of water important for the design and implementation of policies and programs? It is because development programs and projects are often designed in the expectation that they would create incentives for behavior change and, by implication, lead to progress. This is true, for instance, in the case of open defecation. Various approaches have focused on the importance of behavior change. However, behaviors are often underpinned by belief systems. Governments and project personnel may well consider some behaviors inexplicable, self-destructive, or irrational, but the behaviors may well be perfectly in keeping with local beliefs and norms. Some communities attach an emotional value to a natural resource, even when there may be no overt spiritual value.

Some rules and norms related to water and sanitation serve to assert status and power and reinforce established hierarchies. In Mali, for instance, only men, sometimes only the village headmen, are allowed to sink wells for drinking water and watering livestock. Violation of this norm is interpreted as an attempt to stake a claim on the land, hence challenging the headman's authority (Toulmin 1992, cited in Benda-Beckmann 1997). Menstruating women are considered impure in many cultures, thus serving to keep them from participating fully in education and employment. Another illustration is the caste system in many parts of South Asia, where those lowest in the hierarchy, mainly Dalits, are saddled with the most menial and unclean tasks. Women among the Dalits have the least power to resist their ritual status, although they exercise their agency in many ways. Lest this sound path-dependent, we want to clarify that behaviors and norms change over time, sometimes quite dramatically, with the right diagnostics, the right incentives, and prior consultation with the groups that hold such beliefs.

Local populations sometimes confer spiritual or even legal attributes to physical bodies of water. Rivers are considered embodiments of goddesses in Hindu mythology, and are almost always female. Such deification of rivers is also common in many parts of Africa. Akpabio and Takara (2014) cite Finneran (2009) to point out that the "Bambara"[1] peoples regard the Niger River as having the body of their deity Faro, and the waters, in addition to having healing powers, are supposed to confer fertility. The Yoruba of Nigeria believe that the deity Yemoja gave birth to all rivers and is explicitly associated with fertility. The water goddess Nne Mmiri fulfills a similar function in Igbo cosmology in Nigeria. New Zealand and an Indian High Court recently awarded to rivers the status of living entities, but the High Court judgment in the latter case was struck down by the Supreme Court of India. The political struggle around the status of rivers therefore continues.

Toilets have historically been physical and social spaces through which gender relations have played out. If water is an instrument for reinforcing gender inequality, toilets can be seen as sites for the movement toward equality. Take the case of the United States, where the movement against separate toilets has become emblematic of the struggle over toilets as a gendered space. The movement is founded on the fact that it is not sex at birth but gender identity that should determine the choice of toilets. The movement for unisex toilets has played out in the legal and social arenas, to the extent that laws have been passed for and against segregated toilets. The placement or geography of toilets has much to do with their acceptability. The origin of sex segregated public toilets itself was a deeply gendered development, which may well have outlived its utility in many contexts and become the source of exclusion of several groups of individuals:

> Despite common intuitions, the historical and social justifications for the ubiquitous practice of separating public restrooms by sex were based not on a gender-neutral policy related to simple anatomical differences between men and women. Rather its origins were deeply bound up with early nineteenth century moral ideology concerning the appropriate role and place for women in society..... this architectural practice causes both physical challenges and emotional harms to

> significant groups of people: transsexuals facing workplace discrimination based on an employer's refusal to allow them to use the restroom designated for the sex with which they identify; persons with disabilities needing assistance from an opposite sex partner who is not allowed into the opposite-sex's restroom; parents with opposite sex children facing hostile stares when they bring their child into a public restroom; women at public events inevitably waiting in long restroom lines during intermission, well after the men's restroom has cleared; intersexual persons facing the emotional challenges in choosing which restroom to use.
>
> Kogan (2007, 56)

The toilet as a unisex space can be juxtaposed against cultures where segregation is strictly practiced. Separate public toilets for women in developing countries are essential to their ability to access other spaces, such as schools, markets, health centers, and transport facilities. Toilets are often considered impure, with complex rules surrounding their location and use. Therefore, separate toilets for females in developing countries are also a means to segregate their impurity. Lawrence et al. (2016) find that taboos against using the same toilets as in-laws, members of the opposite sex, or different generations within a family are a barrier to toilet use in many communities in Zambia. In many parts of South Asia, toilet cleaning is restricted to those who were previously considered as belonging to "impure castes." Men and women from certain castes suffer unspeakable indignity while cleaning toilets, and the chances are that gender inequality makes women more vulnerable. In sum, toilets are the realm for the assertion of purity and pollution that affect males and females differentially.

If rivers and streams are often embodiments of purity, human waste has a ritually polluting status in most cultures. The taboos around menstruation transcend religion and culture. Every major religion has a set of superstitions around menstruation, with menstruating women being set aside from daily life in various ways and degrees (Guterman, Mehta, and Gibbs 2007). The exclusion of menstruating women, whether socially required or self-imposed, is an onslaught on their dignity and self-respect, as well as keeps them from normal activity, like going to school or work. Rituals of purification after the completion of menstruation are similarly onerous in terms of time and water needs, and hence have monetary implications; they place an additional burden on women and girls.

> "...certain streams are regarded as unfriendly to women in their menstrual periods: 'In our land, tradition forbids a woman in her menstrual period from going to stream or river to have her bath.' This attitude is tied to the cultural belief linking menstruation to evil spirits and curses." (Akpabio 2011, cited in Akpabio and Takara 2014)

Women are not just passive recipients of unfair norms; they often resist unfair treatment through a set of practices. In the realm of the informal, and often the domestic, women can secure land and water rights, as well as a place in decision making, indirectly and often by stealth. They use techniques of overt and covert bargaining, negotiation, and coalition building, among others, to achieve their goals. These "everyday forms of resistance"[2] do not show

up as large-scale social change until they become normative. In some contexts, there are informal rules of resistance and claiming space. In Nigeria, for instance, hygiene is often linked with female beauty. Conversely, "calling a woman 'dirty' or 'stinky' is generally perceived as degrading to the dignity of womanhood." Women may respond by mobilizing in a "nude protest," with fines and punishments imposed on the accuser (Akpabio and Takara 2014). Such protest certainly shows the power of women to organize against insults connected to hygiene, indicating that beliefs and norms are complex and fulfill a multitude of social and economic objectives.

Informal channels of influence can often be successful in securing rights and influence for women. Sometimes, limited participation in formal groups frees women from the constraints of complying with rules and the time burden of participating in meetings. In an irrigation scheme in Nepal, for instance, women are able to take more water than they are entitled to and contribute only minimally to maintenance work because they are not formal members in the water user groups (Zwarteveen and Neupane 1996). Some studies suggest that informal institutions are more effective at representing the needs of women, because such institutions take into consideration preexisting social networks and practices (Cleaver 1998; Sokile and van Koppen 2004). However, although informal institutions open spaces for women to make their claims, such spaces are often less secure and do not necessarily improve the bargaining power of women in their households and communities (Meinzen-Dick and Zwarteveen 1998).

Women have had a strong role in the history of resistance against the appropriation of their rights over natural resources. Every continent has its own set of such movements and recounting those is not within the scope of this paper. Box 4.1 highlights the role of Sioux women in one of the most recent cases of such resistance, the Dakota Access Pipeline. The box discusses the political activism of women, as well as the value that the river holds for them.

Despite their strategies to claim social and political spaces, women's representation in formal water management institutions is limited. Even when women have a strong role in informal systems, they do not have a formal role, and so their strategies are really attempts to subvert an unjust system. Often, women and men work toward a common goal, but women are not able to circumvent practices like underrepresentation in water committees. A study in Ethiopia shows that men and women have a shared interest in "drinking pure water." Women do the lighter work while men do the heavy lifting, but men also make decisions and deal with conflicts in the management of water points. Further, "management of rehabilitated/extended irrigation scheme was carried out by male committee members despite that there were several women plot holders. Irrigation with multi-purpose facilities… (was) managed by two separate committees; water committee and irrigation committee. The former committee had a fair representation of men and women within the committee while the latter was composed by only men…." (Ebato and van Koppen 2005, 13). A study of drought in Yunnan, China, finds that men and women have different coping strategies and perceptions about drought. Women take a more proactive stance in changing their

BOX 4.1. Sioux Women Have Resisted the Dakota Access Pipeline

"Water is the 'first medicine'; it sustains us in our mother's womb [...] It's used in ceremonies to heal people. [...] Water can clean a spirit when it's bleeding. It can calm a person and restore balance."

Faith Spotted Eagle, Native American activist and politician from the Sioux Nation (in Ravitz 2016)

By emphasizing the spiritual value of water, Spotted Eagle's assertions resonate with the motto of the Dakota Access Pipeline protests: *Mni Wicani* (Water Is Life).

Women have played an important role in the protests against the Dakota Access Pipeline that began in early 2016 and intensified throughout the year. Not only did women appear in great numbers among the thousands of protestors that converged around the climax of the protests, many media outlets portrayed women as the driving force behind the resistance (Treuer 2016; Levin 2016). Some sources explained the salience of women in the protests as reflective of their important position in Native American society. "Women are the backbone of every tribe and every indigenous community," is how a young woman from the Chemehuevi tribe was quoted as putting it (Levin 2016).

