

The Real Water Wars: Water, Water Justice & Women

Maria Carmona and Aleena Naseem

Abstract

This paper is about the real water wars: the wars between the ‘haves’ and the ‘have nots’. It uses case studies across the globe—from the Andean Highlands in Peru and Ecuador, Thailand in the East, Zimbabwe in the South, all the way to the First Nation Reserves in Canada—to expose the water injustices faced by the marginalized. The paper then draws from the Integrated Water Resources Management (IWRM) and the Sustainable Development Goals (SDGs) and recommends that the social equity pillar of the IWRM be strengthened through the *IWRM+* approach. A special focus is given to women who, instead of being treated as victims, can be used as a force to improve water management through mechanisms ensuring inclusion.

Introduction

Universal and equitable access to water is critical for the achievement of the sustainable development objectives. Improving access to water contributes to better health and education outcomes, increases agricultural productivity, improves livelihood and incomes, helps towards poverty reduction, and is a driver of gender equality and women’s empowerment (World Water Development Report, 2012). However, the World Health Organization reports that as of 2015, 2.1 billion people globally lack safe water at home and 844 million do not have basic drinking water services (WHO, 2015). It is estimated that one in three people experience moderate to high water stress¹ and that this will increase to two-thirds of the global population by 2025 (Falkenmark & Rockström, 2004).

¹ Water stress is reached when annual water supply drops below the threshold of 1,700 m³ per person per day. Water scarcity occurs when annual water supply goes below 1,000 m³, and absolute scarcity when supply is below 500 m³ (UN-Water).

In 1995, Ismail Serageldin, Vice President of the World Bank at the time, warned that "if the wars of this century were fought over oil, the wars of the next century will be fought over water—unless we change our approach to managing this precious and vital resource." His prediction helped to bring water issues to the forefront in the policy arena. Serageldin was also widely criticized for being an alarmist, to which he made a clarification that 'wars' meant conflict between countries as well as "civil strife between competing groups within countries" (Serageldin, 2009). Shiva (2002), citing Serageldin, said that water conflicts are "paradigm wars—conflicts over how we perceive and experience water" (p. ix). Swatuk (2017) added that the real water war is being "waged by the rich against the poor" (p. 8).

Contemporary global water discourses describe water scarcity as a 'crisis of governance'. Integrated Water Resources Management (IWRM) is heralded by some experts as one of the most influential governance models in the water sector—the "institutional Holy Grail" that will solve all the world's water problems (Clement et al., p. 870). IWRM is an approach to improve efficiency in water use (the economic rationale), promote equity in access to water (the social or developmental rationale) and to achieve sustainability (the environmental rationale). However, it has also received widespread critique, not for its underlying concepts, but on the pace and manner it has been implemented (Butterworth et al., 2010; Biswas, 2008). This has led us to ask in what ways the IWRM can be improved to achieve greater fairness and more equitable water resource capture, access, and decision-making.

Through this paper, we attempt to expose how peasant and indigenous communities and women experience water injustice (the "is"). We will also show that IWRM, as an approach to tackling water access problems and alleviating injustices, can be enhanced by strengthening its social equity pillar (the "ought"). The paper will proceed as follows:

Section 1 will discuss some of the critiques of IWRM in relation to the social equity pillar and will describe the approaches that we used to aid in analyzing various case studies in Section 2.

Section 2 will focus on case studies of indigenous communities in the Andean highlands, women in Zimbabwe, Thailand and the Aboriginal women of Canada.

Section 3 will detail some ways in which water management can be made better e.g., IWRM+, for the benefit of marginalized sectors in general, and women in particular.

Section 4 will conclude the paper with the recommendation that IWRM in principle is a sound mechanism; however by enhancing the social equity aspect, it can be strengthened further and may also improve on-ground results.

