

# Barriers and Bias: Women in Water Utilities Are Breaking Them All

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## ABSTRACT

Around the world, women are the mainstays of society, from raising children to supporting families to caring for the needy. In developing countries, they are also usually responsible for collecting and providing water for the family. In doing so, their time, health, safety, education and income are compromised. Outdated and undisputed social norms create the biases that force women to bear the responsibility to secure and distribute water, thereby creating barriers to women's advancement in educational opportunities and significantly reducing income-earning potential. Similarly, in the developed world, outdated social norms create biases and barriers in the water industry that limit women's advancement in terms of roles and leadership opportunity. However, with increased awareness of opportunities in the water sector in the early stages of their careers, it is possible to attract more women to the water sector and for these women to become the next generation of water leaders. This article discusses the biases, barriers and bottlenecks facing women who work in water utilities, current leadership's responsibility to attract more women to the sector and the role of communications in attracting more young minds toward water utilities. This paper presents the state of the knowledge of female employment in water careers in the United States (US) and is supported by learnings from interviewing four women water leaders working in four different large US water utilities.

## 1 INTRODUCTION

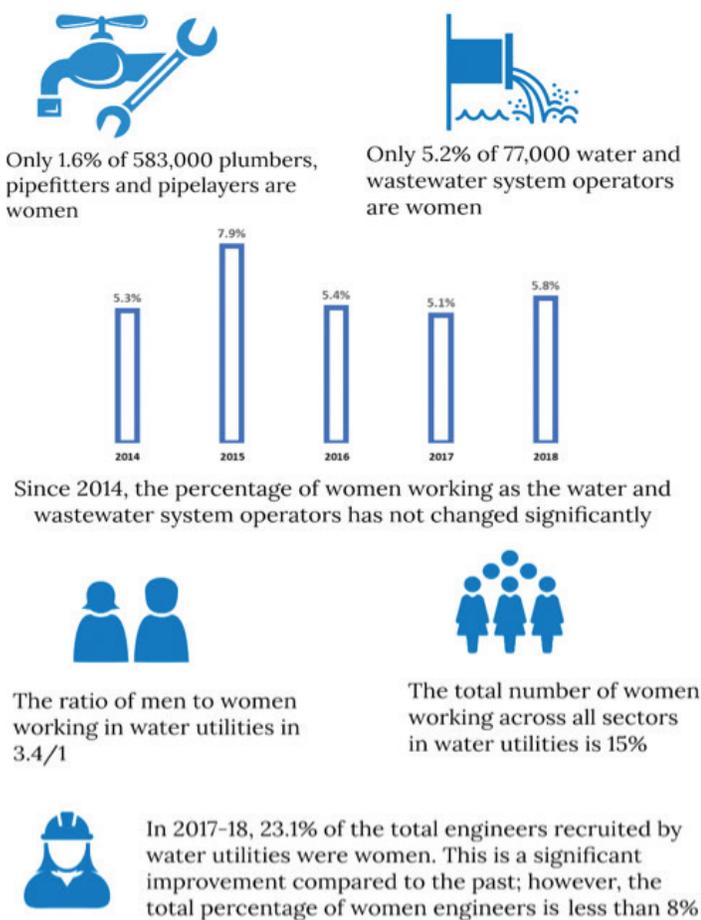
Historically, women have been directed toward care giving jobs such as nursing, teaching, day care, and the like due to social norms and lack of opportunity in other roles. As such, in the developing world, women and girls often endure the responsibility of fetching water from long distances in order to provide sanitation and hygiene to the whole family. Irrespective of the developing or the developed world, water is a key source of employment, both directly, as an employer in

water related services, and indirectly, through water-dependent economic activities such as agriculture.

In the developed world, where the water industry is responsible for delivering water to consumers, women are underrepresented in terms of overall employment and are not often in positions of leadership when it comes to managing water resources and water infrastructure. This presents both a challenge and untapped opportunity for the water industry. Encouraging and facilitating women's employment in the water industry will help address the issue of gender bias and inequality.

Though women make up 46.8 percent of employees across all professions in the United States, they account for less than 15% percent of the water workforce. While women make up a majority of water workers in certain administrative positions—including 95 percent of administrative assistants — they only account for a fraction of employment in some of the largest water occupations overall, including water treatment operators (5.2 percent) and plumbers (1.4 percent). Women are consistently under-represented across water utilities, particularly in the skilled occupations and in management positions - just 6 percent of water utility CEOs are women (Kane and Tomer, 2018). Some of the statistics related to women employment in water utilities are depicted in Figure 1.

