

# The Principles of Xeriscaping



Rainwater harvesting works best when it is combined with the waterwise principles of xeriscaping. The goal of xeriscaping is to create visually attractive

landscapes that use plants selected for their water efficiency. When creating a xeriscape, follow the seven principles listed below.

- 1. Planning and Design.** Consider the topography and climatic conditions of the site. Also consider your recreational and aesthetic needs.
- 2. Soil Improvements.** Add organic matter as needed to increase the soil's ability to retain moisture.
- 3. Appropriate Turf Areas.** Reduce the area devoted to turfgrasses and use drought-tolerant grasses wherever possible.
- 4. Low-Water-Use Plants.** Select native and well-adapted plants that can thrive on little or no supplemental water. Group the plants into "zones" by their water requirements.
- 5. Efficient Irrigation.** A well-planned irrigation system can significantly reduce landscape water use. In addition, use rainwater harvesting to direct rainfall to your plants.
- 6. Mulching.** Use mulches to cover and cool the soil, thus minimizing evaporation, reducing weed growth and slowing erosion.
- 7. Proper Maintenance.** To ensure healthy plants and continued water savings, keep your irrigation system and rainwater harvesting components properly adjusted and maintained.

Additional information about xeriscaping is available free from the New Mexico Office of the State Engineer. Call 1-800-WATER-NM or visit the website at [www.ose.state.nm.us/water-info/conservation](http://www.ose.state.nm.us/water-info/conservation).



## WARNING!

It is not safe to drink stored rainwater unless it has been properly treated. This brochure deals solely with utilizing rainwater for landscape irrigation, and it is not intended to promote the capture, storage and use of rainwater for any other purposes.

## Need More Info?

For more information about rainwater harvesting: Request a copy of *Rainwater Harvesting: Supply from the Sky* from the City of Albuquerque if you reside in the city (phone: 505-768-3655, website: [www.cabq.gov/resources](http://www.cabq.gov/resources)) or from the New Mexico Office of the State Engineer (1-800-WATER-NM).

Visit the website at

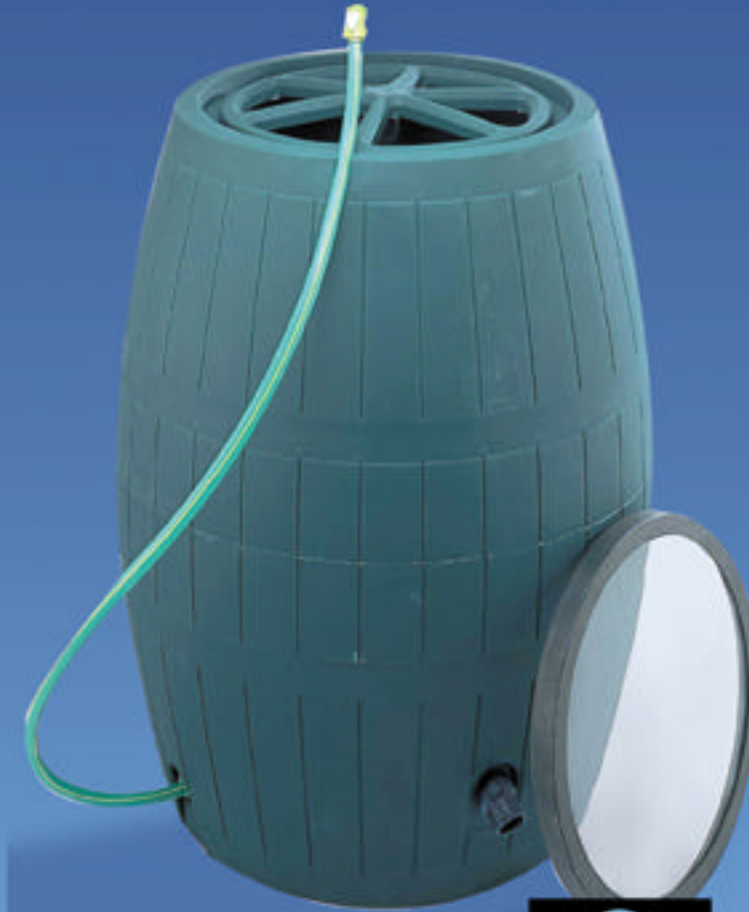
- ⌘ <http://ag.arizona.edu/pubs/water/as1052/harvest.html>
- ⌘ Request a copy of *Texas Guide to Rainwater Harvesting* from the Texas Water Development Board (phone: 512-463-7847). A PDF version of this publication is downloadable from [www.twdb.state.tx.us/assistance/conservation/rain.htm](http://www.twdb.state.tx.us/assistance/conservation/rain.htm)

