THE LOW COST EMAS TANK AND PUMP: AN OPTION TO SCALE UP RAINWATER HARVESTING IN UGANDA

Introduction

Rainwater as a free good has the potential to address water needs and relieve poor ugandans of the burdens, abuse and violations faced in search for water. Uganda has an average annual rainfall of 1,500 mm and most parts of the country have a bimodal rainfall pattern. Despite this high potential, there is general laxity towards rainwater harvesting countrywide. Where some initiatives have been done, poor functionality of installed systems remains one of the predominating challenges.

A study on causes of low functionality of rainwater harvesting systems for domestic water supplies at household and institutional level revealed absence of quality improvement features in all the 446 studied systems. Low functionality was attributed to; vandalism, cracking of tanks due to prolonged dry spell, inadquate designs, poor operation and maintenance. Other challenges included small capacity of storage tanks and high capital cost of systems (ATC, 2013). Based on these findings, ATC has taken action steps including research into low cost rainwater harvesting tank options.

EMAS Tank and Pump

EMAS tank and pump are some of the technologies invented by Wolfgang Buchner, a German citizen living in Bolivia (South America). The EMAS tank is a low cost underground rainwater harvesting tank, easy to construct, operate and maintain. It has capacity of 6000 -8000 litres, saves money and space. Construction of the EMAS tank does not involve any brickwork since the tank is constructed by just plastering the earth following excavation.

Step1: Laying ground for tank excavation

Step2: Complete excavation

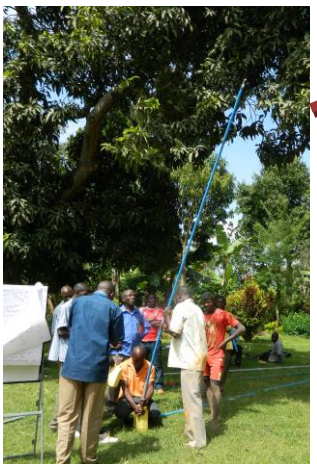
Step3: Plastering of the excavation

Step4: Fitting the pump holder

Step5: Making the cover

Water is extracted from the tank using a locally made EMAS pump that can elevate water up to 40m from a shallow well or tank. The normal discharge is 0.25 litres per stroke but depends on the elevation of the handle. The EMAS tank is suitable for areas with stable ground formation.

Assembling the EMAS pump



The EMAS research journey

The first tank was constructed in Kikandwa model village in December 2012. This was followed by exposure visits at village, regional and national level. These visits popularised the technology and created a lot of demand. In October 2013, ATC organized training in construction, operation and maintenance of the EMAS tank and pump. This drew together technicians from 11 NGOs, 1 CBO and Local Government i.e., Busoga Trust, AMURDA, KARITAS MADDO, JESE, Devine Waters, Kaproroni, Kigezi Diocese, Katosi Women Development Trust, HEWASA, NETWAS Uganda, Uganda Rainwater Association, Karujuba Maizi Bwomezi (CBO), Lwengo and Mukono District (Local Government).

One month down the road, Busoga Trust has replicated the technology by constructing one tank in Luwero, one of their areas of operation. Mbwagule Hannington, a trainee from Mukono District Local Government opted to concretize his experience by constructing the EMAS tank at his residence. He used this personal initiative to come up with the bill of quantities which totalled to about 700,000/-. He and other two trainees have taken it on as a business and already they are constructing their first contraction at Muwalimu Lukwago's residence in Kikandwa model village.

Recommendations:

- Uptake for promotion by NGOs as a low cost tank
- In places a high water table or collapsing soils, a rectangular shallow design can be adopted
- EMAS pump (costing about 120,000/-) may be used on shallow wells for self supply.