**Figure 1: Current status of women employment in US water utilities (Data Sources: AWWA, 2016; Data USA, 2018; Globe, 2016; Koukouli, 2018)**



Much of the water infrastructure in the United States is at the end of its useful life and therefore jobs to update and restore infrastructure provide considerable promise. Field workers in these jobs earn modest wages and educational requirements to enter the workforce are minimal. However, they develop deeper knowledge and transferrable multidisciplinary skills. Also, there is a coming wave of retirements and other employment shifts which means that prospective recruits can find a long-term career in the infrastructure sector. The United States' water infrastructure is exemplary

of this significant opportunity. From rivers and lakes to pipes and pumps, water systems are in need of urgent repair, maintenance and restoration. This 'workforce gap' presents water utilities an opportunity to enhance their skilled workforce as well as increase gender diversity in this sector. Gender is the most basic form of diversity and if gender parity is not achieved the economy would be squandering half of the brain-power available to make this world a better place.

This paper discusses the current status of female employment in US water utilities, describes commonalities between up and coming women water leaders, reviews biases and bottlenecks for women in employment, retention and career advancement and provides examples of practices around the world that attract more women to unconventional careers such as the water sector and programs that increase gender diversity in the water industry. Findings from this review were supported by interviewing four women leaders from different US water utilities. All of the women interviewed - Alissa Lockett, Elesia Glover, Dana Lawson and Doa Meade- were nominated as Next Generation Water Leaders by the CEOs of their respective water utilities. Each woman presented her vision of the ideal water utility in the year 2050 at the American Water Summit in Houston, Texas in November 2019.

- Alissa Lockett, Director of Engineering, San Antonio Water System
- Dr. Elesia Glover, Project and Public Policy Manager for the City of Atlanta, Georgia
- Doa Meade, Director of Infrastructure Management, Las Vegas Valley Water District
- Dana Lawson, Senior Engineer, Central Contra Costa Sanitary District

## 2 A COMMON MOTIVATION TO PURSUE WATER CAREERS

Despite different backgrounds and paths to the water sector, all four women chose working at water utilities in part because they wanted to pursue a career that is meaningful, purposeful and rewarding. "I always wanted to do something that I felt good about giving back to the world", says Doa Meade when asked about what motivated her to pursue a career in the water industry. Elisa Glover said, "Water impacts everyone, [it is] essential for life. Working in water provides pride and gratitude because you are working on a resource that is important for our future". Understanding at a young age that it is possible to have a secure career in the water industry is important for the sustainability of water sector. Motivation can start anywhere- at home, at school or because of a role model. For Alissa Lockett, motivation started at home because her father was a biochemist at San Antonio's largest wastewater treatment plant. She was inspired by the service her father provided to the industry in making sure the water was safe. For Dana Lawson, her father was a single parent and raised his daughter no differently than his sons. Dana's father worked as a utility consultant and motivated her to study engineering, mathematics and science.



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**Dr. Elesia Glover**, *Project and Public Policy Manager*

*for the City of Atlanta, Georgia*

### 3 BIASES AND BARRIERS FACED BY WOMEN IN WATER UTILITIES

Women working in water utilities today face a set of outdated biases in terms of the roles they commonly play within the utility work force and being underrepresented in leadership positions. Although these biases are slowly changing as more women are gaining employment in the water industry in all positions including operations, engineering and management, the industry overall still has a long way to go to achieve gender parity. The ratio of men to women employees was observed to be substantially higher in small to medium scaled utilities compared to large utilities across the world (World Bank Group, 2019).

Within a single utility, the gender gap may be more pronounced in some areas and less so in others. “There is no inequality in hiring, but there is inequality in terms of exposure” according to Elesia. Elesia believes if women are qualified, they will be hired. Gender inequality differs according to the type of positions in water utilities. For example, in Alissa’s experience, there is more gender inequity among field workers and more equality on the managerial side. This difference in where the gender inequity exists may be due to subconscious bias where field worker is not considered a traditional career path for women. While there is uncertainty around the exact contributing factors for this issue, there is

clearly a need and an opportunity for female empowerment in field and technical work in US water utilities.

A recent report by World Bank Group broke down stages of the employee career cycle in water utilities and how these might be acting as barriers for more women to enter the industry. These stages include attraction, recruitment, retention and advancement as shown in Figure 2.