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# A Waterwise Guide to Rainwater Harvesting



**WATER USE AND CONSERVATION BUREAU**  
New Mexico Office of the State Engineer

# What is Rainwater Harvesting?

**R**ainwater harvesting is the art of diverting or capturing precipitation (rainwater and melted snowfall) so that it can be used to support life. Rainwater harvesting is an increasingly popular practice in arid climates, but it isn't a new idea. The native inhabitants of New Mexico knew that water was a precious commodity in the desert, so they collected rainwater for drinking and cooking, and they planted their crops where rainwater could be diverted.

Today in New Mexico, the term "rainwater harvesting" is used primarily to describe a landscaping strategy designed to use naturally falling rainwater to irrigate your landscape. No matter what kind of plants you have in your landscape, rainwater harvesting can reduce the amount of supplemental irrigation you'll need to apply.

## Advantages of Collecting Rainwater

**1** Rainwater harvesting conserves water. Every gallon of rainwater you use to irrigate your landscape will reduce the amount of potable municipal or well water you use.

**2** Rainwater is free. Unlike the municipal water you use, you'll never get a monthly bill for the rainwater you harvest.

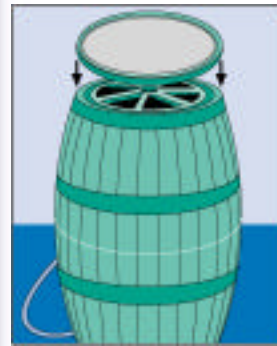
**3** Rainwater harvesting conserves energy. Water from a centralized municipal system must be pumped throughout a vast service area before it can be piped to your house — which requires a tremendous amount of energy.

**4** Rainwater is naturally low in salts (sodium), so plants thrive on it.

**5** Rainwater harvesting can reduce flooding and erosion by reducing or eliminating water runoff.

# How Can Rainwater Be Collected?

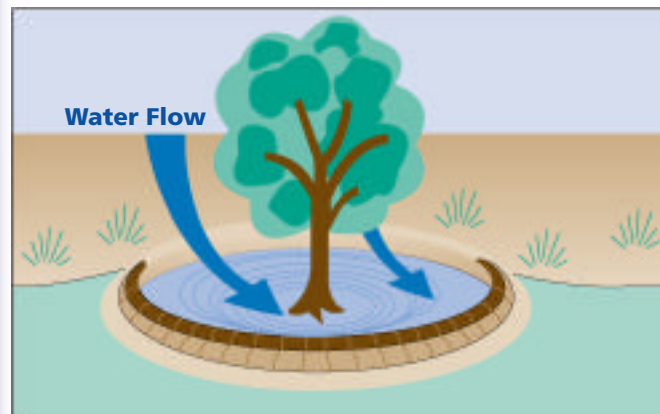
Collecting rainwater can be as easy as putting a rainbarrel underneath a gutter downspout, or it can be as complex as constructing an elaborate underground cistern and a water pumping system. Here are some of the many ways of collecting and diverting rainwater so that it can be used to irrigate landscape plants:



*The tops of rainbarrels should be covered with a screen or a tight-fitting lid to keep out mosquitoes.*

**Rainbarrels, Tanks and Cisterns** – Virtually any large, clean container (such as a trash can or barrel) can be used to collect rainwater from a rooftop or gutter. Rainbarrels, designed specifically to store rainwater, are commercially available at many nurseries and home improvement centers. Tanks and cisterns can be installed and/or constructed to catch and store large quantities of rainwater. Underground storage tanks are typically more expensive due to excavation and construction costs.

