3R: Recharge - Retention - Reuse

People living in drought-prone areas are one of the most difficult groups to reach with the millennium development goal efforts. Climate change and increased incidence of extreme weather events will even have a further negative impact on water security. This challenge requires innovative solutions, one of which we refer to as 3R. 3R stands for "*Recharge, Retention and Reuse of Groundwater & Rainwater*". 3R is both an approach and an initiative that deals with the management of the water buffer - in relation to development as well as adaptation to climate change, like dealing water scarcity, salinization and issues of flooding. 3R is a promising development track, which deserves promotion and funding, combining rainwater harvesting, groundwater management and efficient water use.

Where is 3R? In many countries, like
Ethiopia
Nepal
Mali
Kenya
Mozambique
Senegal
Burkina Faso
The Netherlands
Uganda
Bangladesh
Your country?

What is 3R?

3R is an initiative of four Dutch entities (RAIN, Acacia Water, MetaMeta and Aqua for all), all involved in sustainable and innovative management of water resources. They joined forces in their attempts to contribute in climate change adaptation and pro poor development aid. Also BGR from Germany and IGRAC joined and support the initiative. 3R solutions are already applied in many countries and are integrated in various water resource development plans. The 3R organization is a group of complementary partners that closely work together to successfully upscale this promising approach.

3R is about managing the water buffer

Recharging water is a hydrologic process in which rainwater moves downward from surface water to groundwater. Water *retention* refers to the technologies for the storage of water, which may vary according to local conditions and available materials. *Reuse* of water involves technologies, which enable available water to be recycled in times of need and scarcity. 3R presents an alternative concept in storing water, which is different from large surface reservoirs, using many smaller systems and storing water in the landscape, either underground or in small surface systems or as soil moisture.

The advantages are plenty. 3R solutions are decentralized solutions that when applied at scale do not disrupt the local environment, but add value to it. 3R technologies and can be applied in many different circumstances. Combined with relative low investment costs this makes 3R an alternative that is highly feasible for sustainable water supply on a local scale. By storing water in the soil profile 3R technologies can also contribute to diminish the risk of crop failures in rain-fed agriculture.

Examples of 3R solutions are sand-and subsurface dams for riverbed storage, valley dams and ponds as open reservoir storage or rooftop harvesting for storing in closed tanks. The use of bunds and terraces helps in retaining more water in the soil profile.

Some stunning 3R facts:

- Water harvested from a rock outcrop of 1 hectare can harvest around 900.000 litres of fresh water from a mere 100 ml of rainfall.
- Plastic mulch is successful in decreasing the amount of water lost through evaporate-transpiration and increase yields up to 50%.
- The average time spent to fetch water decreased from 140 to 90 minutes after the introduction of sand storage dams.
- Grass strips planted along contour lines help in slowing down runoff and

What is the added value of 3R?

3R partners work on projects and programs aiming to deliver a structural contribution in solving water scarcity issues. We promote technologies to assist people in water scarce areas and to maximize the use of available water. The program focuses, for example on improving rainwater storage in wider hydrological units, providing water for drinking and for economic use. 3R is closely related with initiatives like Multiple Use water Services (MUS) and improving water access, sanitation and hygiene (WASH) in the efforts for poverty reduction. With 3R solutions in place, it basically functions as a precondition for sustainable interventions on water & sanitation and water & agriculture.

3R is a powerful approach to cope with the increasing uncertainty in water availability due to climate change, population changes and land degradation. Managing floods,

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augmenting soil moisture with yields increases of up to 40%.

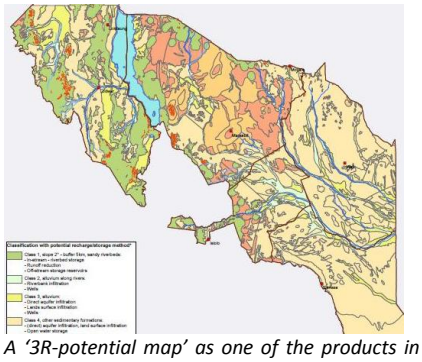
preventing erosion and a most efficient rainfall use will surely help building up resilience to climate change.

How do we work?

Through the combined efforts of various water management stakeholders, the 3R partners work on *convincing major planning and financing agencies* to invest in the application of these effective technologies. Pilot projects and experiences of third parties have proven successful, and we see great potential to replicate the benefits of these technologies in a wider area. In our approach a technological basis is combined with capacity building and training of local water managers, always based on a demand driven inventory. We work on the ground with our Implementing Partners, who are experienced and familiar with the local context, an important requirement for successful implementation of 3R solutions and operation and maintenance.
The 3R group actively seeks support from "out-of- the-3R-box" agencies to increase awareness and to promote this innovative approach. We are scoping out possible partners to join forces and to exchange useful information. Furthermore, we seek valuable knowledge on advocacy and fundraising.

3R for you?

3R can be easily integrated in developing or existing programs that deal with the issue of water scarcity in relation to poverty reduction. 3R can be added as an important component to systematically improve the resilience of local communities to water scarcity, food insecurity and climate change. 3R is not a blueprint. Depending on the approach of a project or program, a 3R component can be added starting from different perspectives. For instance a technical '3R scan' could be a starting point as a basis to determine applicable solutions (top down). Another approach is more bottom up, by starting from existing activities on agricultural improvement or water management and add a 3R component for a more sustainable approach. For every challenge a suitable and effective 3R approach is available.



A '3R-potential map' as one of the products in the Kenya Arid Lands program

One of our latest 3R projects-Kenya Arid Lands Disaster Risk Reduction

In this project, a group of Dutch organizations contribute to a large drought resilience program proposed by the US Millennium Water Alliance (MWA). The Dutch work closely together with the US Implementing Partners to improve access to WASH *and* build resilience to climate change for at least 160,000 people in the arid lands in the north of Kenya. An important 3R component is added by Acacia water (on ground water recharge), IRC (on Multiple Use Systems), while Aqua for All delivers a business development component to the project and coordinates the Dutch contribution. The total program will be executed from 2013 to 2015 with a total budget of more than 9 million Euro, funded by both US and Dutch partners.

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For more information on 3R:
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About 3R

In the 3R group the following organizations work together:
Acacia Water: www.acaciawater.com
Aqua for all: www.aquaforall.nl
Meta Meta: www.metameta.nl
Rain Foundation: www.rainfoundation.org
BGR: www.bgr.bund.de
IGRAC: www.un-igrac.org