The Dakota Access Pipeline protests began as a resistance to the construction of an oil pipeline near the Standing Rock Sioux Reservation. For members of the Standing Rock Sioux tribe, the pipeline represents a major environmental and cultural threat. The pipeline transports crude oil under the Missouri River, which is the primary source of drinking water of the Sioux tribe and the surrounding communities. Possible leakages from the pipeline could lead to devastating contamination of the water. The pipeline also damages sacred tribal sites. Regulations require federal agencies to consult with Native American tribes when public land is concerned; however, members of the Standing Rock Sioux tribe claimed that consultations were not adequately carried out on the construction of the Dakota Access Pipeline, and that in the process, sacred burial grounds were destroyed (McKibben 2016; Meyer 2016).

agricultural strategy, and this is important given their salience in farming. But women do not find place in formal decision-making structures (Su et al. 2017).

Women's representation in user groups is often cited in policy circles as a panacea for poor management of natural resources and service delivery. This is a simplistic framing of the more complex discussions that take place in the policy realm. However, it is also true that many projects push the idea of user groups (such as water user associations or citizens' groups for sanitation) in the somewhat naïve belief that they will, just by their existence, help the project meet its objectives. A large part of the project-based literature that considers

female participation in user associations that are set up at the instigation of project or program authorities bemoans the low levels of women's representation and participation (see, for instance, Mahapatra 2006, in the case of Pani Panchayats in Odisha, India). Others argue that pressuring women to participate in user groups adds to women's burden or work (Sun, Mwangi, and Meinzen-Dick 2011). Such insights serve to emphasize that directives for setting up user groups do not succeed unless they are built on a strong foundation of social capital and preexisting groups in which women see value.

Merely having women as members of a solidarity group does not necessarily lead to good outcomes across the board. In one of the few studies on irrigation management in Pakistan that also considers the role of female-headed households, Nagrah, Chaudhry, and Giordano (2016) assess the role of tertiary-level farmer organizations, called Khal Panchayats (KP). The KPs were expected to improve the efficiency of irrigation systems by maintaining watercourses, collecting seasonal water charges from within the watercourse community, and facilitating dispute resolution. The KPs also have a vote in higher-level irrigation management organizations. However, the study reveals that none of the KPs had female members. Other results are more surprising. On the one hand, a higher share of female-headed households in the community lowered the percentage of contributions in watercourse maintenance. On the other hand, communities that had a larger share of female-headed households were more engaged in collecting water charges and voting in local elections. These findings suggest that headship alone does not empower female farmers in participating in management forums.

In sum, water is the theater for the play of gender relations in many ways. Water clearly occupies physical space, but also carries cultural, social, political, and religious significance. Therefore, the idea of space is at once real and symbolic. It highlights the intangible aspects of water, that it has spiritual and ritual significance. Within the many spaces that water occupies, the roles of women and men differ greatly, despite a strong history of strategies that they have devised to be able to claim and retain space.

Notes

1. This term is used by Akpabio and Takara, citing Finneran (2009).
2. Term adapted from Scott (1985).

Chapter 5 A Tide That Lifts More Boats: Moving Toward Greater Gender Equality

Just as many facets of "water writ large" reinforce gender inequality, it follows that water is a potent instrument to advance gender equality. The tide of progress has lifted many boats. How can we ensure that it lifts many more? How do we help policy and practice in thinking about what could work? World Bank (2013) emphasizes the importance of raising *the ability, opportunity, and dignity* of the individuals and groups most likely to be left out. This chapter reflects on ways in which change toward greater gender equality can take place. As we emphasize the role of water in making a dent in gender inequality more broadly, project personnel may ask the following. "We are extending coverage to an entire area. Should that not lead to benefits across the board? Why emphasize gender inequality here?" Or, "our program deals with water supply. What does gender or social exclusion have to do with it?" These are important questions to address.

It deserves simultaneously underscoring that an area-based approach or indeed a household-based approach does not ensure that all members can or do participate. First, there are significant inequalities in intra-community and intra-household dynamics that often impede the ability, opportunity, and dignity of those who may need the intervention the most. Second, interventions that focus on just one domain, such as better delivery of water supply, without attention to power relations and inequality, may not reach historically excluded groups, of which women may be one. This is because deficits in power and status arising from lack of assets in the form of land or boats or tractors may also make those groups less likely to assert their rights on the new water supply project. In short, not just the design but the delivery of policies and programs matters for gender equality.

A final introductory point in this chapter is that interventions that enhance gender equality in water-related domains need to go beyond water-related "sectors" or ministries. Since water impinges on every aspect of life, policies and programs will perforce have to be grounded in many and not just a few sectors or areas. To take the example of the World Bank Group, not just the Water GP, but other groups and practices, such as Energy, Agriculture, Social, Urban and Rural Development, Health, Education, Social Protection, Transport, Environment, and Poverty, as well as Gender, Jobs, Climate Change, and Disaster Risk Management would need to take independent and coordinated action. Table 5.1 maps some of the channels through which interventions can take place, drawing from the examples in the paper.

Who Drives Change?

World Bank (2013) notes that several actors can take steps to enhance social inclusion and this can be applied to water and gender equality. The actors include the state, excluded groups, private sector, champions in the community, and facilitating groups like nongovernmental organizations, community-based organizations, lobbyists, and lawyers. The role of the state in propelling social inclusion or, in this case, moving toward greater gender equality, deserves special mention.

> The preeminent role of the state as the driver and propeller of change towards inclusion is well recognized. It can intervene for social inclusion through three conduits. The *first* is to create an enabling environment for social inclusion, such that citizens have the freedom to exercise their choice and to innovate for better outcomes and processes. The *second* is to design legislation, policy and programs that directly or indirectly affect social inclusion. The *third* is to ensure implementation and enforcement of the legal and policy framework. All these roles are underpinned by the nature of the state, the degree of openness of the polity and the vision that the state and citizens share. The strength of both formal and informal institutions is critical for the success of state-led actions.
>
> World Bank (2013, 200)

Women and minorities are agents of change. They influence change at multiple levels—the household, community, subnational, and national. Broad-based social movements that lead to empowerment can enable them to assert their rights with respect to water. In Rajasthan, for instance, initiatives such as the Women's Development Program and later the Right to Information movement found that once women have been inducted into a process of public participation and group formation, they are also better able to demand and secure rights with respect to drinking water. New empirical evidence draws the same conclusions, for instance, through the study of MGNREGA (Girard 2014). Thus, collective action for water, where women's actions are salient, is often preceded by a deeper process of social capital formation. Such capital is formed for instance through groups such as burial societies in Ethiopia (Dercon et al. 2008), self-help groups in India, or church, temple, or lineage groups in China (Tsai 2007).

The role of women's groups and their leadership become especially important in fragile and conflict settings. In such settings, there is a breakdown of service delivery and communities come under incredible stress. A set of three case studies from the Democratic Republic of Congo, Afghanistan, and Liberia shows the pressures that communities face and the vulnerability of women to gender-based violence and exclusion. The case studies show that women can play an important role in their communities, in reconstruction after conflict and in water management during and after conflict (Burt and Keiru 2011). ADB (2013) reports that a water supply and sanitation project in the Dang district of Nepal was constructed by a women's group that worked during a period of militancy. Overall, there is considerable anecdotal evidence of the role of women in rural infrastructure during the conflict. This is partly because the conflict in Nepal was accompanied by large-scale out-migration of men. In the Democratic Republic of Congo, women's involvement in infrastructure projects increased significantly. Over time, and with the help of development partners and the government, women received contracts for construction and procurement of material and were employed in infrastructure.

Networks, partnerships, and coalitions provide sustained support to actions for change. Men and boys are often the most powerful allies in the road to gender equality. Women's groups have of course been written about extensively, but moving toward greater equality also needs champions from across the social spectrum, and not least from men. In many cases, men are the main allies of women seeking assets, services, or spaces. These allies could be in the form of elites in the community or elders (or even young schoolboys) in the household. Benda-Beckmann et al. (1997) give the example of a project in Southwest Burkina Faso that offered titles to rice plots to local men on improved land. In this case, the men redirected the project team to women by pointing out that rice cultivation was women's domain. An initiative in North India run by WaterAid and Vatsalya involved men and boys in supporting menstrual hygiene management. The actions included setting up separate groups for men and boys, and using games, films, and meetings, oriented to gender issues. Male masons and male members of school management committees were also trained. This reduced the stigma around menstruation, and men and boys were more supportive of the menstrual needs of women and girls in their community (Mahon, Tripathy, and Singh 2015). Finally, coalitions across state and civil society, across civil society, or with the private sector can have positive consequences. In the area of urban sanitation, the Indian Alliance pooled the strategies and networks of the Indian National Slum Dwellers' Federation, along with Mahila Milan, a women's network initiated by the Society for the Promotion of Resource Centers, to push for more and better toilets (McGranahan and Mitlin 2016).[1]

The private sector has a strong role to play as well. Given that it has an important role in financing water initiatives, the private sector can use its influence toward greater gender equality. It can do this, among other ways, through the labor market, education, and in finding better solutions to enable women and minorities to participate through scientific research.

