

Editorial: rainwater harvesting

WHEREVER PEOPLE LIVE, THERE is rainfall – even if some people survive in extremely dry environments where rainfall can be highly variable from year to year. Capturing rainfall at or near the place where it falls is an obvious solution to the problem of water access, and it is one which has been practised for thousands of years.

Some advantages of rainwater harvesting for domestic and agricultural water supply are clear: 1) water on the spot, where the household or crops need it; 2) water under the control of the individual household, as opposed to a communally managed system; and 3) in all but the driest climates, the possibility of capturing significant quantities of water.

However, there are drawbacks too. Roofwater harvesting for domestic water supply is expensive – the greater part of the cost being the storage needed to carry the users through dry periods. Long dry seasons pose obvious difficulties for rainwater harvesting. Rainwater harvesting may not be able to provide a year-round source of water supply. The apparent simplicity of rainwater systems can beguile users into thinking that no maintenance and repairs are needed – leading to neglect and under-performance.

The papers in this thematic issue address various aspects of both the difficulties and opportunities posed by rainwater harvesting, for domestic and agricultural purposes.

Terry Thomas reviews a number of challenges associated with domestic roofwater harvesting, concluding, among other things, that it is best suited for use as a partial water supply (for drinking water), and calling for more research and development to drive down the cost of water storage.

John Gould and colleagues describe the way in which rainwater harvesting in the semi-arid Gansu Province of China, together with related soil and water management activities, has enabled great improvements to water security, environmental management, and livelihoods in that region. The possibilities of adapting some of these practices in other arid and semi-arid environments are significant.

Diego Garcia-Landarte Puertas and colleagues make the link between roads and hydrology, pointing out that roads concentrate runoff and alter subsurface flows. They describe how road design can be integrated with water development and management, to the benefit of both transport and water supply services.

Johann Gnädlinger reports on living with periodic droughts in another semi-arid region, in this instance in Brazil. As in Gansu, rainwater harvesting is an important part of a package of measures which enable survival in such difficult environments.

Hans Hartung and Paul Akkerman describe roofwater harvesting in islands off the coast of Guinea-Bissau. These islands experience severe shortages of fresh drinking water, and the implementation of household rainwater harvesting systems since 2005 has provided a highly valued improvement to people's lives. A noteworthy

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point in this paper is that most of the households are collecting water from thatched rather than impermeable roofs.

In looking back at systems installed in 2008, Shadi Saboori and colleagues report some improvements to water access achieved by school rainwater harvesting systems in Kenya, but also significant challenges around cleanliness and maintenance.

We are introducing in this edition an occasional piece called 'Expert Answers'; we have invited people with wide-ranging practical experience to respond to the questions on rainwater harvesting we think you would like to put to them. Brett Martinson opens with a discussion of water quality from rainwater harvesting and its cost. Robert Meerman and Maarten Onneweer make a dual appeal, first, for greater consideration to be given to rainwater, and second, for rainwater harvesting to be appreciated as part of a wider set of water recharge, retention, and reuse (3-R) activities. Aftab Opel discusses rainwater harvesting in urban and rural areas, and makes a plea for building designs to be adapted to better permit rainwater harvesting, and for surplus rainfall to be used to recharge aquifers in times of plenty. Finally, Ian Neal draws attention to sub-Saharan Africa's undeveloped potential for the use of seasonal rivers in agriculture, especially highlighting limitations in access to hydrological and meteorological data – limitations which he argues could be minimized through use of a range of new technologies for generating and sharing data.

Finally, Jay P. Graham and Wilbert Quintanilla address the issue of WASH services for people living with HIV/AIDS. They report the practices of, and challenges experienced by, a number of organizations which are trying to integrate improved WASH into HIV programmes. They conclude that some good WASH practices are integrated into the HIV programmes of the organizations reviewed, but that more could be done to strengthen such programmes.

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