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Achieving universal access to clean water and sanitation in an era of water scarcity: strengthening contributions from academia

Cecilia Tortajada[1] and Asit K Biswas[2]

As the Millennium Development Goals did earlier, the Sustainable Development Goals have mobilised the international community into what can be the most important, although the most challenging, development goals of the 21st century. However, a main limitation has been that the SDGs considered as a baseline the inaccurate figures that were presented by the UN at the end of the MDGs. These figures were not challenged, not even by the academic community, who in many cases has used them uncritically. As a result, innovative proposals that would improve management of water resources in general and of water supply, sanitation and wastewater management in particular did not emerge, with the consequent negative health and environmental impacts for billions of people globally.

Addresses
[1] Institute of Water Policy, Lee Kuan Yew School of Public Policy, National University of Singapore, 469A Bukit Timah Road, Tower Block, Level 2, Singapore 259770, Singapore
[2] Lee Kuan Yew School of Public Policy, National University of Singapore, 469A Bukit Timah Road, Tower Block, Level 2, Singapore 259770, Singapore

Corresponding author: Tortajada, Cecilia (cecilia.tortajada@nus.edu.sg)

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Introduction

Sustainable Development Goal (SDG) 6 is dedicated to clean water and sanitation. It aims at ensuring availability and sustainable management of water and sanitation for all, and achieving quality and sustainability of water resources worldwide. Together with the rest of the SDGs, it is intended to help to improve the quality of life of billions of people all over the world.

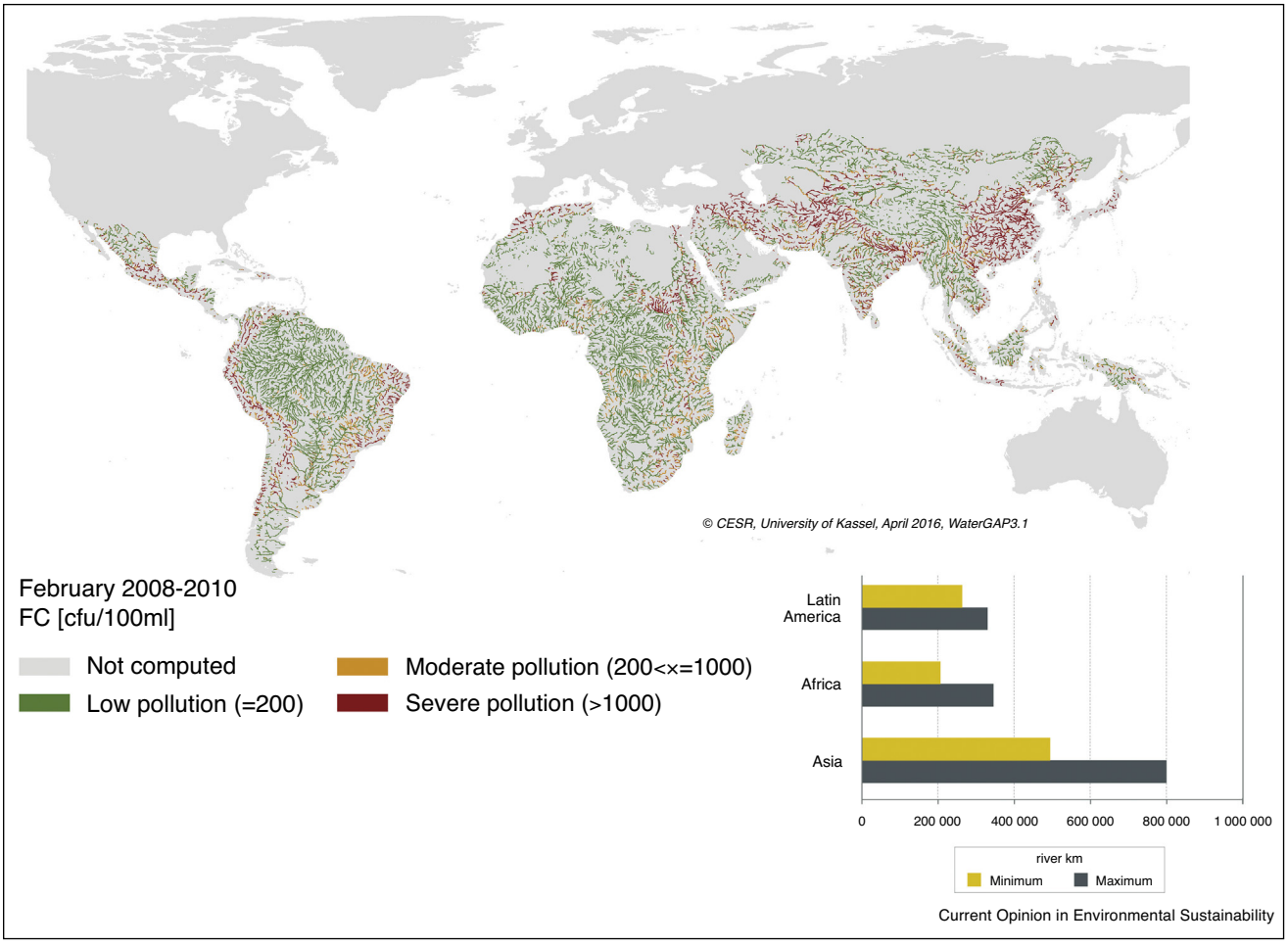
Its baseline parameters are those where the MDGs left off in 2015. Among other things, 2.6 billion people are said to have gained access to improved drinking water sources since 1990, while 663 million still lacked it, and 2.4 billion people did not have access to basic sanitation, defined as access to toilets and latrines [1,2]. A significant problem, however, is that the achievements reported by the UN agencies at the end of the MDGs did not reflect the global situation accurately at that time. In the MDGs, access to safe drinking water was measured using access to improved sources of water with no consideration of water quality. As a result, the statistics missed that, in 2012, at least 1.8 billion people were exposed to drinking water sources contaminated with faecal matter [3]. In addition, the population without access to safe drinking water at baseline in 1990 was greater than estimated as several sources of water considered as improved were in fact unsafe. This also means that the proportion of population that would need to get access to drinking water by 2015 was higher than considered in the MDGs [4].

