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Addressing health through multiple use water services

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Multiple use water services can bring more health benefits than separate water supplies for domestic and productive uses – if health is explicitly and properly addressed. That means that in the planning phase due attention has to be given to adequate water allocation for various purposes as well as to providing safe sanitation and offering complementary health and hygiene education. These elements can also be useful in step-wise upgrading single purpose systems to multiple use water services. Sufficient water of good quality is needed for drinking water and hygiene. If the system cannot supply adequate water quality, then additional facilities such as home water treatment can be a good solution, provided the users understand and can operate the treatment themselves. The (re-) use of water for home gardens with a variety of vegetables and fruits is important for balanced nutrition. Proper design, construction, operation and maintenance of water systems can avoid the creation of breeding sites for vectors of diseases such as malaria mosquitoes and schistosomiasis snails. Environmental sanitation, including construction and safe use of latrines, but also protection of water resources from pollution by runoff and animals, reduces the demand for water treatment as well as risks of water use (exposure to pathogens and toxic chemicals) for productive and domestic purposes. Upgrading of water services often reduces water collection efforts for women and children, leading to a whole range of additional socio-economic benefits that in turn may bring health benefits, while poverty reduction in itself also leads to improved health.



Photograph 1. Rehabilitated irrigation canal in Uda Walawe, Sri Lanka, offers clean and comfortable bathing sites (Boelee et al. 2006).

Source: Ronald Loeve



Photograph 2. People often perceive clear water as being clean and turbid water as dirty as here in South-Central Ethiopia.

Source: Peter McCornick (pending permission)



Photograph 3. Open reservoir filled with water from irrigation canals in Hakra 6R, Punjab, Pakistan. The water is heavily polluted during transport and storage in the tank that often serves as solid waste collector as well (Ensink et al. 2002; van der Hoek et al. 2002). The pipes lead to individual houses where an electric pump provides the pressure necessary to serve the entire house. The water flowing from the tap looks clear and gives a false impression of good quality.

Source: Eline Boelee



Photograph 4. By taking drinking water from an irrigation canal, this boy makes a clever decision; the groundwater from wells in the Rift Valley in Ethiopia is highly contaminated by fluoride with levels up to 9 mg/l. Hence surface water is actually the healthier alternative here (see also Jensen et al. 2001).

Source: Eline Boelee



Photograph 5. In arid regions of South Asia and North Africa, pumps and wells are often dug near unlined irrigation canals to benefit from the local groundwater recharge. While seepage from canals reduces irrigation efficiency, this indirect multiple use of water may have health benefits, such as here in Hakra 6R in Punjab, Pakistan, where the groundwater is too saline for consumption. The horizontal filtration through the soil generally improves the canal water (Boelee et al. 2007; Ensink et al. 2002; Meijer et al. 2006; Shortt et al. 2003, 2006).

Source: Eline Boelee



Photograph 6. Even when clean water is provided from a good distribution network, practices of water collection and storage may contaminate the water and make it as polluted as surface water (Ayalew et al. 2008; Guchi 2007; Jensen et al. 2002; Scheelbeek 2005). Photo from Gorobiyo, Eastern Ethiopia.

Source: Michiko Ebato



Photograph 7. Multipurpose water system in Adidaero, Tigray Region, Ethiopia: left an irrigation canal, right a horizontal filtration gallery for clean drinking water (Ebato and van Koppen 2005). It took several months before the community accepted the water as clean water for consumption – the convincing argument being a field worker who drank the filtered water instead of buying bottled water.

Source: Eline Boelee



Photograph 8. Home water treatment in locally made earthen pots with a sand filter inside removes 91-99% of bacteria, parasites and turbidity (Guchi 2007). The water is sufficient for daily drinking water requirements, serving a household of 6 people, and a year after introduction, most pots were still used properly in Yubdo-Legebatu, West-Central Ethiopia (Cousins 2007).

Source: Ephrem Guchi



Photograph 9. Simple facility for hand washing in South-Central Ethiopia, keeping the water clean.

Source: Peter McCormick (pending permission)



Photograph 10. Using a perforated can for drip irrigation, daily wastewater from bathing or washing utensils can provide sufficient water for one papaya tree, safeguarding the entire household from blindness due to vitamin A deficiency (Scheelbeek 2005). Ajo village, Legedini Peasant Association, Dire Dawa District, Ethiopia.

Source: Eline Boelee



Photograph 11. In many large-scale irrigation systems, steps have been built on large canals to facilitate access to the water for domestic purposes such as bathing and laundry. While this reduces the drudgery of water collection, it may also expose people, especially women and children, to schistosomiasis, such as here in Office du Niger irrigation system in Mali (Boelee and Madsen 2006).

Source: Henry Madsen (pending permission)



Photograph 12. Communal tank, old stone structure rehabilitated with cement in Tessaout Amont irrigation system in central Morocco (Laamrani et al. 2000). Farmers use part of their irrigation water allocations to fill it. What looks like a door is the intake and the manholes on top are used to haul water out. Before it gets into the tank, the water is transported over some 15 kilometres: first from the reservoir through the old riverbed, then into cement-lined main canals and elevated concrete secondary canals system all the way to the site. The last 10 meters it flows over the ground by the side of the road and gets polluted by animal droppings and other waste.

Source: Eline Boelee



Photograph 13. These boys in the Tessaout Amont irrigation system in Central Morocco explained that they have to go to an upstream canal further away to get cleaner water. In the rubber bags on the donkey they can take some 30 litres but would still need to go at least twice a day and therefore could not attend school (Boelee et al. 1999).

Source: Eline Boelee



Photograph 14. Children hazardously collecting water from large irrigation canal in Tessaout Amont, Morocco. Several children and even adults drown in this canal every year. Though it doesn't show on this particular day, the water can flow very fast and wipe you away easily while it is very difficult to get out.

Source: Menno Houtstra



Photograph 15. Catchment management is important for springs, wells and rain water harvesting structures such as this small reservoir Mai Negus in Tigray Region, northern Ethiopia, to reduce erosion and siltation as well as pollution by grazing livestock and runoff. Such measures can improve the water quality and reduce the need for treatment (Million 2008).

Source: Eline Boelee



Photograph 16. In arid mountainous areas, water collection can be a physically risky undertaking, as shown in Sesella well, Eastern Ethiopia. In villages like this, the development of water services closer to homes can drastically reduce the number of broken legs, arms and hips. In these isolated areas where health services are far away, fractured bones often lead to lifelong disability.

Source: Pauline Scheelbeek

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