The global water crisis is considered by many to be a major environmental challenge of the 21st century (APHA, 2008). Today, 20 percent of the world's population live where water is scarce or where they are unable to access available water sources (World Health Organization [WHO], 2007). 1 in 6 people (1.1 billion) worldwide lack access to clean water (Food & Water Watch [FWW], 2008). By 2025, one-third of humanity (3 billion) will face severe water shortages; 80 percent of affected people live in developing countries, mainly in rural areas and urban slums (Watkins, 2006). Currently, 42 percent of the world's population (2.6 billion) lack access to sanitation facilities (WHO, 2007). And, 1.8 million die every year of diarrheal disease; 90 percent are children under the age of 5 years living in developing countries (WHO, 2007). Diarrhea, resulting from unsafe water, kills more people than malaria or tuberculosis (TB), and five times as many children die of diarrhea than those who die of HIV/AIDS (Watkins, 2006).

Each year, 443 million school days are lost to water-related illnesses; and, repeated bouts of diarrhea and infectious disease in childhood has shown to reduce earning potential and lead to poverty in adulthood (Watkins, 2006). In addition, women and girls face the heavy burden of carrying water for hours every day—this prevents them from gaining an education and being productive members of society. Addressing the water crisis can help reduce extreme poverty and hunger, decrease child morbidity and mortality due to water-related illnesses, help children (especially girls) obtain an education, and promote gender equality (Watkins, 2006). In this paper, I will begin with identifying environmental factors impacting water scarcity. Then, I will explore how water scarcity is "rooted in power, poverty and inequality, not in physical availability" (Watkins, 2006, p. 2). Finally, I will propose solutions to address water scarcity and the inequitable distribution of water.

Environmental Factors of Water Scarcity

Environmental factors such as climate change, increased population, and water degradation, contribute to water scarcity. Even though 70 percent of the Earth's surface is covered with water, less than one one-hundreth of one percent of the world's total water supply is available for human consumption and is renewed by snow and rainfall (USAID, 2007). Today, 70 percent of water used worldwide is used for agriculture (Kirby, 2004) thus water scarcity is closely connected with food insecurity. In 2003, 850 million people in the world were food insecure; 60 percent of them live in South Asia and Sub-Saharan Africa, and 70 percent live in rural areas (Comprehensive Assessment of Water Management in Agriculture [CAWMA], 2007). Furthermore, the global population is expected to grow from 6 billion today to 8.9 billion by 2050; water consumption will increase as people expect Western lifestyles and diets (Kirby, 2004).

Owing to rapid population growth and increasing per capita water use, total domestic water consumption will increase by 71 percent, of which greater than 90 percent will occur in developing countries (Rosegrant, Cai, & Cline, 2002). Several water basins are being over-pumped and groundwater levels are rapidly declining in excess of natural recharge rates. These sources include the Rio Grande and Colorado River Basins in the Western U.S.; Yellow and Haihe River Basins in northern China; and, several river basins in northern and western India, Egypt, West Asia, and North Africa (CAWMA, 2007; Rosegrant et al., 2002). Population growth, climate change, and over-pumping of current water supplies, will likely lead to millions of "water refugees" in the future (Kirby, 2001).

In addition, water quality degradation is a major factor in water scarcity (WHO, 2007). Land and water resources are being degraded via pollution, erosion, salinization, seawater, and

nutrient depletion; and, this degradation decreases water available for potable use (CAWMA, 2007). Climate change is also impacting freshwater availability. Temperatures are rising and precipitation patterns are changing; tropical areas such as Sub-Saharan Africa will be most negatively affected, as well as farmers dependent on snow melt for irrigation purposes (CAWMA, 2007). Climate change, a growing population, and water degradation are major contributors to water scarcity. However, the key factors driving the global water crisis are "lack of commitment and targeted investment, insufficient human capacity, ineffective institutions, and poor governance" (CAWMA, 2007, p. 10). Addressing the global water crisis requires a paradigm shift; we must first recognize water as a human right.

