Technology Fact Sheet for Adaptation

REUSE OF TREATED WASTEWATER FOR IRRIGATION [i]

4. TECHNOLOGY:	REUSE OF TREATED WASTEWATER FOR IRRIGATION
Introduction	Wastewater is used water. It includes substances such as human waste, food scraps, oils, soaps and chemicals. In homes, this includes water from sinks, showers, bathtubs, toilets, washing machines and dishwashers. Businesses and industries also contribute their share of used water that must be cleaned.
Technology Characteristics	Typical wastewater treatment schemes incorporate multiple levels of physical, biological, and chemical treatment in order to ensure that water discharged to the environment does not pose a significant risk of adverse environmental or health impacts (Elliot et al 2011). The extent to which treated wastewater can be reused depends on the level of treatment that has been carried out. The main concern for reuse of treated wastewater for irrigation is the risk for microbial contamination of the irrigated crops. Primary, secondary and even tertiary treatment cannot be expected to remove 100 percent of the incoming waste load and as a result, many organisms still remain in the waste stream. In order to destroy pathogens, disinfection/sterilization will be needed in order to destroy micro-organisms, depending on the intent reuse.
Country Specific Applicability & Potential	A number of major towns in Kenya have sewerage treatment facilities, maturation ponds. The treated effluent from these plants can be used for irrigation agriculture and aquaculture farming to supplement food requirements in these urban areas. Additionally, manufacturing industries using a lot of water and hence producing high waste water effluent discharge can treat and reuse the wastewater for cooling and other operation not requiring high quality water and for water grass and plants in the compounds. Given the water stress status of Kenya the project impact of water resources and availability due to climate change re-use of waste water, both domestic and industrial will go along way in easing the water stress.
Status of Technology in Kenya	The reuse of the treated for agriculture, aquaculture and other purposes is not common and the water, after treatment, is usually discharged into the nearby water bodies. However, in some urban areas uncontrolled irrigation of vegetable gardens for commercial purposes, sometimes using untreated wastewater, is practiced, which has in the recent pact raised public health concerns.

Benefits to Economic/Social and Environ-mental Development	• Creation of jobs as this technology will require trained staff to operate and maintain the system. • This will result in additional water for irrigation, and thus the potential to promote development. • Reduce public and private expenditures associated with water infrastructure. • Water for irrigation will be available and will not compete with other users. • This treated water can also contribute to productive and economic livelihood purposes. • Increases per capita water availability for irrigation purposes. • By treating and reusing the treated wastewater this will result in an reduction in the discharge load on receiving waters, and in addition a reduction in the demand of already harnessed fresh water.
Climate Change Adaptation Benefits	Re-use of treated wastewater will contribute to the reduction of water deficit occasioned by climate change and also reduce incidences of crop failures due to more recurrent draughts. Additionally it contributes to climate change adaptation by allowing water resources to be diversified and conserved are treated wastewater can be applied to permeable land surfaces or directly injected into the ground for the purpose of recharging groundwater aquifers and preventing saline intrusion in coastal areas (Elliot et al 2011).
Financial Requirements and Costs	The financial implication will mainly be related to the need for expanding treatment works to include a tertiary stage, where it does not exist, and distribution system to the required areas. Estimates for facility serving 200 households is US$ 100,000

[i] **This fact sheet has been extracted from TNA Report – Technology Needs Assessment Reports For Climate Change Adaptation – Kenya. You can access the complete report from the TNA project website http://tech-action.org/**