

IBM Institute for Business Value

# Smarter water for smarter growth



*Why generating sustainable growth and development requires “smarter” water management systems*

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## Overview

Water shortages and poor water infrastructure can have adverse effects not only on worker productivity, but on industries in general that depend on water to function. As such, water is crucial to healthy economic growth. However, water systems globally are facing intensifying challenges relating to demand, quality, availability and regulations. “Smarter” water systems – those that are instrumented, integrated and intelligent – can help combat these challenges to facilitate sustainable growth and development.

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## Why does water matter?

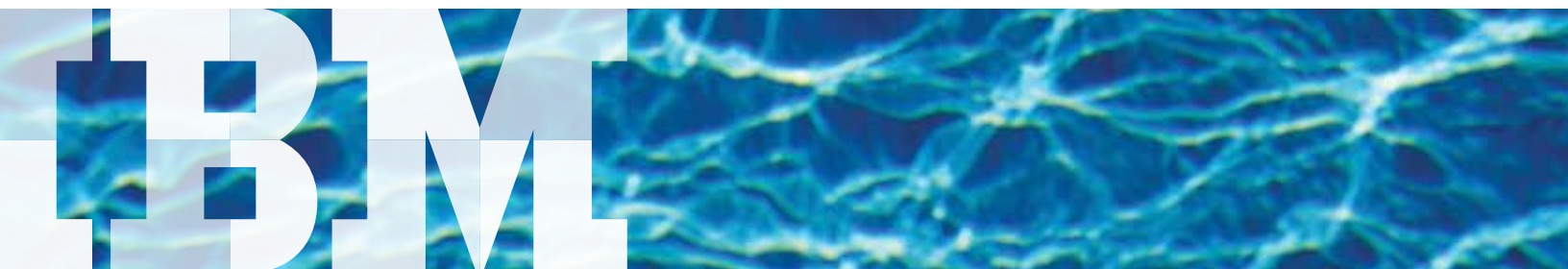
Water is essential for economic activity and economic growth – scarcity of water and poor water infrastructure can lead to lower economic growth. Not only does the business of producing and distributing water contribute to the economy, but water also contributes indirectly via all the other sectors that depend on and use water (see Figure 1).

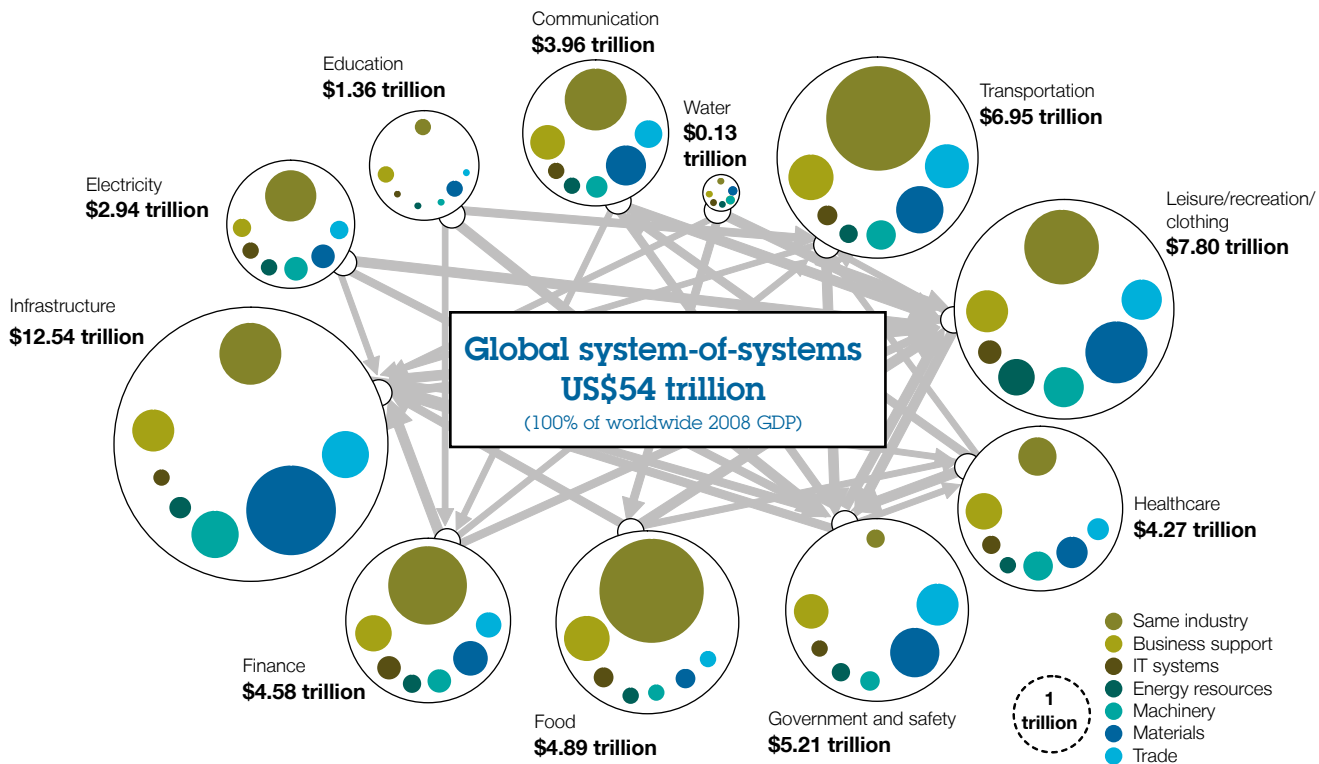
In addition, water has a large indirect impact on economic growth and activity through its effects on workforce health and productivity. It is estimated that half of all hospital beds globally are occupied by people suffering from illnesses related to unsafe drinking water, inadequate sanitation and poor hygiene.<sup>1</sup> Think of the impact such illnesses have on productivity. Poor water quality and lack of sanitation can lead to serious health concerns that affect both worker productivity and the number of potential workers in general. In addition, poor access to water can lead to large amounts of time being spent collecting water instead of working.

