

## Restoration And Preservation of Traditional Water Resources: A Study of Uttarakhand

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### Article Info

#### Article history:

Received Nov, 2023

Revised Nov, 2023

Accepted Nov, 2023

#### Keywords:

Natural Water Resources,  
Naula, Dhara, And Rainwater  
Harvesting

### ABSTRACT

The essence of all life is water. Without water, nothing on our planet can grow. Traditional water resources, which were once the lifeblood of the Himalayan population, are disappearing alarmingly in Himalayan areas of Uttarakhand. In these steep regions of Uttarakhand, life cannot advance in the correct path without these natural water sources. Traditional water resources provided for many kinds of daily requirements, including drinking, cooking, cleaning, irrigation, and caring for animals. Water is becoming more scarce everywhere in the world, even in the Himalayan region. In an effort to prevent future generations from facing a shortage of potable water, efforts should be made to protect these ancient natural water sources.

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## 1. INTRODUCTION

The most important component for maintaining life is water. As far as we are aware, "Earth" is the only planet that can support life of all kinds. Only the existence of water on this planet makes this feasible. Water is necessary for all living things, single-celled or multicellular, to grow and flourish. It is true to say that "life cannot exist without water." In Indian culture, water holds a significant position. In our civilization, it is revered as a sacred object. Without water, no religious rite can be performed [1]. This emphasis on the value of water in our numerous sacred writings caused the general public to believe that water should be kept clean and inspired our forefathers to preserve the water in its purest form and use it for drinking and cooking in addition to our

religious practices. Nowadays, it is common knowledge that just 2.7% of the water on Earth is potable (suitable for drinking and cooking). It is now our moral obligation to responsibly use pure water for drinking and cooking, as well as to pass down this legacy to the generations to come. Less drinkable water is available as a result of the population increase, pollution, industrial waste, etc. Using unclean water puts us at serious risk of contracting a number of water-borne illnesses, including typhoid, dysentery, cholera, lead poisoning, dengue, malnutrition, hepatitis encephalitis, and other intestinal disorders, among others. Therefore, it is our responsibility to offer clean water to women, especially those who are pregnant, as studies have shown that drinking unsanitary water can cause a number of ailments in both the

mother and the child. The amount of potable water is currently diminishing at an extremely alarming rate [2]. Water is becoming increasingly scarce around the world as a result of numerous issues including deforestation, water waste, inefficient water storage, etc. Increasing droughts, increased irrigation demand, increased industrial demand, increased pollution, increased water wasting, and increased irresponsible behaviour are all contributing to the current global water problem [3].

Water is not distributed uniformly throughout our nation due to variations in latitude, varying rainfall patterns, topography, and regional disparities. Our nation experiences a protracted dry season as a result of various geographic factors [4], [5]. Our need for water is met during dry periods by water stored in lakes, reservoirs, and underground water. Rivers, lakes, and groundwater are the primary sources of freshwater in India [6]. The purest form of drinkable water is either directly gathered from natural sources, as is the case in the majority of rural areas, or it is delivered by various bodies, such as municipal departments or public health departments, after being treated for use in urban areas [7]. Today, the majority of water needs to be treated before it can be consumed. Natural water sources, such as groundwater and springs, are the cleanest since they don't contain any bacteria, viruses, or other hazardous suspended particulates that make water unsafe to drink. Natural filtration renders the water from natural sources consumable by keeping it free of any dangerous substances as it travels through the soil. For the benefit of both the present and coming generations, we must practice water conservation. To do this, we must take water conservation seriously and implement a variety of water harvesting techniques.

## 2 METHODS

### Natural Water Sources in Uttarakhand

Natural water sources differ slightly throughout the Himalayan region, for

instance, in the state of Uttarakhand. On November 9th, 2000, the himalayan districts of Uttar Pradesh were separated to form Uttarakhand, which is now the 27th state in the Indian Union. 86% of the 53,483 km<sup>2</sup> that make up Uttarakhand are mountains. In the Himalayan region, freshwater is deposited as ice caps, glaciers, rivers, and groundwater. Hillside water sources are disappearing or drying up. There could be a lot of causes for this disaster. The pace of soil erosion in the hilly areas is worrying. The rate of soil erosion in 88% of the state is 10 MT per year per hectare. It is time for us to take a cue from our ancestors and follow their traditions about water conservation and maintaining a close relationship with nature. To combat the water scarcity in the state's hilly regions, which is experienced by the people, particularly during the summer months, different types of natural water sources need to be restored and maintained. Since the beginning of time, people have wisely used these natural water sources. The depletion of water in these hilly areas can be prevented by conserving these traditional water sources. There are numerous natural water sources in Uttarakhand that are still utilised to meet a variety of daily needs. The supply of clean water to the inhabitants in the hill areas and water conservation are the two goals of these traditional water sources, despite the fact that their nomenclature may vary. The following table lists the common water sources in Himalayan areas of Uttarakhand, including Kumaon and Garhwal;

Natural Water Sources in Uttarakhand S. No Name Source Used For:

1. Srot [6] is a natural water resources used for drinking, domestic use, animals and irrigation.
2. Gadhera is a Stream used for drinking and irrigation.
3. Gaad belongs to River used for drinking, domestic uses, animals, irrigation and water power.
4. Ghuls are known as Waterfalls used for irrigation.

5. Dyo is a source of Rainfall used for Rainwater harvesting.
6. Tal or Khal or Pokhar or Simar Ponds and Lakes used for Animals.

