

HOW TO STORE AND SECURE YOUR WATER RESERVE



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HOW TO STORE YOUR DRINKING WATER RESERVE



People can go on for weeks without food, but not without water. During hot conditions like drought, dehydration can set within hours, and hot conditions may pose certain hazards to health. Heat stroke, heat cramps, heat rashes, etc. are some heat-related illnesses.

Anyone who has physically exceeded under the heat without replenishing can actually die in a period of several hours.

The same is true with anyone who is locked inside a hot car for long hours. We need water to live, period. But when shit hits the fan, no one is on the easy street.

Having a steady supply of clean water is perhaps the most important aspect of off the grid living, and an essential factor in maintaining good hygiene. Before you finalize any plans for going off grid, be sure you have

water sorted, and plan for more than one source. Start by having a plan to store clean water for immediate needs during a crisis. This could mean stocking up on bottled water and collecting water in your bathtub or your pool. Further, you can build a storage system for your water, using buckets, drums, or else. Storing more than a couple 55 gallon drums of water is a space issue for most people, so you could build a wall unit that will hold seven drums efficiently.

The toughest part is cutting the wood to the right lengths and the biggest expense is the wood, assuming you already have the drums. If you're a bit handy or want to take the time to figure out the numbers to scale this project up or down, you can modify this to suit your need for more or less storage space or smaller barrels.



What Type of Container to Use for Water Storage?

The best option is to store water in ceramic, glass, metal or treated plastic containers.

Plastic Containers

Plastic is made out of petroleum, so you'll need to use treated plastic to protect your health. Toxic substances from the plastic such as BPA — aka Bisphenol A — may contaminate your water supply especially if the plastic bottles are exposed to sunlight or hot environments.

Metal Containers

Aluminum is toxic too, so you should avoid it. Some metals, as stainless steel, can be used for water storage, as long as you don't treat your water prior to storing because the chlorine will attack most metals.

Glass Bottles & Ceramic Containers

Emergency water storage using glass bottles is often disregarded in the prepping community because plastic is easier to come by and lighter to tote.

Usually people prefer to use plastic bottles for storing water, but glass bottles are the best option around. In case you did not know, water is best kept in glass containers (the best tasting beer is in bottles, not in cans) as opposed to metal or plastic ones.

Glass bottles are cheap and abundant and make for the best receptacle when it comes to storing potable water for extended periods of time.

In many cultures, clay pots are preferred for water storage due to their properties that allow the water to evaporate through the clay while the water inside is cooled.

A Few Safety Rules to Remember

Whatever you choose for water storage, keep in mind a few easy rules about your containers:

- In order to preserve the quality of the water, these containers should have a small opening or a spigot to get water out. This way, you won't insert your hand in the water and avoid contamination. For the same reason, you should use the tap instead of dipping the glass into the drinking water.
- Avoid any container previously used for transport or storage of toxic substances as pesticides, petroleum products, and other chemicals.

- Clean your water containers properly, using soap and clean brushes, or diluted chlorine solution. This treatment should be developed on regular basis in order to keep your water clean and safe.

When building your emergency water supply, keep in mind that the average person will require half a gallon of water per day just for drinking (and sometimes even double that amount in harsh, environments) while nursing mothers and children require as much as a gallon and a half per day. This estimate only accounts for drinking water, not water for hygiene.

To play it on the safe side, store at least one gallon per family member per day for at least a two week period. Also keep in mind that if your water supply runs low, NEVER ration water for drinking below the recommended daily amount; try to find or produce more instead.

Also, you should rotate your water supply every 6 months and you may want to consider buying a high-quality water filter.

HOW DO YOU STORE YOUR RAINWATER?



Rainwater is an excellent source of free water, or so you'd think, right? Apparently not, though.

For example, some Western states including Utah, Washington, and Colorado outlawed home owners from collecting rain water on their own properties. According to the good' ol' government, the water that falls from the skies belongs to someone else and you're essentially stealing if you collect it.

So check your laws before moving forward, and find out if harvesting rainwater is allowed in your state on National Conference of State Legislatures website.

Now, if you choose a dedicated rainwater collecting system, which is very easy and straight forward to build, you can DIY from readily available materials. Its advantages, besides providing you with a good quality water source, are its simplicity of construction, the ease of maintenance,

and its convenience.

