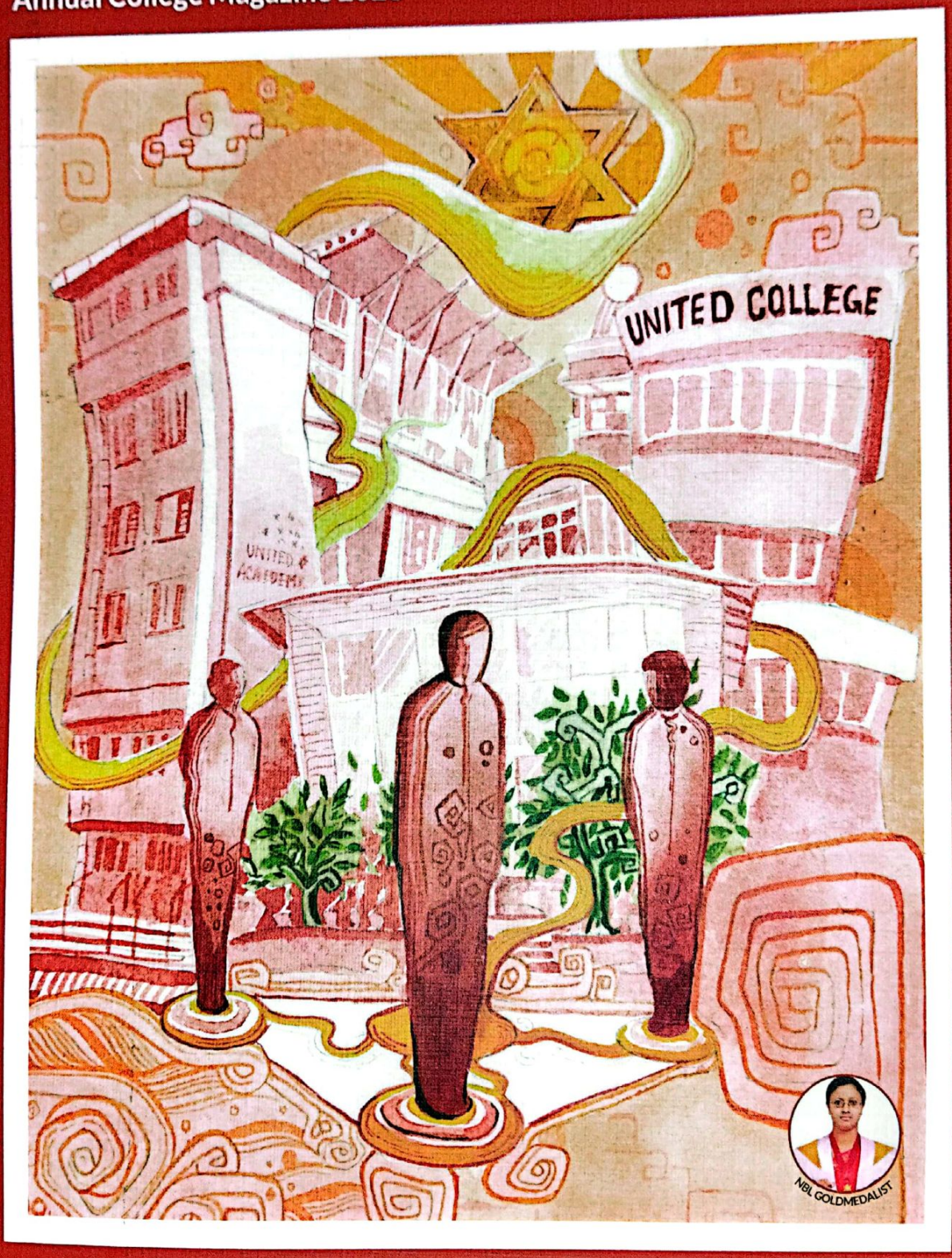


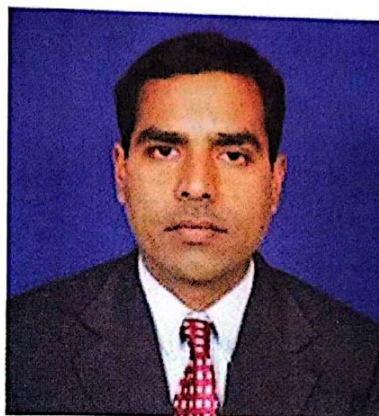
UNITED LUMINARY

Annual College Magazine 2023



Rainwater Harvesting in Nepal: A Pathway to Sustainable Water Management

Dr. Maheshwar Prasad Yadav, PhD is Head of Department, Planning, Monitoring, and Reporting Department, Nepal Water for Health (NEWAH) headquartered in Kathmandu, Nepal. With regard to educational background, he is a PhD holder in management and has published over 21 peer-reviewed research articles in journals of national and international repute in Nepal, India, and UK. Similarly, he has over 19 years of experience in I/NGOs including the United Nations (UN), out of which over 12 years of experience in the WASH sector at the senior level. Currently, he is leading the planning, monitoring, and reporting department at Nepal Water for Health (NEWAH). NEWAH is one of the country's leading NGOs in the water supply, sanitation, and hygiene promotion (WASH) sector. Established in 1992, NEWAH is dedicated to helping poor, underserved communities obtain access to WASH facilities irrespective of gender, caste, class, and belief. Its vision is that of a prosperous and harmonious Nepal where every citizen can realize their right to safe drinking water, basic



Dr. Maheshwar Prasad Yadav

Head of Department,
Planning, Monitoring, and
reporting
Nepal Water for Health
(NEWAH)

hygiene, and sanitation. In the past 31 years, it has served about 2.2 million people which is about 8 percent of the country's population through 2,670 projects by July 2023 ranging from safe and affordable drinking water supply to community-led total sanitation (CLTS), health, and nutrition, menstrual hygiene management, 3R (recharge, retention, and re-use of groundwater and rainwater harvesting), climate change adaptation, and disaster response and rehabilitation.

What is the current status of drinking water services in Nepal?

