

# Harvesting Rainwater

## A Safe, Sustainable Water Source

|   | Page |
|---|------|
| Harvesting rainwater                          | 2    |
| What is rainwater harvesting                  | 2    |
| Why we harvest rainwater                      | 2    |
| The benefits are endless                      | 2    |
| Water storage and tank selection              | 3    |
| Choosing the size of your tank                | 3    |
| Calculating the appropriate size              | 3-4  |
| Location for the Tank - above or below ground | 5    |
| Tank Types                                    | 5    |
| Polyethylene tanks                            | 5    |
| Metal tanks                                   | 5    |
| Fiberglass tanks                              | 5    |
| Bladder tanks                                 | 5    |
| Pump selection                                | 5    |
| Accessories                                   | 6    |
| More Information Resources                    | 6    |

## **What is rainwater harvesting?**

Rainwater harvesting is the collection, storage and distribution of rain water from the roof for use inside and outside the home, farm or business. Also known as cisterns.

## **Why we harvest rainwater.**

1. Increasing water usage as population continues to grow.
2. Climate change.
3. Storm water run off damages the environment.
4. Increasing the storm water infrastructure cost taxpayers millions.
5. Increase property value.
6. Save potable water for drinking.

## **The Benefits are endless.**

1. Start harvesting water now! Rainwater reduces water usage in every home. Installing a system you will start saving water immediately.
2. Rainwater is naturally pure and fresh. It is not recycled water!
3. Research supports rainwater can meet all household requirements.
4. Significant cost savings for the community and each household. When you consider the total cost to the community, it makes sense to install a system to catch rainwater that falls for free from the sky and utilize it in and around the home.
5. Lower overall water usage. People that collect and use their own rainwater become more aware of their water use and further reduce their overall water use.
6. Lower energy consumption and green house gas emissions. There are significant cost to treat and pump mains water throughout the community. Widespread installation of collection systems result in reduced energy consumption and less greenhouse gas emissions. Rainwater is an ideal water source for 95% of our requirements.
7. Protect local waterways, bays, estuaries and reduce storm water infrastructure cost. Harvesting reduces both the volume and velocity of storm water run off.

## Water Storage and Tank Selection.

### Choosing the size of your tank

Things to consider when determining the size of you storage tank include:

1. Rainfall - how much rainfall in your area.
2. Roof area - how large the surface area is.
3. Water usage - what you use the rainwater for and how much you expect to use.
4. Site characteristics - how much space you have and the location you intend to install the tank.

### Calculating the appropriate size

#### Rule number one!

Shoot for 1000 gallons and go from there. 1000 gallons on a 1000 to 3000 square foot house is a nice starting point and will supplement your existing water use quite nicely. Supplementing is the key word. It is not always practical to depend 100% on rainwater, but it is always practical to supplement potable water with rainwater.

#### Formulas:

**square footage of roof area X .6 = gallons per 1 inch of rain.**

**gallons per 1 inch of rain X .average inches rain per month = amount available for collection**

#### Example

Square footage of roof area (length x width) 1800 sq. ft

**1800 x .6 = 1080 gallons**

Average inches rain per month in most of Florida is 3 inches - this does not include June, July, August and September which are about double that.

**1080 gallons x 3 = 3240 gallons collected**

Let us assume 2 people live in this home. With each person using 69 gallons of water per day (this is average), that is 138 gallons per day or 966 gallons per week and 3864 gallons per month.

Considering the frequency of rain, a 1000 gallon to 2000 gallon storage capacity would be a good fit for this home.

## Water Storage and Tank Selection.

### Calculating the appropriate size (continued)

Daily indoor per capita water use in the typical single family home is 69.3 gallons.

