

Good to the last drop:

Capturing Africa's potential for rainwater harvesting



Photo: Alex Odior

INSIDE:

RELMA's key rainwater harvesting interventions

Case Study

In Lare Division, Kenya, rainwater harvesting has boosted the quality and quantity of crop yields. Easy access to markets has converted the increased agricultural productivity into cash, leading to one of the highest adoption rates of RWH ponds in East Africa.

Decision Support Tool

A new GIS database — the first of its kind for Africa — is mapping the untapped potential for rainwater harvesting. The maps are helping policy makers to identify and prioritize appropriate rainwater harvesting interventions in 10 African nations.

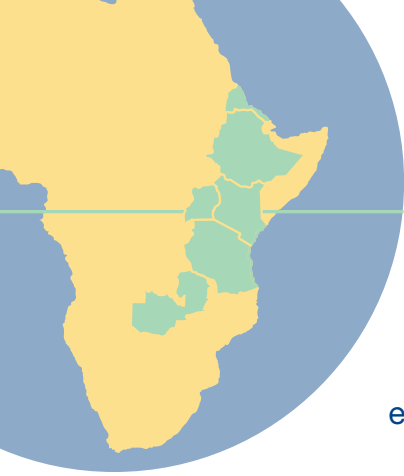
Managing available water resources is an important component of sustainable development (1). In Africa, a continent with annual freshwater resources estimated at 5,800km³, 300 million people struggle with water scarcity, as a result of poor spatial distribution and timing of rainfall — not an absolute shortage (2). This situation is hampered by climate change which is causing erratic rainfall, often leading to droughts or floods (3).

Africa's water crisis could be lessened by harnessing the vast potential for rainwater harvesting (RWH). Since the early 2000s, RELMA has actively promoted rainwater harvesting techniques and good practices. In doing so, RELMA has assisted communities to effectively use their available water for domestic, agricultural and industrial purposes, as well as to support conservation activities and maintain ecosystem functions (4, 6, 7).



RELMA

The Regional Land Management Unit (RELMA) was closed in 2006. The second issue in a four-part review series, this leaflet examines RELMA's involvement in promoting rainwater harvesting in East Africa. The RWH activities will continue under the guise of the Southern and Eastern Africa Rainwater Network (SearNet).



Key RWH interventions:

At the moment, 14 African nations are categorized as ‘water stressed’ or ‘water scarce.’ Without urgent action, another 12 African countries are expected to join this list by the year 2025 (2). Rainwater harvesting (RWH) has been identified as an important means of improving the management of existing water resources in Africa (1, 2).

Since the early 2000s, RELMA has joined SearNet in aggressively pursuing the goal of mainstreaming rainwater harvesting into key policy frameworks at the national, regional and international levels, with the aim of connecting high-level policy makers with the realities of communities. This has meant challenging significant gaps in water policies that traditionally emphasize the role of water supply infrastructure, overlook private sector inefficiencies in servicing impoverished communities, and do not adequately address issues of water and sanitation (4).

To address these and other policy constraints, RELMA undertook a wide range of activities to generate awareness and stimulate debate about rainwater harvesting, including policy research, seminars, workshops and exchange visits (4). For example, RELMA contributed towards the cost of participation for representatives from various African rainwater harvesting associations to attend an annual course in China. RELMA has also supported participation in training courses hosted by the International Rainwater Harvesting Alliance (IRHA) and the Centre for Science and Environment (CSE).

Rainwater harvesting (RWH) describes simple, low-cost techniques that involve the capture and storage of rainwater (4).

In a region where rainwater harvesting is not yet widespread, information is vital to create awareness, influence policy and encourage adoption of appropriate technologies. In addition to a multi-media catalogue of rainwater harvesting resources, RELMA has built a solid reputation for publishing quality training materials, including in local languages (5). One example is the Dholuo language training manual on the construction of rainwater harvesting tanks (6). Such resources have proved invaluable tools in working with local communities to implement RWH activities.

RELMA rainwater harvesting activities have received media coverage in print, radio and television, effectively raising the public profile of RWH (4).

Working together: SearNet

At the 1998 Africa Water Network meeting, participants from Ethiopia, Kenya, Tanzania, Uganda, Zambia and Zimbabwe, expressed an interest in forming a regional rainwater harvesting network. With RELMA support, the Southern and Eastern Africa Rainwater Network (SearNet) was formed as a regional apex for registered national rainwater harvesting networks operating across 12 countries in the region. SearNet’s vision is to improve livelihoods by ensuring sustainable access, management and utilization of rainwater (4).



