

Water harvesting for home food security

Poverty in rural households has deepened in the past two years through rises in food and fuel prices, followed by global economic meltdown, all amidst growing climate uncertainty. Balancing water availability within and across growing seasons, water harvesting helps to buffer households against drought. Research on water harvesting in South Africa has focused on rural household livelihoods.

Research on water harvesting by the Water Research Commission of South Africa has aimed to develop household solutions for recurrent food and water shortages, especially in the rural areas. Some of these research outcomes are now being implemented through government programmes (DWA 2007) and private initiatives.

Innovative solutions most often draw heavily on local traditions as well as modern science, and cover not only technologies, but also mobilisation and learning approaches.

The “Mind Mobilisation” approach

In the past century, as mining and industrial jobs started dominating, livelihoods became increasingly cash-based and many families lost

their age-old traditions of home food production. When unemployment and retrenchments sent ever-larger numbers of workers home to the rural areas, abject poverty and apathy set in for many.

“Mind mobilisation” is an innovative approach which helps people to face up to their situation and start doing something constructive with whatever little assets they have. This approach was developed by MaTshepo Khumbane, a retired social worker and development activist, and documented by the International Water Management Institute (IWMI) and South Africa’s Water Research Commission (WRC 2009). This approach is now built into learning material for the University

of South Africa’s new programme for the training of Household Food Security Facilitators (UNISA 2009) – supported by the South African Institute for Distance Education through funding from the Kellogg Foundation.

The “mind mobilisation” steps have a lot in common with the Twelve Step approach of Alcoholics Anonymous, and use a set of facilitation tools that fit well with local culture, notably the ‘Helicopter Plan’ and daily activity charting – light-heartedly called ‘The Manager’.

Helicopter Planning is a combined visioning/action planning/self-monitoring technique: people ‘fly over’ their homestead yard in their mind’s eye, drawing what they ‘see’ from above – especially where the runoff flows during rainstorms. Then they draw their vision of the yard five years later, fully developed for water harvesting and production to support food security. This drawing becomes their action plan: hanging on the wall it reminds them constantly of their dream, and of the next steps to be taken to achieve that dream.

‘**The Manager**’ also hangs on the wall where all in the house can see it. Daily recording of everyone’s activities

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Photo: M. Botha



MaTshepo’s own Helicopter Plan... implemented! Note the run-on pathways between the permanent deep-trenched beds, planting of root crops in the ‘brims’ around each bed, and diversity of cropping.

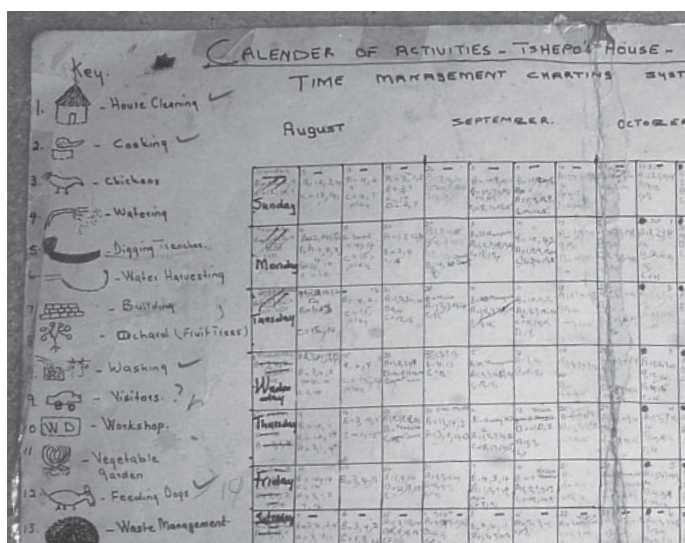


Photo: M. de Lange

'The Manager' – daily activity charting raises awareness of time as a resource, and unites household members in their efforts for food security.

fully as a learning approach for food insecure households (WRC 2009). Each household in the Garden Learning Group (GLG) chooses a topic they wish to experiment within their own garden, and show their results at GLG learning meetings throughout the season.

