

Rainwater Harvesting

Rainwater harvesting systems can be as simple as directing gutters to a lidded garbage can or as complex as a concrete cistern, roof washer and filtration system. But whatever your application, the water you retrieve will be some of the purest, and least expensive, water around.

Rainwater can be used for potable water (drinking, cooking, and bathing) or non-potable uses such as landscape irrigation, livestock watering, and washing. Collecting and using rainwater has numerous benefits, ranging from improved water quality to reduced stress on underground aquifers. After water falls from the sky, rainwater percolates through the earth and rocks, where it picks up minerals and salts. In many cases, this water also collects other contaminants such as industrial chemicals, pesticides and fecal coliform bacteria found in the soil. Captured before it hits the ground, rainwater is free of many pollutants that plague surface and underground water supplies and, according to the Texas Water Development Board, "almost always exceeds [the quality] of ground or surface water" (Mother Earth News, 2005). Rainwater typically has very low hardness levels, which reduces the use of soaps and detergents, and eliminates the need for a water softener. Fewer minerals also saves wear and tear on your plumbing fixtures. Stored rainwater also is a good standby in times of emergencies such as power outages or during periods of extreme drought when wells dry up. In some areas where water supplies may not be available or dependable (or may be prohibitively expensive), collected rainwater is sometimes the least expensive option and can easily be less expensive than bottled water. Rainwater harvesting reduces the impact on aquifers, lessening the demand on ecologically sensitive or threatened aquifers. Collecting some of the rainwater falling on impervious surfaces also minimizes erosion and flooding: On some lots, as much as 50 percent of the land area is covered by roof surface. Because it does not have to be treated, pumped or distributed through a complex network, harvested rainwater saves energy and the use of chemicals.

Some municipal water users switch to harvested rainwater as a way to avoid chlorination and fluoridation treatments" (Mother Earth News, 2005). Bobby Markowitz, a Santa Cruz landscape consultant, identified several benefits to site water harvesting. First, he noted that when you have such a system you are no longer solely dependent on drilling wells. In one project he worked on, the owner of the property had drilled 6 wells previously and all the wells (at \$20,000-\$30,000 each) only produced a small amount of water and was of a poor to moderate quality due to mineral content. This leads into the second major benefit of site water harvesting, higher quality water from a clean roof. Bobby's Santa Cruz clients were able to harvest water that only had a count of three parts per million (ppm) total dissolved solids (TDS) versus 240 ppm TDS which was the count for domestic trucked in water. This would not be true in all cases as roof debris need to be filtered out and in his project there were no trees tall enough around the house to cause dirt, etc. to enter the system. But Bobby noted that you could easily filter out such debris if you have it around your roof by installing a diverter valve prior to the water entering the receptor tank so that the dirt from the first rain may be diverted. According to Bobby, it costs anywhere from \$5,000 to \$30,000 to implement a water catchment system. In

the case of a drought, it would cost \$300 for 3,000 gallons of water to be trucked in. His client spent about \$6,000 per year to truck in water. But Santa Cruz receives on average enough water consistently to make a water catchment system pay itself off over time. The average rainfall in Santa Cruz is anywhere from 25 to 60 inches per year. The owner of Bobby's project received 42 inches in the Santa Cruz Mountains. Bobby noted that you would need a roof ranging from 1000 to 2000 square feet at least in order to catch enough water based on the above rainfall amount. In Santa Cruz, the average household of two uses 100 gallons of water per day (for landscaping and for household). This equals 3000 per month and 36,000 per year just for domestic use. In his particular project the fairly extensive Japanese garden utilizes a similar amount. Therefore, 72,000 plus gallons per year are used for domestic and landscape use. In most situations rainwater harvesting is the cost effective choice overall. With proper filtering, water catchment systems can be used even in urban areas where air pollution is a problem.

Information for this article came from:

1. Markowitz, Bobby. 2005.

2. Mother Earth News. 2005.

<http://static.highbeam.com/m/motherearthnews/august012003/harvesttherainwranglewaterfromtheskyforwateringwas/>.