**Landscape Contouring** – Raised areas in the landscape, such as crescent-shaped berms on the downhill sides of trees, can catch and hold rainwater for use by the nearby plants. Channels and ditches can be used to divert water to plants that need additional irrigation.



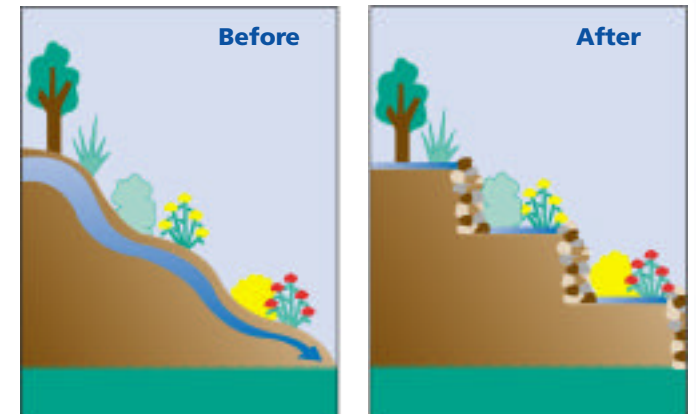
*A mounded ridge of soil, also known as a berm, can retain rainwater that would otherwise run off.*

**Swales and Ponding Areas** – Depressed areas in a landscape, commonly called swales, can be created to collect water runoff. These shallow excavations can slow the flow of water so it can be absorbed by the soil. Swales can also gently direct water through a landscape to plants that need extra or deep irrigation. Locating water-thirsty plants near swales and in ponding areas helps give these plants the supplemental water that they need.



*A swale can direct the flow of rainwater to a ponding area that can provide deep watering for trees and shrubs.*

**Terraces** – Soil terracing can turn a steep slope into a series of flat areas. Instead of running off the slope, rainwater can collect in each of the flat terraced levels.

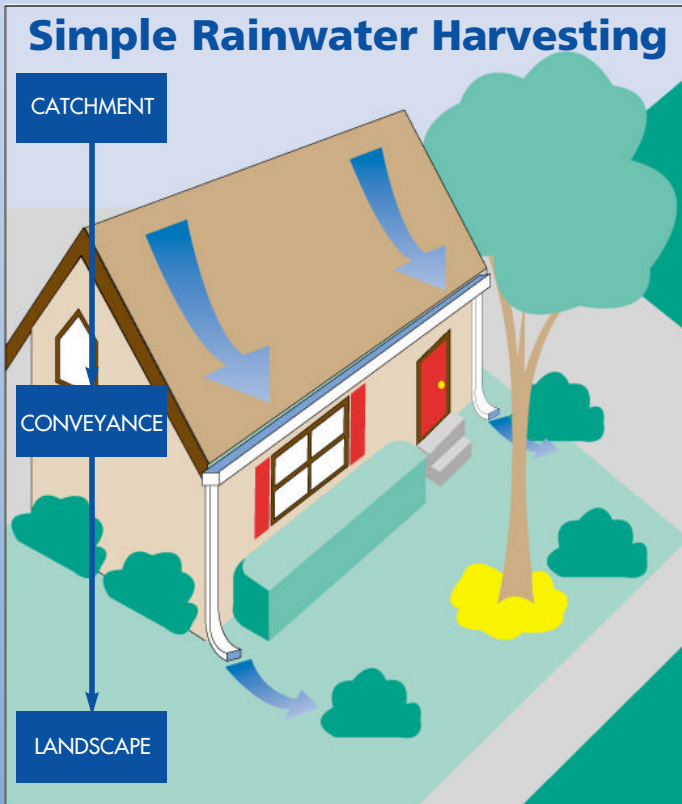


# Elements of a Rainwater Harvesting System

The simplest rainwater harvesting systems use just three components: a catchment area where rainwater can be collected, a conveyance system that moves the water and a landscape area where plants use the water. Complex rainwater harvesting systems use the same principles as simple systems, but they include additional components. Typically, complex systems are designed to not only collect and convey rainwater but also to filter, store and distribute it for future use.