1.0 Conceptual framework

1.1 IWRM and social equity

One of the critiques of IWRM is its bias in favor of the efficiency pillar, which results in the neglect of the social equity pillar. Water users and uses are ranked based on calculations of efficiency, consistent with the reductionist approach to water security. The ‘more efficient’ or ‘modern’ users—multinational commercial enterprises, large agribusiness firms, private drinking water bottling companies, and mining and hydropower conglomerates—are given preferential treatment in terms of water access and capture. Small-scale farmers who use traditional irrigation systems for growing crops are perceived as ‘less efficient’ and ‘backward’ and have less power to demand for their water needs (Zwarteveen & Boelens, 2014). This bias mirrors the period of industrial modernity manifest as the ‘hydraulic mission’ of the mid-twentieth century, typified by large-scale construction of infrastructure e.g., dams (Allan, 2003). The inequity in water allocation pervades up to the present times with the emergence of water-development discourses e.g., the water, food and energy nexus, where IWRM plays a central role.

Related to the first critique, IWRM is seen as more water-centric than people-centric. As a result, IWRM falls short as an effective water allocation mechanism by “overlooking diversity and politics in society” (Zeitoun et al., 2016, p. 145) and failing to see that water scarcity is “more a political rather than a

technical challenge” (Allan, 2003, p. 9). As Swatuk (2005) said, IWRM should not be simply treated as “a policy or method, but a site where power—political, social and cultural—is exercised through discourse, knowledge creation and social practice” (p. 877).

Another weakness that is seen in IWRM is the universal application of its principles and its inability to tailor solutions that are unique for each country and context. This cookie-cutter approach has led to limited benefits, if at all, especially for developing countries where conditions are very different from developed countries (Al-Saidi, 2017). Numerous researchers and authors, such as Denby, et al. (2016), a critique about the IWRM in the Inkomati Water Management Area in South Africa. The authors outline how the IWRM failed to ‘integrate’ based on the historical context of the region, particularly to the black farmers. By including the social equity element, injustices faced by the black farmers including the interplay of existing power dynamics, would be recognized, if not entirely resolved.

Last but not least, IWRM is critiqued for its elitist nature, owing to the influence of what Conca (2006) referred to as the “epistemic communities” (p. 9) of technical experts. As a result, knowledge of local communities in equitable and sustainable management of water resources has often been disregarded.

We have summarized in the foregoing paragraphs some of the shortcomings of IWRM in relation to social equity, which we hope to address through some of our recommendations in Section 3.0.

1.2 Water justice

This section discusses approaches that aided our analysis of various case studies in Section 2.0. We take as a point of departure, Sen’s (2009) idea of justice. Sen emphasizes the contextual character of justice i.e., justice from the perspective of those who experience political oppression, cultural discrimination or economic exploitation. Using the “justice lens” to bring to light the institutional and cultural barriers to more equitable water access will aid in reforming current structures (Zeitoun, et al., 2016).

Similarly, this paper argues the importance of the concept of “hydrosocial cycle” in the campaign for water as a human right as well as in the practice of water management. This concept recognizes the multidimensional nature of water and puts people at the center of the discussion on water security (Linton, 2014).

Finally, we draw from Mehta et al. (2014) who argue that the global environmental justice (GEJ) approach is an appropriate tool to challenge injustice regarding the global right to potable water. The authors argue that GEJ is a powerful tool to counter local injustices, however, its actual uptake is shaped by the diversity of nations, including their political economy. According to the authors, injustices are often a product of the nature of the state and its disregard for the marginalized and biases in policy-making that benefit the wealthy.

2.0 Case studies

2.1 Peasant and indigenous communities in the Andean highlands (Peru & Ecuador)

Majority of Andean peasant and indigenous populations face water insecurity and are exposed to water injustice, as can be seen in the cases of Peru and Ecuador (Boelens, 2015; Boelens, Getches, Guevara-Gil, eds., 2010; Seemann, 2016; Roa-Garcia, M.C., 2014; Rodríguez-de-Francisco & Boelens, 2016).

Water management in Peru clearly favors efficiency over equity or sustainability. Article 55 of the 2009 Peruvian Water Law allocates water based on which user or use has the highest contribution to public interest. The most efficient, the highest income generator, and the producer of the least environmental impact are granted efficiency certificates that serve as their passport to water rights. This puts small-scale and peasant farmers at a disadvantage vis-à-vis larger farmers and corporate players who can make investments in efficiency improvements. Roa-Garcia (2014) describes this as the domination of “hegemonic economic groups”, marginalizing small, indigenous users through “water plundering” (p. 309).