The Right to Water

In 2002, the United Nations Economics and Social Council adopted water as a right, entitling "everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic use" (United Nations Economics and Social Council, 2002, General Comment No. 15). In addition, several countries (i.e., Panama, Ethiopia, Uganda, etc.) have indicated water as a right in their constitutions (FWW, 2008). Former UN Secretary General, Kofi Annan, has said, "Access to safe water is a fundamental human need and, therefore, a basic human right" (Watkins, 2006, p. 4).

According to the Human Development Report (2006), water insecurity violates four social justice principles. That is, first, the "social minimum" states that everyone should have access to water to meet their basic needs (20 liters per person per day is the minimum requirement); second, "equal citizenship" asserts that women who spend hours collecting water are less able to participate in society; third, "equality of opportunity" recognizes that children suffering from diarrheal illnesses are less likely to gain an education; and, lastly, "fair

distribution" acknowledges the inequality in access to clean water (Watkins, 2006, p. 3). The water scarcity issue is not a problem of absolute scarcity as much as poor management and inequitable distribution, and this is the topic to which I turn next (USAID, 2007).

Poverty and Water

The poor suffer the most: water scarcity translates to walking miles to fetch water, high prices to buy it, food insecurity, and illnesses from drinking polluted water (Kirby, 2004). Nearly two-thirds of people lacking access to clean water survive on less than $2 a day, with one-third living on less than $1 a day (Watkins, 2006). Access to clean water mirrors the distribution of wealth; in many poor countries only 25 percent have access to piped water in their homes, compared with 85 percent of the wealthiest (Watkins, 2006).

Not only do the poor have access to less water and to less clean water, they pay more for it. For example, poor people living in the slums of Manila, the Philippines, Jakarta, Indonesia, and Nairobi, Kenya, pay 5-10 times more for water per unit than wealthy people in the same city—and more than residents of London or New York (Watkins, 2006). There are three main reasons behind the poor paying more for water: the distance to the utility inflates prices (i.e., rural populations are more dispersed than urban areas); the poor are unable to pay the connection fee (even in the poorest countries, this can exceed $100); and, utilities refuse to connect households lacking formal property titles (Watkins, 2006). Access to water is closely associated with poverty reduction, particularly in rural-based, low-income countries (WHO, 2007).

Equity and Water

Water scarcity is an equity issue for the poor in general and women in particular. In water-stressed regions of India, wealthy farmers are provided water 24 hours a day while neighboring poor farmers are left to rely on the rain (Watkins, 2006). Likewise, in Nairobi,

wealthy residents receive water 24 hours a day whereas slum residents are forced to wait more than two hours a day at standpipes that function for 4-5 hours a day or less (Watkins, 2006). Israel and Palestine share aquifers below the West Bank, and the average per capita water use by Israeli inhabitants on the West Bank is about nine times higher than their Palestinian neighbors (Watkins, 2006). And, while the average American uses 150 gallons of water per day, those in developing countries cannot find five (Charity:Water, 2008). The underlying cause of water scarcity is not absolute scarcity; water scarcity is manufactured by way of institutional and political practices that disadvantage the poor (Watkins, 2006).

There is a clear unequal distribution of water and lack of connection to water utilities in poor areas. For example, in Lima, 60 percent of the population receives just 12 percent of the water each day. And in Guayaquil, Ecuador, 40 percent of the population receives only 3 percent of the piped water. In Accra, Ghana, connection rates are 90 percent in high-income areas and 16 percent in low-income areas. The poor are often not connected to the utility so they purchase their water in bulk; consequently, they often pay 10 times more for water than residents (connected to the utility) in high-income areas (Watkins, 2006).

Women and girls are disproportionately burdened by water scarcity and this increases inequalities; they sacrifice their time and education to collect water. In Mozambique, eastern Uganda, and rural Senegal, women spend 15-17 hours each week collecting water; and, it is not unusual for women to walk in excess of 10 kilometers per day during the dry season. An estimated 40 billion hours each year are spent collecting water in Sub-Saharan Africa alone—the equivalent of a year's worth of labor for the entire workforce of France. The time lost collecting water reduces income, reinforces poverty, and disempowers women. A direct correlation between time spent collecting water and loss of educational opportunity is observed in schools.

