

“SARNET 06th webinar highlights the importance of reviving traditional rainwater harvesting systems suitable for the country context to meet the increased demand for water and, climate change-induced prolonged dry weather”.



“Rainwater harvesting as an adaptation mechanism for climate change and the looming water crisis” was the title of the 06th webinar hosted by SARNET on the 25th of May 2021. This webinar featured the experiences on water availability and rainwater harvesting practices of Pakistan and Afghanistan. Three key experts on hydrology and rainwater harvesting from Afghanistan, Pakistan and Sri Lanka shared their experiences and observations on the effects of climate change and water availability and the best practices of rainwater harvesting.

In the Opening Remarks, the moderator of the webinar Dr Sarika Kulkarni founder of Raah Foundation, India had this to say: “with the rising global temperatures the most impacted resource will be water. Therefore, the water sector must seek alternative improved water management approaches”.

The speaker explaining the Pakistan country context Eng. Zaheer Gardezi, Former Director-General – Water Sanitation, Earthquake Reconstruction & Rehabilitation Authority (ERRA), Govt of Pakistan stated that with the

increased demand for water and climate change-induced prolonged dry weather rainwater harvesting is the need of the hour. Mr. Gardezi provided an outline of the hydrogeological features of the country, recent policy level initiatives and best practices.

### **Rainfall patterns and sources of water supply in Pakistan**

The terrain of Pakistan has both mountainous and desert regions. The southern part of Sindh and desert areas in Punjab receive the average lowest rainfall of 200ml. The highest annual rainfall is 17000ml in the northern parts.

The sources of water supply include both surface water from springs Streams, rivers, rainwater harvesting and groundwater from Tube wells, Open wells, Hand pumps and *Karez*. *Karez* is a source of a traditional underground water channel in Baluchistan which is a high-temperature area. These underground water channels are used as they are safe from evaporation. People in the north of the country

use rainwater. Surface water is extracted from streams, springs etc.

### **Does Pakistan have a national water policy?**

The country did not have a national water policy until 2018. The first National Water policy approved in 2018 includes countering the effects of climate change and extreme weather events, integrated water resources management, augmentation of available water resources, rainwater management, sustainable consumption, and production patterns, improving availability and reliability and quality of freshwater.

### **Rainwater harvesting initiatives and best practices from Pakistan.**

In Pakistan, so far there had been 4 major rainwater harvesting initiatives. One was done by Pakistan Council for Water Research in the Desert areas. in Punjab province in Cholistan in which water ponds were created. The aim was to support the livelihoods of the community by providing water ponds. These ponds helped to meet 16% of the daily requirement for the water of this community. Under another initiative by the Agency for Barani area development established under the govt sector constructed around 900 mini dams with an average capacity of 25-acre ft and, 13000 plus villages got water ponds with an average capacity was 10-acre ft in Punjab. The third initiative by the Capital Development Authority for groundwater recharging was a pilot project supported by UNDP in 2010. This project had not been scaled up. In Punjab province, UN-Habitat is supporting a groundwater recharging project.

The largest project was the project initiated under the slogan “Build back better” in 2005. This project was able to address the two key

challenges related to providing water: the quality and quantity of the water provided. As a way of addressing water quality labs were set up to test the water quality and many awareness-raising programmes were conducted for policymakers and at the community level. According to Eng. Gardezi upon discovering the potential for rainwater harvesting the largest ever rooftop harvesting initiative was launched with the assistance of the OPEC Fund for International Development. As part of this initiative more than 13000 plus public buildings were provided with rooftop rainwater harvesting units. It was named promotion of rainwater harvesting in earthquake-affected areas.

This initiative also had capacity-building measures involving and engaging university students. To scale up technical guidelines were developed, and Technical Advisory Groups were established with the local govt department of the concerned areas. Before this initiative, people used conventional methods for harvesting rainwater. They were capturing rainwater directly to the main storage tank. As a result of this project first, flush systems and simple purification systems were introduced.

A third-party evaluation was done with the support of UNFCC. This project was selected as a best practice as it had contributed towards reducing workload, increasing income, and promoting a climate change resilient initiative.

Eng. Gardezi recommended that “in the respective countries the policymakers and senior managers need to be advocated and sensitized on the importance of rainwater harvesting before launching mass scale adaptations”.

Dr Abdul Qayyum Karim (PhD in Hydrology/Environmental Engineering) Assoc.

Prof. and Head of Civil Engineering Department, Faculty of Engineering, Kabul University and Director, WATER-Center, Afghanistan presented an overview of the present challenges faced by Afghanistan due to climate change and the rainwater harvesting practices.

### **Ground Water sources in Afghanistan are glaciers.**

Afghanistan is in the arid and semi-arid belt of the earth. The droughts and floods in the past have caused displacement, economic and loss of lives in the country.

Glaciers are in central and northeastern parts of Afghanistan. According to ICIMOD, because of climate change 13.4% of glaciers in Afghanistan have been lost in the past few years. The main groundwater sources in the country are glaciers. People in the region too benefitted from these glaciers.

Afghanistan has a long history of rainwater harvesting. In the past also people had observed this problem. As a result of the change in the temperature the rate of evaporation has been increased and the atmospheric capacity of holding water has consequently excess precipitation in terms of intensity. After the rain, there is an increase of the water flow in the rivers and afterwards long periods of water shortages.

Rainwater is collected in ditches underground and used during dry periods. People also use to store snow underground to store and get their water for domestic water use during the dry season. People collect rainwater in ponds.

### **Best practices on rainwater harvesting in Afghanistan.**

The Ministry of Water and Energy has started a pilot project of rooftop water harvesting all over Afghanistan. Afghanistan is focusing on Road water harvesting as one of the components of rainwater harvesting as there is high rainfall in winter in the country. In Afghanistan, 5% of paved roads are damaged by rainwater and there are 80% of unpaved roads to get damaged due to rainwater. Road water harvesting has triple benefits; it prevents flooding and damage to roads and water is harvested for productive purposes. This can be also adopted in the South Asia region. Annual investment on roads is 1-2 trillion USD.

### **Reviving the traditional Dabas and small dams will help address the water stressed terrain of Afghanistan.**

Eng. K. Deva. Hapugoda, with long years of experience in Water and Sanitation and in serving Helvitas and World Vision in northwestern Afghanistan from 2002 to 2009 also joined as a speaker to share observations and experiences. Eng. Deva Hapugoda stated that "People collect water in underground Dabas – pits dug into store water". Water is also collected in rocks. Eng. Hapugoda had contributed to designing artificial *Dabas* small dams in the northwest Jawan in Baghdadis and Sangadesh provinces in Afghanistan. Reflecting on his experiences in the Afghanistan terrain he had this to say: "Small dams were the ideal solution for Afghanistan. Most of the material and labour were found locally. It solved poverty and access to water. The bottom of the dam should lie on the rock rest of the dam completely masonry no steel. We built 2 dams' cost 5to 600 US\$". His view was that Rooftop rainwater harvesting is not a suitable solution due to the type of roofs in houses and due to the catchment.

According to Eng. Deva Hapugoda in the north-west Jawan in Baghdadis and Sangadesh the small dams and **Dabas** were the most suitable option for long dry spells in supplying water. In rural Afghanistan, access to freshwater is a major issue. Water provided from runoff in water harvesting is not potable. Eng. Hapugoda also highlighted that there should be structures in place to provide funding for water in the country.