Another extreme form of water injustice in Peru is ‘water grabbing’ (similar to land grabbing), where powerful stakeholders e.g., multinational corporations, wealthy investors or governments, acquire vast areas of land and take control over related resources e.g., water, minerals, forests. Agro-industrial production of export and high-value crops e.g., asparagus, avocados, grapes and cut flowers, has been booming since the 1990s. The majority of the agro-industrials are located on the coast, where climatic conditions are favorable but where irrigation is required for large-scale farming. Investment in irrigation infrastructure, which is traditionally the responsibility of the state, has been overtaken by private investors. Irrigation projects that support industries located on the coast diverted water from users in the highlands who are mostly poor indigenous communities. In the Ica region in southern Peru, agro-industrials (which account for 0.1% of users) use 36% of the water, whereas small farmers (accounting for 71% of all users), have access to only 9% of the water.

The Water Law of Peru explicitly recognizes the rights of peasant and indigenous communities, especially the right to use water resources from their land, but to date there have been no guidelines in place to put the law into practice.

Similarly, the highland community of Mariano Acosta in Pimampiro, Ecuador has been in the ‘race for water’ against the municipality’s urban center. When Pimampiro’s urban center was officially recognized as a municipality, Mariano Acosta was annexed to the former despite heavy resistance by the peasant community of the latter. During that time, the urban center had already accumulated most of Mariano Acosta’s water sources, leaving Mariano Acosta with no irrigation rights at all. For many years Mariano Acosta peasants have been demanding water rights, among others, to access part of the water that originates and flows from their own territory. But the urban center’s need for water continues to increase due to the drinking water needs of the growing population, and most of all, because of the intensification of commercial agricultural activities downstream.

Water insecurity and water injustices in Peru and Ecuador perpetuate poverty among peasant and indigenous farmers who are dependent on water for their subsistence and livelihood.

2.2 Women in Zimbabwe, Thailand and the Aboriginal women of Canada

Water injustice is correlated with an added burden on women particularly in the South. However, this association is mostly tied to physical exertion primarily the long distance and physically hauling the water to their homes. In reality we see women suffer a number of added stresses due to water scarcity or lack of access. These include physical tiredness, decrease or substantial loss of education or employment, vulnerability particularly to sexual harassment, mental stress, cultural and social norms limitations, sanitation issues, cultural taboos, health issues for themselves as well as their families, reproductive health issues, monetary burden due these illnesses, loss of nutrition and finally also a loss of culture and identity. These have been outlined in the case studies below.

Women, water, and sanitation: Rimuka, Zimbabwe (Remigios, 2011)

We have seen water to have a direct impact on social justice. The case study for Rimuka, Zimbabwe is particularly insightful as it highlights how women suffer detrimental effects, which surpass physical discomfort of water collection. Women, particularly in Africa, have to travel far and beyond the WHO stipulated 1 km distance (Right to Water, 2010). The water collected is often disease ridden (particularly diarrhea, cholera and dysentery) and well below the minimum 20 liters per day per person requirement also stipulated by WHO (Right to Water, 2010).

In November 2010, a study was conducted in Kadoma, Zimbabwe in the Rimuka suburb, which suffered acute water shortage eventually leading to a cholera outbreak. The suburb received an influx of rural immigrants, causing an additional strain on the aging infrastructure. Leakages caused a 30% loss of

water, and electricity power cuts led to decrease in pumping of water, leading to the water scarcity for the residents.

Women faced the brunt of this scarcity, being directly responsible for water collection. Their responsibility entailed waking up at 3:00 am to line up at water points to transport approximately 20 liters of water about 2 km back to their houses in a single trip, often making multiple trips to fulfil household requirements. These trips were undertaken before work or school, leading to physical exhaustion and often times missing school if queues were long.

