

Mis-Measuring Water Scarcity: Why Meeting Millennium Development Goal of Access to Safe Drinking Water Doesn't Add Up?

Shafiqul (@ShafikIslam) Islam and Adil (@AdilNajam) Najam

In 2010, the [United Nations](#) proclaimed that the world met the Millennium Development Goal (MDG) of halving the proportion of people without access to improved sources of water, five years ahead of schedule. They estimated that as of 2011, [768 million people](#), did not have improved sources for drinking water.

With this metric, we have a success story to celebrate. But we may be celebrating too soon. Where do these people live who lack access to water, and why? What does *access* mean? What is the difference between *improved* water and *safe* water? How does *drinking* water relate to our *total needs* for water access? And, more importantly, are water needs truly met for those who have access to improved water?

It's time to rethink how we measure – and sometimes mis-measure – development progress.

Having access to drinking water equates 20 liters of water per person per day that can be obtained from a source within 1 kilometer from where it is used. Improved water is delivered to communities via infrastructure – like pipes or protected wells.

Looking at 768M without access to improved water, 83% live in rural areas, creating the appearance that water access is predominantly a problem for rural Sub-Saharan Africa, India and China. However, in urban mega slums like Dhaka or Karachi, people pay exorbitant costs for access to water. The 768M statistic does not address the daily reality of water access in these slums.

Additionally, access to improved water doesn't mean delivery of safe water – improved water may still require treatment or boiling for consumption due to sanitation vulnerability. Merely counting how many people can access water that is pumped or piped to their location doesn't capture actual access to safe water. Reliable access to safe water for populations in urban slums is much lower than indicated via the UN estimate.

Is this lack of access related to water scarcity? [Water scarcity](#) usually means when water availability is less than 1000 cubic meter per person per year (equivalent to 2,740 liters per person per day). Even under severe water scarcity, providing 20 liters per person per day to satisfy basic domestic water needs can be met, suggesting that access to water is not necessarily constrained by availability.

The abject lack of water access within urban slums in Asia and Africa, highlights that barriers beyond availability hinder meeting the most basic water needs. While water can be an economic good in agriculture, industry, and the subsidies that privileged water users enjoy; it is a social good at the 20 liters per person per day level.

We contend - similar to Stiglitz, Sen, and Fitoussi when they argued [that GDP doesn't add up to measure our lives](#) – addressing our water problems requires change in how we measure availability and access to water. We need to ask: *what do we measure and why does this matter?* More importantly, how do our current choices of water allocation relate to present and future consequences they represent?

The choice of treating water as an economic or social good needs to be framed as an allocation problem compounded by distributional complexities related to place, politics, and legacies. We can't have meaningful dialogues about these choices until we address more focused question about water scarcity: **for whom? at what cost? and at what scale?**

Water users and decision makers need to challenge the belief that water is a *scarce* resource. Cooperation among governmental and non-governmental actors, and creative problem reframing can make [water a flexible resource](#). Rather than framing decisions in terms of winners and losers for a specific water quantity allocation, we can find creative opportunities that lead to non-zero sum solutions.

There are examples of these non-zero sum solutions. [The slums of Dhaka, Bangladesh](#) constitute a large part of the capital city in terms of population (almost 35%) and occupations (garment workers, shopkeepers, taxi drivers, etc.). Most slum dwellers in Dhaka access water through informal means, purchasing water at a cost of US\$1.25 - \$3.15 per 1000 liters from vendors with illegal connections to the public utility. Water costs – regardless of quality and reliability - substantially more through these informal means than the subsidized costs of municipal water (US\$0.08 per 1000 liters). Another example, the [Karachi water tanker mafia](#) collects approximately PKR50 Billion (US\$510 million) annually by siphoning off over a billion liters of water per day (40+% of the city's supply) from the public utility and selling it at exorbitant rates to residents in legally settled areas and informal slums.

This situation – exclusion from a public, government-subsidized, formal water distribution network– for urban slum dwellers is prevalent in almost all cities in the developing world. The Dhaka Water Supply and Sewerage Authority (DWASA) cannot provide water connections to households that cannot demonstrate the legal status of their land tenure. In other words, slum dwellers are not entitled to water access from the public utility. Without legal status, they do not exist statistically and physically must not need water, either!

Dushtha Shasthya Kendra (DSK), a local NGO, used a non-zero sum collaborative pathway for an actionable solution. DSK proposed to act as an intermediary between the slum communities and DWASA to enable the establishment of water connections in some of the slums. Through this arrangement, DSK helps to organize community groups who manage water points, and [DSK acts as the guarantor](#) to the DWASA, to ensure the water supply. This arrangement allowed DWASA to override their usual policy and practice provide two water points in the slums.

In this creative arrangement, slum dwellers access water at a reasonable price, DWASA collects revenues for their services and DSK facilitates the process as a guarantor. Everyone wins. Today, 88 water points serve more than 200,000 residents through this initiative in Dhaka. Similar collaborative flexible solutions can be replicated in other urban areas around the world.

The metrics we use shape theories we construct, beliefs we hold, hypotheses we test, inferences we make, and behaviors we adopt. Flawed or biased metrics can lead to inappropriate inferences. As the built and institutional infrastructure that provides water for cities like Dhaka and water allocation for agriculture, industry or energy become increasingly complex, our metrics for measuring progress in meeting water needs and estimating real water stress have to recognize the legacies and politics of people, place, time, and scale we've imposed upon a shared resource.

Meeting the global water need is about having the ability to use water to fulfill the needs of the most vulnerable segment of our communities. We need to ask ourselves if – in our haste to meet the MDG for water – we have lost sight of meeting the real needs of people who are thirsty.

There is no single metric that can capture the complexities of water scarcity, security, and sovereignty from multiple perspectives. We need to rethink water as a social and economic good with competing – and often conflicting - needs to arrive at a negotiated set of metrics – through a collaborative adaptive process, as we demonstrate in our book on [Water Diplomacy](#) - for the people and the place we want to make water secure.

Shafiqul Islam is a Professor Civil and Environmental Engineering and the Fletcher School of Law and Diplomacy at Tufts University and the Director of the Water Diplomacy Program. Adil Najam is the Dean of Pardee School of Global Studies at Boston University and former Vice Chancellor of the Lahore University of Management Sciences, Pakistan.