## What are the challenges?

Water systems globally are facing several key challenges, which continue to intensify:

- The increasing pace of urbanization brings additional demand for core services such as water. Already, more than half of the world’s population is based in urban areas, and this is set to increase.<sup>2</sup> In developed economies between now and 2030, the proportion of the population based in urban areas is set to increase from 75 to 81 percent.<sup>3</sup> In developing economies, the increase is even larger – from 45 to 55 percent, a growth rate of 22 percent.<sup>4</sup>





Note: Size of bubbles represents systems' economic values. Arrows represent the strength of systems' interaction.

Source: IBM Institute for Business Value analysis of Organisation for Economic Co-operation and Development (OECD) data.

Figure 1: Water is a valuable input into economic activity across the global economy.

- The world is facing several issues related to the quality of water. Globally, two million tons of sewage and industrial and agricultural waste are discharged into the world's water.<sup>5</sup> Naturally occurring arsenic pollution in groundwater now affects nearly 140 million people in 70 countries on all continents.<sup>6</sup> For example, nearly 70 million people living in Bangladesh are exposed to groundwater with arsenic above the World Health Organization's recommended limits of 10 micrograms per liter.<sup>7</sup>
- There is less certainty regarding the availability of water. Projections suggest that up to two thirds of the world's population may be affected by water stress over the next two decades.<sup>8</sup> Without massive improvements in water-use efficiency, India and China are projected to have large water deficits, which are expected to put a severe restraint on growth.<sup>9</sup>
- Water systems face problems with leakages and theft. Globally leakage rates can represent up to 60 percent of water supplied, costing water utilities worldwide US\$14 billion every year.<sup>10</sup>

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- Cities – where global population and economic activity is concentrated – are facing intensifying challenges relating to flooding and storm water. Twenty-one of the 33 cities projected to have a population of 8 million or more by 2015 are located in vulnerable coastal zones and are increasingly vulnerable to sea-level rise.<sup>11</sup> Rising oceans could contaminate both surface and underground fresh water supplies, worsening the world's existing fresh water shortage. Underground water sources in Thailand, Israel, China, Vietnam and some island states are already experiencing salt water contamination.<sup>12</sup>
- In tandem with these issues, utility providers are facing increasing amounts of regulation to which they need to transparently and effectively respond. For example, the European Union Water Framework Directive imposes standards that create additional compliance burdens on utility providers.<sup>13</sup>

Generating sustainable growth and development requires “smarter” water management systems to address these pressures.

## What is smarter water and how can it help?

Smarter water management means that water systems are instrumented, integrated and intelligent. Data can be gathered on a host of issues such as water levels, water quality and leakages. Bringing this data together or integrating it from all the various parts of the water ecosystem and applying the latest advanced information technology and analytics can help extract the full value from the data.

The insight gained from analysis on current and historical data can form the basis for more effective decision making. It can also support more efficient and effective use of limited resources by allowing providers to “visualize” the water system so the source of problems can be identified and rectified, as well as helping foster better preparedness in responding to infrequent events.

A “smarter” water system means that these efficiency benefits can generate further spillover benefits for the users of the system, thereby helping foster efficiency savings in other parts of the economy. Smarter water systems help utility providers effectively address wastewater issues, water quality, and supply and flood pressures. Smarter water systems can also help improve quality of life and help reduce risks to citizens and businesses – thus realizing benefits for providers, citizens and businesses across the economy.

## What next?

A more detailed analysis of these pressures and challenges and what governments and utility providers can do to effectively respond to them will be available in the third quarter of 2011. For further information or to reach an IBM industry expert, please contact [iibv@us.ibm.com](mailto:iibv@us.ibm.com).



## Notes and sources

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