International Rainwater Harvesting Alliance
Alianza Internacional para la Gestión del Agua de Lluvia *(IRHA)*
Alliance Internationale pour la Gestion de l'Eau de Pluie *(IRHA)*

bRAINstorming

NEWSLETTER NO. 29 – JANUARY 2010

Our newsletter focuses on all activities concerning rainwater harvesting, the International Rainwater Harvesting Alliance (IRHA) and its partners.

Topic of this issue: Agricultural Rainwater Harvesting Pt 1

Editorial

Dear Rainwater Harvesters, Readers, the IRHA Members and Friends,

It is estimated that 36% of the global population live in areas that are subject to water constraint, and around 500 million (8.9%) of these people rely on rainfed agriculture for their survival (Rockström and Karlberg, 2009).

Rainfed agriculture generates 60–70% of the world's staple food and is practised on 80% of the world's agricultural land. In semi-arid and dry sub-humid zones rainfed agriculture dominates food production systems, but rain is erratic in these areas and dry spells are common, making water a key limiting factor on crop growth (Rockström and Karlberg, 2009).

Agriculture plays a key role for economic development and poverty reduction; every 1% increase in agricultural yield translates to a 0.6–1.2% decrease in the percentage of absolute poor (Rockström and Karlberg, 2009).

These simple statistics show the importance of rainfed agriculture and how just a small improvement in a crop yield can release farmers, their families and their communities from poverty through increased food availability, income and employment.

Rainwater harvesting can have a large impact on rainfed agriculture by mitigating the effects of sporadic shortages of rain. If water can be stored during the rainy season, it can be used to irrigate crops in dry periods, thereby increasing the yield.

This Newsletter introduces you to agricultural rainwater harvesting, so you to can see the benefits it can bring.

Hannah Price

A Quotation

"Rain is grace; rain is the sky condescending to the earth; without rain, there would be no life."

John Updike (1989)

History of Agricultural Rainwater Harvesting

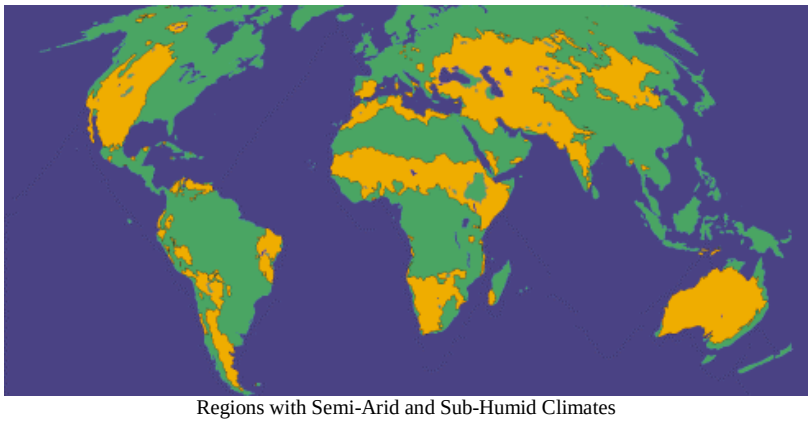
The use of rainwater harvesting for agriculture has been around for thousands of years and been utilised by many civilisations. It is believed that the first techniques originated in Iraq over 5000 years ago, in the Fertile Crescent of Mesopotamia. Findings also point to rainwater collection being used for irrigation in India as early as 3000 BC. For many societies, the development of rainwater harvesting formed the basis of their existence (Rockström, 2002).

However, with the introduction of modern irrigation systems in the mid 1950s, the traditional methods of rainwater irrigation began to fade. The Green Revolution was characterised by government subsides on water, large-scale groundwater development and electrified, or diesel, pumps. In recent years, the results of many modern irrigation systems have lead to the over-extraction of groundwater reserves. This, linked with the fact that several governments are unable to get water supplies to their entire population, means that an alternative water supply is needed and many are returning to the traditional methods of rainwater harvesting (Rockström, 2002).

Agricultural Rainwater Harvesting in Context

Areas that have the greatest need for rainwater harvesting are those that rely on rainfed agriculture. This type of agriculture is prolific and most countries rely on it for their grain food. In Sub-Saharan Africa over 95% of farmed land is rainfed, followed by 90% in Latin America, 75% in East and North Africa, 65% in East Asia and 60% in South Asia (Wani *et al.*, 2009).

Rainfed agriculture is abundant in the semi-arid and sub-humid tropics. However, the adverse biophysical growing conditions and the poor socioeconomic infrastructure in many of these regions, means that they are home to over 45% of the world's hungry and more than 70% of its malnourished children (Wani *et al.*, 2009). The map below shows the close link between countries that rely on rainfed agriculture and those that have a semi-arid or sub-humid climate.