In addition to time and physical exhaustion, they were also made to feel vulnerable and exploited, being offered water for sexual favors or money, by men at these sites. The men with pushcarts would transport the water for sale, using the constraint as an economic opportunity, which was unavailable to the women. These men would often jump queues, leading to quarrels and further mental stress. The women were unable to utilize technology like the men and use pushcarts, being further oppressed by cultural norms under which it was inappropriate for women to be using any method other than carrying water on their heads.

Water shortage also translated into prioritizing water usage. Water was mostly used for cooking food and washing, leading to cooking utensils and clothes particularly dirty nappies, being unwashed for days, attracting flies and potentially increasing the incidence of diarrhea. People chose to forgo lunch, sticking to one meal a day in order to collect water, leading to decreased nutrition and health. Hygienically people chose to bathe less often, again compromising health.

Another direct impact of the scarcity was sanitation particularly for women. Women felt ashamed using communal toilets due to a social taboo, preferring to go when dark, risking stepping in human waste since the toilets are not cleaned. They also risk being abused by men in the community using the communal toilets at night. A number of women resorted to the “bush” system, further impacting the sanitation conditions.

Finally, the lack of water led to blocked sewage pipes. In the event when water was available, the pipes burst due to blocked sewage. This in turn caused a cholera outbreak. It further impacted the mental and financial burden on the women, being responsible for caring for household members, which now included transporting household members, and paying for their doctor visits.

It is interesting to note, it was post-outbreak that the NGOs were mobilized to help train the local women to identify cholera and to best treat it. They were also taught the importance of boiling water prior to use, which added another task to their already full day. However, no preventative measures were undertaken prior to the outbreak, and even following the outbreak, the response was limited. Health groups were created to maintain the public toilets and report burst sewers, again expecting women involvement, adding to their time constraints. Moreover, the external efforts to build more toilets were done without consultation with the women, locating them at inconvenient or inaccessible locations for these women. This particularly highlights the core failure to consider or involve women who in themselves are at a position to bring about change.

Gender and water in North East Thailand (Andajani-Sutjahjo et al., 2015)

Another interesting perspective was provided by a case study conducted in North Eastern Thailand in 2011, largely a lowland paddy field area, dependent on (rain-fed) agriculture. This particular research highlighted despite a bottom-up approach in water management, the local power and gender differences were neglected. The community chosen for the study in Ban Koke in subdistrict Tambon, was of Isaan ethnicity society. Thailand being primarily matrilineal, adds to the ambiguity of this disconnect between women's role in water resource management in Thailand.

In this particular community, the primary source of water was rainwater in different forms (water tanks, roof run-off, farm run-on, groundwater and public surface water). Women were primarily responsible for domestic tasks hence most water usage, including cooking, cleaning, washing (both clothes and dishes).

Given the hot humid weather, based on their tasks they needed to bathe more often to be able to complete their chores. Men needed water for farming but in cases of drought men would go to nearby cities for labor intensive jobs and the farming would also fall in the women's' ambit.

Since women are the primary users of water, they are also the first to identify potential problems with the water supply based on odor and color as well as any skin conditions developing within the family (primarily because of contaminated water use). In cases of problematic water, they have to repeatedly ask the men to communicate the problem to the village community. When that fails, they come together as a group and take samples of water to the mayor themselves. The men mentioned in case of minor problems the women ask the men to fix the problem or to communicate it to the village committee but when the problem gets out of hand, the women themselves take it to the village committee. There is clearly a conflict in men and women's roles surrounding water issues. Women expect men to help in fixing minor problems, which they themselves cannot. Men on the other hand expect women to be caretakers of water so want them to resolve the issues on their own.

This brings us to the second aspect: women's public participation. Traditionally Thailand has been progressive but women's involvement in public spheres has still been limited. The involvement is directly tied into the Buddhist ranking of tasks: religious, political followed by economic tasks. Men by virtue of their sex are privileged in religious and political spheres. Women are positively involved in trade or economic activities, but impeded in political spheres due to the social hierarchy.

The case-study states women's participation, particularly in water management, is primarily impeded due to three reasons. Given cultural constraints where women are expected to uphold wifely duties particularly household tasks, women need to prioritize household chores which puts them at disadvantage in social spheres where they have less time for other activities. Secondly, public meetings were mostly held at night when women were busy with household chores and children; safety and security may also be a concern. Thirdly women lacked confidence to speak up in male-dominated meetings.