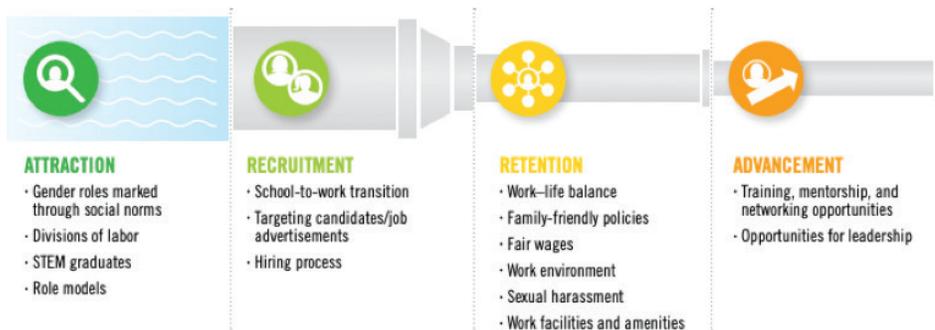
#### Attraction

One of the many factors that contributes to lower female participation in water utilities is bias based on outdated social norms. Because of established social norms and practices, women do not often see water utilities and other infrastructure sectors as an obvious career choice in the US or in other countries. While there are several barriers for women to enter these industries, the chain of barriers begins in education, with only a small number of women pursuing graduation in Science, Technology, Engineering and Mathematics (STEM) fields. Dana Lawson stated that, “Educating at a young age that water jobs can be stable is the key to attracting more young men and women to this sector.” Historically engineering disciplines have been underrepresented by women and there is still a need to break this barrier. Some women are fortunate to find mentors who can help break this barrier. For example, Doa Meade had an influential advisor when she was studying engineering at the University of Nevada, Las Vegas. This advisor recruited female students from a wide variety of disciplines across campus by publicizing the importance of women in engineering. This resulted in Doa’s engineering cohort to have nearly 30-35% female students.

#### Recruitment

Bias can push women away from as well as toward certain roles. Currently most of the women around the world that work in water utilities work in customer care because of traditional biases where women are assumed to be good at soft skills and human relations. Women are likely to be deterred from pursuing fieldwork such as plumbing\* and system operations and maintenance because of old social norms that prescribe that these jobs are not suitable for them or that they are

Figure 2: Employee career cycle in Water Utilities; graphic reused from World Bank Group 2019 report (World Bank Group, 2019)



\* Plumbing is considered a different field of work from the water utilities. In utilities similar positions are referred to as utility technicians or operators

not capable of performing well. Instead, women should be encouraged to work in any aspect of water sector that interests them. “The idea that we are protecting public health and environment should be a driver for women to work in this industry just like it is a driver for women going into nursing. Getting this message out is what is missing.” says Alissa. She also thinks that strong women working in utilities need to present their work experiences in schools and colleges to show young girls that they can make a meaningful difference through many different roles in the water industry, not just traditional ones. This is particularly important because young women do not have many role models to look up to in the water industry.



“The idea that we are protecting public health and environment should be a driver for women to work in this industry just like it is a driver for women going into nursing. Getting this message out is what is missing.”

**Alissa Lockett**, *Director of Engineering at the San Antonio Water Systems*

Findings from World Bank, AWWA and several other organizations reveal that women are hired at a much lesser rate in water utilities compared to men. In many countries around the world, women are not particularly targeted for infrastructure related jobs including water utilities. Often, women graduates are unaware of the available opportunities in this sector. Further, several studies show that the language used in framing the job description could be less appealing to women and hence the jobs do not attract them (Gaucher et al., 2011; Mohr, 2014; O’Brien, 2019). Job postings in male-dominated industries, such as STEM-related fields, often contain gender-biased terminology that emphasizes masculine strengths and skill sets. For example, many utilities refer to the entry points for gravity sewers as manholes.

Elesia believes that water should be one area that is completely bipartisan, irrespective of gender, race, socio-economic status or language.

### Retention

The third challenge to eliminating the gender gap in water utilities is retaining female talent within the industry. Some of the reasons that women leave their jobs in water utilities include insufficient flexibility in provisions that enable women to reconcile work and caregiving responsibilities, concerns over working conditions related to the absence of essential amenities (separate toilets, changing rooms, and sanitary facilities), the feeling of isolation in a male-dominated environment, sexual or other forms of harassment and wage gap. Inadequate family-friendly policies to support employees in their roles at work, at home, or in the community

affects all employees, but it is likely to be felt more acutely by women, who assume more domestic and caregiving responsibilities.