Though it may sound simple, harvesting rain water is not as simple as putting a bucket under your gutters; things are actually a bit more complicated than that. To begin with, contrary to popular belief, rainwater is not as pure as an angel's tears.

The air is filled with pollutants nowadays, not to mention the filth that lies on your roof (you'll harvest the rainwater from your roof, generally speaking): dead bugs, birds feces, dust, arsenic, lead, and a variety of other not-so-delicious toxins accumulate up there and will run right into your bucket along with the rainwater.

Filter It First!

Depending on the type of the roof you have, you must filter the rain water thoroughly. Only if you have a steel/glazed tile roof, you can collect rain water without filtering it.

A roof made of asphalt shingles, concrete tiles, or galvanized metals will require you to filter the water before storing it in order to remove debris. We recommend filtering it regardless of what type of roof you have.

Aside from the rainwater collecting system, you should also consider investing in a high quality water filtration system.

If you already decided to collect rain water directly from the roof, remember to let the rain to wash your roof for 10 minutes before starting to collect it; that way you will prevent larger debris and at least a layer of contaminants from getting into your water supply.

You should use a screen to capture the larger particles from the water, like leaves and bugs. In the next step, if necessary, you will use a dedicated water filtration system before storing it.

In a SHTF situation, it would be a good idea to hide your rain barrel from your neighbors or passersby using trees or plants.

How to Use Rainwater?

The decision of using rainwater is a matter of choice which may be attributed to the initial outlay and necessity.

Installing rainwater tanks may or may not require large one off installation expenditures as it would entirely depend on water practices of each household and the location of the dwelling.

These two factors generally influence the design and type of maintenance required for the tanks.

For those whose budget is in consideration, going off the grid with rainwater at a minimum cost is also possible with other tank substitute, i.e. food storage barrel and big garbage bins. Think out of the box, there could be something else that could possibly be customized into a rainwater tank or can be purchased at a lower price from bulk stores nearby.

Besides, sustainable alleviation during emergencies should be cost effective at the same time causing minimal adverse impact in the environment.

If you're requirements would necessitate you to pull extra amount out of your pocket as you would generally be using the rainwater as a main source of water at home, consulting professionals for variations, and proper installation would be the best thing to do.

You should also check the government guidelines for specific requirements and possible rebates and subsidy.

Types of Rainwater Tanks

Underground Water Tank



This is ideal for those who have limited space and want to keep their barrel out of sight. This type of water tank hence is expected to sit underground should be placed in a light traffic areas where heavy loads and vehicles are not regularly driven.

This is also perfect for those who have large storage requirements i.e. school, agricultural, and manufacturing business, etc.

To avoid structure failure, maximum groundwater level, structural integrity of the ground, drainage capability of the soil, as well as the types of load which may occur (if installed underneath a drive way or regularly driven area) must be checked prior to installation.

Since installing these types of tanks generally involves excavation, the price is relatively high compared to the aboveground tanks. In any circumstances these tanks must be well ballasted otherwise, it would pop out of the ground when empty.

Less commonly, rainwater that is collected in underground tanks can be subject to microorganisms associated with animal and human feces which may contaminate the water if not fully enclosed.

That is why most rainwater from underground tanks is not recommended for personal hygiene and drinking where sufficient main water supply is available, unless properly treated and maintained.

Aboveground Water Tank

When it comes to installation, this does not require much of work as this can be erected anywhere above ground. This should be sufficiently elevated to provide adequate pressure to appliances.

Unlike underground water tanks, this type of tank is more susceptible to microbial contaminants i.e. bacteria, protozoa, etc. which are acquired from feces of birds, reptiles, and amphibians that have free access to roof or tanks.

Rainwater may also accumulate contaminants from dust washed off the roof surface.

Other contaminants may also generate from leaf litter, lichen, moss, roofing materials. As such, this type of tank should be filtered and treated properly to eliminate the presence of bacterial contaminants. Gutter guards or mesh filters are recommended to be installed.

Readiness Checklist

Purpose

You have to decide what you will use the rainwater for. Would you be using it for food preparation, flushing the toilet and drinking? For rainwater used as the main source of water, additional mandatory equipment is required like taps, filtration, and pumping system.

For rainwater tank to be used for outdoor purposes like gardening and washing vehicles, smaller tanks of 1,000 L with taps are just fine. In addition to determining the purpose of the tank, you also need to consider how it should be connected to the storm water pipes and downpipes to identify possible extra cost.