There are several examples of bottled water companies, soft drink companies, and others funding water-related initiatives as part of their corporate social responsibility. In the case of large infrastructure, the private sector has a key role in ensuring that construction, design, and monitoring consider the needs of those least likely to be able to agitate. Innovations in the design of infrastructure, for instance, can enable persons with disabilities to participate in public spaces. Women and girls with disabilities face formidable barriers when they are menstruating. Accessible toilets can make a huge difference in their ability to participate in school and the labor market. Finally, the media can raise awareness, check facts, and report responsibly to ensure that the important issues surface when solutions are being sought.

What Kinds of Policies and Programs Can Help in Lifting More Boats toward Gender and Social Inclusion?

Policies and programs that change the terms and conditions on which women and men at risk of being left behind participate are the foundation for lasting change. *What* policies do is as important as *how* they do it. The best opportunities can come to naught unless they are cognizant of the cultural and social preferences of their clients, or indeed implemented with sensitivity, enhancing the dignity of those for whom they are designed. For example, some types of employment are notoriously exploitative and workers feel undervalued or harassed and if they can afford to, would rather not participate. De Silva and Yamao (2006) studied the effects of "organizational fairness" and "supervisor evaluation perceptions" on the dedication of female employees in the Sri Lankan seafood processing industry. The industry prefers to hire single young women, since they are more likely to work longer hours in greater discomfort. The study found that perceptions of fairness are an important determinant of employee performance and dedication to the organization. The same is true of women's participation in water user groups or when they are consulted as part of a new program. Unless they feel that their views are valued, that they are making a difference, they would be unlikely to take the time to participate. Terms and conditions could improve, for instance, by holding supervisors, facilitators, and project personnel accountable for their behavior, and seeking regular feedback from women and minorities on their satisfaction with a service provider, supervisor, or any person/group in authority. Several citizen feedback tools are available. The challenge is to adapt them for a purpose and put them into effective action.

Various policy and programmatic interventions, through infrastructure or services, can help women enter and stay in the labor market. In the case of water utilities, human resource policies can create incentives to hire and retain women. They can do this, among other ways, by enforcing wage equality and fairness and facilitating on-the-job training and overall career progression. Zero tolerance of sexual harassment, facilities or support for childcare, paid leave, flexible working hours, and other policies can create conditions that will attract women into the utilities. Other policies and programs, ranging from implicit and explicit affirmative action to those that cultivate leadership among women and girls, can also help.

Countries that do not have enough engineering graduates would benefit from greater push for females in STEM programs. They can also learn from countries like the Arab Republic of Egypt and Iraq, which have a more balanced representation of women in water utilities. For instance, 30 percent of the technical employees in the water utility in Baghdad are women. Table 5.1 lays out steps that water utilities can take to hire and retain women.

Programs that boost the skills of women and minority groups have benefits that go well beyond employment or individual empowerment. Consider the high risk of drowning, where the issue of women's swimming ability and opportunity is called into question. Swimming ability, or lack thereof, is sometimes linked to norms of seclusion, in that females

TABLE 5.1. What Can Utilities, the Private Sector, and the State Do to Attract and Retain Female Professionals?

STEM education	Attracting and retaining women in water companies	Legal architecture
◆ Encourage girls to enter STEM through ***scholarships*** in secondary and tertiary education. In Lao PDR, an Asian Development Bank project gives scholarships to female high school graduates to train in the field of engineering. ◆ Conduct STEM ***outreach programs*** to attract girls. The Working to Advance African Women Foundation trains university students to provide STEM tutoring to girls in secondary schools. ◆ Provide ***practical experience*** to young graduates through ***internships*** in utilities. ◆ Match girls to women leaders in the field through ***mentorship programs***. The Million Women Mentors initiative in the United States offers mentoring to girls to support them to pursue careers in STEM. ◆ Introduce ***curricula reform*** to attract girls in science and math. ◆ Offer ***training to teachers*** to retain girls in STEM programs. ◆ Build ***bridges between universities/*** vocational education and utility companies.	◆ Encourage women working in the sector to form formal and informal ***peer networks***. Women scientists, engineers, managers, and policy makers in Central Asia created a network for women in water to collaborate in the region. ◆ Offer ***training*** on gender equality to all employees. The International Water Association develops action plans for water service providers in Sub-Saharan African countries to implement gender equality in their companies. ◆ Identify women leaders to ***showcase the role of women*** in the sector. ◆ Offer ***awards*** to women who excel in the field. The government of South Africa offers awards to women who contribute to the water sector. ◆ Build ***leadership and managerial capacity*** of women at all levels. ◆ Offer ***mentorship programs*** to female staff. A mentoring program by the Association of Women in Water, Energy and Environment brings professional women together to share experiences and knowledge. ◆ Encourage management to ***motivate*** junior female staff. ◆ Develop ***communication mechanisms*** to incorporate women's feedback. ◆ Establish ***human resource policies*** that incentivize hiring and retaining women.	◆ Establish ***legal measures*** to increase the number of women in the water industry. ◆ Introduce ***mandatory training*** on gender equality for all utility employees. A USAID program builds the capacity of Kenyan utilities to mainstream gender in service delivery and institutional operations. ◆ Introduce policies that ***mandate equal gender representation*** in the sector. ◆ Establish ***equal pay laws***. Some member countries of the Pacific Water and Waste Association pay their female staff more than men. In American Samoa, the total salary of women is 135 percent of the total salary of men; 77 percent of these women staff are engineers. ◆ Implement ***family-friendly policies***, such as childcare facilities, paid leave, and flex work. ◆ Enforce strict ***sexual harassment regulations and anti-discrimination policies***.

Sources: Authors compilation based on ADB 2014; AWWEE n.d.; IWA n.d.; Million Women Mentors n.d.; PWWA 2016; Republic of South Africa Department of Water and Sanitation n.d.; Thompson et al. 2017; USAID 2014; WAAW Foundation n.d.; Women for Water n.d.
Note: STEM = science, technology, engineering, and mathematics; USAID = U.S. Agency for International Development.

in some communities do not swim with males or in their presence. Some programs have tried to address this issue. For instance, SwimSafe (n.d.) in Bangladesh works to ensure gender balance in training volunteer instructors and children ages 4 to 10 years. Moore et al. (2010) document the case of Somali immigrants in Seattle, Washington, who are almost all Muslim, and have strict norms of seclusion. A project worked with the immigrant community to design a culturally appropriate swimming program. In the process, the project gave many females the opportunity to learn to swim and improve their fitness levels. A program in Zanzibar provides young women and girls appropriate swimwear, and gives them swimming and aquatic safety lessons (National Geographic n.d.). The private sector has also responded with a range of appropriate swimwear for women and girls who are prevented from learning to swim due to cultural restrictions.

Several programs have focused on sharpening women's skills in the technical aspects of water supply systems. A program in Gujarat, India, trains rural women who have low human capital to repair village handpumps. Participation in the training program significantly increases the women's likelihood of being employed outside household farms. There are other voice and empowerment benefits as well (Jie Chen and Chindarkar 2017). In Nepal, a rural water supply project trained women as village maintenance workers, local latrine builders, and rainwater harvesting jar masons (Rautanen and Baaniya 2008). Although there has been no robust evaluation of impact, anecdotal evidence suggests that such training empowers women to have a greater say within the household and in the community. Other insights suggest that such empowerment can also place women at risk of backlash from male members. This underscores the need for a better understanding of what works in innovations that empower women and close gender gaps, what the unintended consequences could be, and how such innovations can be sustained.

Sometimes, broad area development or women's empowerment programs have large impacts on the ability of women and minority groups to access water-related services or assets. In India, an entire generation of "watershed development" programs focused on multiple problems, but used the watershed as the binding frame. In a recent study from Rajasthan, India, Desai and Joshi (2014) analyze the impact of an "integrated rural livelihoods" program in Dungarpur, Rajasthan, that was piloted by the Self-Employed Women's Association (SEWA). They assigned villages randomly to treatment or control groups. Their results confirm the widely held idea that overall empowerment through group strengthening programs, such as self-help groups, has a salutary effect on a range of areas in women's' lives. In this case, the study finds that in villages with SEWA programs or among women who are members of SEWA at the village level, there is greater participation in group programs, increased control over domestic decision making, and greater awareness of where to express grievances about public services. The results are particularly salient in the case of drinking water. Box 5.1 illustrates how a project intended to protect local populations from floods can also build in components for crime and violence prevention intended to protect the most excluded groups of males and females.

