

Development of guidance for sustainable irrigation use of greywater in gardens and small-scale agriculture in South Africa

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Abstract

Greywater is untreated household effluent from baths, showers, kitchen and hand-wash basins and laundry (i.e. all non-toilet uses). More than half of indoor household water is normally used for these purposes and can potentially be intercepted by the householder for additional beneficial uses. Greywater use is practised on an informal basis to supplement irrigation water, either in urban gardens in middle- to upper-income suburbs or in food gardens in lower-income informal, peri-urban and rural areas. It holds the potential to contribute significantly to food security in poor settlements by providing a source of both irrigation water and nutrients for crop plants. However, there are presently no formal guidelines for the use of greywater in South Africa. This paper presents the rationale and framework of a guidance document for the sustainable use of greywater to irrigate gardens and small-scale agriculture in South Africa, developed under the auspices of the Water Research Commission. The 3 driving principles in developing this guidance were: protection of human health; protection of plants irrigated; and protection of soil and the environment. Risk-management scenarios were developed on the basis of the extent of greywater characterisation. Water-quality constituents for inclusion were selected from among those indicated as presenting a problem in previous studies. Guidance was provided for managing greywater quality, either by mitigation of greywater quality (by practices such as irrigation method, amelioration of soil, leaching of soil and planting of tolerant plant types) or by small-scale biological treatment of greywater. Guidance was also given regarding the volumes of greywater which can be applied, together with factors to adjust these volumes for site-specific conditions.

Keywords: greywater, irrigation, food security, sustainable agriculture, health, soil, plant growth