In the case of the Ban Koke village, the male dominated local municipality claimed to have power over water management locally. The government budget is provided to the municipality (and local administration) members of which altogether undermine the role (skills, abilities and leadership) of local men and women. Often times the local villagers together fix the problem instead of going through the municipality, which in itself indicates their ability and resourcefulness.

Despite women having the resources and knowledge to address water related issues, and living in a matrilineal society, the patriarchal norms still prevail. The overlap between the roles of women and men in water management also causes a further conflict. Gender norms are embedded into the society and curtail women's participation and access to decision-making, particularly with regard to water issues, even though women's capabilities are undeniable.

Aboriginal women's experiences (Anderson et al., 2013)

Generally there is a perceived North-South divide with women particularly in the South seen as suffering the consequences of water injustices. However, this perception does not bar the women in the North from being impacted. The aboriginal women in Canada particularly face the brunt of this inequality derived from water insecurity. These women have a deep and special relationship with water, based on their cultural beliefs, social practices, and central role in reproduction. However, their voices are not heard and their experiences are not taken into consideration in water resource management.

Most First Nation reserves are in close proximity to areas with high air pollution and water contamination. As of February 2010, 73% of the aboriginal community's water and wastewater systems were marked as high or medium risk of contamination (Anderson et al., 2011). Due to Drinking Water Advisory (DWA) issued for most of these reserves, they are instructed to boil the water prior to use which, given time and other constraints, is not possible for the aboriginal women. In this particular case study conducted in

First Nation reserves across Canada, a common theme was found highlighting the adverse impacts of contaminated water particularly on the women.

Aboriginal women treat water as sacred, and believe water has a spirit and needs to be treated with respect. In most aboriginal cultures, the earth is referred to as Mother Earth and in some cultures, waters of the earth is treated as the veins of the Mother. Safeguarding the water is therefore very important to them, without which it may bring disease. They believe like water is essential to life, women have a particularly strong association with water since women bring life into this world. Women are also directly involved in the birthing process as midwives and are also associated with preparing the dead for burial.

Water is also considered 'sentient' or perceived to be alive (or have a spirit). This spirit connects them to the water, providing a spiritual connection, particularly the women. They also have beliefs that certain waters help cure diseases with grandmothers actively involved in this process. Water itself is considered a feminine in aboriginal traditions.

Since women are directly responsible for reproduction, there have been detrimental effects of water contamination on the aboriginal women particularly in Aamjiwnaang First Nation Reserve, which is close to Canada's industrial cluster. The contamination has been causing high rates of miscarriages, stillbirths including birth defects (Anderson et al., 2011).

Where water impacts physical health, in the case of aboriginal women it also impacts their cultural and spiritual existence. Their relationship with water and knowledge is often not taken into consideration but its impacts are deepest for aboriginal women. Although there is not enough research to draw conclusive evidence about the significance of the impact on aboriginal women, the link shown via this particular case study is very strong.

Women & mental health: a side note

In addition to the impacts of water insecurity faced particularly by women outlined above, a case study conducted in Ethiopia indicates a significant association of water insecurity with psychosocial distress (Stevenson, et al., 2012). This mental stress been mentioned in the cases above, and has been substantiated numerically in the Ethiopian case study.

Women & water insecurity: A summary

From the case studies above, we can conclude women face the brunt of water insecurity. The impacts are manifold and not limited to physical exhaustion as normally perceived. In order to mitigate these impacts, concrete steps need to be taken which take the cultural and social perspective of water-related activities, into account. This needs to include health and sanitation particularly, but also the mental health of the women. These actions will not merely be a preventative measure but will also be a proactive one, encouraging women participation in other spheres of life, including economic welfare of the people. We talk about this in detail in the next section.