Sizakele Mduba, Potshini village, KwaZulu-Natal experimented with two rainwater harvesting techniques, namely run-on and deep trenching. She compared her results with the local traditional practice of shallow hoeing and manuring. She found a convincing increase in plant available water throughout the season through both methods, and in overall soil fertility and crop yield through deep trenching.

A culture of creativity and experimentation equips households to cope better with ever-changing circumstances, without having to wait for outsiders.

on this 'Calendar of Activities' becomes great fun, and everyone – from the smallest child to the grandparent – learns to value and prioritise their time and to contribute to household food security. Often this leads to restructuring of gender roles and mutual appreciation among household members.

Learning approaches

Creativity is one of a poor household's strongest weapons against uncertainty and adversity. In recent research, "learning through experimentation" has been used success-

The 'Nutrition Workshop' is another powerful mobilisation technique, which enables food insecure and often illiterate participants to record and analyse their family diets through the use of easy but accurate nutrition concepts. They discover their nutritional gaps and often, causes for health problems in the family. This motivates them to grow specific foods to fill those gaps.

Harvest celebrations are powerful instruments in the fight against hunger. Worldwide, poor people are scorned and labelled as lazy, which adds to their sense of powerlessness. Harvest celebrations reinforce a sense of achievement and creates goodwill and support from neighbours and village leadership for the self-help efforts of food insecure families.

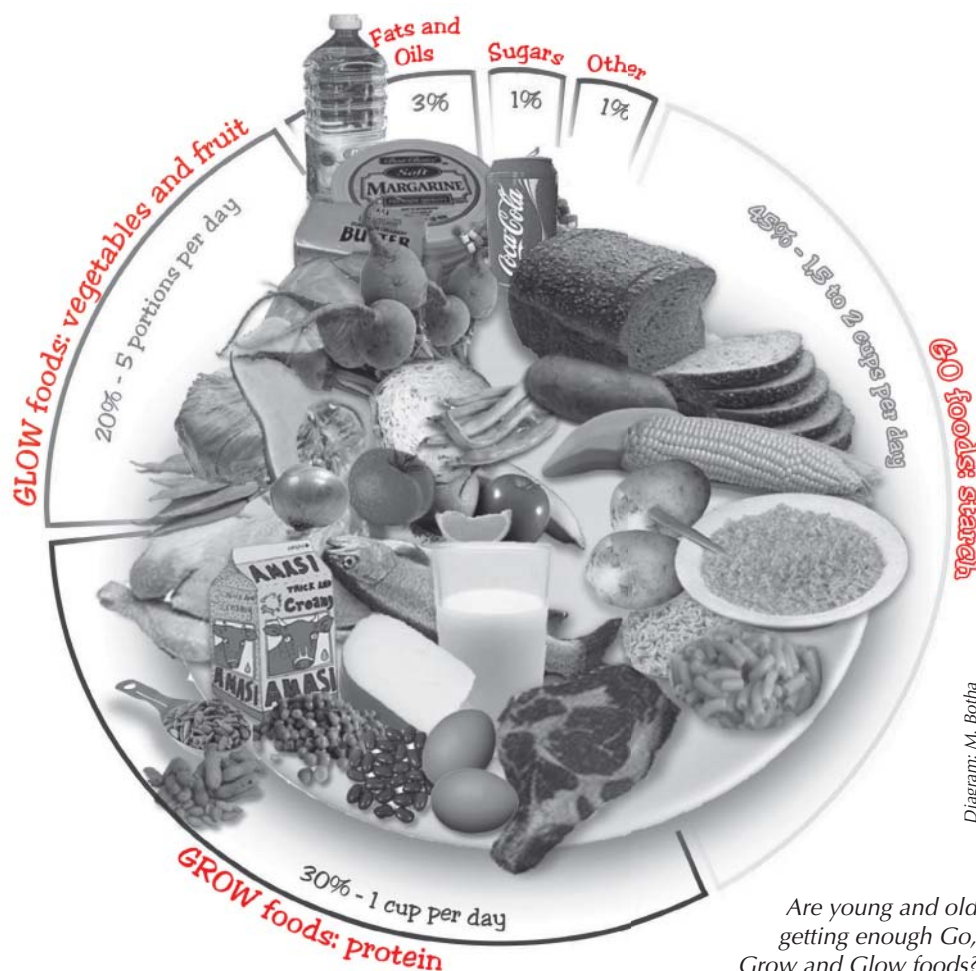


Diagram: M. Botha

Are young and old getting enough Go, Grow and Glow foods?