In the context of Nepal, there is only 16 percent of the population has access to safely managed drinking water services and 91 percent of the population has basic drinking water services. In this connection, there are different sources of water such as groundwater, surface water, and rainwater that have been used to meet the water demand of the people in the country.

What is the current state of water resources availability in Nepal? How can rainwater harvesting help address water scarcity in the country?

The lack of irrigation and drinking water scarcity due to the recent drought from July to August 2023 in Madhesh, the southern part of the country from east to west is an example of water challenges in the country. Due to the extreme shortage of drinking water in Madhesh, it has been analyzed that the construction of roads and other structures around the Chure or Siwalik

Range and the extracting materials such as sand, stones, gravel, etc. from the rivers without considering the environmental impact. Similarly, due to the environmental impact caused by the unplanned construction of roads by dozers toward the mountains, attention should be paid to minimizing disasters like floods and landslides. Therefore, when constructing a structure that will have a long-term impact while conserving water for future generations, a decision should be taken to build such a structure or not only after a thorough analysis of its environmental, financial, and social impacts. If this is not done, it is certain that there will not be a conducive enabling environment for future generations.

In addition, the availability of water sources is decreasing day by day and rainwater is one of the most prominent

sources where it falls. Most of the Nepali people are using springs, streams, and groundwater where it is available but some of the community people are residing on hilltops or on high land and there is less chance of surface water sources. So, in those communities, rainwater harvesting is the only opportunity for drinking water.

