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Futurist Book Group Discussion

When the Rivers Run Dry: Water – The Defining Crisis of the Twenty-First Century

by Fred Pearce

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Synopsis of the May 2007 Futurist Book Group meeting, summarized and reviewed by Ken Harris

This book is meant to wake up every reader who is not a water expert to one of the great environmental crises of our time and, even more importantly, our children's and grandchildren's times unless we act urgently – the global water crisis. **FUTUREtakes** readers will find that it does just that, and it does so in a very understandable way. Author Fred Pearce is a British journalist who traveled the world and conducted hundreds of interviews to discover why the world faces a water shortage and what might be done about it. In his introduction, he says, "My book is a journey of discovery on the world's great rivers to find out why we face this crisis, what happens when great rivers die, where we could be headed – and how we could restore the rivers' health and our hydrological future."

Readers take away five major lessons from the book.

1. *Although our planet contains a lot of water, a relatively small amount of it is available to humans for consumption, and the available water is very unevenly distributed so the coming world water shortage is very apparent to some and not very apparent to others.* Pearce calculates that of the 1.1 quadrillion acre feet that exist, only about 7 billion acre feet of water are left to meet human needs, because more than 97% of the water is seawater and much of the remainder is locked up in ice caps and glaciers or is inaccessible with current technology. He estimates that there are about 370,000 gallons for everyone on earth, but just 6 countries – Brazil, Russia, Canada, Indonesia, China, and Colombia – have half the world's renewable fresh water on their territory. Moreover, water-intensive agriculture takes much of the fresh water that is available and makes fresh water even scarcer to meet people's needs for drinking, bathing and washing.

2. *Meeting relatively short-term water needs trumps viable long-term water management solutions.* *With politicians' support, engineers build water management projects such as large dams, dikes, and canals that meet short-term needs but often complicate long-term water management.* The

Colorado River in the United States is one of the world's most regulated. Lake Mead behind Hoover Dam and Lake Powell behind Glen Canyon Dam capture snowmelt from the Rocky Mountains, and the water from these and other dams on the Colorado is distributed according to detailed agreement to meet the needs of cities and agriculture in the Western US. The dams on the Colorado and agreements on how its water will be shared have made it possible for Phoenix and Tucson, Arizona, to become two of the fastest growing cities in the nation and to use water profligately. The Central Arizona Project alone diverts about 1.6 million acre feet of water from the Colorado – approximately 1/5 of its annual flow – and sends it along a 300 mile canal to Phoenix and Tucson. Moreover, the irrigation systems fed by the river's waters are causing irrigated land to become salted and crop losses from salting are growing. Examples such as this make a convincing case that large engineering projects are not the long-term answer to water management. Pearce notes that even Daniel Beard, a retired Commissioner of the Bureau of Reclamation, now wears a t-shirt proclaiming "No More Dams."

3. *Traditional water management technology often is better than modern technology at managing scarce water resources.* In traditional Indian agriculture, farmers captured rainwater using tanks and small check dams. Tanks were small, shallow mud-filled reservoirs in valley bottoms. Farmers scooped water from them and diverted it down channels and onto fields or left it in the ground to re-fill their wells. British colonial engineers did not understand the purpose of the tanks. Instead, the British colonial government and later the Indian government promoted more modern water management technologies, and the tanks fell into disuse. Check dams are barriers collected in small streams and gullies long enough for it to percolate underground. Now, with the modern irrigation methods failing, use of tanks and check dams is being revived with great success.

4. *Without changes in how we manage scarce water, 21st century conflicts will often be about water.* In chapter 20, "Swords of Damocles," Pearce catalogs conflicts that can arise over scarce water. He notes that India has the potential to cut off Pakistan's water and that Indian engineers are building a dam on the Chenab River – which is the biggest source of water for Pakistan's breadbasket region, the Punjab – and that India has refused Pakistan's repeated requests for arbitration. More generally, he says, "Almost half the world's population lives in international river basins. Two thirds of these basins have no treaties for sharing their water. Each is the scene for a potential water war."

5. *We can meet the challenge.* The final two chapters "More Crop Per Drop" and "Water Ethics" leave the reader with hope that the emerging fresh water crisis can be "nipped in the bud" with a mix of reversion to traditional means of water conservation, judicious use of modern technology, and new attitudes. In the final chapter, he says:

"The solution in most cases is not more and bigger engineering schemes. It is not south-to-north projects or river-interlinking projects or giant canals or megadams. Such projects are hugely expensive, and many are the cause of as many problems as they solve. To manage the water cycle better, we have to give up the idea that water has to be extracted from nature and put inside metal or behind concrete before it can be used. We have to treat nature as the ultimate provider of water rather than its wasteful withholder. We must learn to 'ride the water cycle' rather than replace it...That certainly means doing better science and investing in a 'blue revolution' to bring the old green-revolution crops in line with hydrological realities. But beyond that, we need a new ethos for water – an ethos based not on technical fixes but on managing the water cycle for maximum social benefit rather than narrow self-interest..."

"These new priorities will often mean going back to ancient ways, such as harvesting the rain where it falls...My one technological bet for the twenty-first

century is that rainwater harvesting will resume its pre-industrial place in water management in many countries, providing local water to meet local needs.

“But the new ethos will also harness modern methods and ideas. It will adopt high-tech irrigation to provide ‘more crop per drop’ while recognizing the realities of finite water resources inside closed river basins.”

The major lessons of the book far outweigh any minor quibbles a critic might dream up such as whether improving technology will make desalination of seawater a much cheaper and better option for increasing the fresh water supply than now seems possible. Read this book and you’ll think twice every time you turn on a faucet.

POINTS FOR THE CLASSROOM (send comments to forum@futuretakes.org):

- *How is the need for crisis anticipation and preemptive response reconciled with a common political model, by which elected officials make decisions for near-term gain and are safely re-elected – or complete their terms of office – long prior to the “day of reckoning”? How is it reconciled with the utility function that economists use?*
- *Will water issues, or other resource or environmental issues, lead to longer-business and political cycles that can address long-term issues? Which countries have business and political cycles that can better address long-term issues – but even so, to what avail, since actions and policies in one part of the world can have pervasive impact far away?*
- *A related issue is the imperative to increase food production per acre, added to increased interest in healthy diets. What impact to water consumption, if any, do you foresee from this?*
- *Will possible forthcoming changes in living and working patterns impact water consumption in your part of the world? If so, in what way?*
- *The author refers to traditional Indian agriculture and more generally to traditional means of water conservation. What else can we learn from various peoples of the world, and cultures of the present and past, regarding resource management?*