Sizakele Mduba's experiments have convinced her of the value of deep trenching and run-on techniques.

Technologies

LEISA. Low external input and sustainable agriculture (LEISA) methods are recommended for home food production in a changing climate, because they:

- are suitable for low-income families; and
- engage people in processes that build up, instead of destroy, the environment.

Recommended technologies. Recommended water harvesting technologies (WRC 2009) include:

- 'Deep trenching' and 'run-on', which can be applied by poor households in almost every climatic zone, without the need for expensive equipment or cash inputs.
- 'Tower', 'bag' and 'keyhole gardens', which bring intensive food gardening to the kitchen doorstep.
- 'Infield rainwater harvesting', which prevents rainfed crop losses due to

late season dry spells, by increasing infiltration, especially on heavy clay soils.

- Homestead water storage tanks, which enable the household to save food crops from drought during the rainy season, and also make it possible to grow food in the dry season.

Experimentation with rainwater harvesting and LEISA techniques in a homestead food gardening context assists in building resilience to shocks such as climate change. Working in learning groups bolster skills, creativity and confidence and provides resilience through social cohesion.



Photo: E. Kruger

Further reading

1. DWAF, 2007. *Programme Guidelines for Intensive Family Food Production and Rainwater Harvesting*. Department of Water Affairs and Forestry, Pretoria, South Africa.
2. UNISA, 2009. *Participatory facilitation of food security*. Module 2 of the Learning course for Household Food Security Facilitators. University of South Africa, Pretoria. Forthcoming.
3. WRC, 2009. *Agricultural Water Management in Homestead Food Gardening Systems – Resource Material for Facilitators*. WRC Research Project K5/1575. Water Research Commission, Pretoria, South Africa. Forthcoming.

Zusammenfassung

Die Armut der ländlichen Haushalte hat sich durch die weltweite Entwicklung in den letzten zwei Jahren verstärkt: Auf massive Preissteigerungen für Lebensmittel und Treibstoffe folgte die globale Wirtschaftskrise, und dies alles vor dem Hintergrund zunehmend unsicherer Klimabedingungen. „Water Harvesting“, also das Auffangen, Speichern und gezielte Ableiten von Wasser, gleicht die Verfügbarkeit von Wasser innerhalb und zwischen den Wachstumsperioden aus und hilft den Haushalten, Dürreperioden besser zu überstehen. In Südafrika

konzentriert sich die Forschung zu Water Harvesting auf ländliche Haushalte. Die Ergebnisse dieser Forschung werden in vielen Dörfern des Landes bereits durch innovative, angepasste Technologien des Water Harvesting und Maßnahmen zur Nahrungssicherung umgesetzt.

Resumen

La pobreza en los hogares rurales se ha agravado en los dos últimos años debido a acontecimientos de orden mundial: alzas sin precedentes en los precios de los alimentos y los combustibles, que fueron seguidas por una crisis econó-

mica global, todo ello en medio de una creciente incertidumbre en torno al clima. La cosecha de agua ayuda a proteger a los hogares contra la sequía al equilibrar la disponibilidad de agua dentro y entre las estaciones de cultivo. La investigación sobre la cosecha de agua en Sudáfrica se ha centrado en los medios de vida de los hogares rurales. Actualmente, se vienen obteniendo resultados innovadores mediante tecnologías apropiadas para la cosecha de agua y técnicas de facilitación para la seguridad alimentaria en diversas aldeas de Sudáfrica.