## Catchment

A catchment is any surface from which rainwater can be collected, such as a paved area, roof or soil surface. The most efficient catchment areas are smooth, nonpermeable surfaces. The amount of rainwater that can be collected depends upon the area, slope, surface texture and the amount of rain that falls upon the catchment surface.



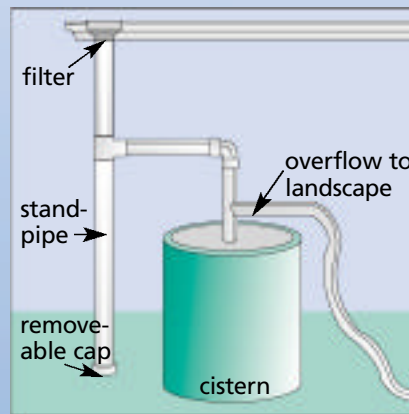
Perhaps the simplest example of a suburban rainwater harvesting system is water runoff from a roof that's diverted directly to a landscape area.

## Conveyance

Conveyance components deliver water to a specific area in the landscape (in a simple system) or to a storage container (in a complex system). Roof gutters and downspouts are the most common conveyance components. In a simple system, gravity moves the water from the highest place (the roof) to the lowest place (the landscape). Even in a complex system, gravity usually provides the force needed to direct water through gutters and downspouts to the storage tank(s).

## Filters

If rainwater is to be stored, it should be filtered to remove debris. Depending upon the amount of debris in the water, a leaf screen at the top of a downspout may provide all the filtering necessary. If the stored water will be used in a drip irrigation system, however, additional filtering may be required to keep drip lines and emitters from clogging.



Because the first flush of rainwater washes accumulated dirt and debris from roofs and other catchment areas, many rainwater harvesting systems divert the first rainwater from the storage tanks.

A simple "roof-washing" filter system is a PVC pipe equipped with a cleanout valve at the bottom. The first rainfall washes debris from the roof and is collected in the standpipe. The remaining water flows through the attached pipe that connects to the cistern. The standpipe should be drained after each rainfall.

## Storage Tank(s)

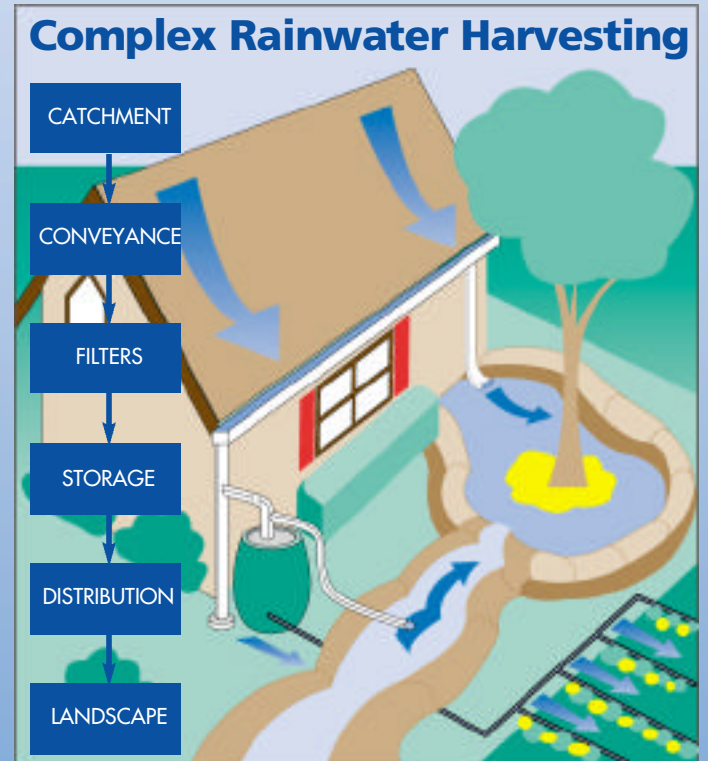
Rainbarrels and cisterns store rainwater for future use. Storage tanks and barrels should be opaque, shielded from direct sunlight (if possible) and covered to keep debris and mosquitoes out. Keep storage tanks secure from children, and regularly clean and maintain them to ensure optimum water quality and system operation.

