Technology Fact Sheet for Adaptation

SURFACE RUNOFF WATER HARVESTING [i]

3. TECHNOLOGY:	SURFACE RUNOFF WATER HARVESTING
Introduction	Most precipitation that falls on human settlements is lost to the atmosphere through evapotransporation, or runs into rivers away from settlements before it can be used. However, if the rain is collected using appropriate infrastructure, it can contribute greatly to the volume of freshwater available for human use. This is particularly relevant in arid and semi-arid regions, where the little rainfall received is usually very intense and often seasonal (Elliot et al 2011).
Technology Characteristics	Surface runoff water harvesting is the collection, accumulation, treatment or purification, and storing of stormwater for its eventual reuse. It can also include other catchment areas from manmade surfaces, such as roads, or other urban environments such as parks, gardens and playing fields. Surface runoff water is an excellent alternative to using mains drinking water for many purposes. If properly designed, Surface runoff catchment systems can collect large quantities of rainwater. The main challenge Surface runoff water harvesting poses is the removal of pollutants in order to make this water available for reuse. Small reservoirs with earthen bunds or embankments to contain runoff or river flow are built from soil excavated from within the reservoir to increase storage capacity and a spillway or weir allows controlled overflow when storage capacity is exceeded (Elliot et al 2011). The reservoirs can vary in size from less than a hectare to up to 12 ha.
Country Specific Applicability & Potential	The water endowment in Kenya is low and the demand for renewable freshwater outstrips supply, with only 57% of households using water from sources considered safe (MW& I, 2010). The annual per capita availability of renewable freshwater is only 647 cubic meters (m^3), far much lower than the UN recommended amount of 1000 m^3, implying that Kenya can be classified as a water scarce country. There can be large seasonal variation in rainfall such that during the long dry season, water shortage is experienced in many river basins, while during the rainy season severe floods cause tremendous damage in the same river basins. Rainwater harvesting has the potential to alleviate water shortage in Kenya. For example, by UNEP, shows that Kenya's capital has the potential to supply the water needs of between six and 10 million people with 60 litres a day if rainwater were efficiently and effectively harvested and that for Kenya as a whole the rainfall contribution is more than adequate to meet the needs of the current population several times over if rainwater harvesting is fully implemented.
Status of Technology in Kenya	Kenya's water policy takes into account all the relevant issues including water conservation and preservation of its quality. In this regard, mainstreaming of rainwater harvesting is very prominent. In agricultural production, rainwater harvesting is mainstreamed into the soil and water conservation. This approach promotes rainwater harvesting on the field thus minimizing run off. Through a presidential initiative, district competitions are held to encourage farmers in water and soil conservation. Initially the emphasis was more on soil conservation but there has been a shift in thinking towards rainwater harvesting and soil conservation as equally important components.

Benefits to Economic/Social and Environmental 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 water can also contribute to productive and economic livelihood purposes. • Increases per capita water availability for irrigation purposes. • By collecting storm water, this will result in an reduction in the loss of water to the sea and also a decrease in the discharge load on receiving waters, and in addition a reduction in the demand of already harnessed fresh water.
Climate Change Adaptation Benefits	Climate change projection for Kenya indicates general rainfall decrease most of the country, which together with population growth is bound to impact serious strains in existing low freshwater endowment in the country. Harvesting surface runoff during rainy season and storing it for use during the dry season will play an important role in contributing to adaptation to water shortage occasion by prolonged droughts associated with climate change. Additionally, widespread rainwater storage capacity can greatly reduce land erosion and flood inflow to major rivers. Rainwater collection can also contribute greatly to the stabilization of declining groundwater tables (Elliot et al 2011).
Financial Requirements and Costs	The cost of construction of a retainer dam depend on the size of the project and location but estimates for a small dam serving 200 households in about US$ 75,000.

[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/**