Rainwater harvesting – The Silver Bullet for arid and semi-arid areas

The effects of climate change have been a harsh reality in arid and semi arid (ASAL) areas in the southern hemisphere for years. While some suffer from frequent floods, most ASAL areas in eastern Africa experience vastly increased cycles of drought. The most affected rural areas are also chronically poor and neglected. Many are water scarce with no or dilapidated water supply infrastructure. Frequently there just aren't any water sources in abundant quantity – neither from rivers nor from the aquifer. Rainfall patterns are biannual, sometimes with a total annual precipitation of just 150–400 millimetres. Almost all rivers are seasonal. They carry water briefly during the rains and dry up again a few hours later. Boreholes along the volcanic Rift Valley mostly provide saline water, sometimes with high fluoride content. And, as is commonly known, boreholes require energy for pumping, maintenance, spares and sometimes the replacement of entire units. All this is expensive and unaffordable for most poor communities. In several countries, communities cannot count on their governments to assist. Still, many people live in water-scarce inhospitable areas, and most are unlikely to be awarded Green Cards to emigrate to “greener pastures” any time soon. Nor do many of them want to. Nor should they.

Conditions have changed

So, what can be done to help the drought-affected populations in water-scarce areas in the Horn of Africa and elsewhere in the arid and semi-arid world to ensure their daily drinking water? You might say that people have always somehow survived in dry areas. However, conditions have changed tremendously: Population figures have almost doubled in the past 20 years. Environmental degradation and climate change have further aggravated the problem of water supply. Many such challenges have solutions which are neither complicated nor costly. In eastern Africa, Welthungerhilfe and the rural communities with whom we work look keenly toward methods of collecting water for humans and animals by harnessing water from the rains.

Why rainwater collection in a dry area, is this not a contradiction in itself? By no means! Rainwater collection and storage for drinking purposes is a vastly under-used strategy for the decentralised supply of clean drinking water. In the Masai pastoral district of Kajiado near the Kenyan-Tanzanian border, for example, hardly any collectible rainwater is currently used. However, less than one percent of the rains even in dry years would be sufficient to cover the drinking water needs of its entire human and livestock population. Rains as low as 150 millimetres per season cater for the demands of a whole primary school if they are collected from the school roof, stored in a tank, and used during the drier months of the year. Other water scarce areas are lucky to have natural rock formations whose runoff can be channelled into open weirs and from there into storage tanks. For example, Maparasha rock in southern Kajiado has a vast catchment surface of over 10,000 square metres. Considering a run-off coefficient of 0.90, even in poor seasons with only 150 millimetres rainfall this rock collects as much as 1,350 cubic metres or 1,350,000 litres of drinking water – twice per year. By Sphere drinking water standards (5 litres/person/day), some 3,000 people get all of their drinking water from this rock for a full three months, i.e. for the driest months between rainy seasons. The sheer numbers already make a compelling argument for using rainwater collection and storage to support the supply of clean drinking water in dry areas.

By building roof catchments and masonry storage tanks in 150 schools, more than 15 million litres of clean water could be collected every year.

Photo: Krebber

Now take the example of Kenya which is officially classified as water-scarce and consider the potential with the country presently only collecting 4 percent of its collectible rainwater! What an opportunity to help tap at least part of the remaining 96 percent!

During the past ten years, Welthungerhilfe has supported 150 primary schools to construct roof catchments and masonry storage tanks for over 15 million litres of water per year. Over 60,000 school children of poor parents in dry areas now have drinking water available in their schools. Welthungerhilfe has also assisted 30 poor communities to construct rock catchments with storage tanks for about 25 million litres of clean water per year. All communities constructed their water structures themselves – and they love their “sweet water”.

While population growth and increasing droughts make life in the dry areas more and more difficult, rainwater collection and storage systems offer a compelling solution to a major part of the problem. If donors wish to invest their funding for the good of poor rural communities with value for their money – over 500,000 happy rainwater users in ASAL Kenya will be happy to confirm that this silver bullet certainly hits the mark.

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