BOX 5.1. Brazil: A Municipal Governance Project Provides More Than Protection against Floods

In Teresina, Brazil, a project titled "Enhancing Municipal Governance and Quality of Life" was intended to modernize and improve the capacity of the municipal government to protect poor residents in the Lagoas do Norte region from perennial flooding. This involved resettlement to safer areas and expanded access to sanitation and water services for the resettled families. In a second phase, the project received additional financing and introduced new components. For example, a dedicated component was introduced on enhancing social and economic development of the Lagoas do Norte region targeted to the low-income population. The project area has a higher proportion of female residents, compared with the city in the aggregate. The second phase focused on strengthening community associations to improve access to basic services and crèches, and on activities for crime and violence prevention that were targeted to the most vulnerable groups, such as Afro-descendant youth and women. As part of the violence prevention activities, the project focused on good diagnostics, job training, public awareness campaigns, and support services for survivors of violence. In all these activities, there has been a focus on both men and women.

The way a project or program reaches out to its clients can have a bearing on its sustainability and even its short-term performance. This once again emphasizes that not just the design of the policies and programs, but also the manner they implicitly and explicitly treat clients and citizens is important. Some approaches use cultural beliefs and taboos or forms of psychological pressure to achieve sanitation goals. Akpabio and Takara (2014) cite Scott et al. (2007), pointing out that a national handwashing program in Ghana used disgust to motivate handwashing, leading to an increase in self-reported handwashing prior to eating by 41 percent and after defecation by 13 percent. Programs in Burkina Faso also used disgust to motivate behavior change. The Community Led Total Sanitation approach uses the idea of shaming to put pressure on households to give up open defecation. Activities known as "triggering" are used to elicit reactions of shame and disgust, which put pressure on households to build and use latrines and handwashing stations. These strategies have come under criticism for humiliating especially the most disempowered groups (Bartram et al. 2012). Other approaches include subsidies to citizens to encourage them to build and use toilets. Still others build on existing programs, to "mainstream" messages related to water.

With the spread of microfinance experiments across most of the developing world, women have built successful platforms through which they can engage in a broad range of activities. Of these, water and sanitation are two areas where microfinance groups can provide small loans to individuals and groups to build or maintain their water-related infrastructure. The Katosi Women Development Trust, a nongovernmental organization in Uganda,

combines loans with capacity building. The strong group connections, knowledge about financial gains to be made, and awareness of the importance of water quality on health ensure that women have the skills and resources to pay back loans. Furthermore, the Katosi Women Development Trust helps women to sell the excess water harvested during the rainy season to people without water tanks (Waldorf 2013). In India, the self-help group movement is also experimenting with loans for toilet construction, as part of the Swachh Bharat (Clean India) mission. The social capital accumulated in microfinance groups is often of great value in deciding on the right investments for individual members and the group.

In the current milieu of rapid change, technology can be an agent of inclusion or exclusion. Irrigation technology is a case in point. Because women have a lower likelihood of having titles to land and a higher likelihood of being smallholders, they can be excluded from new technologies. But this need not be the case if active efforts are made to reach them with information and training. A study of treadle pumps in Malawi shows that women had a higher chance of adopting the new technology due to the intensive information and training programs that were targeted to them. This is despite that women were less likely to own assets than men were (Kamwamba-Mtethiwa et al. 2012). In another example from Malawi, Wood, Foster, and Kols (2012) find that the successful adoption of a chlorine water treatment product, WaterGuard, depended on continuous and positive contact of women with health care workers, especially during home visits, and an extended free trial of the product to cover the initial cost. Social support from family and the community also helped. The study underscores the importance of interpersonal communication in ensuring consistent use of the chlorine water treatment. Finally, technology provides the opportunity for citizens to engage with the state and service providers. However, the chances are that women's access to such platforms is more limited than men's, a risk that special efforts can mitigate.

It is important to ensure that the voices of disadvantaged women are heard and their interests protected during the construction of large water infrastructure. As World Bank (2013, 237) notes: "Consultations segregated by gender and other groups can…help project teams understand why group characteristics matter and how they can be addressed for good results." But consultations are only a first step toward good design and implementation. The large hydropower project Trung Son in Vietnam put in place systems that seek positive results toward gender equality in several areas: access to compensation under the resettlement plan; strengthening the overall monitoring system of livelihood improvement activities, including by enhancing the capacities of project staff on data collection and reporting; increasing women's participation in livelihood activities; better training curricula and methods, including coaching the district Women's Union in their use; and developing and successfully piloting cost-effective, appropriate, and innovative solutions to reach out to the most vulnerable ethnic Hmong populations, including informing them about project impacts and compensation in their own language (World Bank 2017d).

Reforms related to natural resources or infrastructure that appear gender neutral may have unexpected outcomes. These could be positive or negative. Feminist critiques

of policy changes in the field of environment, land tenure, and other areas related to water often point out that women's customary rights can be infringed unless these are considered upfront (for instance, Zwarteveen 1998). Carney (1993) analyzes policy changes to the Gambian wetlands through irrigated rice farming and horticulture and finds that these were accompanied by year-round cultivation instead of one-crop activity, agricultural diversification, surplus cereal production, and new avenues of income generation among rural households. Many of these opportunities meant additional demands on female labor, without the commensurate benefits of ownership and control of resources. Harris (2006) studies the spread of irrigation to Southwest Anatolia, which, while leading to overall prosperity, also intensified inequalities between landowners and the landless. Harris highlights how the attendant large-scale cotton cultivation placed additional demands on female and child labor, which in turn skewed the marriage market, as men looked for additional wives.

Yet, all unforeseen outcomes need not be negative. In the evaluation of a short-term impact of a pilot land regularization program in Rwanda, Ali, Deininger, and Goldstein (2014) find that households in the treatment group whose land rights had been regularized had a higher probability of starting or continuing soil conservation investments such as in bunds, terraces, and check dams. This was twice the change in the incidence of investment in the control group. Female-headed households in the treatment group had an almost threefold increase in the likelihood of investing in or continuing soil conservation, compared with the control group, and thus had greater welfare impacts.

Shaping the Tide to Lift More Boats

This chapter has thus far highlighted ways in which change can take place toward greater gender equality in water-related domains. It has also emphasized that water-related interventions can have implications for gender equality much more broadly. Thus, the rising tide can be influenced to lift many more boats. What can we do to propel this change? The first step toward change is to identify the problem. Unless we know what we are up against, we are likely to design policies and programs that do not have the outcomes we would have expected. Box 5.2 highlights the first step toward lasting change—good ex ante diagnostics that address four key questions: who is likely to be left out, from what and how, why this would be the case, and what can be done. The final part of this chapter maps initiatives that can move the needle toward greater gender equality in water.

In concluding this chapter, table 5.2 maps actions along the three domains of water—asset, service, and space—to show examples of initiatives that can further gender quality. The table draws mainly from examples used in the paper to highlight and summarize how they can help in moving the needle toward more effective policies, programs, and projects. The list is illustrative and provides a snapshot of the types of interventions that have been used by others.

BOX 5.2. Step 1 toward Greater Gender Equality in Water: Asking the Right Questions

Framing the problem accurately is the first step in the direction of achieving greater gender equality in water. This paper shows that we lack evidence in several areas and that the conventional wisdom is not always borne out in practice. Further, gender inequality often plays out in unexpected ways. Hence, we need a clear understanding of who is excluded, from which domains, through which processes, and what should be done next. Without such a framing, we are likely to design imperfect policies and programs.

Das (2016) summarizes this in a "four-question" methodology, based on the tenets of World Bank (2013).

The "who" question. Clearly, gender is not women and not all women are disadvantaged. Neither are all men equally privileged. The intersection of multiple identities compounds disadvantage, as does place in the lifecycle or specific lifecycle events. The initial diagnostic identifies who is excluded.

The "how" question. What are the domains from which and the processes through which exclusion occurs? Inequality and exclusion often manifest through formal and informal rules and practices. Many of these practices are embedded in social norms and even religious rituals. Norms and rituals often reinforce inequality and established hierarchies. Designing policies that necessitate significant behavioral change therefore needs a careful understanding of the origins of the behaviors and norms that underpin them. The "how question" will identify the gendered nature of exclusion, the domains from which exclusion takes place (assets, services, and spaces), and the practices through which exclusion is enforced.

The "why" question. Why is gender inequality so pervasive? Why are some men and women disadvantaged? Are there historical and institutional reasons for the inequality or exclusion? What are the underlying power relations that maintain the status quo? The "why question" will analyze the underlying power structures that abet the exclusion of some women and men, at the household, community, subnational, national, and transnational levels. It will look at the political economy constraints to moving forward.

The "what next" question. How do we move forward toward greater gender equality in water-related domains? The analysis of the who, how, and why will provide pointers to what needs to be done and how. This initial step toward designing policy and actions will provide invaluable input to policy makers and development practitioners.

Overall, the four questions are "step 1" in the design of effective policies and programs.

