Potential of Rain Water Harvesting ....

Rain water harvesting (RWH) is an environmentally friendly practice that has been used traditionally in many parts of Sri Lanka and in other ancient cultures to mitigate drought risk. Its enhanced use can serve as an adaptation strategy for rising water stresses including climate change. Through this project, we assessed water scarcity and the use of climate information for RWH at Idamelanda, a village in Hanguranketa, Sri Lanka, which is vulnerable to drought.

Background to Drought in Sri Lanka

Drought is the most frequent disaster in Sri Lanka and the expenditure on drought relief has been the dominant except for the recent Tsunami. Drought leads to agricultural losses, hardships for those in drought affected areas, and also in a loss of hydroelectricity generation leading to planned electricity outages. Rising population and intensification of water use by domestic, industrial and municipal sector along with land use changes can lead to higher frequency of drought incidence. Rain Water Harvesting (RWH) techniques are being revived due to increasing drought tendency.

Background to Drought in Idamelanda

At Idamelanda, water is required for domestic purposes, as well as for agricultural activities. Home gardens are important for the peoples' welfare. In addition, due to non availability of a dependable source of water for agriculture, people engage in rain fed cultivation Chena (Slash, Burn and fallow) cultivation. Chena cultivation is unsustainable as forests are being depleted. In addition, it leads to the decline of the water table and to soil erosion leading to siltation of the Victoria Reservoir.

Project Objectives

- To characterize drought in Idamelanda
- Develop design guidelines for RWH
- Develop a proposal for a pilot RWH unit

Characterizing Droughts

Several methods are available to assess the severity of a drought and out of these, we have used:

- PDSI (Palmer's Drought Severity Index)
- WASP (Weighted Anomaly Standardized Precipitation) Index

View of the Victoria Reservoir from Idamelanda

Location Map - Idamelanda

FECT

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Various stages of the building process of an On-Surface/Above-Surface RWH Unit at Idamelanda, Left – concreted base and wire mesh reinforcement, Middle and Right: Application of mortar to roof. Photo Credits: Janaki Chandimala, 2008.

Design of RWH System

- A RWH system consists of a collector, storage system and conveyances of water. The size of the collector and the size of the storage tanks are pivotal. The storage should be sufficient to help families tide over dry spells. The collector should be sufficient to harvest adequate volumes during the rain spells.
- Rain fall and evaporation, dry spells and intensity of rainfall and runoff affect RWH design. Climate factors also affects the demand for water for agriculture, domestic use or livestock
- A computer program was developed to use daily rainfall observations to guide the design of the collector and storage system.

Proposal for a RWH Unit

In a community setting, the catchments are usually roof based or ground based systems. The storage systems can include tanks, cistern or pond systems. Elements of our proposal include:

- An above ground tank – to collect the surface run off from the roof
- A plastic tank recommended – to collect the run off from ground

The designs we have proposed – above ground tank and polythene tank – have a low installation & maintenance cost. The proposal relies on local materials and technical capacities for construction and installation.

Summary

- The characteristics of drought and relationships to climate was identified
- Software was developed to design RWH units, to check its reliability, and to calculate the water requirement for domestic & agricultural needs.
- Investing in RWH can reduce drought relief payments.
- RWH is a suitable mitigatory measure for drought with minimal cost

Implications and Future Work

- A systematic process is available to estimate impacts of climate and climate change on drought and mitigation option of RWH.
- This work can be extended to the whole island.

Further Information

- Project report is available.

To advance the application of science for societal welfare

Our officers have been working on projects on environment, climate and technologies. We started a Foundation in 2002 and registered it as a non-profit company in 2003. At present, we work in climate adaptation, information technology, communication and capacity building for sustainable development.

Our work is oriented towards developing useable scientific information that can be applied in diverse sectors. We build capacity through education, training, and collaborations.