Photo: SearNet

Case study:

RELMA-sponsored rainwater harvesting projects in Kenya illustrate how rainwater harvesting is helping rural communities improve livelihoods, adjust to land use changes and mitigate increasing water scarcity.

Lare Division provides a unique vantage from which to evaluate the uptake of rainwater harvesting technologies. Maps generated over the last thirty years have allowed RELMA scientists to pin point changes in land cover — a 24% loss of forest cover accompanied by a 45% increase in crop cover. Over the same period, stream flow to the area has dramatically decreased (7).

To mitigate the resulting water shortages — especially common during the dry season — farmers in Lare Division begun using a trio of rainwater harvesting technologies: runoff harvesting ponds, roof water harvesting, and in situ water harvesting (7).

A satellite image snapped in 2004 depicted the high adoption rate of the most popular of the three technologies: approximately 9 runoff harvesting ponds can be spotted per km² — the highest recorded rate of adoption in East Africa (7).

While high economic returns were cited as the main reason for successful adoption (see box below), several other positive changes accompanied the adoption of rainwater harvesting, including: 1) increased water and food security, due to water availability over longer periods; 2) less time spent

collecting water means more women and children are now free to engage in other socio-economic activities, including small business ventures and schooling; 3) access to more water is supporting environmental conservation through tree planting; and, 4) a new industry has sprung up, specializing in the construction and maintenance of the ponds (7, 8).

The last point deserves special attention. Although the run-off ponds were successful in Lare Division, they were less successful in Olepolos (Kajiado District, Kenya) due to poor placement and construction (8). To ensure functionality and sustainability of RWH infrastructure, capacity building and training in construction and maintenance must be incorporated as a key element in RWH projects.



Markets make RWH pay

In Lare Division, the dividend on the RWH ponds is dramatic: agricultural productivity climbed from just 590 USD/ha per season to 3540USD/ha per season, an increase attributed to additional dry season cultivation and higher quality produce capable of fetching a better price at market. Access to the market was identified as the key to ensuring the economic return on the RWH investment, and by extension, as a critical factor in the unprecedented uptake of the technology (7).

In Olepolos, a dry area with little agricultural production and poor market access, a different tack was necessary to ensure economic sustainability for RWH activities. RELMA teamed up with UNEP and the Rotary Club of Nakuru to add a microfinance component, 'Pesa ya Meza,' to their RWH activities. Microfinance provided locals with access to the capital needed to install and upkeep the RWH harvesting infrastructure, and gave the Masaai women a means of investing the money earned during the hours saved from fetching water (8).

Decision support tool:

In the past, a key barrier to the adoption of RWH techniques was a lack of scientific information that could be readily used to identify areas that stood to benefit from specific rainwater harvesting technologies. Existing data was often too raw or technical to be useful to decision makers. Not anymore.

A new Geographic Information Systems (GIS) database has been developed by the United Nations Environment Programme (UNEP) and the World Agroforestry Centre (ICRAF), both members of the Rainwater Partnership, to service the demands for simple tools to support rainwater harvesting advocacy and implementation in Africa (2).

The database includes information on several factors that affect the potential for RWH interventions, e.g. rainfall, in ten African nations: Botswana, Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Tanzania, Uganda, Zambia and Zimbabwe. When many of these factors are layered together on a single map, the overlaps reveal 'development domains' — areas that are suitable for select RWH technologies. As a result, policy makers can easily identify priority areas for investment in one or more of four select rainwater harvesting techniques.

The time has come to realize the potential for greatly enhancing drinking water supplies and smallholder agricultural production by harvesting more of the rain when and where it falls.

*~ Dennis Garrity, Director General,
The World Agroforestry Centre (ICRAF)*

While an important advance — the database is the first tool of its kind for Africa — the maps can only be used to provide broad insight into where particular RWH technologies might be appropriate. Actual planning of the RWH activities requires detailed surveys and consideration of other socio-economic factors, such as competing water requirements, financial constraints, politics and culture (2).

To ease use by policy makers and non-GIS users, existing maps have been converted into several different user-friendly file formats that can be viewed in photo imaging software or even Microsoft Word (2).

The emerging picture is clear: Africa has a vast and untapped potential for rainwater harvesting. And with the advent of tools such as the GIS database, decision makers are now equipped to take advantage of this opportunity.

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