Users

Water consumption will largely depend on the number of individuals using rainwater for different purposes. So, aside from considering the reason of the installation, identifying the number of people within the household will also help determine the capacity of the tank to be purchased.

Area

Different areas have different regulations which are based upon the location of the dwelling, accessibility to centralized water systems and precipitation frequency.

Since rainfall pattern varies year on year everywhere, this should be considered before investing in rainwater system. The length of stay in the area, if rented should also be considered as moving the tank from one place to another can be a hassle.

Space

The design of the house should be factored in before purchasing a tank. Small, slim-line lightweight polyethylene and underground tanks are ideal for those who have limited space at home and want to keep the barrel hidden from view.

Roof Catchment Suitability

Roofing materials should be checked prior to installation.

Gutters should have sufficient and continuous water flow to downpipes to prevent pooling of water that could increase accumulation of various contaminants.

Paints and coatings may not be suitable for roofs to collect rainfall due to possible hazardous content.

Asbestos fibers on the other hand are no longer used in new houses as it was proved to cause danger to health when inhaled in sufficient quantities. Maximizing the roof catchment means maximized water savings.

Approval

Before purchasing a rainwater tank, the local community and regulatory authorities should be contacted to determine specific requirements like planning, installation permit, operation approval, and other guidelines needed to be accomplished prior to and after the installation.

Depending on local conditions, policies for using rainwater may be emphasized within the food security or the environmental protection policy context.

Standalone tanks that are not connected to downpipes do not generally need approval, except if you are under the roof of a government that completely restricts the use of rain barrels.

Cost

Tanks can cost as little as a few hundreds to thousands of dollars, depending on the size, design, color, and material of the tank. Extra cost may also be incurred during the installation for additional materials (level indicator, first flush device, etc.), delivery, and setup charges.

Design

Rainwater tanks come in a wide variety of designs (shapes, sizes, materials, and color). Slimline type has become the most preferred due to its compact and sleek style.

As the internal and external hydrostatic pressure of the tank affects the water's flow and volume, the size of the tank should be highly regarded. The wider the tank the better.

Standalone lightweight empty barrels that are not connected to downpipes can be easily blown over by the wind during gusty season, placing a clean rock in the bottom of the tank may prevent this.

Location

Rainwater tank can be installed underground or aboveground. In designing rainwater system, the location should be first investigated, especially if excavation is required, as structural integrity and materials are regulated through building codes and standards in some areas of jurisdiction.

When installing aboveground rain barrel, the ground should be level and fully packed to provide a solid foundation.

Installation and Maintenance

Ground rainwater service pipes must be clearly labelled "rainwater" continuously along their length. Tank, covers, plumbing pipes and fittings should be light proof to reduce daylight penetration and potential growth of algae.

When connecting numerous barrels it is vital to make sure the

connected pipe is large enough to provide smooth and quick flow between the barrels.

In any circumstances, the choice of using rainwater is at the risk and responsibility of the owner therefore it should be in compliance with the regulations of the responsible authorities.

Irrespective of how it is being utilized proper maintenance is recommended to keep the quality of the water and efficiency of the tanks.

Cleaning and Maintenance

Cleaning and maintenance of the rainwater tanks can be achieved by these few tips:

- Check the sides and the bottom of the tank for accumulated sludge
- Keeping roof catchments free from animal and insect faeces
- Regular cleaning of gutter and tank inlet for any build ups
- Cut back trees and branches that extends beyond the roof
- Test the water periodically to determine appropriate and adequate treatment
- If pumping system is attached, inspect that it is in good functional condition
- Replace roofing and other material as needed
- If adequate access to the tank is impossible, contact the tank cleaning company
- Regularly check and clean the tank's inlet and overflow screens

Rainwater Tanks and Water Diversion around the World



The Basilica Cistern in Istanbul (Turkey) is a structure built around 3rd or 4th century during the Early Roman Age and was converted into a cistern in the 6th century.

According to historical claims 7,000 slaves were involved in the construction of the structure which can hold up to 100,000 tons of water.

The Underground Parthenon in Kasukabe (Saitama, Japan) is a subterranean 213 foot silos and 83 foot pillared main tank for water runoffs that lies under a football field.

