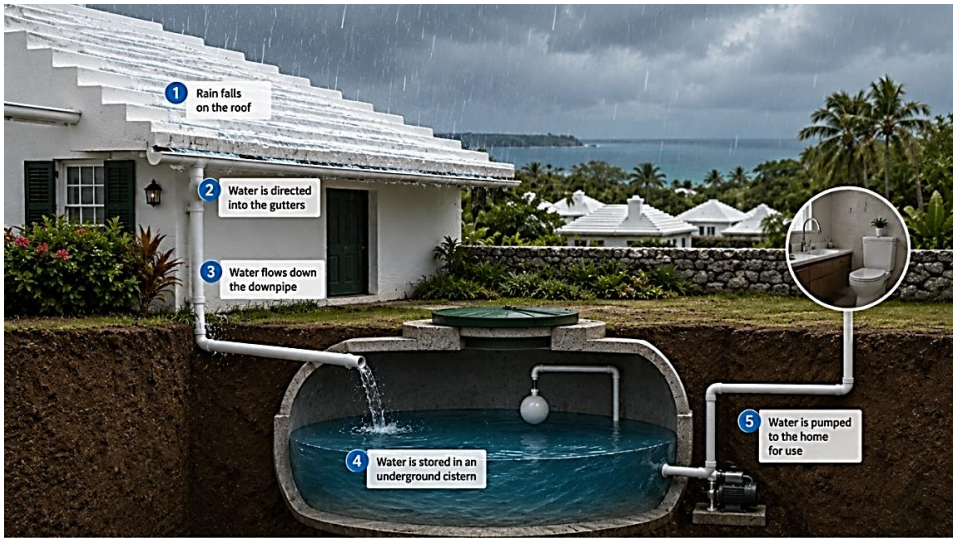
THE INGENIOUS RAINWATER HARVESTING SYSTEM BUILT INTO THE ROOFS IN BERMUDA

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An article published in the timesofindia.com website presents the ingenious rainwater harvesting system built into roofs in Bermuda. The article highlights that Bermuda has no rivers, no freshwater lakes and no natural springs, yet it has supplied drinking water to its residents for more than four centuries. The country relies on this clever system, which is built into the roofs of nearly every home. Around 65,000 people depend on these distinctive white, stepped limestone roofs, which capture rainfall and channel it into underground storage tanks..







Using locally quarried limestone, islanders developed distinctive stepped roofs made from overlapping limestone slates. These roofs serve two purposes: protecting homes from Bermuda's harsh Atlantic weather and collecting rainwater for daily use. Over time, the design became a defining feature of Bermudian architecture and one of the world's best-known examples of rainwater harvesting. Traditionally, the roofs were coated with lime-based whitewash, which helped waterproof the limestone and maintain clean roof surfaces. Today, approved white roof coatings perform the same function while also reflecting sunlight, helping keep homes cooler in the island's subtropical climate.

Rainwater flows down the stepped limestone slates into gutters before passing through pipes and into large underground cisterns beneath each home where it is stored for household use. The stepped profile also helps control the movement of water during heavy rainfall while contributing to the roof's durability in Bermuda's hurricane-prone climate.

A study published by the Government of Bermuda underlines that "over 350 years, rainwater harvesting has been practiced in Bermuda and continues to be the primary source of drinking water and the key feature of the island's vernacular building architecture. Born out of necessity and ingenuity, in Bermuda collecting rainwater is not only a way of life but is also mandated by law, with each household being responsible for its own water supply. The houses constructed by the first settlers in Bermuda were initially very similar to those of their native England. However, construction quickly adapted to the indigenous materials of Bermuda cedar (Juniperus bermudiana) and limestone. A unique feature of Bermuda roofs has been their role in water supply. Given its geology, Bermuda has no rivers, streams, lakes or freshwater ponds for obtaining freshwater. Thus, for basic survival, the first settlers were obliged to meet their drinking water needs by means of rainwater harvesting. Until the 1930s, rainwater provided the only source of potable water. Water

was collected on roofs, where wedge-shaped limestone "glides" were laid to form sloping gutters on the roof surface, diverting rainwater into vertical leaders and subsequently into storage tanks.

When rooftop water systems with adequate storage first began to be systematically encouraged, tanks were moved underground and became part of the foundation. Current systems include storage tanks under buildings with electric pumps and pneumatic tanks. From the small original cottages to the office blocks of today, for over 350 years rooftop rainwater harvesting has been practised in Bermuda and continues to be the island's primary source of drinking water. Today, roof-top rainwater harvesting is mandated by law for all buildings in Bermuda and is the primary source of water for domestic supply, with approximately 85% of Bermuda residents currently using their tank water for drinking on a regular basis. Bermuda’s legislation and building codes specify the requirements for the construction and maintenance of water catchments and water storage tanks. All buildings are required to have rainwater catchments and tanks to supply and store rainwater for people occupying or using the building. Buildings must have at least 80% of the roof area sufficiently guttered to catch rainwater or must have a ground catchment with a corresponding area and have a water storage tank with a capacity corresponding to the catchment area.”

Fortunately, Bermuda’s climate favours rainwater harvesting. The islands receive an annual average of 55 inches of rainfall that is spread evenly throughout the year.

The article published in India times concludes by highlighting that in Bermuda rainwater harvested from rooftops remains the primary water source for many households. During droughts or periods of high demand, desalination plants, groundwater wells and water delivered by tanker trucks provide additional supplies. Large hotels and commercial buildings often depend on these supplementary sources because rooftop collection alone cannot meet their water requirements. As climate change places increasing pressure on conventional water supplies, Bermuda's centuries-old approach has attracted growing interest from engineers, architects and urban planners. Rather than relying solely on reservoirs and extensive pipeline networks, the island demonstrates how decentralized rainwater harvesting can strengthen water security at the household level. Although Bermuda's model cannot be copied everywhere, it shows how architecture, local geography and long-term planning can work together to create resilient communities. More than 400 years after it first emerged, Bermuda's iconic white roof remains far more than an architectural symbol. On an island without rivers or lakes, it continues to provide one of life's most essential resources while offering valuable lessons for a world confronting growing water scarcity.











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