TABLE 5.2. Influencing Gender Equality in Water: Snapshot of Actions

Channel for intervention	Illustrative actions targeting those most likely to be left behind	Illustrative examples of policies, programs, and projects
Assets		
Natural resources	• Securing property rights—ownership, control, usufruct, de facto, and de jure • Ensuring that smallholders are not excluded from credit, information, and technology • Implementing broad area development, for example, watershed development programs, with a gender differentiated approach • Considering the unintended gender outcomes of reforms related to natural resources	In the Andes, women participate in the construction of irrigation systems and thereby establish their rights to irrigation water.
Infrastructure	• Participation in decisions about location • Benefit sharing—compensation, employment, skills, and so forth related to the construction and operation of infrastructure • Corporate social responsibility of the private sector	The Trung Son hydropower project in Vietnam included benefit-sharing measures, including increasing women's participation in livelihood activities.
Jobs	• Better terms and conditions of work—wage equality, sexual harassment, childcare, safety, and flexible working hours • Enforcement of anti-discrimination laws • Representation of women in water utilities • Investing in mechanisms to ensure hiring and retention of women in water utilities • Providing mentoring and coaching to encourage women to pursue engineering jobs • Being cognizant of occupational sex segregation in water-related jobs and designing ways to transcend it • Facilitating on-the-job training and overall career progression for women in water utilities • Focusing on job quality, so that women who are freed from the responsibility of domestic water management can enter and stay in the labor market, if they have a choice	A program implemented by SEWA in Gujarat, India, trained rural women to repair village handpumps, resulting in increased employment outside household farms for women. A rural water supply and sanitation project in Nepal trained women as village maintenance workers, local latrine builders, and rainwater harvesting jar masons. A mentoring program by the Association of Women in Water, Energy and Environment brings professional women together to share experiences and knowledge. A USAID program builds the capacity of Kenyan utilities to mainstream gender in service delivery and institutional operations. In water utilities in the American Samoa, women have higher wages than do men and 77 percent of female staff are engineers.
Risk mitigation and adaptation	• Safety nets • Employment in projects to smooth income variability • Better information and awareness of opportunities • Focus on violence prevention and wellbeing of minorities and women	Bangladesh's social safety net program—the Employment Generation Program for the Poorest—put in place quotas for female participants to tide over income variability during the lean season or during disasters. A program in Brazil intended to improve the capacity of the municipal government to protect poor residents in the Lagoas do Norte region from perennial flooding, introduced new components. These included crime and violence prevention and were targeted to the most vulnerable groups, such as minority youth and women and also provided support services for survivors of violence.
Services		
Water supply	• Paying attention to distance, predictability, and affordability when designing projects • Understanding norms around who manages water and how it may impact their productive and reproductive roles • Leveraging microfinance, especially when it empowers credit and thrift groups	The Katosi Women Development Trust in Uganda provided loans and capacity building to women's groups to access improved water sources.
Sanitation	• Ensuring that toilets are "package deals"—clean, safe, predictable, secure, private, with water supply, and accessible • Understanding the intangible, social, religious, and cultural values of water when programming for behavior change	A national handwashing program in Ghana used disgust of contamination, disease and interest in children's wellbeing to motivate handwashing.

table continues next page

TABLE 5.2. continued

Channel for intervention	Illustrative actions targeting those most likely to be left behind	Illustrative examples of policies, programs, and projects
	• Using conditional cash transfers efficiently with attention to cultural norms and practices • Building coalitions across the state, civil society, and/or private sector	
Irrigation	• Targeting small farmers and women • Improving women farmers' access to extension services	The Malawi government targeted training in treadle pump use to women, resulting in a higher likelihood of women adopting the new technology.
Information, communication, technology	• Ensuring that ICT takes a gender differentiated approach, realizing that access to enablers such as mobile phones and the Internet is gendered and can leave out those who most need it • Investing in research for new solutions in design, accessibility, and monitoring	The Ministry of Health in Malawi encouraged women to adopt a chlorine water treatment product by relying on interpersonal communication and extending a free trial of the product.
Waterways	• Ensuring that women can access ferries and other waterways • Providing safety, affordability, and predictability	The Inland Waterway Project in Vietnam mainstreamed gender in the transport authority and in the design and operation of the project.
Spaces		
Skills that break stereotypes and enable the exercise of voice and agency	• Training in nontraditional skills, investing in STEM skills for females, and following through with preference in STEM jobs related to water • Teaching girls and women to swim, in a culturally sensitive manner • Building women's capacity in negotiation, leadership, and mentorship and following it through in the medium or long term	The Working to Advance African Women Foundation trained university students to provide STEM tutoring and training to girls in secondary schools. An ADB project in Lao PDR gives scholarships to female high school graduates to train in the field of engineering. SwimSafe in Bangladesh teaches children to swim and ensures gender balance in training volunteer instructors.
Accountability of the state and providers	• Strengthening the demand side as well as the supply side • Ensuring that grievance redress systems take into account the likelihood of exclusion of some members of the community in their design and accessibility • Enabling citizen feedback tools to report on satisfaction with service providers • Ensuring the cultural competence of providers and project personnel • Establishing well-rounded monitoring systems	Citizen Report Cards in Kenya captured women's complaints that they were heckled while accessing water from kiosks, the long queues they had to endure, and the inconvenience and loss of time in their efforts to obtain water.
Incentives to change norms	• Realizing that norms are mutable and the right polices can change retrograde norms that reproduce inequality • Focusing on men and boys as agents of change toward gender equality	WaterAid and Vatsalya in North India involved boys and men in supporting MHM, resulting in reduced stigma around menstruation. Training women in nontraditional skills, such as hand pump mechanics, as in projects in Gujarat, India, and Nepal, breaks stereotypes about male and female occupations in water.
Social capital	• Ensuring that new forums build on existing social capital, but also being cognizant that traditional groups can be exclusionary of women and other minorities	SEWA's integrated livelihood program in Rajasthan, India, worked with self-help groups and generated positive results for women (including increased control over domestic decision making and greater awareness of where to express grievances about public services).
Formal roles in decision making and ensuring participation	• Recognizing that informal institutions can be more representative of the needs of women, but that they can also be less secure • Building-in formal roles for women in decision-making structures (such as quotas in local government or user associations) and accompanying this with training and oversight to ensure active participation • Conducting meaningful consultations with women and men and ensuring that the needs of the whole community are heard, especially of those most likely to be left behind	Institutionalizing formal participation of women through quotas under MGNREGA in India led to their increased participation.

Source: Authors.

Note: ADB = Asian Development Bank; ICT = information and communications technology; MGNREGA = Mahatma Gandhi National Rural Employment Guarantee Act; MHM = Menstrual Hygiene Management; SEWA = Self-Employed Women's Association; STEM = science, technology, engineering, and mathematics; USAID = U.S. Agency for International Development.

Note

1. Mahila Milan ("Women Together") is a federation of women's collectives that provides credit to pavement dwellers in Mumbai and other cities across India. Its credit scheme aims to promote regular savings by women and thereby increase their decision-making power. Microfinancing by Mahila Milan financed the water and supply initiatives promoted by the Society for the Promotion of Resource Centers (World Bank 1999).

Chapter 6 Conclusion

...With the certainty of tides, Just like hopes springing high, Still I'll rise

"Still I Rise," Maya Angelou

In mapping the relationship between water—visualized in all its breadth—and gender, this paper is possibly the most comprehensive, to our knowledge. It points out that water and gender are intimately connected and that water can be seen as a canvas for the play of social and gender relations. Based on a review of a vast, multidisciplinary literature, the paper presents a "thinking device" to enable academics and practitioners to envision water and impute its relationship with gender more clearly. Water is presented as an asset, a service, and a space. The idea of space is at once the paper's most original contribution and perhaps the most complex element to comprehend. The idea brings out the physical and esoteric dimensions of water, which carries cultural, social, political, and religious significance, in addition to occupying physical space. The paper also highlights change in behavior, which is often at the heart of reforms related to water, and often depends on cognizance of the nonmonetary, noneconomic, esoteric values of water. Further, norms and practices in the domains related to water are often instruments of solidifying gender inequality and hierarchies at large, but these are mutable and interventions in water can have far-reaching consequences for equality and inclusion more generally. In sum, this paper is a contribution to two sets of discourses—one on the understanding of water more broadly, and the other on advancing gender equality.

Although the paper contributes to the world of ideas, it is also a reflection on the path to action. Using the metaphor of a rising tide that may leave some boats behind, the paper is forward looking and asks: how can the tide lift more boats? It asks practitioners to start with the right diagnostic of the problem they intend to solve, and emphasizes that *what* policies do is as important as *how* they do it. Finally, it points out that interventions that enhance gender equality in water-related domains need to go beyond water-related "sectors" or ministries. Since water affects every aspect of life, the policies and programs need to be grounded in many and not just a few sectors or areas.

The following are the main messages of this study:

1. Water can be thought of as an asset, a service, and a space. It has distinct economic, as well as noneconomic and nonmonetary values. The latter are often spiritual or social and the underlying norms and practices that play out are often deeply gendered.
2. Water is an arena where gender relations play out in ways that often mirror inequalities between the sexes. For instance, women's lower access to land is mirrored in their lower access to water-related natural resource assets.
3. Gender inequality in water, as elsewhere, reflects complexities that are not easily predicted. For example, not all women are disadvantaged, nor all men privileged.