The inflexibilities in work schedule can result in work/life imbalance and many women find it hard to remain in the job. “There is a strong need for image change in engineering in order to make engineering attractive to women. Back in the day, broadcasting had attracted women mainly because of advertising through media. The exact same approach is needed for attracting women into engineering and other technical fields.” says Doa. The exit rate of women is much higher in technical and engineering jobs compared to managerial or customer support roles



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**Doa Meade**, *Director of Infrastructure Management, Las Vegas Valley Water District*

Providing employees with opportunities for professional development, such as training, mentoring, or promotions, is one way of overcoming the problem of retaining qualified staff. However, literature points out that female employees are rarely given equal opportunities to advance in their careers. The lack of retention or advancement is attributed to a “leaky” talent pipeline, whereby at each career step in STEM related or other technical fields, women are increasingly left behind. In the water sector, this has been called the “missing women” in water leadership (Jalal, 2014).

Irrespective of the factors that affect female retention in this industry, “not letting any of these phase you out is the key” Alissa advises. Alissa thinks that a lot of factors are changing now because the world has shifted, and the US especially is shifting towards more diverse work environments. Dana notes that “Making professionals in this field feel that they are doing the right thing for the world by supporting (the) environment” is key to retaining female workers and for advancement of their career trajectory.

## 4 ROLE OF LEADERSHIP IN ADDRESSING THE GENDER GAP

Leadership is not about appointing women to token positions, but truly enabling them to influence decision making for the benefit of women, as well as men. No individual factor can adequately explain the absence of women in water agencies,

water governance, and policy making. Rather, it is the confluence of multiple elements that keep women marginalized with respect to leadership roles. While female leadership in the water sector matters, it is also critical to ensure they have power to make decisions. To address the gender gap in water utilities, there is a need for concerted efforts, especially among executive leadership, to ensure women are provided with opportunities to become leaders and that once in those leadership positions, women's voices are heard, and their decisions are supported by top management.

Effective leadership can promote STEM education for girls and encourage more women to work in infrastructure fields. Communication is essential in this effort through showcasing innovations that open up research and development related opportunities. Two of the major factors that can help address gender diversity in water utilities are incubating innovations and influencing the change. These two factors are discussed in detail in the following sections.

#### 4.1 Incubating innovation to attract women to water utilities and address the gender gap

Leaders understand that innovation is always needed and that it must be encouraged as well as incubated. All the four water leaders interviewed are at the forefront of innovation at their respective water utilities and lead innovation efforts to address issues such as aging infrastructure, water leakage, technology, human resources and policy gaps. These innovations will help attract more young women interested in STEM, Human Resources, research and communications to the water sector. Although women fall far behind men in terms of participation in STEM careers, one study found that the gender-based age gap is smaller in STEM related fields compared to non-STEM related fields. This information could be shared as a way to attract more women to STEM careers (Suneby, 2014). Some of the examples of the need for innovation provided by the next generation water leader interviewees are summarized below. These innovations are multidisciplinary in nature and hence attract young men and women across all fields.

- **Technology:** Many systems such as the ones used to manage customer payments and manage assets are not interconnected and hence do not communicate well with each other. There is a need for technology that helps better manage assets and brings all utility activities under one umbrella. Also, there is a need for better sensors to pro-actively detect water leakage underground so that the problem can be fixed more rapidly.
- **Work life balance:** There is a need for innovation in terms of creating more flexibility for employees through flexible work hours and work from home options in order to provide a better work life balance. This flexibility will in turn attract more women to water utilities.
- **Equity:** New strategies must be implemented by water utilities to address water rates, affordability and environmental equity issues. This can be accomplished through utilities working more closely with community leaders.

- **Asset management:** Increased funding, improved technology and consolidation of distributed systems is needed to manage assets more efficiently.

These examples of the wide variety of innovations needed in water utilities are multidisciplinary in nature and will create new opportunities for employment. This will address at least the attraction and recruitment challenges discussed earlier in this paper as well as gender related issues simultaneously.

#### 4.2 Influencing the change

The overall purpose of leadership is to influence others, and to ensure that the allocation of resources benefits people and advances organization's development. During interviews, the water leaders provided excellent ideas to influence women to think about water as a career option at a young age. This section summarizes the ideas from all the four interviewees.

It is important to introduce the concept of women as a valuable asset to the water sector early by visiting schools, colleges and career fairs with the message that water careers are a good choice for both men and women. The primary objectives of this activity would be to:

- Educate young women and men that water jobs can be stable
- Explain how water sector jobs support the environment
- Help young minds understand that water is a public health issue in order to attract more women
- Spread the message that caring for and managing water resources is the right thing for the world
- Spread awareness that there is are good alternative careers for women in the water sector apart from conventional careers

In addition to visiting schools, colleges and career fairs, water utilities should attract more women to the industry by using communication channels including print materials, broadcasting and email blasts.



