Rainwater and the Millennium Development Goals

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TRANSFORMING LIVES AND LANDSCAPES

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Foreword

This publication for Rainwater Harvesting and the Millennium Development Goals represent our efforts to confront the increasing stress on the world's supply of fresh water for domestic use, agriculture, industry and the environment. Rainwater harvesting is a simple and low cost supply technology that has been practised for thousands of years. In modern times, it has received little or no attention despite its high potential in contributing to the achievement of Millennium Development Goals with a view to eradicating poverty and hunger, providing safe drinking water, promoting gender equity and empowerment of women.

The primary aim of this publication is to create awareness among governments, donors, UN agencies and other relevant stakeholders on the contribution of rainwater harvesting to improving the livelihoods of people worldwide. It is envisaged that the information offered will encourage governments and donors to invest both financial and human resources towards promoting rainwater harvesting especially among resource poor people who are hardest hit by water scarcity.

UNEP and RELMA-in-ICRAF prepared this publication in close consultation with an expert group and many contributions from individuals and organisations belonging to the Rainwater partnership. The Partnership was established on 7th October 2004 in The Hague. Its objectives are to promote:

- the integration of rainwater harvesting in water policies,
- the exchange of information between its members and,
- the allocation of necessary financial, institutional and human resources for using rainwater harvesting.

We sincerely hope that the brochure shall enlighten readers and stimulate action towards supporting rainwater harvesting. As stated by Centre for Science and Environment, "*Rain is decentralised. So is the demand for water. Why can't we decentralise the supply?*"

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Introduction

The Millennium Development Goals (MDGs), the blueprint for the world to accelerate development and measure progress was adopted by Heads of State in the year 2000. It contains a set of time bound and measurable goals and targets for combating poverty, hunger, disease, illiteracy, environmental degradation and discrimination against women. Goal 7 – Ensure Environmental Sustainability, focuses on water. However, all the MDGs depend on the availablity of water in acceptable quality and adequate quantities to meet their targets.

It is predicted that one-third of the population in developing countries will face water scarcity by 2025, with severe water deficits being experienced in West Asia, North Africa, the Indian Punjab, the central plains of China, as well as several regions in Latin America. Most of these regions are located in arid and/or semi-arid belts, where rainfall is low and erratic, with much of the precious water getting lost as surface runoff into the seas and oceans. At the same time it courses flooding and destruction. There is urgent need to reduce the water loss by applying rainwater harvesting. Rainwater harvesting is the collection, storage and productive utilization of rainwater. It reduces surface runoff and prevents soil erosion, thereby contributing to environmental conservation.

Rainwater harvesting is not new. There is evidence of its existence about 4000 years ago in Palestine and Greece. In ancient Rome, residences were built with individual cisterns and paved courtyards to capture rainwater to augment water from city's aqueducts. As early as the third millennium BC, farming communities in Baluchistan and Kutch impounded rain water and used it for irrigation. In Tunisia, jessours have been used for centuries to collect run-off from long hillslopes. Farmers build earthen dams across the valley floors to trap the run-off water and silt. In the desert areas of Arizona and northwest New Mexico, floodwater farming has been practiced for at least 1000 years. In the "Khadin" system of India and the spate irrigation system of the Great Horn of Africa, floodwater is impounded behind earth bunds, and crops then planted into the residual moisture when the water infiltrates.

The Rainwater Partnership was established on 8th October, 2004 in The Hague, The Netherlands to promote:

- the integration of rainwater harvesting in water policies,
- the use of rainwater in all sectors,
- the exchange of information between its members and,
- the allocation of necessary financial, institutional and human resources for using rain-water.

The Partnership brings together leading organisations concerned with the advocacy and imple-mentation of rainwater harvest-ing on national, regional and global scales.

It has 37 members from all over the world. also has endorsements from 11 govern-ments.

The United Nations Environment Programme (UNEP) is the interim secretariat of the part-nership

It

Rainwater harvesting technology

Rainwater may be harvested from roofs, ground surfaces as well as from intermittent or ephemeral watercourses. Instead of leaving runoff to cause erosion, it is harnessed, stored and utilized. In the semi-arid and drought-prone areas, water harvesting enhances yields and reliability of production while also conserving the soil. In many parts of the world, rainwater harvesting provides a source of water for household use, for institutions such as schools and community centers, for agriculture where it provides full or supplemental irrigation, environmental conservation and prevention of flood damage.

Water harvesting on croplands may be achieved through micro-catchment or macro-catchment systems or through floodwater farming. Under micro-catchment systems, runoff is collected close to the crop growing area and used to replenish soil moisture. Under the same systems, overland flow is harvested from short catchment lengths, about 1-30 metres long, and having a catchment to cultivated area ratio of about 1:1 to 3:1. Since micro-catchments handle small flows, they normally have no provision for overflow.

Macro-catchment systems, also known as external catchment systems, handle large runoff flows diverted from some source such as a road, home compound, pasture or hillside. The catchment is usually 30 - 200 metres in length while the ratio of catchment to cultivated area is usually 2:1 to 10:1. The runoff may be allowed to infiltrate into the soil profile where a crop is grown. Alternatively, runoff is channelled into storage structures such as ponds, tanks or groundwater aquifers for various uses, including supplementary irrigation. Due to the large volumes handled, provision for overflow is made.

Floodwater farming is practiced when water flow is diverted from a valley or wade onto cropland which is subsequently cultivated. In this case, floodwater systems must have overflow structures to handle unexpected flows. The catchment is usually large, and thus the ratio of catchment to cultivated area may exceed 10:1.

Criteria for selection of technologies

Factors considered for choosing rainwater harvesting for domestic use include:

- catchment type and size
- cost of the rainwater harvesting system
- family size
- length of the drought period
- alternative water sources

In choosing the type of water harvesting intervention for crop production, several factors are considered. These include:

- rainfall amounts, intensities and evapotranspiration rates;
- soil infiltration rate, water holding capacity, fertility and depth;
- crop characteristics such as water requirement, length of growing period and resistance to waterlogging;
- topography;
- hydrology; and
- socio-economic factors such as population density, labour, people's priorities, costs of materials, land tenure and regulations governing water resources use.

Effective water harvesting requires community participation, which is enhanced by:

- sensitivity to people's needs ;
- indigenous knowledge and local expertise;
- full participation in all aspects and consideration of gender issues and,
- taking consideration of the prevailing farming systems as well as national policies and community by-laws.