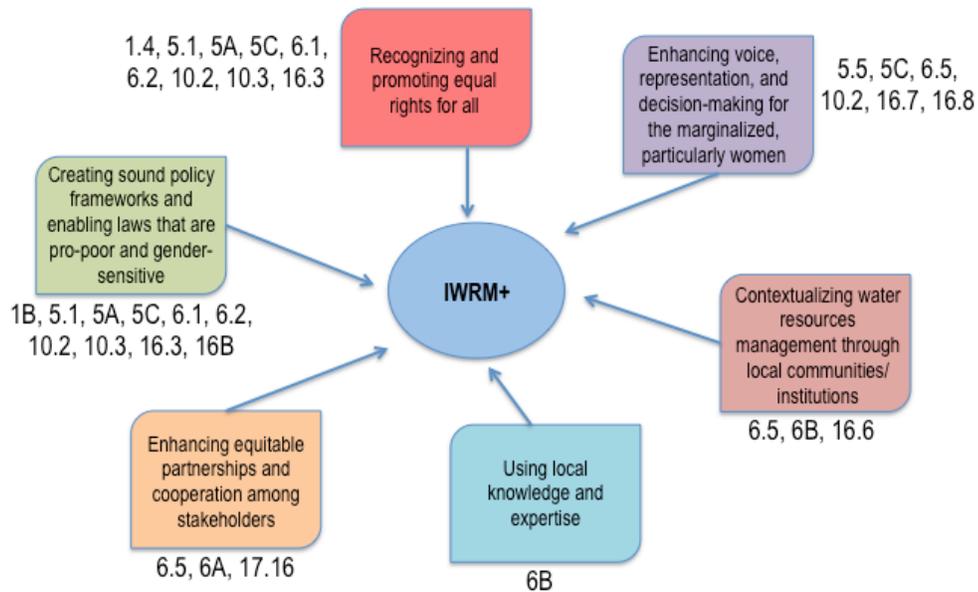
3.0 The next steps forward

The section above outlined the many injustices faced by the weak within society, namely the peasants and indigenous communities, particularly women, due to (lack of) access to water. Correcting this injustice will not just benefit these marginalized groups, but will actually help the entire society in the long run. Benefits include bringing about economic, social, and cultural and maybe even political change.

The following section will discuss some of the ways in which water management can be improved. Drastic measures are not proposed in this section, rather we recommend strengthening and enhancing the existing IWRM framework.

3.1 IWRM+: Strengthening the social equity pillar of IWRM by integrating the equity principles of SDGs (Goals 1, 5, 6, 10, 16, 17)

The following visual representation helps frame the connection between the IWRM and Sustainable Development Goals, in essence forming the IWRM+.



Notes: Authors' visualization
Numbers refer to Sustainable Development Goal targets (See Appendix 1 for list)

Fig 1: Integrated Water Resources Management and Sustainable Development Goals (IWRM+)

The IWRM is believed to be a comprehensive solution, encouraging a coordinated effort to develop and manage water (and related) resources. It encourages economic, efficient and environmentally sustainable efforts in managing water resources. Based on the research presented above, we propose an *IWRM+* approach, which will enhance the social equity pillar within the existing framework, covering the following areas: (1) recognition and promotion of equal rights for all; (2) enhancement of voice, representation, and decision-making for the marginalized, especially the women; (3) contextualization of water resources management through local communities/institutions; (4) use of local expertise and

knowledge; (5) enhancement of equitable partnerships and cooperation among stakeholders; and (6) creation of sound policy frameworks and enabling laws that are pro-poor and sensitive.

It is worthy to note that whereas all applicable SDGs have been accounted for in the above visual depiction, our recommendations are not all encompassing. Sound policy frameworks and supporting laws are critical to implement reforms in a complex system such as water resources management and social equity, but it falls beyond the scope of this paper. However, given its importance and magnitude, this topic may be the subject of future research.

3.2 Contextualizing water management

Recognizing the issues is the first step towards finding equitable solutions. We address the challenges that have been brought to light in this research through some proposed solutions.

IWRM is not the “institutional Holy Grail” and therefore its implementation should consider diversity/complexity rather than focus on the universal and rigid application of its principles (Joy, et al., 2014; Butterworth, et al., 2010; Clement, F., et al., 2017). There can be no uniform, cookie-cutter approach to water resources management. Each country has its own development priorities, social and economic challenges, water resource endowments, level of infrastructure, institutions, laws, cultures and norms. Each country, city, municipality, and community needs to determine the approach that is most suited to its particular context.