“Putting the word out to students and young minds that there is an alternative career and educating that water jobs can be stable is the key to influencing change”

**Dana Lawson**, Senior Engineer,  
Central Contra Costa Sanitary  
District

## 5 PROGRAMS AROUND THE WORLD THAT BREAK GENDER STEREOTYPES

US water utilities can learn from international initiatives on how to break gender stereotypes and reduce the gender

gap. In 2011, Jordan's Ministry of Water and Irrigation organized a program called 'Water Wise Women' that was partly funded by Germany's Agency for International Cooperation (GIZ). Through Water Wise Women initiative, local women are trained to be plumbers. The motivation for this program was that Jordan is 75% desert and is running out of water. One of the most immediate solutions to water scarcity was to fix the leakage that resulted from aging infrastructure. In the first pilot there were 17 women participants. Now, more than 300 women in 15 locations across the country have been trained, about 10% of whom are Syrian refugees (Ruggeri, 2018). The demand and popularity of this program is growing day by day. These women are now able to address water leakage issues resulting from aging infrastructure at homes and their communities. Jordan's Water Wise Women initiative is an excellent example of breaking gender-based stereotypes in the water industry.

Women's involvement is low in the utility sector in general, in both water and energy. In 2012, Asian Development Bank undertook an initiative to improve gender equity and mainstreaming in rural areas of Bhutan, Nepal and Sri Lanka. The goal of this project was to develop Sustainable and Gender Responsive Renewable Energy Operational Systems in Remote Rural Communities by training women to be electricians (Asian Development Bank, 2016). Specifically, the project in Nepal included implementation of small hydro-systems to widen energy access and enhance energy-based livelihoods of women and vulnerable groups by training poor women as electricians and technicians. These female representatives present their work to schools, colleges, and the community, hence serving as role models. More such role models are needed in the water sector to encourage young women to join the water sector.

### **5.1 Increasing awareness of job opportunities in the water sector:**

In 2016, Macedonia's energy authority implemented a program called 'Bring Your Daughter to Work Day' under USAID's Engendering Utilities Program (USAID, 2016). This program helped nearly 70 girls realize the value of education and envision a future with no gender limitations. The same program was also implemented in the Nigerian energy authority. The US water sector needs programs like this to increase awareness among young women about the benefits of working in water utilities. These initiatives encourage young children to find their passion and work towards it. Increasing the awareness about water utility jobs and explaining that water is a public health issue and that working in the water sector helps protect the environment is a great motivation to draw a higher number of young people to the field.

### **5.2 Scholarships**

The Asian Development Bank provides scholarships to young women who want to pursue a career in water utilities in the Laos People Democratic Republic. The female schol-

arship program is linked to the Small Towns Water Supply and Sanitation Project and is a pilot program funded by ADB's Gender and Development Cooperation Fund<sup>1</sup>. This program is designed to address the current gender gaps in leadership of the urban water and sanitation sector and to build a future pipeline of female water professionals and water utility leaders.

## **6 MESSAGE FROM WATER LEADERS TO NEWBIES**

For men and women aspiring to take up a career in water, one of the most important things to understand is to start somewhere. Irrespective of a person's background or technical interests, an entry-level position can open up an avenue to various other opportunities within the water sector. One Next Generation Water Leader advises young people to join professional organizations such as the American Water Works Association (AWWA). These organizations increase member visibility as well as help with networking. Specialized training available through these organizations such as the Water Distribution Operator Certification can be an entry point into water utilities. Entry level positions are important to begin carving a personal path in the water industry.

## **7 CONCLUSIONS**

While it is hard to deny that women are historically under-represented in water utilities, this trend has been changing. There are many initiatives around the world that are geared towards increasing female employment in infrastructure related jobs. People in leadership positions are working to increase women engagement not just by offering token positions but truly enabling them to influence decision making for the benefit of women, as well as men. Several initiatives around the world over the last decade show considerable promise in addressing the gender bias and barriers in the water industry. These programs provide role models to the world that young women can look up to and work toward. The water infrastructure in the United States is at the end of its useful life and therefore water utility jobs provide a considerable promise. Through carefully designed interventions, utilities can address the specific needs of their utility and thereby ensure that they have the best possible trained and skilled workforce, including women, to support them in their task of providing water and sanitation services to all.

<sup>1</sup> <https://www.adb.org/results/tomorrows-women-water-leaders-lao-pdr>

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