



**WESTERN RESOURCE
ADVOCATES**

THE CASE FOR CONSERVATION RAINWATER HARVESTING

Water conservation plays a key role in helping communities meet growing demand and reduce the need to invest in expensive water development projects. Many utilities have implemented cost-effective programs that have resulted in significant water savings. Understanding the components of a successful program and the costs involved make for better decisions. There are many examples of successful water conservation programs. This factsheet presents some of the most well-researched efforts, including water savings, costs, pros and cons, and things to consider when developing a program.

Why are they effective?

Rainwater harvesting is the act of capturing rainwater, usually from a roof, and diverting it to plants or storing it for later use. In the Southwest, most of the water that falls on a lot evaporates or runs off. Capturing rainwater for landscape watering replaces treated, expensive tap water with water that is free and beneficial to plants since it lacks treatment chemicals such as chlorine. Because landscape watering represents 50% or more of residential use in some areas, using rainwater to meet some portion of outdoor demand results in substantial water savings, saves higher quality water for drinking, and reduces utility costs. Harvesting rainwater has an added benefit of reducing storm runoff by retaining water on site. Basic rainwater harvesting systems are easily installed by homeowners, and commercial systems can save large amounts of water.



Photo courtesy of Scott Calhoun/Zona Gardens, L.L.C.

What are the program components?

Rainwater harvesting can involve an active or passive approach, or both. In an active approach, rainwater is collected from a catchment area/roof using gutters and downspouts and stored in barrels or cisterns/tanks for use at a later time. In a passive approach, rainwater is directed to the landscape using pipes, channels, berms, and detention basins.

Utilities in Arizona, New Mexico, Texas, and California have identified rainwater harvesting as an effective demand management measure and provide incentives (i.e. rebates or vouchers) for the purchase and installation of rainwater harvesting systems, typically focused on gallons of water that can be stored in a tank. For example, many systems rebate \$.25 to \$.50 per gallon of storage with a 50 gallon tank minimum and a monetary cap.

Some municipalities, including Tucson, Arizona have adopted rainwater harvesting ordinances. The Tucson ordinance requires that all new commercial buildings

The green building industry is steadily advancing rainwater collection in its strategies. Even high-rise office buildings are now collecting rain water. In some designs, these tanks hold additional alternate water resources (gray water, condensate, cooling tower blow-down, etc.) along with the rainwater for uses beyond irrigation of landscapes.

must harvest enough rainwater to meet at least half of the landscape's irrigation needs. Santa Fe County, New Mexico requires that new homes larger than 2,500 sq. ft. include a rainwater harvesting system and a cistern/pump system with a goal to capture runoff from at least 85% of the roof area.

Programs may be financed through water customer revenue, general funds, grants, or by developers as part of a community's water demand mitigation program.

What are the water savings and costs? - Case Studies

Although many communities in the southwest, including San Diego, Austin, Santa Fe, Albuquerque and Tucson, have rainwater harvesting rebate programs, water savings have not been well quantified to date, in part, because of the variability of rainfall, landscape watering needs, and system design. There are efforts currently underway to quantify rain water harvesting savings, including one led by the Cochise Water Project, that involve initial estimation combined with follow-up site visits.

Study	Target Sector	Tanks	Savings/Tank (gallons)	Cost/Acre-Foot
The Cochise Water Project RWH Rebate Program	Residential; Non-residential	20	5,080	\$1,320

Systems that include a storage component, even with a rebate, can be cost-prohibitive for some water customers. The economic benefit-cost ratio of rain barrel systems (<500 gallons of storage) is not favorable when compared to most potable water prices because water costs are so low, while, in general, larger rainwater storage systems are often more cost effective. However, customers of water providers with a tiered rate structure that encourages outdoor conservation as well as rising water rates and water development costs make rainwater harvesting systems an increasingly cost-effective option.

Things to Consider



In addition to landscape use, as in this passive approach where rainwater is directed to the landscape, properly filtered and treated harvested rainwater can be used for other uses, such as toilet flushing.

Rainwater harvesting systems are growing in popularity, especially in communities whose residents have a strong water conservation ethic and interest in using resources more sustainably. The Tucson Water residential rebate program has been enormously successful, with demand outstripping the originally budgeted funding. Ideally, rainwater harvesting incentive programs should provide applicants with sufficient information to design an effective system, taking into account the amount of water that can be harvested as well as irrigation watering needs. While rain barrels do not store much water, they are relatively inexpensive, easy to install, and raise awareness about water use – which may lead to additional water conservation practices.

Rainfall amount and variability, the monthly distribution of precipitation, landscape design, water demand, and irrigation system all influence the appropriate size and design of a rainwater harvesting system and the amount of savings that can be achieved. Because of this variability, incentive programs should include a follow-up strategy to assess post-installation water savings.

References:

- Tucson Water Single-Family Residential Rain Water Harvesting Incentive Rebate Program <http://cms3.tucsonaz.gov/water/rwh-rebate>
- City of Tucson Rainwater Harvesting Manual, available at <http://cms3.tucsonaz.gov/files/transportation/2006WaterHarvesting.pdf>
- Santa Fe County Ordinance No. 2003-6
- City of Tucson Rainwater Collection and Distribution Requirements Ordinance; available at http://cms3.tucsonaz.gov/files/ocsd/CMS1_035088.pdf

50%

Approximate percentage of household outdoor water use.

5,080 gallons

Average amount of water saved per household per year in a pilot study.

11,200 gallons

Amount of water that can be collected annually from a 1,500 square foot roof in an area with 12 inches of rainfall per year.

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