It is difficult to outline a standard solution especially for social equity because on-ground realities, cultures and societal nuances vary from city to city, village to village. However, once these are identified and concerted effort is made to integrate the subtleties particular to the geographical area, the benefits will be far-reaching. Social equity indirectly ties in with the economic pillar, providing economic benefits through integration of the marginalized communities at a macro scale. The marginalized groups can contribute insightfully, based on their experience and direct relationship with water, particularly women.

In the same light, water resources management at the local level must be linked to a country's overall sustainable development strategy. Management at the local level should be supported by sound policy frameworks and enabling laws at the national level. While a river basin perspective is crucial, as emphasized by the IWRM, it must be supported by an overarching national policy to be effective (Lenton & Muller, eds., 2009).

Mechanisms and platforms to enable the participation of all stakeholders in water resources management must be put in place. Collective action through the creation of multi-scalar water user federations and networks e.g., the Provincial Water Users Federation or Interjuntas-Chimborazo in Ecuador, will be crucial in defending access to water, maintaining autonomy, and struggling for a voice in decision-making over issues that concern water rights. Interjuntas was created in the late 1990s, putting together 300 grassroots irrigation and drinking water organizations. Today, Interjuntas has extended its network through the national multi-stakeholder platform, the National Water Resources Forum (WRF), which brings together multi-ethnic groups, grassroots organizations, individuals, NGOs, state institutions, and academics from the whole country. Through its active participation in national water policy debates since the early 2000s, WRF has become an important voice when it comes to national water legislation (Hoogesteger, et al., 2016).

In Caracas, Venezuela, technical water committees (*mesas técnicas de agua*, or MTAs) emerged in marginalized neighbourhoods in the early 1990s to meet the needs of poor populations. MTAs are challenging the distinction between community and expert knowledge. The term 'technical' was deliberately added to the name of the water committees to reflect the communities' ability to make decisions about water service, rather than deferring to 'specialists'. The biggest achievement of information sharing through the MTAs has been in managing water distribution in areas where piped water is delivered to households in rotation. In elevated parishes such as Antímano, there is insufficient pressure to pump water to all sectors (neighbourhoods) simultaneously, so most sectors receive water only periodically. Before, communities rarely knew when the water would arrive. It would often come in the middle of the

night, and residents would have to sacrifice sleep to fill up their water tanks. Now, the engineers work with the community to deliver water according to a predetermined schedule, so that communities can better plan their water storage. The government eventually envisions transferring the entire management of the local water cycle to the communities themselves, including the operation of the valves. Scaling up and institutionalizing grassroots initiatives such as the MTAs will be important for mobilizing local knowledge and expertise and raising the political capacity of the poor (excerpted from McMillan, Spronk & Caswell, 2014, p. 208).

In addition, possession of ‘local ecological, social and political knowledge’ attributable to local communities can significantly contribute to strategies particularly helpful in adapting to issues related to climate change (Figueiredo & Perkins, 2012, p. 188).

3.3 Women as a force

Even though the Dublin Principles (ICWE, 1992) acknowledge the importance of the role of women in water management, few substantive measures have been taken to incorporate their role within the water management sector, especially in the face of social inequity. Since mostly women are the first point of contact with water, their role as first users is critical in identifying potential hazards. Their knowledge and adaptive behaviors, often passed down through generations, is particularly insightful. However, despite their knowledge and potential contribution to water resource management systems, they are often under-represented, if not completely excluded in some cases, from environmental decision-making processes (Figueiredo & Perkins, 2012). In the present day, given climate change, the impact on women is even more profound. However, instead of viewing them as victims, we can use their knowledge for the betterment of the community (Bouwer, 2006).

Figueiredo & Perkins in their paper titled “Women and water management in times of climate change: participatory and inclusive processes” (2012) argue for a bottom-up approach in which residents

themselves using their local skills and knowledge, identify potential vulnerabilities and recommend solutions. They propagate this particular learning from a climate change perspective but this knowledge is equally important in the basic use of water, which in turn will impact climate change adaptation strategies. The authors highlight the need to advance women's political participation in addition to supplementing women's adaptive capacities.