#### 4. RESULTS AND DISCUSSION

**Naula:** An aquifer of water that exists naturally is called Naula (Little Depression Aquifers). Many areas of Kumaon and some areas of the Garhwal region are home to it. The majority of the water from these Naulas is used for drinking. The most frequent source of natural drinking water seepage is a naula, which is often shaped like a rectangle or square with stairs on all four sides. The water comes from springs that are replenished as a result of surface water seeping into the ground. Others are plain or unadorned, while certain Naulas may be embellished with a variety of nature sceneries and idols of deities. Some Naulas are constructed to resemble temples from the outside, most likely with the intention of keeping the Naula clean and preventing pollution. Some of the examples of ancient Naulas may be recalled such as Joshiyara Naula in Almora, Siddhi ka Naula in Almora city, Badrinath Ji ka Naula in Bageshwar, Panthyurh Naula in Syunrakot village in Almora, Jahnvi Naula in Gangolihat village in Pithoragarh, Baleshwar Naula in Champawat, Ek Hathiya Naula in Dhaknaa village in Champawat, Tularameshwar Naula in Almora, Khanka Naula in Pithoragarh, Bahkund in Narayankoti village in Rudraprayag.

**Dhara (Springs):** Dharas in the area have traditionally been used for drinking and household reasons. The majority of the villages in this area still rely on Dharas for a reliable water supply [8]. Normally uncovered, dharas are protected by building boundary walls. As they provide water for Ghuls or canals, these Dharas also serve as irrigation systems. Devalthal, Berinag, Chopata, Thal, Naini, Jainti, Tharkot, Tehri Garhwal, Pauri Garhwal, Dwarahat, Garampani, etc. all have some of the well-known Dharas. Katyuri Dhara in Baijnath, Sipahi Dhara and Parada Dhara in Nainital,

Ganga-Yamuna Dhara in Guptkashi, Panch Dharas in Badrinath, Shiv Dhara in Uttarkashi, Kalinag Dhara in Uttarkashi, etc. are a few of the well-known Dharas.

**Ghuls (irrigation canals):** are more of a system for supplying and diverting water than for storing it. Ghuls are tiny channels that branch off from a source (often groundwater) and are subsequently directed to fields or other appropriate locations. Today's Ghuls are permanent features that are typically constructed from stone masonry construction, however they can also be created by hand-digging channels plastered with cement that help channel water, particularly for delivery into agricultural fields. Ghuls are utilized for drinking water and powering water mills (Gharats), in addition to irrigation [9].

**Conserving the Traditional Water Sources:** The Naulas and Dharas are very rapidly running out of water. These natural water supplies are being destroyed mostly as a result of deforestation, environmental problems, ecological activities, industrial limitations, rising population, etc. The inhabitants of Uttarakhand's hill areas depend on these water sources for their very existence [10]. If actions are not taken to refill these springs or natural water sources, one cannot picture how scarce the water will be. The following actions could contribute to the preservation of these traditional, enduring natural water sources;

1. **Chaal/Khaal (Trenches):** Chaals or Khaals are constructed to replenish dwindling springs. In order to collect runoff water during rainy seasons, trenches are built in the hills. Rainwater is collected in the depressions in Uttarakhand's mountainous regions. In these Chaals/Khaals, rainfall that would otherwise be wasted is collected. The natural springs are kept alive by the water that gently seeps into the soil.

2. **Plantation:** We can witness deforestation all around us. Natural water sources and springs eventually dry up as a result of this. Broad leaf trees like oak (baanj), rhododendron (buransh), kaafal, and others can be planted to assist the soil retain more moisture. These plants' roots have a large capacity for holding water. If our woods are healthier, springs will function better and there will be more water in our natural water sources.
3. **Check Dams:** A check dam is a modest, short-term or long-term structure built across a drainage ditch, swale, or channel to slow down concentrated flows and control runoff velocity in steep and wide depressions on hills. Check dams are constructed from loose or dry stone. It primarily serves two functions: first, it provides direct irrigation during rainstorms, and second, it makes it easier for nearby wells to be recharged through percolation. The water table in wells, the amount of irrigation, and the yield rate of various important crops and cropping areas have all improved as a result of the Check Dams.
4. **Rainwater Harvesting:** Tapping the rainwater where it falls" is the idea behind rainwater harvesting. Rainwater that lands on the earth's surface primarily drains off into streams, rivers, and ultimately the sea. According to local conditions, the technique of rainwater harvesting entails collecting the rainfall from small catchment surfaces, such as roofs, flat/sloping surfaces, etc., either for immediate

consumption or to supplement groundwater supplies.

5. **Rooftop Rainwater Harvesting:** Rainwater from the roof is collected in a tank or storage container and used when there is a shortage. These systems are typically created to support the family's needs for cooking and drinking.

## 5. CONCLUSION

Despite the fact that traditional water sources have many benefits, it is encouraging to see that they are openly being rejected. When technology was less developed in the past, people had to travel long distances to get potable water. The people who lived in hilly locations at the time used to benefit greatly from these traditional sources. Everyone is now dependent on technologies like hand pumps, taps, water pumps, etc. because of technical progress. Because of the conveniences right outside our door, we are no longer motivated to walk even a little distance to get these traditional water sources for drinkable water. This makes the agony caused by the depletion of conventional water sources much worse. When there is a water shortage in the hill regions during the dry seasons, people typically utilise these natural water sources. If conventional water supplies continue to be neglected in the same way, all natural water sources would eventually dry up, leading to a catastrophic water shortage in the hill regions. Through their correct upkeep and use, sincere efforts must be undertaken to revitalize and conserve these natural water sources. The entire society has a responsibility to reflect on the customs of the past and learn how to repair the links between all forms of life and nature. We must step up and take the initiative in water conservation, combining both conventional and cutting-edge methods.

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