

Rainwater harvesting

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(Redirected from [Water harvesting](#))



Rainwater capture and storage system at the [Monterrey Institute of Technology and Higher Education, Mexico City](#).



A [cistern](#) for rainwater storage

Rainwater harvesting is the accumulation and deposition of rainwater for reuse before it reaches the [aquifer](#). Uses include water for garden, water for [livestock](#), water for [irrigation](#), and indoor heating for houses etc.. In many places the water collected is just redirected to a deep pit with percolation. The harvested water can be used as [drinking water](#) as well as for storage and other purpose like irrigation.

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Advantages

Rainwater harvesting provides an independent water supply during regional water restrictions and in developed countries is often used to supplement the main supply. It provides water when there is a drought, prevents flooding of low-lying areas, replenishes the ground water level, and enables dug wells and bore wells to yield in a sustained manner. It also helps in the availability of clean water by reducing the salinity and the presence of iron salts.

- Makes use of a natural resource and reduces flooding, storm water, erosion, and contamination of surface water with pesticides, sediment, metals and fertilizers.
- Excellent source of water for landscape irrigation, with no chemicals such as fluoride and chlorine, and any dissolved salts and minerals from the soil.
- Home systems can be relatively simple to install and operate and it may reduce your water bill.
- Promotes both water and energy conservation.

Quality

The concentration of contaminants is reduced significantly by diverting the [initial flow](#) of runoff water to waste. *New Scientist*, 3 April 1999. Improved water quality can also be obtained by using a floating draw-off mechanism (rather than from the base of the tank) and by using a series of tanks, with draw from the last in series. The stored rainwater may need to be analyzed properly before use in a way appropriate to its safety.

The quality of collected rainwater is generally better than that of [surface water](#). Contamination is always possible by airborne dust and mists, bird feces, and other debris, so some [treatment](#) is necessary, depending on how the water will be used.

System setup

Rainwater harvesting systems can be installed with minimal skills. The system should be sized to meet the water demand throughout the dry season since it must be big enough to support daily water consumption. Specifically, the rainfall capturing area such as a building roof must be large

enough to maintain adequate flow. Likewise, the water storage tank should be large enough to contain the captured water. ^[citation needed]

Vendors

There are three main types of companies operating in the rainwater harvesting industry: makers of water storage, makers of accessories, and integrators. Water storage companies make tanks, barrels, and underground cisterns. Accessories are added to facilitate or improve the water capturing process. Integrators are regional practitioners which install systems. ^[citation needed]

Rain water harvesting by freshwater flooded forests



[Ratagul Freshwater Flooded Forest, Bangladesh](#)

Rain water harvesting is possible by growing [fresh water flooded forests](#) without losing the income from the used /submerged land. ^[1] The main purpose of the rain water harvesting is to utilize the locally available rain water to meet water requirements throughout the year without the need of huge capital expenditure. This would facilitate availability of uncontaminated water for domestic, industrial and irrigation needs.

New approaches

Instead of using the roof for catchment, the RainSaucer, which looks like an upside down umbrella, collects rain straight from the sky. This decreases the potential for contamination and makes potable water for developing countries a potential application. ^[2] Other applications of this free standing rainwater collection approach are sustainable gardening and small plot farming. ^[3]

A Dutch invention called the [Groasis Waterboxx](#) is also useful for growing trees with harvested and stored dew and rainwater.



 Presentation of RainSaucer system to students at Orphanage in Guatemala.

History

Earlier

Around the third century BC, the farming communities in [Baluchistan](#) (in present-day [Pakistan](#), [Afghanistan](#) and [Iran](#)), and [Kutch](#) (in present-day [India](#)) used rainwater harvesting for irrigation.^[4]

In ancient [Tamil Nadu](#) (India), rainwater harvesting was done by [Chola kings](#).^[5] Rainwater from the [Brihadeeswarar temple](#) was collected in Sivaganga tank.^[6] During the later Chola period, the Vīrānam tank was built (1011 to 1037 CE) in Cuddalore district of [Tamil Nadu](#) to store water for drinking and irrigation purposes. Vīrānam is a 16-kilometre (9.9 mi) long tank with a storage capacity of 1,465,000,000 cubic feet (41,500,000 m³).

Rainwater harvesting was done in the [Indian](#) states of [Madhya Pradesh](#), [Maharashtra](#), and [Chhattisgarh](#) in the olden days^[when?]. [Ratanpur](#), in the state of [Chhattisgarh](#), had around 150 ponds. Most of the tanks or ponds were utilised in agriculture works.^[citation needed]

Present day

- Currently in China and Brazil [rooftop rainwater](#) harvesting is being practiced for providing drinking water, domestic water, water for livestock, water for small irrigation and a way to replenish ground water levels. [Gansu](#) province in China and semi-arid [north east Brazil](#) have the largest rooftop rainwater harvesting projects ongoing.
- In [Bermuda](#), the law requires all new construction to include rainwater harvesting adequate for the residents.
- The [U.S. Virgin Islands](#) have a similar law.
- In [Senegal](#) and [Guinea-Bissau](#), the houses of the [Diola](#)-people are frequently equipped with homebrew rainwater harvesters made from local, organic materials.
- In the [Irrawaddy Delta](#) of [Myanmar](#), the groundwater is saline and communities rely on mud-lined rainwater ponds to meet their drinking water needs throughout the dry season. Some of these ponds are centuries old and are treated with great reverence and respect.
- In the [United States](#): until 2009 in [Colorado](#), water rights laws almost completely restricted rainwater harvesting; a property owner who captured rainwater was deemed to be stealing it from those who have [rights to take water](#) from the watershed. Now,

residential well owners that meet certain criteria may obtain a permit to install a *rooftop precipitation collection system* (SB 09-080).^[7] Up to 10 large scale pilot studies may also be permitted (HB 09-1129).^[8] The main factor in persuading the [Colorado Legislature](#) to change the law was a 2007 study that found that in an average year, 97% of the precipitation that fell in [Douglas County](#), in the southern suburbs of [Denver](#), never reached a stream—it was used by plants or evaporated on the ground. In Colorado you cannot even drill a water well unless you have at least 35 acres. In [New Mexico](#), rainwater catchment is mandatory for new dwellings in [Santa Fe](#).^[9] Texas offers a sales tax exemption on the purchase of rainwater harvesting equipment. Both Texas^[10] and Ohio allow the practice even for potable purposes. Oklahoma passed the Water for 2060 Act in 2012, to promote pilot projects for rainwater and [graywater](#) use among other water saving techniques.^[11]

- In [Beijing](#), some housing societies are now adding rain water in their main water sources after proper treatment.
- In [Ireland](#), Professor Micheal McGinley established a project to design a rain water harvesting prototype in the Biosystems design Challenge Module at [University College Dublin](#)

India

- In the state of [Tamil Nadu](#), rainwater harvesting was made compulsory for every building to avoid ground water depletion. It proved excellent results within five years, and every states took it as role model. Since its implementation, [Chennai](#) saw a 50 percent rise in water level in five years and the water quality significantly improved.^[12]
- In [Rajasthan](#), rainwater harvesting has traditionally been practiced by the people of the [Thar Desert](#). There are many ancient water harvesting systems in Rajasthan, which have now been revived^[13] Water harvesting systems are widely used in other areas of Rajasthan as well, for example the [chauka](#) system from the [Jaipur district](#).^[14]
- [Kerala](#):

Main article: [Rainwater harvesting in Kerala](#)

- At present, in [Pune](#) (in [Maharashtra](#)), rainwater harvesting is compulsory for any new society to be registered.
- An attempt has been made at Dept. of Chemical Engineering, IISc, Bangalore [\[1\]](#) to harvest rainwater using upper surface of a solar still, which was used for water distillation^[15]

Sri Lanka

- Rainwater harvesting has been a popular method of obtaining water for agriculture and for drinking purposes in rural homes.
- The legislation to promote rainwater harvesting was enacted through the Urban Development Authority (Amendment) Act, No. 36 of 2007.^[16]
- Lanka rainwater harvesting forum^[17] is leading the Sri Lanka's initiative.

United Kingdom

Main article: [Rainwater harvesting in the United Kingdom](#)

In the [United Kingdom](#), [water butts](#) are often found in domestic gardens to collect rainwater, which is then used to water the garden. However, the British government's [Code For Sustainable Homes](#) encourages fitting large underground tanks to new-build homes to collect rainwater for flushing toilets, washing clothes, watering the garden, and washing cars. This reduces by 50% the amount of mains water used by the home.

Israel

- The Southwest Center for the Study of Hospital and Healthcare Systems in cooperation with Rotary International is sponsoring a rainwater harvesting model program across the country. The first rainwater catchment system was installed at an elementary school in Lod, Israel. The project is looking to expand to Haifa in its third phase. The Southwest Center has also partnered with the Water Resources Action Project (WRAP) of Washington D.C. WRAP currently has rainwater harvesting projects in the West Bank.
- Rainwater harvesting systems are being installed in local schools for the purpose of educating schoolchildren about water conservation principles and bridging divides between people of different religious and ethnic backgrounds all while addressing the water scarcity issue that the Middle East faces.^[18]

Non Traditional

- In 2012, American artist [Michael Jones McKean](#) created an artwork in Omaha, Nebraska at the [Bemis Center for Contemporary Art](#) that created a fully sustainable rainbow in the Omaha skyline. The project collected thousands of gallons of rainwater storing the water in six, daisy-chained 12,000 gallons tanks.^[19] The massive logistical undertaking, during its 5 month span, was one of the largest urban rainwater harvesting sites in the American Mid-West.

See also



- [Atmospheric water generator](#)
- [Water conservation](#)
- [Peak water](#)
- [First flush](#)
- [Namib Desert beetle](#)
- [Freshwater swamp forest](#)
- [Deepwater rice](#)
- [Nelapattu](#)

- [Air well \(condenser\)](#)