People have multiple identities based, among other things, on ethnicity, race, caste, religion, socioeconomic status, location, disability status, and sexual orientation. The intersection of identities creates unique situations—and requires specific solutions.

4. Norms and practices related to water often exacerbate ingrained gender and other hierarchies. Informal institutions, taboos, rituals, and norms all play a part in cementing the status quo. Therefore, water often reflects, and even reinforces, gender inequality.
5. Interventions that balance gender relations in water-related domains can have a strong influence in furthering gender equality more broadly.
6. The nonmonetary, noneconomic values of water are important for policy and practice. That is because they influence the behavior of individuals and groups, particularly their response to water-related reforms or interventions.
7. Policies and programs can influence change. They are particularly effective when they give voice and provide opportunity to those likely to be left out.

Appendix A Steps for Review for the Study

1. Established criteria for selection: peer-reviewed journals, book chapters, and selected working papers from reputable scientific research organizations, after 1990.
2. Conducted Google scholar keyword search based on the business lines and thematic codes for water in the World Bank Group. (Keywords: water carrying, hygiene and sanitation, natural disasters, water management, irrigation, fisheries, water insecurity, hydropower, and dams)
3. Expanded keyword search to more than 50 keywords. Search terms combined with "gender" and "women."
4. Selected articles and authors of relevance and significance and their bibliographies to identify further articles.
5. All selected articles read and summarized in an annotated bibliography.
6. Articles catalogued and tabulated according to selected criteria.
7. Targeted search to find additional supporting evidence for the report.
8. Review of relevant knowledge products that did not meet the annotated bibliography criteria.

References

Abiona, O., and M. Koppensteiner. 2016. "The Impact of Household Shocks on Domestic Violence: Evidence from Tanzania." Working Paper No. 16/14. University of Leicester, United Kingdom.

ADB (Asia Development Bank). 2013. *The Role of Women in Peacebuilding in Nepal*. Publication Stock No. ARM135756-2. Manila, Philippines: ADB.

——. 2014. *Women, Water, and Leadership*. ADB Briefs No. 24. Manila, Philippines: ADB.

Akpabio, E., and K. Takara. 2014. "Understanding and Confronting Cultural Complexities Characterizing Water, Sanitation and Hygiene in Sub-Saharan Africa." *Water International* 39 (7): 921-32.

Alexander, K., C. Oduor, E. Nyothach, K. Laserson, N. Amek, A. Eleveld, and M. Ombok. 2014. "Water, Sanitation and Hygiene Conditions in Kenyan Rural Schools: Are Schools Meeting the Needs of Menstruating Girls?" *Water* 6 (5): 1453-66.

Ali, D. A., K. Deininger, and M. Goldstein. 2014. "Environmental and Gender Impacts of Land Tenure Regularization in Africa: Pilot Evidence from Rwanda." *Journal of Development Economics* 110: 262-75.

Anastasiadis, F., F. Archontakis, G. Banias, and C. Achillas. 2014. "Consumers' Perception of Wastewater Usage in Agriculture: Evidence from Greece." In *Agricultural Cooperative Management and Policy: New Robust, Reliable and Coherent Modelling Tools*, edited by C. Zopounidis, N. Kalogeras, K. Mattas, G. van Dijk, and G. Baourakis, 137-50. Cooperative Management Series. New York: Springer.

AWWEE (Association of Women in Water, Energy and Environment). n.d. 2017 *AWWEE Mentoring Program*. AWWEE, Sacramento, CA (accessed August 1, 2017), https://awwee.org/mentoring-program/.

Bartram J., K. Charles, B. Evans, L. O'Hanlon, and S. Pedley. 2012. "Commentary on Community-Led Total Sanitation and Human Rights: Should the Right to Community-Wide Health Be Won at the Cost of Individual Rights?" *Journal of Water Health* 10: 499-503.

Benda-Beckmann, K., M. de Bruijn, H. van Dijk, G. Hesseling, B. van Koppen, and L. Res. 1997. "Rights of Women to the Natural Resources Land and Water." Working Paper No. 2. Women and Development, Development Assistance, Development Cooperation Information Department, Ministry of Foreign Affairs, The Hague, the Netherlands.

Burt, M., and B. J. Keiru. 2011. "Strengthening Post-Conflict Peacebuilding through Community Water-Resource Management: Case Studies from Democratic Republic of Congo, Afghanistan and Liberia." *Water International* 36 (2): 232-41.

Cairns, M., C. Workman, and I. Tandon. 2017. "Gender Mainstreaming and Water Development Projects: Analyzing Unexpected Enviro-Social Impacts in Bolivia, India, and Lesotho." *Gender, Place and Culture* 24 (3): 325-42.

Caldwell, B. K., W. T. Smith, K. Lokuge, G. Ranmuthugala, K. Dear, A. H. Milton, M. R. Sim, J. C. Ng, and S. N. Mitra. 2006. "Access to Drinking-Water and Arsenicosis in Bangladesh." *Journal of Health, Population, and Nutrition* 24 (3): 336-45.

Carney, J. 1993. "Converting the Wetlands, Engendering the Environment: The Intersection of Gender with Agrarian Change in the Gambia." *Economic Geography* 69 (4): 329-48.

Chen, M. 2014. *Informal Economy Monitoring Study Sector Report: Home-Based Workers*. Cambridge, MA: WIEGO.

Cleaver, F. 1998. "Incentives and Informal Institutions: Gender and the Management of Water." *Agriculture and Human Values* 15 (4): 347-60.

Coffey, D., A. Gupta, P. Hathi, N. Khurana, D. Spears, N. Srivastav, and S. Vyas. 2014. "Revealed Preference for Open Defecation Evidence from a New Survey in Rural North India." *Economic and Political Weekly* 49 (38): 43-55.

Corno, L., N. Hildebrandt, and A. Voena. 2016. "Weather Shocks, Age of Marriage and the Direction of Marriage Payments." DISCE Working Paper No. 40. Universita Cattolica del Sacro Cuore, Milan, Italy.

Council of Canadian Academies. 2015. *Some Assembly Required: STEM Skills and Canada's Economic Productivity—The Expert Panel on STEM Skills for the Future*. Ottowa: Council of Canadian Academies.

Das Gupta, M. 1995. "Life Course Perspectives on Women's Autonomy and Health Outcomes." *American Anthropologist* 97 (3): 481-91.

Das, M. 2016. *Social Inclusion in Macro-Level Diagnostics: Reflecting on the World Bank Group's Early Systematic Country Diagnostics*. Washington, D.C.: World Bank Group.

Deininger, K., A. Goyal, and H. Nagarajan. 2010. "Inheritance Law Reform and Women's Access to Capital: Evidence from India's Hindu Succession Act." Policy Research Working Paper 5338, World Bank, Washington, DC.

De Silva, D., and M. Yamao. 2006. "The Involvement of Female Labor in Seafood Processing in Sri Lanka: Impact of Organizational Fairness and Supervisor Evaluation on Employee Commitment." In *Global Symposium on Gender and Fisheries: Seventh Asian Fisheries Forum*, edited by P. Choo, S. Hall, and M. Williams. Penang: World Fish Publishers.

Dercon, S., J. Hoddinott, P. Krishnan, and T. Woldehannna. 2008. "Collective Action and Vulnerability: Burial Societies in Rural Ethiopia." CAPRi Working Paper 83. CGIAR, Washington, DC.

Desai, J., and S. Joshi. 2014. "Collective Action and Community Development: Evidence from Self-Help Groups in Rural India." *The World Bank Economic Rev*iew 28 (3): 492-524.

Dias, S., and M. Samson. 2016. *Informal Economy Monitoring Study Sector Report: Waste Pickers*. Cambridge, MA: WIEGO.

Doocy, S., A. Daniels, S. Murray, and T. D. Kirsch. 2013. "The Human Impact of Floods: A Historical Review of Events 1980-2009 and Systematic Literature Review." *PLOS Currents Disasters* 16 (1).

Drolet, J., L. Dominelli, M. Alston, R. Ersing, G. Mathbor, and H. Wu. 2015. "Women Rebuilding Lives Post-Disaster: Innovative Community Practices for Building Resilience and Promoting Sustainable Development." *Gender & Development* 23 (3): 433-48.

Ebato, M., and B. van Koppen. 2005. "Gender Relations and Management of Multiple Water Use System in Adidaero Watershed, Tigray Region in Northern Ethiopia." Paper prepared for International Research Workshop on "Gender and Collective Action," Chiang Mai, Thailand.

Flatø, M., R. Muttarak, and A. Pelser. 2017. "Women, Weather, and Woes: The Triangular Dynamics of Female-Headed Households, Economic Vulnerability, and Climate Variability in South Africa." *World Development* 90: 41-62.

