

Editorial

Rainwater Harvesting Essential for Dryland Sustainability

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Water has become a highly valuable commodity in the 21st century. In countries with larger areas of drylands, water scarcity threatens livelihoods of people. Drylands, by the way cover over 41% of the world's land surface area [1]. They also harbor world's unique biological and cultural diversity. To make matters worse, water tables are rapidly declining in many parts of the world due to excessive draining of groundwater and aquifer resources. In highly populated countries such as China and India, falling water tables have already started to minimize harvest of grains, vegetables and fruits. It may eventually trigger food shortages if the hydrological crisis is not tackled scientifically.

India for example, needs to increase food grains productivity above 340 million tonnes by 2020 in view of its population growth. The Living Planet Report published by the World Wide Fund for Nature has already warned that people are turning resources into waste faster than nature can turn waste back into resources. Therefore by 2050, humanity will demand resources at double the rate at which the Earth can generate them [2]. This scenario certainly looks scary. There are main major issues that influence the global overshoot on bio-capacity, and they include population, consumption of goods per person, resource use intensity, bio-productive areas, and bio-productivity per hectare. The highly populated countries like China and India have got to eliminate all the above excessive demands before it is too late.

One way to tackle the excess materialistic needs is to transform the unproductive drylands to useful land resource. How can the water-scarce drylands be converted to prolific farmlands? The answer lies in the ancient tradition of rainwater harvesting. I studied the

rainwater harvesting techniques implemented by a non-government organization, the NM Sadguru Water and Development Foundation based in Dahod (Gujarat, India) and how it transformed the drylands through cost-effective check dams built in small, medium and large rivers to harvest rainwater across the western India [3].

Till March 2014, a total of 371 check dams, 391 lift irrigation systems, and over 600 other water resource development projects were established in over 1000 villages covering the states of Gujarat, Rajasthan and Madhya Pradesh [4]. Water saved through these small dams transformed the infertile wasteland into productive agricultural land, which ultimately alleviated poverty and food insecurity in local communities. Village cooperatives manage the structures and farmers pay a modest sum for the use of water to irrigate their fields. This massive effort benefited nearly 317,193 families or 1, 905,535 people, and this model can be replicated across the developing world to manage drylands sustainably [4].

The check dam concept is not new. The Grand Anicut, also known as the '*Kallanai*' in Tamil language, was built by an ancient Chola King named Karikalan in the Cauvery river delta of Tamil Nadu state of south India during the 2nd century AD. This check dam is considered to be one of the oldest water-diversion structures in the world and it is functional. This design was later adopted by the British irrigation engineer, Arthur Cotton, who built various dams and irrigation structures across India in the 19th century [5]. India has pioneered in simple innovative technology to harvest rainwater for use in agriculture over two millennia ago. Hence transforming drylands both in India and elsewhere can be achieved through appropriate rainwater harvesting techniques.

References

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