

Efficient Usage of Water in South African Township Gardens

Founded in 1999, Ubuntu Education Fund is an NGO dedicated to providing vulnerable children and their families in the townships of Port Elizabeth, South Africa, with an empowering environment and access to services and opportunities. Ubuntu Education Fund began developing urban community gardens at schools, health clinics and community backyards in 2005. The purpose of these gardens is to provide food and income to orphaned and vulnerable children and people living with HIV (see article in UA-Magazine no. 18).

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Availability of water

Port Elizabeth is not a drought-ridden area, however the substantial amount of rainfall received is often periodic and torrential in nature. All of the Ubuntu gardens have access to tap water provided by the local municipality, and the schools and clinics where these gardens are located are public institutions that do not have to pay for their water, which is always clean and of a reasonable quality. There are, however, limitations on the quantity of water each institution may use for irrigation, and during times of drought severe restrictions are implemented on water use for gardening.

With these factors in mind, Ubuntu seeks to develop systems of gardening which are efficient and conservationist in their utilisation of water, prioritising low-cost simple technologies that are appropriate to an urban setting. Using these techniques in the urban gardens has contributed to high productivity and year-round yields of crops such as swiss chard, carrots, beet roots, green peppers, broccoli and cauliflower, and prevented the periodic lack of water from becoming a serious issue. In future all of the gardens will be using rooftop collection and drip irrigation, with tap water being almost completely phased out.

Water-saving practices

In developing a garden site, the topography is first examined to see if there is significant flooding, and run off from pavement and rooftops. If this is a major issue, a trench of approximately 1 metre

wide is dug, transecting the garden, and following the contours of the landscape. This swale serves the purpose of allowing water that would otherwise have caused flooding, run off into drains, or otherwise been wasted or destructive, to absorb directly into the garden's water table (Mollison, 1991). Plants, planted on the swale help to prevent it from eroding, and fruit trees or windbreak hedges planted along the swale will benefit from the large volumes of groundwater.

Ubuntu has had considerable success with using swales to absorb greywater from the school kitchens. Only liquid dish soap is used in these kitchens, so there is no risk of toxicity from the water. Either a pipe is run from the sink drains, or a concrete furrow is used to channel the water into the swale. Concrete furrows can also be built to channel water to the gardens from the fountains used by children at the school for drinking and washing their hands. Greywater has also successfully been channelled into mulch pits used for growing bananas, which would otherwise be difficult to grow in our climate. Mulching prevents the top soil from drying out, which would reduce microbiological activity. In the gardens, water-conserving micro-climates are created by planting windbreak hedges, utilising fast-growing, hardy species that require little attention, like Vetiver grass. Compost, besides assisting in overall plant health, allows the soil to absorb more water and hold it for longer. Compost is added at each planting in a layer of 4-6 inches covering the bed.

Since 2006, Ubuntu has been installing plastic gutters, pipes and large PVC tanks to collect water from school and clinic rooftops. The water is used for irrigation either by filling watering cans with a normal garden hose and watering attachment, or ideally by means of a gravity-fed micro-drip irrigation system. A main line is run along the length of the garden and blocks of micro-drip line are then attached to this main line. Gardeners turn on each block by opening a valve. The micro-drip irrigation ensures that more water penetrates deeper into the soil. Less water is wasted or lost to evaporation and the gardeners have more time to devote to other tasks such as weeding or planting. Watering cans and hoses are still used for watering newly planted seedbeds and seedlings.

Some of the garden sites face a challenge of severe soil salinity due to an underground aquifer of brackish water. The salt tends to get worse after intense rainfalls. Drip irrigation at these sites is prioritised, since overhead watering will bring salt up in the way that rain does. In addition, raised beds allow the salt to drain out of the beds more rapidly after rainfalls, and adding large amounts of compost helps to neutralise the salinity.

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