The locals themselves particularly women, can emphasize their needs, but a robust mechanism is needed to ensure women's participation and counsel for water related decisions. The social pillar mentioned above particularly the cultural norms and social taboos, inhibit women's participation the most, which is a critical pillar for the success of the water resource management system.

Moreover, as the IWRM already suggests, comprehensive and inclusive methods need to be adopted, with input from all stakeholders being taken into consideration. Efforts need to be undertaken to include the under-represented and marginalized. Equally important is the role of the academics, as is seen in the case of the Sisters Watershed Project undertaken in Brazil from 2002 - 2008 (Figueiredo & Perkins, 2012). The program was designed by academics in both Brazil and Canada who worked together to develop an inclusive system. Previously low literacy particularly in women, impeded women's participation in studies and capacity building measures. This project, aided by NGOs and local university students, helped reach out the women often excluded from water decision-making. Moreover, such projects indicate the role academia can play in designing inclusive projects, demonstrating the importance of academic and non-academic partnerships in reaching a mutual goal. The role of civil society is equally important in reaching this goal.

The Sisterhood Watershed project can also be seen as an example of community based, people-centric approach, reached through education and organization of communities. Sometimes community mobilization is more important than merely analyzing health indicators and physical distance of water

sources. In the proposed IWRM+, more such measures need to be undertaken to ensure female inclusion, instead of expecting inclusion.

The potential role of the marginalized, particularly women, needs to be highlighted to ensure incorporation into water resource management systems. Once the importance of the role of women is established, the resilience and sustainability of such projects will also increase. It has been seen that inclusive projects help improve the resilience and sustainability of the projects. (Figueiredo & Perkins, 2012).

There are many other ways of improving the water management system, such as utilizing wastewater as a potential resource (France, 2013), but the core change needs to be inclusion of the marginalized. To reiterate, the social equity pillar, particularly inclusion of women, can be particularly beneficial for integrated water resources management and its success.

4.0 Conclusion

From the case studies and analyses above, we have seen that the real water wars are between the 'haves' and the 'have nots'. The indigenous populations, rural farmers, and women in particular, are marginalized from not only water access, but also water resource management. Their experiences and potential solutions as users can particularly be beneficial. The IWRM, considered the 'Holy Grail' of water management (Clement et al., p. 870) subordinates social equity to efficiency. Building on the IWRM and SDGs, we recommend an inclusive approach strengthening the equity pillar of the IWRM, which will be integral to its success. Also, instead of treating women as victims, they should be used as a force through ensuring their participation in water resource management. The long-term effects of this inclusion will translate into better health and education outcomes, increased agricultural productivity, improvement in livelihood and incomes, poverty reduction, and will drive better gender equality and women's empowerment (World Water Development Report, 2012). Moreover, a shift away from water-centric approaches towards people-centric approaches will be crucial in this regard.

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Appendix 1: List of Sustainable Development Goals and Targets in IWRM+

SDG 1: End poverty in all its forms everywhere

1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance

1.B Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions

SDG 5: Achieve gender equality and empower all women and girls

5.1 End all forms of discrimination against all women and girls everywhere

5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life

5.A Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws

5.C Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels

SDG 6: Ensure availability and sustainable management of water and sanitation for all

6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all

6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations

6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

6.A By 2030, expand international cooperation and capacity-building to support to developing countries in water- and sanitation-related activities and programs, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies

6.B Support and strengthen the participation of local communities in improving water and sanitation management

SDG 10: Reduce inequality within and among countries

10.2 By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status

10.3 Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard

SDG 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

16.3 Promote the rule of law at the national and international levels and ensure equal access to justice for all

16.6 Develop effective, accountable and transparent institutions at all levels

16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels

16.8 Broaden and strengthen the participation of developing countries in the institutions of global governance

16.B Promote and enforce non-discriminatory laws and policies for sustainable development

SDG 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development

17.16 Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries