

# Moving Forward

*Aging infrastructure, energy costs and environmental protection are among the challenges facing modern water/wastewater professionals. In an interview with WWD Associate Editor Caitlin Cunningham, Robert Y.G. Andoh, director of innovation for Hydro Intl., shed light on the need for the industry to make a paradigm shift.*



**Caitlin Cunningham:** *What do you believe to be today's most pressing issues in regard to water and wastewater treatment?*

**Robert Y.G. Andoh:** My view is that the most pressing issue is the need to raise global awareness and consciousness regarding water—that it's a precious resource and giver of life which we are taking for granted. If we do that, it will help both our collective and individual responsibilities because some of the looming challenges, things like aging infrastructure, tend to be buried below ground, out of sight and out of mind.

**Cunningham:** *You have advocated for the industry to make a paradigm shift in 2008. Please explain.*

**Andoh:** Well, it's multidimensional. It requires a change in both approach and attitude. The current way we've addressed water/wastewater infrastructure needs has been energy-intensive, centralized systems. Most of our treatment plants are in centralized locations, and we use energy-intensive and mechanized systems such as the activated sludge process for wastewater treatment. We need to move to more eco-friendly systems and approaches—what I call distributed, adaptive systems—that, in a sense, mimic nature's way.

...There is a concept I'm evolving in my mind; I call it the five R's, for the paradigms of new water management. The first paradigm I call reverence water, or respect water. It's a consciousness paradigm. It calls for improved knowledge and awareness both as an individual and on a

community basis. Once we start to respect water, we will take better care of water.

The second paradigm is what I call a reduce, or quantity, paradigm, where we look at conserving and minimizing our impact and the amount of water we use. ...The third paradigm is what I call a reuse, or low-waste, paradigm. By that paradigm I mean we have to use water that's fit for a purpose. So, for example, we don't treat water to potable water standards and then use it for watering our lawns or washing our cars. We can capture rainwater, reharvest it and then use it for watering lawns, washing cars and the like.

The fourth paradigm is a reclaim, or a quality, paradigm, where we treat water to practicable standards. The fifth is a recycle, or reprogram, paradigm where we cooperate with nature and aid natural processes to renew the water.

**Cunningham:** *Has treatment undergone any such shift historically, or is this a unique movement for change?*

**Andoh:** It's been a gradual shift over time. One of the major technological advances in more recent times has been membrane technologies, and the relatively recent trend toward the "greening" of urban water infrastructure. Technological evolution has been relatively slow, as the industry is very, very conservative. New technologies tend to be very slow on the uptake. ...That's part of what I think needs to change moving forward if we're going to harness adaptive and eco-friendly technologies. We'll need more rapid acceptance

and uptake of greening infrastructure, novel technologies and so on.

**Cunningham:** *If a new paradigm is to be established, what kind of timeline and results do you anticipate?*

**Andoh:** I would like to see it happen immediately, but it will probably take in the order of a half a generation or a generation. ...Most of the systems we have now are costly downstream solutions. If we change the direction and start to look for more cost-effective upstream solutions, this is where we will gain the benefits. The more we move further upstream and the more we look at how do we mimic nature, harness natural energy and minimize our impact or footprint—the more effective and sustainable our solutions are going to be.

It takes that change in initial direction, or an "Aha!" moment, to realize the relevance of the 5-Rs paradigms. This will take time to evolve and become the collective norm, as it requires individuals going through that change in perspective and attitude. This has begun but needs to gain more momentum. **WWD**

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