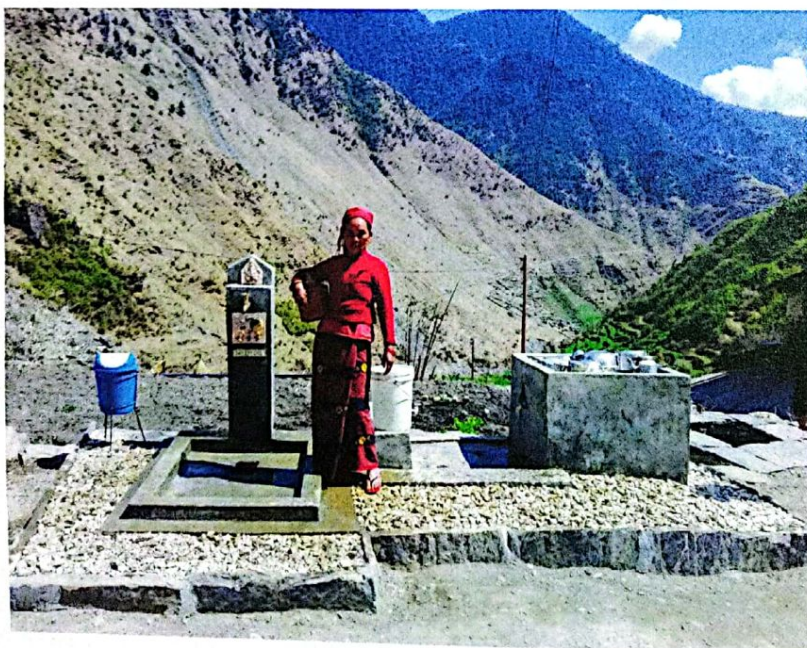
In this connection, the consequences of the global climate crisis are somehow linked to water. Climate change is increasing variability in the water cycle, reducing the predictability of water availability, affecting water quality, and threatening sustainable development. The increasing water demand simultaneously increases the need for energy-intensive activities such as water pumping, transportation, and treatment. Climate change is affecting the sustainability

of drinking water services. Meeting increasing water stress and future water demands means making difficult decisions about how to allocate water resources amid competing water uses. In this connection, rainwater harvesting would be an important source of water for climate adaptation across the country.

Can you explain what rainwater harvesting is and its significance in water conservation?

Rainwater harvesting is a process of catching water from rainfall. It is the collection, purification, and storage of rainwater from paved and unpaved rooftops before it is runoff. As this technique is cost-effective, more and more people are harvesting rainwater to meet their needs.

Its primary purpose is to provide water to drink. During downpours, rain seeps into the ground to become a part of the rivers and lakes which is called groundwater. Without rainwater constantly replenishing our groundwater sources, water would be scarcer than it is right now. In addition, rainwater harvesting has more advantages to the environment than we may think. Apart from aiding in nature's cycle, it will be reducing flooding by runoff water, saving on energy, protecting the environment by reducing carbon emissions



as well as growing healthy plants.

Can you provide a general overview of the rainwater harvesting procedure, from collection to storage and usage?

A rainwater harvesting system comprises various components- catchment, transporting rainwater through pipes or drains, a first flush, filtration, and storage in tanks for reuse or recharge. The catchment is the area on which rain falls directly. It is the area that contributes water to the rainwater harvesting system such as rooftops, sloppy roofs, courtyards, and paved and unpaved areas are catchment areas. Transportation pipes transport rainwater from the catchment to the storage system. They include down water pipes and drains. The first flush is a device to flush off the first shower of rain. It is important to flush off this water as it contains all contaminants and bacteria from the catchment and atmosphere. Filtering rainwater is important before its storage and usage to make the water fit for potable use. The tank that stores rainwater after its purification is called a storage tank.

How do you ensure the quality of harvested rainwater? What types of filtration and treatment methods are typically employed?

The proper operation and maintenance of rainwater harvesting systems protect



water quality in several ways. Regular inspection and cleaning of catchments, gutters, filters, and tanks reduce the likelihood of contamination. It would ensure that water from other sources should not be mixed with that in the tank. Rainwater is one of the purest forms of water. It is a high-quality soft water,

so it requires less amount of detergent and soap for washing clothes and body. It can be used for multiple purposes such as drinking, watering plants, toilets, and laundry. However, while collecting and storing, rainwater gets contaminated. So, to ensure the quality of rainwater, a properly designed and operated rainwater



harvesting system is required. Moreover, the filtration system by using gutter screens, in-tank filters, sand filters, and cartridge filters to make the water fit for drinking purposes.