Regarding improved sanitation, this focused on hygienic separation of human excreta from human contact (e.g. sewer connections, septic system connections, pour-flush latrines, ventilated improved pit latrines and pit latrines with a slab or covered pit) [5]. Treatment and disposal of wastewater was not considered. The statistics on sanitation thus failed to provide an indication of the complexities and magnitudes of the social, economic and environmental related problems.

According to the World Bank, 68% of the world's population has access to basic sanitation. However, only 39% of this global population has access to *safely managed sanitation* (emphasis of the authors), which includes its safe collection, treatment, and end use and/or disposal [6]. Wastewater systems that are inadequate and septic tanks that are generally poorly designed and maintained have resulted in pollution of surface and groundwater with serious health impacts [7].

Overall, pollution with pathogens resulting from disposal of non-treated wastewater affects approximately one-third of all rivers in Africa, Asia and Latin America (Figure 1) [8], transforming them into open sewers.

Figure 1



Estimated in-stream concentrations of faecal coliform bacteria (FC) for Africa, Asia and Latin America (February 2008–2010)* [8]. Notes: Low: Suitable for primary contact; Moderate: Suitable for irrigation; Severe: Exceeds thresholds. *Bar charts show minimum and maximum monthly estimates of river stretches in the severe pollution class per continent in the period from 2008 to 2010.

The baseline: where did it go wrong, and how has this affected universal access to clean water and sanitation?

The lack of progress on providing clean water, sanitation and wastewater management for all has constrained overall development and quality of life for a significant proportion of the world population. The MDGs for water and sanitation were intended to address the immense-related challenges and try to improve the situation for billions of people, mainly in the developing world.

On 18 September 2000, the United Nations Millennium Declaration was presented during the General Assembly to the international community and accepted by 189 countries [9]. Regarding development and poverty eradication, the Declaration aimed, among many other objectives:

> 19. To halve, by the year 2015, the proportion of the world's people whose income is less than one dollar a day and the proportion of people who suffer from hunger and, by the same date, to halve the proportion of people who are unable to reach or to afford safe drinking water.

In terms of protection of the common environment:

> 23. To stop the unsustainable exploitation of water resources by developing water management strategies at the regional, national and local levels, which promote both equitable access and adequate supplies.

The aims were laudable, and international organisations were enthusiastic about contributing to their realisation. In order to record the progress towards the commitments made, a set of goals and targets were developed to 2015. However, the indicators that were chosen to measure progress were inappropriate and the way on which they were reported was misleading. While the target for