In Tanzania, school attendance is 12 percent higher for girls who live 15 minutes or less from a water source compared to those that live an hour or more away. Also, the absence of sanitation facilities and water in schools is a significant factor to girls dropping out of school (Watkins, 2006). Historically, privatizing water has been offered as a solution to water scarcity, but it frequently increases inequities at the expense of poor countries.

The Privatization of Water

Corporations have a history of privatizing water, calling it the "oil of the 21st century" or "blue gold." Privatizing water is a practice that has been driven by the World Bank and International Monetary Fund (IMF) policies that pressure indebted developing countries into privatizing their water supply systems in order to be eligible for debt relief (Bär, 2004). Water is registered as a "good" in the World Trade Organization (WTO) and North American Free Trade Agreement (NAFTA), and as an "investment" in NAFTA (Barlow & Clarke, 2002). In other words, water is treated like a tradable good and one to make profits from. In fact, according to Fortune, annual profits of the water industry surpass that of the pharmaceutical industry and are 40 percent of the oil industry's earnings (Barlow & Clarke, 2002).

Privatization of the world's water supply often fails since it allows "the emergence of a water elite that will determine the world's water future in its own interest" (Barlow & Clarke, 2002, p. 3). Former chairman of Perrier, now part of Nestlé, once declared, "It struck me…that all you had to do is take the water out of the ground and then sell it for more than the price of wine, milk, or, for that matter, oil" (Ferrier, 2001, p. 19). The privatization of water often pads the pockets of stockholders while hurting the world's poor. The negative consequences of privatizing water include rate hikes, poor quality water, bad customer service, loss of jobs, profits leaving the community, the poor losing access, less accountability, and heightened

corruption (FWW, 2008). In addition, many water removal projects harm both the environment by depleting aquifers and the local economy by paying too little for the water they take (FWW, 2008). The Human Development Report (2006) states that privatization is no "magic bullet" and that history points to a greater need for regulation and a commitment to equity in public-private partnerships (Watkins, 2006, p. 10).

Solutions for the Future

The inequities surrounding water scarcity need to be addressed. A more sustainable and equitable management of water resources would help reduce extreme poverty and hunger, reduce child morbidity and mortality, achieve universal primary education, improve maternal health, and promote gender equality (WHO, 2005). First, the United Nations should create an international water convention to establish the right to clean water for all humans in a binding manner and to protect water as a public good (Bär, 2004). Further, marginalized people should be protected against water utilities to ensure accountability and equity (Watkins, 2006). Harmful policies that enhance inequities (e.g., the World Bank and IMF-enforced water privatization) should be abolished and exemptions should be made for water from international trade and investment schemes (Barlow & Clarke, 2002). Next, a clean water trust fund should be created for poor communities so that water and sewage systems can be improved, and water provision networks can be expanded both in urban and rural areas (FWW, 2008).

Also, conservation and improved efficiency of water should be made a priority. Since 70 percent of water worldwide is used for agriculture, governments should increase funds for crop research and water management reform (Kirby, 2004). Drip irrigation should also be considered as a more efficient alternative to flood irrigation (Kirby, 2004). In addition, water protection measures should be enacted to preserve freshwater sources (Kirby, 2004).

Women and children are marginalized populations especially impacted by water scarcity; solutions must address these inequities. First, child morbidity from water-related illnesses should be treated as a national emergency and as a violation of basic human rights (Watkins, 2006). Second, international aid should be strengthened to prevent and treat diarrhea. Third, annual estimates should be published of child deaths due to water and sanitation problems (Watkins, 2006). Also, sanitation facilities and water should be provided in schools, with separate facilities for girls. Lastly, legislation should ensure women have equal rights by reforming property laws and irrigation rules, and require female representation on water committees (Wakins, 2006). In conclusion, the water crisis is "holding back human progress, consigning large segments of humanity to lives of poverty, vulnerability and insecurity" (Watkins, 2006, p. 1). To invest in water security is to invest in health security, poverty alleviation, and in human potential (WHO, 2005).

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