Here is how it breaks down:

| Use                 | Gallons per Capita | Percentage of Total Daily Use |
|---------------------|--------------------|-------------------------------|
| Showers             | 11.6               | 16.8%                         |
| Clothes Washers     | 15.0               | 21.7%                         |
| Dishwashers         | 1.0                | 1.4%                          |
| Toilets             | 18.5               | 26.7%                         |
| Baths               | 1.2                | 1.7%                          |
| Leaks               | 9.5                | 13.7%                         |
| Faucets             | 10.9               | 15.7%                         |
| Other Domestic Uses | 1.6                | 2.2%                          |

By installing more efficient water fixtures and regularly checking for leaks, households can reduce daily per capita water use by about 35% to about 45.2 gallons per day Here is how it breaks down for households using conservation measures:

| Use                 | Gallons per Capita | Percentage of Total Daily Use |
|---------------------|--------------------|-------------------------------|
| Showers             | 8.8                | 19.5%                         |
| Clothes Washers     | 10.0               | 22.1%                         |
| Dishwashers         | 0.7                | 1.5%                          |
| Toilets             | 8.2                | 18.0%                         |
| Baths               | 1.2                | 2.7%                          |
| Leaks               | 4.0                | 8.8%                          |
| Faucets             | 10.8               | 23.9%                         |
| Other Domestic Uses | 1.6                | 3.4%                          |

Considering the above figures, with efficient fixtures and a collection system capable of supplementing your water needs, you can make a significant impact on the environment and your pocketbook too!

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## Water Storage and Tank Selection.

### Location for the Tank - Above Ground or Below Ground

It is important to consider the space you have available and whether it will be placed above or below ground. In many cases tanks are installed above ground, especially when the tank is being installed along side an existing building.

Poly, metal, and bladder tanks can be installed above ground and are a popular option due to quick installation and low cost. Often incorporated as part of a new development for new homes, underground tanks are space saving solutions. Ideal for areas where the home is close to the property set back, slim line tanks can be utilized and are very attractive.

### Tank types

#### Polyethylene (poly) tanks

Popular due to their lightweight material, which makes for easy site preparation and installation, poly tanks are the most common for household use and come in a variety of shapes, sizes, and colors. Poly tanks are among the fastest growing types of tanks. They are made from polyethylene which is UV treated, impact modified and food grade, which means it is suitable for potable (drinking) water.

#### Metal tanks

Metal tanks are extremely strong and many feature food grade polyethylene tank liners to prevent corrosion and ensure water quality. They have been popular for years and continued development of new colors, shapes, and sizes has ensured they still are.

#### Fiberglass tanks

Fiberglass tanks are corrosion resistant, sturdy and are relatively expensive but are long lasting. These tanks have been around for years and are made of the same material as boats.

#### Bladder tanks

New space saving bladder tanks have been developed in recent years. Bladder tanks are placed in crawl spaces or under homes with stem walls. They can store as little as 500 gallons and as much as 50,000 gallons, space permitting. They are sealed and flexible, and have extremely high puncture resistance. If space permits, multiple bladder tanks can be installed either end to end or side by side at opposite ends of a building. The possibilities are endless.

### Pump Selection

To get the pump that is best suited for your situation, it is best to talk to a professional. There are many factors that govern the type and size of the pump to deliver the water as you would expect.

## Accessories

It is the accessories that make the system. Having a tank that collects water without the proper accessories can be a constant maintenance issue. Be sure to get the proper accessories.

### Accessories can include

- **Gutter protection (filters)** - keeping the gutters free of debris.
- **Debris diverters** - keeping down spouts and tanks free of debris and mosquitoes.
- **First Flush diverters** - removal of the initial water flow of each rain containing contaminates. Can be 2 to 30 gallons.
- **Chlorinators** - allowing for a wider range of uses.
- **Auto fill** - automatically maintains a working level for pumps, yet keeping tank level available for the next rain.
- **Pop-up emitters** - for overflow of tanks to proper runoff areas.
- **Level indicators** - visual, wireless, or both.
- **Fire fighting valves** - can provide instant access to fire fighters.
- **Bottom Scour cleaning outlet** - removal of dirt or silt settling in bottom of tank.

## More Information Resources

Please visit these websites for photos and detailed information about the rainwater harvesting options that are available to you.

[www.raindropscisterns.com](http://www.raindropscisterns.com)

[www.rainharvesting.com](http://www.rainharvesting.com)

[www.bushmanusa.com](http://www.bushmanusa.com)