## Distribution System

The distribution system delivers the stored water from the tanks to the plants. Depending upon the location of the water cistern and the plants to be irrigated, the water distribution system could be as simple as a water faucet and valve (e.g., a hose bib) and a garden hose. More complex systems might also include water lines and drip emitters. An electric pump may be required to deliver water to landscape areas not located downhill from the cistern.

## Landscape Area

Ultimately, the harvested rainwater is delivered to the landscape area where it can be used by plants. Modifying the area in the landscape where the rainwater is delivered can be as easy as creating a berm of dirt around the plants to hold the harvested rainwater or digging out an area where the water can collect.



Rainwater collected from the roof passes through a filter on its way to the rainbarrel. Water stored in the cistern is distributed to the landscape using irrigation piping. Swales and berms on this property also help direct uncollected rainwater to the areas in the landscape that will benefit from additional water.

# Putting Rainwater Harvesting to Work for You

Now that you know the basic elements of rainwater harvesting, it's time to take a careful look at your property. The most effective rainwater harvesting plans take into account both the natural elements of the property and the man-made elements that affect the flow and utilization of water.

## STEP 1 **Observe How Water Moves on Your Property.**

Right after the next rain — or while it's raining, if you don't mind getting a little wet — observe where the water flows on your property. When water flows off your driveway and sidewalk, where does it go? Does the water draining off your roof flow into areas where there are landscape plants or does it run off your property unused? Where does water naturally collect? Does water flow onto your property from somewhere else? Are there areas in the landscape where it appears that water soaks into the ground? Are there any signs of water-induced erosion?

### How Much Rainwater Can You Harvest?

Inches of Rainfall	Gallons per Square Foot
0	0
1	0.6
2	1.3
3	1.9
4	2.5
5	3.1
6	3.7
7	4.4
8	5.0
9	5.6
10	6.2
11	6.8
12	7.5
13	8.1
14	8.7
15	9.3

Source: City of Albuquerque

## STEP 2 **Draw a Rainwater Harvesting Plan for Your Property.**

Using your observations, begin to draw up a plan for diverting and/or collecting rainwater. Where are the best areas for higher-water-use plants? How can you slow the flow of rainwater runoff to prevent soil erosion? Where can you contour the land to add swales and berms? Is there a steep slope that can be terraced to prevent excessive water runoff? Can you add rainbarrels or other storage tanks? Remember, the primary goal of rainwater harvesting is to maximize the amount of water that stays on your property so that it will irrigate your landscape!

**STEP 3 **Implement Your Plan.**** Make the physical changes to your landscape, including moving earth to create swales, berms and water diversion channels. Build terraces and other landscape features. Where feasible, replace impermeable surfaces (e.g., concrete sidewalks and patios) with surfaces that allow some water infiltration (e.g., flagstone or brick pavers). In some cases, gravel pathways can provide a water-friendly alternative to solid concrete. Locate trees and other plants that need additional irrigation in areas where water naturally collects and/or in places where swales and berms will direct and hold rainwater near their root zones. Install gutters, storage tanks, filters and water distribution devices as specified in your plan.

**STEP 4 **Enjoy Your New Water-Efficient Landscape!**** After your water-harvesting plan has been implemented, you'll await the next rainfall with eager anticipation. As the precious precipitation falls from the enchanted New Mexico sky, watch the water flow and collect on your property and take pride in a job well done. Your efforts will help conserve New Mexico's most valuable natural resource!



Rainwater harvesting storage tanks, such as this large galvanized steel cistern, should be located as close as possible to both the supply and the landscape where the water will be used.