França Doria, M. de. 2010. "Factors Influencing Public Perception of Drinking Water Quality." *Water Policy* 12 (1): 1 -19.

Gammage, S., K. Swanberg, M. Khandkar, Z. Hassan, M. Zobair, and A. Muzareba. 2006. *Pro Poor Analysis of the Shrimp Sector in Bangladesh*. Arlington: U.S. Agency for International Development.

Gilbert, R., W. Sakala, and T. Benson. 2013. "Gender Analysis of a Nationwide Cropping System Trial Survey in Malawi." *African Studies Quarterly* 6 (1): 223-43.

Girard, A. 2014. "Stepping into Formal Politics: Women's Engagement in Formal Political Processes in Irrigation in Rural India." *World Development* 57: 1-18.

Glick, P. R. 2004. "Integrating Gender into Benefit Incidence and Demand Analysis." Cornell Food and Nutrition Policy Program Working Paper No. 167. Cornell University, Ithaca, NY.

Guterman, M., P. Mehta, and M. Gibbs. 2007. "Menstrual Taboos among Major Religions." *The Internet Journal of World Health and Societal Politics* 5 (2).

Harris, L. 2006. "Irrigation, Gender, and Social Geographies of the Changing Waterscapes of Southeastern Anatolia." *Environment and Planning D: Society and Space* 24 (2): 187-213.

Hodgson, S. 2004. *Land and Water: The Rights Interface*. FAO Legislative Study 84. Food and Agriculture Organization, Rome.

Ilahi, N., and F. Grimard. 2000. "Public Infrastructure and Private Costs: Water Supply and Time Allocation of Women in Rural Pakistan." *Economic Development and Cultural Change* 49 (1): 45-75.

ILO (International Labour Organization). 2016. *Women at Work: Trends*. Geneva: ILO Office.

IWA (International Water Association). 2014. *An Avoidable Crisis: WASH Human Resource Capacity Gaps in 15 Developing Economies*. Seacourt: International Water Association.

——. n.d. *Women Professionals in Urban Water* (accessed August 1, 2017), http://www.iwa-network.org/projects/women-professionals-in-urban-water/.

Jie Chen, Y., and N. Chindarkar. 2017. "The Value of Skills: Raising the Socioeconomic Status of Rural Women in India." *Development Policy Review* 35 (2): 229-61.

Kaliba, A., D. Norman, and Y. Chang. 2003. "Willingness to Pay to Improve Domestic Water Supply in Rural Areas of Central Tanzania: Implications for Policy." *International Journal of Sustainable Development and World Ecology* 10: 119-32.

Kamwamba-Mtethiwa, J., R. Namara, C. De Fraiture, J. Mangisoni, and E. Owusu. 2012. "Treadle Pump Irrigation in Malawi: Adoption, Gender and Benefits." *Irrigation and Drainage* 61 (5): 583-95.

Kogan, T. S. 2007. "Sex-Separation in Public Restrooms: Law, Architecture, and Gender." *Michigan Journal of Gender and Law* 14 (1): 1-58.

Komatsu, H., and G. Joseph. 2016. "Drinking Water Salinity, Burden of Water Collection and School Attendance of Girls: Evidence from Bangladesh and West Bengal." World Bank, Washington, DC.

Koolwal, G., and D. van de Walle. 2013. "Access to Water, Women's Work and Child Outcomes." *Economic Development and Cultural Change* 61 (2): 369-405.

Lawrence, J., K. Yeboah-Antwi, G. Biemba, P. K. Ram, N. Osbert, L. L. Sabin, and D. H. Hamer. 2016. "Beliefs, Behaviors, and Perceptions of Community-Led Total Sanitation and Their Relation to Improved Sanitation in Rural Zambia." *American Journal of Tropical Medicine and Hygiene* 94 (3): 553-62.

Levin, S. 2016. "At Standing Rock, Women Lead Fight in Face of Mace, Arrests and Strip Searches." *The Guardian*. November 4 (accessed June 7, 2017), https://www.theguardian.com/us.

Mahajan, K. 2017. "Rainfall Shocks and the Gender Wage Gap: Evidence from Indian Agriculture." *World Development* 91: 156-72.

Mahapatra, S. 2006. "Functioning of Water Users Associations or Pani Panchayat in Orissa: Principle, Procedure, Performance and Prospects." Paper prepared for the workshop "Water, Law and the Commons," Delhi, India.

Mahon, T., A. Tripathy, and N. Singh. 2015. "Putting the Men into Menstruation: The Role of Men and Boys in Community Menstrual Hygiene Management." *Waterlines* 34 (1): 7-14.

Meinzen-Dick, R., and M. Zwarteveen. 1998. "Gendered Participation in Water Management: Issues and Illustrations from Water Users' Associations in South Asia." *Agriculture and Human Values* 15 (4): 337-45.

Meyer, R. 2016. "The Legal Case for Blocking the Dakota Access Pipeline." *The Atlantic*. September 9 (accessed July 6, 2017), https://www.theatlantic.com/technology/archive/2016/09/dapl-dakota-sitting-rock-sioux/499178/.

Mezgebo, G. K., and Z. Ewnetu. 2015. "Households Willingness to Pay for Improved Water Services in Urban Areas: A Case Study from Nebelet Town, Ethiopia." *Journal of Development and Agricultural Economics* 7 (1): 12-19.

McGranahan, G., and D. Mitlin. 2016. "Learning from Sustained Success: How Community-Driven Initiatives to Improve Urban Sanitation Can Meet the Challenges." *World Development* 87: 307-17.

McKibben, B. 2016. "A Pipeline Fight and America's Dark Past." *The New Yorker*. September 6 (accessed July 6, 2017), http://www.newyorker.com/news/daily-comment/a-pipeline-fight-and-americas-dark-past.

Million Women Mentors Initiative. n.d. (accessed August 1, 2017), https://www.millionwomenmentors.com/.

Moore, E., M. Ali, E. Graham, and L. Quan. 2010. "Responding to a Request: Gender-Exclusive Swims in a Somali Community." *Public Health Reports* 125 (1): 137-40.

Morrison, A. D. 2007. "Gender Equality, Poverty, and Economic Growth." Policy Research Working Paper 4349, World Bank, Washington, DC.

Mukherjee, N. 2001. *Achieving Sustained Sanitation for the Poor: Policy and Strategy Lessons from Participatory Assessments in Cambodia, Indonesia, Vietnam*. Washington, D.C.: Water and Sanitation Program, World Bank.

Mustafa, D., G. Gioli, S. Qazi, R. Waraich, A. Rehman, and R. Zahoor. 2015. "Gendering Flood Early Warning Systems: The Case of Pakistan." *Environmental Hazards* 14 (4): 312-28.

Mwangi, E., and H. Markelova. 2008. "Collective Action and Property Rights for Poverty Reduction: A Review of Methods and Approaches." CAPRi Working Paper No. 82. CGIAR, Washington, DC.

Nagrah, A., A. Chaudhry, and M. Giordano. 2016. "Collective Action in Decentralized Irrigation Systems: Evidence from Pakistan." *World Development* 84: 282-98.

National Geographic. n.d. "On 'Burkini Island' Muslim Girls Can Finally Learn to Swim." *National Geographic* (accessed July 6, 2017), http://www.nationalgeographic.com/photography/proof/2017/06/burkini-swimming-zanzibar-girls-boyiazis/.

Ndesamburo, J., E. Flynn, and S. French. 2012. "Looking through an Equity and Inclusion Lens in Tanzania: The Experience of WaterAid." *Gender & Development* 20 (3): 453-65.

Ngoc Uyen, V. 2003. *Integrating Gender into World Bank Financed Transport Programs—Case Study: Vietnam Rural Infrastructure Inland Waterway Project*. Washington, D.C.: World Bank.

Pradhan, E., K. West, J. Katz, S. LeClerq, S. Khatry, and S. Shrestha. 2007. "Risk of Flood-Related Mortality in Nepal." *Disasters* 31 (1): 57-70.

PWWA (Pacific Water and Wastewater Association). 2016. *Benchmarking Report: Five Years of Performance Assessment (2011-2015).* Apia, Samoa: PWWA.

Rahman, A., A. Fazlur Rahman, S. Shafinaz, and M. Linnan. 2005. *Bangladesh Health and Injury Survey: Report on Children*. Dhaka: Directorate General of Health Services, Government of Bangladesh.

Rahman, A., M. Linnan, S. Rahman Mashreky, M. J. Hossain, and F. Rahman. 2014. "The Prevalence of Naturally Acquired Swimming Ability among Children in Bangladesh: A Cross Sectional Survey." *BMC Public Health* 14.

Rautanen, S. L., and U. Baaniya. 2008. "Technical Work of Women in Nepal's Rural Water Supply and Sanitation." *Water International* 33 (2): 202-13.

Ravitz, J. 2016. "The Sacred Land at the Center of the Dakota Pipeline Dispute." CNN. November 1 (accessed July 6, 2017), http://www.cnn.com/2016/11/01/us/standing-rock-sioux-sacred-land-dakota-pipeline/index.html.

