

Approach for Evaluating Wastewater Reuse Options in Agriculture

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Abstract : Water scarcity is a growing concern in many arid and semi-arid countries. The increase of water scarcity threatens economic development and sustainability of human livelihoods as well as environment especially in developing countries. Globally, agriculture is the largest water consumption sector, accounting for approximately 70% of all freshwater extraction. Growing competition between the agricultural and higher economic value in urban and industrial uses of high-quality freshwater supplies, especially in regions where water scarcity major problems, will increase the pressure on this precious resource. In this circumstance, wastewater may provide reliable source of water for agriculture and enable freshwater to be exchanged for more economically valuable purposes. Concern regarding the risks from microbial and toxic components to human health and environment quality is a serious obstacle for wastewater reuse particularly in agriculture. Although powerful approaches and tools for microbial risk assessment and management for safe use of wastewater are now available, few studies have attempted to provide any mechanism to quantitatively assess and manage the environmental risks resulting from reusing wastewater. In seeking pragmatic solutions to sustainable wastewater reuse, there remains a lack of research incorporating both health and environmental risk assessment and management with economic analysis in order to quantitatively combine cost, benefits and risks to rank alternative reuse options. This study seeks to enhance effective reuse of wastewater for irrigation in arid and semi-arid areas, the outcome of the study is an evaluation approach that can be used to assess different reuse strategies and to determine the suitable scale at which treatment alternatives and interventions are possible, feasible and cost effective in order to optimise the trade-offs between risks to protect public health and the environment and preserving the substantial benefits.

Keywords : environmental risks, management, life cycle costs, waste water irrigation

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