This is a part of the G-can (water way) project of the Japanese government built in 1992 and was finally completed after 17 years of construction. This underground flood diversion and water storage can pump 200 tons of water per second.

The use of the rainwater tank is entirely reliant on the water practices of each individual within the household and the location of the dwelling.

Weather-related issues in any country that includes earthquakes, floods, cyclones, landslides, severe storms, tsunami, and decreased rainfall can threaten lives, jeopardize yield quantity of crops, and induce extensive damages to assets as well as disruption in facilities like power, communication, transportation, and most importantly water.

These weather abnormalities that occur year on year are something everyone should be prepared for.

Although there are different sectors in the regime that can aid in our survival during these times, disconnecting our dependency from government and private facilities through off-the-grid solution with rainwater tanks is by far the best solution.

DON'T IGNORE THE WATER FROM YOUR PIPES



While some people are busy claiming that the planet is heating up, many of us are facing record cold winters.

If you have never dealt with frozen pipes and other difficulties in a routine setting, it will be even harder for you to maintain a supply of running water in winter months during a crisis.

What You Need to Know When Preparing Pipes

There are many reliable methods available for storing and preparing your water pumps and pipes for cold weather regardless of where you live and the situation at hand.

You just need a little preparation, and also some tools at hand.

- Propane torch — can be used to defrost copper and metallic pipes. It can also be used to defrost pump switches on older models that do not have plastic or other flammable parts.
- Hair dryer — can be used to melt ice in pump switches, as well as in plastic, metal, and other pipes.
- Incandescent lamps or heat lamps to generate steady heat without fire

You also need some freezing preventative equipment and materials:

- Fiberglass insulation (without paper backing) — use insulation and a wooden box around the pump and pipes leading into the house.
- Heat tapes — wrap these tapes around pipes, especially near the pump and any area where the pipe may be exposed to freezing temperatures.

Prepare also some alternatives to electric water pumps:

- Cast Iron Hand Pumps — These “old fashioned” pumps can retrieve water up to 300 feet below the surface. They can be installed along with electric pumps and used when needed. Never touch a cast iron pump handle in cold weather with bare hands, as it can rip the skin and flesh from your hands.
- Ram Pumps — This is another “old fashioned” pump design that requires no electricity. As long as you build it from metal parts, it will be easier to manage freeze ups. Just be sure to have some non-frozen water on hand for priming as needed.

It is very important to keep in mind that water is one of the few substances that expands when converted from the liquid to solid state (ice). Even though water may move freely through pipes without damage, ice will break them apart because of the expansion.

Therefore, when preparing pipes for winter, it is always best to err on the side of safety and insulate them as much as possible.

3 Tips to Prevent Freezing

Insulate, Insulate, Insulate

You can use insulation around the pipes, and also heat tape for added warmth. Depending on the area, you may also need to move pipes into the home where they will not be exposed to freezing temperatures under the house. Needless to say, you will also need to take special care to insulate pipes coming out of the pump.

Keep Water Running on Freezing Days

In many cases, if you can manage to keep water running through pipes, it will not freeze up. On cold nights, let warm water drip through faucets so that the lines remain ice free.

You may also want to hook up a smaller water storage tank, and switch over to that so the pump goes on more often. That said, if temperatures fall quickly, you may wind up with a frozen system if the pump freezes up with water still in the lines.

If you need to thaw pipes out, start off by turning on at least one water faucet. This will help draw water through ice patches as soon as they begin to melt.

Depending on the pipe material and surrounding materials, you can use either a propane torch or a hair dryer. As long as there is nothing flammable in the area, the torch will work faster and better.

Take Care of Your Water Pump

As with water pipes, it is very important to insulate pumps and keep them in temperatures above freezing. You can use fiberglass insulation around the pump, and also heating tape to provide extra warmth.

Unfortunately, some areas of the pump, such as the switch are difficult to insulate. You can try keeping an incandescent lamp shining on it, or provide some other heat source to prevent freezing.

When Your Water Pipes Freeze...

No matter how hard you try, there are bound to be times when the pump or pipes will freeze. That would be the moment when you would need these gallons of water that you keep on hand for your hygiene.

Oddly enough, you may also want to keep some blocks of ice stored in sawdust. Even though the ice will need to be melted back into water, hauling in a chunk of ice may be easier and faster than dealing with extensive pipe or pump repairs.

Needless to say, if there happens to be snow on the ground, you can also melt that down for water.