Republic of South Africa Department of Water and Sanitation. n.d. "Women in Water Awards 2011" (accessed August 1, 2017), http://www.dwa.gov.za/events/WWA2011/default.aspx.

Robinson, K., C. Robinson, and S. Hawkins. 2005. "Assessment of Public Perception Regarding Wastewater Reuse." *Water Science and Technology: Water Supply* 5 (1): 59-65.

Rodella, A. S., A. Sanoh, and T. Maiga. 2017. *Of Rivers, Rains and Drops: A Diagnostic of Water, Hygiene, Sanitation and Poverty in Niger*. Washington D.C.: WASH Poverty Diagnostic Series, World Bank.

Roever, S. 2014. *Informal Economy Monitoring Study Sector Report: Street Vendors*. Cambridge, MA: WIEGO.

Scott, J. 1985. *Weapons of the Weak: Everyday Forms of Peasant Resistance*. New Haven, CT: Yale University Press.

Scott, J., and G. Marshall. 2009. A Dictionary of Sociology. Oxford: Oxford University Press.

Sekhri, S., and A. Storeygard. 2014. "Dowry Deaths: Response to Weather Variability in India." *Journal of Development Economics* 111: 212-23.

Sijbesma, C., J. Verhagen, R. Nanavaty, and A. J. James. 2009. "Impacts of Domestic Water Supply on Gender and Income: Results from a Participatory Study in a Drought-Prone Region in Gujarat, India." *Water Policy* 11 (1): 95-105.

Sinha, N. n.d. "Infrastructure, Gender Differences, and Impacts: The Evidence." World Bank, Washington, DC.

Sokile, C., and B. van Koppen. 2004. "Local Water Rights and Local Water User Entities: The Unsung Heroines of Water Resource Management in Tanzania." *Physics and Chemistry of the Earth* 29 (15-18): 1349-56.

Su, Y., S. Bisht, A. Wilkes, N. Shrestha Pradhan, Y. Zou, S. Liu, and K. Hyde. 2017. "Gendered Responses to Drought in Yunnan Province, China." *Mountain Research and Development* 37 (1): 24-34.

Sun, Y., E. Mwangi, and R. Meinzen-Dick. 2011. "Is Gender an Important Factor Influencing User Groups' Property Rights and Forestry Governance? Empirical Analysis from East Africa and Latin America." *International Forestry Review* 13 (2): 205-19.

SwimSafe Bangladesh. n.d. "Preventing Child Drowning" (accessed August 1, 2017), http://swimsafe.org/swimsafe-projects/bangladesh/.

Tarfasa, S., and R. Brouwer. 2013. "Estimation of the Public Benefits of Urban Water Supply Improvements in Ethiopia: A Choice Experiment." *Applied Economics* 45 (9): 1099-1108.

Thompson, K., K. O'Dell, S. Syed, and H. Kemp. 2017. "Thirsty for Change: The Untapped Potential of Women in Urban Water Management." *Deloitte Review* 20 (accessed May 6, 2017), https://dupress.deloitte.com/dup-us-en/deloitte-review/issue-20/women-in-water-management.html.

Treuer, D. 2016. "An Indian Protest for Everyone." *The New York Times*. November 26 (accessed July 6, 2017), https://www.nytimes.com/2016/11/26/opinion/sunday/an-indian-protest-for-everyone.html.

Tsai, L. 2007. "Solidary Groups, Informal Accountability, and Local Public Goods Provision in Rural China." *The American Political Science Review* 101 (2): 355-72.

Twerefou, D. K., K. A. Tutu, E. Botchway, and S. Darkwah. 2015. "Willingness-to-Pay for Potable Water in the Accra-Tema Metropolitan Area of Ghana." *Modern Economy* 6: 1285-96.

Udas, P., and M. Zwarteveen. 2010. "Can Water Professionals Meet Gender Goals? A Case Study of the Department of Irrigation in Nepal." *Gender and Development* 18 (1): 87-97.

UN (United Nations). 2015. *The World's Women 2015: Trends and Statistics*. New York: United Nations Department of Economic and Social Affairs, Statistics Division.

UN Statistics Division. 2008. *International Standard Industrial Classification of All Economic Activities (ISIC)*. New York: United Nations.

Upadhyay, B. 2004. "Gender Aspects of Smallholder Irrigation Technology: Insights from Nepal." *Journal of Applied Irrigation Science* 39 (2): 315-27.

USAID (U.S. Agency for International Development). 2014. *A Tool for Mainstreaming Gender in Water Supply and Sanitation Services* (accessed August 1, 2017), http://pdf.usaid.gov/pdf_docs/pbaab435.pdf.

Van Eijk, A., M. Sivakami, M. Thakkar, A. Bauman, K. Laserson, S. Coates, and P. Phillips-Howard. 2016. "Menstrual Hygiene Management among Adolescent Girls in India: A Systematic Review and Meta-Analysis." *BMJ Open* 6 (3).

Van Koppen, B., L. Hope, and W. Colenbrander. 2013. "Gender Aspects of Small-Scale Private Irrigation in Africa." Working Paper No. 153. International Water Management Institute, Colombo, Sri Lanka.

Van Minh, H., H. Nguyen-Viet, N. H. Thanh, and J. C. Yang. 2013. "Assessing Willingness to Pay for Improved Sanitation in Rural Vietnam." *Environmental Health and Preventive Medicine* 18 (4): 275-84.

WAAW (Working to Advance STEM Education for African Women) Foundation. n.d. "Stem Outreach and Mentoring Program" (accessed August 1, 2017), http://waawfoundation.org/.

Waldorf, A. 2013. "Assessing the Role of Women in Microfinance for Water Supply and Sanitation Services." *wH2O: The Journal of Gender and Water* 2 (1): 28-30.

WHO (World Health Organization). 2014. *Global Report on Drowning: Preventing a Leading Killer*. Geneva: WHO.

Women's Engineering Society. 2014. *Diversity in Engineering.* London: Women's Engineering Society (accessed May 20, 2017), http://www.wes.org.uk/sites/default/files/u82/Diversity%20in%20Engineering%20Data%20Report%20FINAL.pdf.

Women for Water. n.d. "Central Asia Creates Women for Water Network" (accessed August 1, 2017), http://www.womenforwater.org/ca200616.html.

Wood, S., J. Foster, and A. Kols. 2012. "Understanding Why Women Adopt and Sustain Home Water Treatment: Insights from the Malawi Antenatal Care Program." *Social Science and Medicine* 75 (4): 634-42.

World Bank. 1999. *Credit Connections: Mahila Milan*. Washington, DC: Water and Sanitation Program Field Note, South Asia, World Bank.

——. 2009. *Bangladesh: Employment Generation Program Project*. Washington, DC: World Bank.

——. 2012a. *Hidden Harvest: The Global Contribution of Capture Fisheries*. Washington, DC: World Bank.

——. 2012b. *World Development Report 2012: Gender Equality and Development*. Washington, DC: World Bank.

——.2013. *Inclusion Matters: The Foundation for Shared Prosperity*. New Frontiers of Social Policy. Washington, DC: World Bank.

——. 2015. *World Bank Group Gender Strategy (FY16-23): Gender Equality, Poverty Reduction and Inclusive Growth*. Washington, DC: World Bank.

——. 2016a. *India Poverty Diagnostics for Water, Sanitation and Hygiene*. Washington, DC: World Bank.

——. 2016b. *Water and Sanitation Services: Achieving Sustainable Outcomes with Indigenous Peoples in Latin America and the Caribbean*. Washington, DC: World Bank.

——. 2017a. *Bangladesh WASH Poverty Diagnostic Key Findings and Recommendations: Bad Water, Sanitation, and Hygiene—Putting a Brake on Development in Bangladesh*. Washington, DC: WASH Poverty Diagnostic Series, World Bank.

——. 2017b. *Dire Straits: The Crisis Surrounding Poverty, Conflict, and Water in the Republic of Yemen*. Washington, DC: WASH Poverty Diagnostic Series, World Bank.

——. 2017c. *Nigeria WASH Poverty Diagnostic*. Washington, DC: WASH Poverty Diagnostic Series, World Bank.

——. 2017d. *Results of Collaboration for Social Inclusion in the Trung Son Hydro Power Project, Vietnam*. Washington, DC: World Bank Group.

Zagheni, E., R. Muttarak, and E. Striessnig. 2015. "Differential Mortality Patterns from Hydro-Meteorological Disasters: Evidence from Cause-of-Death Data by Age and Sex." *Vienna Yearbook of Population Research* 13: 47-70.

Zwarteveen, M., and N. Neupane. 1996. *Free-Riders or Victims: Women's Nonparticipation in Irrigation Management in Nepal's Chattis Mauja Irrigation Scheme*. Research Report 7. Colombo: International Water Management Institute.

Zwarteveen, M. 1998. "Identifying Gender Aspects of New Irrigation Management Policies." *Agriculture and Human Values* 15: 301-12.

WORLD BANK GROUP

W17068