What are the key cost components involved in setting up a rainwater harvesting system?

The cost associated with catchments, transportation pipes, a first flush, filtration, and storage tank involved in setting up a rainwater harvesting system. The cost per system varies from place to place based on the size of the rainwater harvesting system designed as per the number of people who would be using the respective rainwater system.

What do you see as the future potential and opportunities for rainwater harvesting in Nepal?

Rainwater harvesting is an important source of drinking water everywhere from urban areas to very remote areas in the country. The water scarcity in city areas can be solved by installing rainwater harvesting systems and constructing recharge pits at the household level. It will increase the availability of drinking water as well as increase the groundwater level leading to an increase of water in the well. In addition, rainwater harvesting can also be an important source of water in the Tarai/Madhesh,



the plain areas of Nepal for recharging groundwater by construction of ponds and/or recharge pits. That's why it will be used to a larger extent in the future to meet the growing demand for water.

Can you share examples of successful rainwater harvesting systems that have been integrated into buildings or infrastructure in Nepal?

We have implemented rainwater harvesting in different parts of the country for the rural community people and schools to meet their needs. Most specifically, it was implemented in the Gorkha, Baglung, and Sindhuli districts of Nepal. Rainwater harvesting can be integrated into appropriate buildings across the country. Most recently a 'pumpkin-shaped rainwater harvesting system and recharge system' was built at NEWAH headquarters in Kathmandu as a model system that can be implemented in urban and rural areas to meet the water demand of people as an alternative source of water.

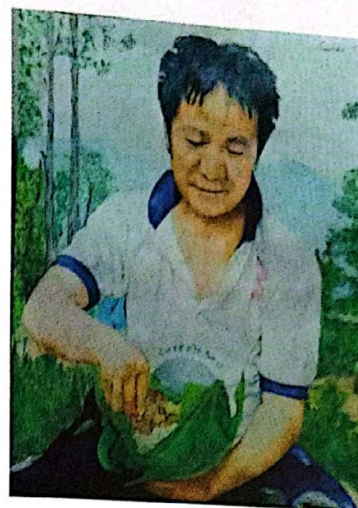
What challenges have you encountered while working on rainwater harvesting projects in Nepal, and how have you overcome them?

Despite the number of benefits of rainwater harvesting, there are a few challenges faced during the implementation of the system as the water from the

rainwater harvesting system may not be sufficient for all domestic uses throughout the year. A combination of the rainwater harvesting system with other sources of water such as groundwater and/or surface water would be a way to cope with this challenge. In some cases, people may not use it for drinking purposes assuming it is not pure as needed. An awareness program having a practical session would increase their confidence to use it in the rural areas of Nepal. It may be a limited supply due to the uncertainty of rainfall. It is not suitable for regions where there is a scarcity of rainfall throughout the year. The rainfall pattern has been changing over the year due to climate change leading to challenges to meet the water demand of the people. To cope with these challenges, a combination of rainwater harvesting with other sources would be a way to meet the water demand of the people of the respective community.

How do you educate and raise awareness about rainwater harvesting among the public, policymakers, and development actors in Nepal?

An awareness program to users on the operation and maintenance of the rainwater harvesting system has been conducted during the implementation to capacitate them. Likewise, coordination meetings and workshops



have been conducted with three tiers of government and development actors for awareness, policy lobbying, and advocacy related to rainwater harvesting in Nepal. Besides the awareness campaign, it has been conducted through action research leading to the publishing of articles in journals, newspapers, and online media to sensitize the actors in the sector.

Lastly, are there any words you would like to add to which aforementioned questions have not been included?

Access to water services is the foundation of a healthy and dignified life for people. Hence, providing water services through rainwater harvesting is a pathway to the sustainable water management of the nation leading to achieving SDGs. Thank you very much for providing an opportunity to talk on very important topics in the context of developing countries like Nepal.