

Successful rainwater harvesting systems should combine new technology with old social habits

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As a crippling drought grips much of the Southern and Southwestern United States, the population continues to grow and water resources become scarcer. One way to address the problem is by a combination of modern engineering and ancient social principles, outlined in a new paper on rainwater harvesting that will be presented at the 2011 ASME International Mechanical Engineering Congress and Exposition.

Author John Whear, biomedical engineer at the [Cancer Therapy & Research Center](#) at The University of Texas Health Science Center at San Antonio, examines how to manage rainwater as a common pool resource. Whear studied management techniques for other common pool resources like fisheries and forests, as well as organizations developed for sharing scarce water, such as the Edwards Aquifer Authority and social systems in pre-colonial India.

Drawing from game theory, Whear argues that a successful common pool resource (CPR) depends on participant behavior, which requires monitoring and management. Effective monitoring can be made simple with the technology available today, he said.

Along with reducing pressure on ground and surface water supplies, Whear proposes that large-scale rainwater harvesting (RWH) systems can also lesson the threat of deadly flash flooding common to urban areas in Central and South Texas.

By catching large amounts of the fast-falling rainwater and draining it slowly over several days, the RWH systems can decrease runoff and increase the amount that is absorbed into the ground and recharge zones.

"Once recharge can be determined with an adequate degree of certainty, the acquired data could be used for the economic benefit of participants," Whear said. "Possibilities include a flood control tax abatement and aquifer recharge credit."

Whear first presented a rainwater harvesting paper last year at the 2010 ASME conference. In that paper he examined the options for distributing harvested rainwater and began contacting water management organizations.

"That's when I learned that rainwater harvesting is as much a social issue as it is an engineering one," he said.

Provided by University of Texas Health Science Center at San Antonio

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