Regions with Semi-Arid and Sub-Humid Climates
Source: University of Utah (2006)

True to its name, rainfed agriculture relies on the rain, rather than irrigation, to water the crops. Consequently, the inherent problems of erratic rainfall in the areas of rainfed agriculture, poses a serious threat to the success of crop yields.

Click here to read about the problems facing rainfed agriculture.

Can Rainwater Harvesting Improve the Productivity of Rainfed Agriculture?

The importance of rainfed agriculture is clear. The sheer number of people it affects means that improving the productivity would have a large impact on the world's poor, but can rainwater harvesting make a difference?

The majority of crop failures are the result of relatively short dry spells that occur during the important stages of crop growth, rather than droughts. In most areas there is enough annual rainfall to grow the crops, it is the uneven distribution of the rainfall that poses a problem. This is where rainwater harvesting can make a difference; if water is stored while it is raining, it can then be used to water the crops during dry periods, bridging the dry spells and avoiding crop failure.

Studies have shown that in tropical semi-arid and sub-humid areas, farmers' yields are 2-4 times lower than optimally achievable yields for major rainfed crops. Grain yields fluctuate around 1-2 t/ha, compared to optimal yields of over 4-5 t/ha. The large gap between current and potential yields indicates that there is a large potential to improve the yields in rainfed agriculture (Rockström and Falkenmark, 2000).

Click here for more details on how rainwater harvesting can improve the productivity.

Millennium Development Goals

The consequences of improved yields within rainfed agriculture are wide-ranging. The implementation of rainwater harvesting in agriculture has the capacity to contribute to three of the Millennium Development Goals (MDGs).

Goal 1: Eradicate extreme poverty and hunger.

Goal 2: Promote gender equality and empower women.

Goal 7: Ensure Environmental sustainability.

To see how rainwater harvesting plays a role in these MDGs, click here.

Interview with Dr. Sharma, International Water Management Institute (IWMI), by Vessela Monta

In May 2009 I visited the New Delhi office of the IWMI South Asia. I was to meet Dr. Bharat Sharma and I felt quite excited to have a discussion on the role which this reputed institution plays within Rainwater Harvesting.

My expectations were justified: Dr. Sharma was very well placed to introduce me to the strategies of enhancing the position of rainwater harvesting in the water policy of this immense country. We discussed a project that wanted to link up several Indian rivers, with the aim of reducing water scarcity in many regions. Research completed under the project suggested that though some links of the project were essential, others may change the existing ecological balance and that several other options, more inclusive and sustainable, are preferable. As India has a great potential for rainwater harvesting, by developing a well structured policy at national level, allocating small investments to help farmers and developing groundwater resources in the eastern region of the country, it should be able to achieve comparable outcomes. A National Rainfed Authority was created, and the IWMI started to work with reputed NGOs (PRADAN, HPPI, NGI, CINI), so they could in turn train the farmers. Dr. Sharma has also published a national blueprint for the dominant rainfed districts of India for improving the productivity of rainfed crops and livelihoods of the poor rain dependent farmers.

Has the knowledge about rainwater harvesting increased in the country, I asked. Dr. Sharma was categorical: "Yes, a lot!" He gave the example of Gujarat, an Indian state with a high level of water scarcity, where the work of NGOs at both village at personal levels, has given excellent results. The fact that IWMI links the water scarcity with poverty, gave a push on water conservation practices in agriculture.

The interview left me with the impression that science and policy have come together to plant the soft but efficient rainwater harvesting policy in the everyday life of Indian farmers. Dr. Sharma has written the paper "Converting Rain into Grain", if you want to more information on this area, we highly recommend this paper!

IRHA News

Next Newsletter

Our next Newsletter will be Agricultural Rainwater Harvesting Pt 2. It will look at how rainwater harvesting is used within agriculture, including details on the different types of techniques and methods and some examples from around the world.

If you are involved in this area of rainwater harvesting and would like to contribute to the next Newsletter, we ask you to get in contact with us and we would be delighted to include your work.

References

This Newsletter was written with the help of several papers in the area of agricultural rainwater harvesting. A list of the articles used can be found here.

New Website

We are pleased to announce that our brand new website is now online, it is not yet fully complete but we are working hard to get it finished as soon as possible. Please visit it and have a look for yourself!

The website has a new 'Business Directory' function; this is an area of our website where companies can advertise their rainwater harvesting products and services and potential buyers can find products for their rainwater harvesting needs.

If you are interesting in becoming part of our Business Directory and have any products or services aimed at rainwater harvesting that you want to advertise, please get in contact with us and we will be happy to include you.

Become a Member

The IRHA Members benefit from our extensive network and contribute to increasing the global use of rainwater harvesting.

Become a Member online (choose one):

- Student Membership
- Organization Membership
- Individual Members
- Supporting Friends Membership
- Private Sector Members

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