

Rainwater Harvesting

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Outline

- I. Introduction
 - A. April showers bring May flowers. This is a saying that would apply to one if he or she invested in rainwater harvesting.
 - B. Due to the scarcity of water in the nation, rainwater harvesting has become more important in all areas of the world. Rainwater harvesting provides an efficient way to conserve water.
 - C. There are many benefits to rainwater harvesting, such as reducing the cost of bills, reducing the demand on groundwater and floods, and reduced maintenance. However, there are some cons as well. Unpredictable rainfall, regular maintenance, and initial high costs pose an issue to why rainwater harvesting is not as successful.
 - D. Rainwater harvesting is a cost effective and efficient way to conserve water; therefore, the local and state governments should support the funding of rainwater drainage systems to help the community.
- II. Body
 - A. Rainwater harvesting involves gathering rainwater from roofs and other surfaces subsequently, storing it for later use.
 - 1. Rainwater harvesting can be traced back to the Roman and Spanish Empires.
 - 2. Many states, such as Colorado, are legalizing the collection of rainwater.
 - B. The system set up of rainwater harvesting is simple.
 - 1. Implementation of drainage system and costs
 - 2. How different countries are using rainwater harvesting
 - C. Advantages
 - 1. Easy to maintain
 - 2. Reduces water bills
 - 3. Reduces demand on ground water
 - 4. Reduces floods and soil erosion
 - D. Disadvantages
 - 1. Unpredictable rainfall
 - 2. Initial high cost
 - 3. Regular maintenance
 - E. The government provides more funding and becomes more supportive of rainwater harvesting.
- III. Conclusion
 - A. Rainwater harvesting has some drawbacks; however, the benefits outweigh the risks.
 - B. If local and state governments support the funding of rainwater harvesting systems, the water scarcity issue could come to a halt.

April showers bring May flowers. This is a saying that one would come to appreciate if he or she invested in rainwater harvesting. During these harsh economic times, one is always looking for a way to save money. Rainwater harvesting is an effective way to save money and conserve water at the same time. Due to the human population's tendency to overuse water, the water scarcity issue in the world has become more imperative. "Only one percent of the world's freshwater is accessible to humans" (Novak, 2014, p.3). Water scarcity is a profound problem in all areas of the world, not just America. Therefore, rainwater harvesting provides a solution to the problem. Rainwater harvesting is simply a technique used to accumulate, store, and use rainwater for basic uses. There are many benefits to rainwater harvesting, such as reducing the cost of bills, reducing the demand on ground water, and it is easy to maintain. However, drawbacks such as unpredictable rainfall, initially high costs, and regular maintenance make some people skeptical about the innovation. Rainwater harvesting is a cost-effective and efficient way to conserve water; therefore, the local and states governments should support the funding of rainwater drainage systems to help the community.

Rainwater harvesting can hardly be considered a new development. "Rainwater harvesting and conservation means to understand the value of rain and to make optimum use of rain water at the place where it falls" (Novak, 2014, p. 1). Rainwater harvesting involves gathering rainwater from roofs and other surfaces, subsequently storing it for later use. The water collected is usually stored in rainwater tanks. This is a technique that can be traced back for thousands of years. Old rainwater catchment systems can be traced as far back as the Roman Empire and Spanish Empire. Christian monks would use the technique when building their monasteries. Over the years and due to increased urbanization, rainwater harvesting became less common ("Rainwater Reservoirs," n.d.). However, many people have continued to collect and use rainwater. Recently, it has caught the attention of researchers. Researchers are now exploring the advantages and disadvantages of rainwater harvesting. Many countries are allocating funding to local and state governments to support the use of rainwater

harvesting, while others have not yet joined the movement. The Punjab Province already has policies and procedures being implemented to keep rainwater harvesting afloat (Karachi, 2017). Many states, such as Colorado, have strict laws in regards to the collection of rainwater. In Colorado, the collection of rainwater is illegal due to the laws that protect long-standing water rights. However, according to national public radio host Grace Hood, Colorado will legalize the use of the allocation of rainwater in August of 2017. Many states have legalized the use of rain barrels to promote rainwater harvesting (Hood, 2016).

Water is one of the world's most valuable natural resources, and many take it for granted. Although the planet is made up three fourths of water, most of it is not able to be used. Ocean and sea water is plentiful, but it cannot be used for drinking or household purposes. Many people are becoming aware of the limited supply of water in our world, and they are now taking measures to combat the water scarcity issue. Implementing rainwater harvesting techniques is fairly simple. Water is usually collected from buildings' roofs and is stored in rainwater tanks. Ground run-off collected in dams can also be harvested for reuse. Many may worry about dirty roofs and public health issues this may cause. However, there are many different devices that allow the first catchment of water to the tank to be emptied from the tank. One of these devices is a first flush device, which allows for the first flow of water captured in the tank to be emptied before use. Therefore, built-up dirt on roofs is excluded from the tank. The area of the roof must also be considered when using this technique. The larger the area of the roof, the more rainfall able to be collected ("Rainwater Harvesting," n.d.). Due to heavy rainfall and pollution of streams and rivers, the United Kingdom has implemented sustainable urban drainage systems to recycle rainwater. Water can be retained by way of stonecrops, buffer ponds, and permeable hard surfaces. Many buildings and homes are using rainwater as the primary source for a water system. The water is also able to be conveyed off site for agricultural use (Capper, 2014).

Rainwater harvesting is easy to maintain. It is free from pollutants, such as salts, minerals, and other contaminants. Therefore, it doesn't require regular filtering and constant purification. This saves money for the community. Rainwater harvesting is based on simple technology. The management of a rainwater harvesting system requires less time and energy than an average water system. Furthermore, one does not need to install an entire system for the collection of rainwater. Barrels, buckets, or large bowls can also be used in the collection of rainwater ("What is Rainwater Harvesting," 2017). These methods make the maintenance for rainwater harvesting simple.

Economic factors may also be taken into consideration. Rainwater harvesting may help consumers to save money. According to a publication from the *Targeted New Service*, rainwater is a helpful way to save money in the household. The article states, "flushing water down the drain is literally flushing money down the drain" ("Down Drain," 2016). This is because most of the water used in the household goes to flushing toilets. Why spend money on something that you are simply going to flush away? Billions of gallons of water are wasted each year due to toilet flushing. Therefore, converting to a rainwater system or collecting rainwater in a barrel can be an easy way to cut back on expenses ("Down Drain," 2016).

Rainwater harvesting reduces the need for ground water. The population in the world is steadily growing; therefore, the demand for water is constantly increasing. Over time, ground water becomes useless, costlier to tap, or effectively exhausted (Novak, 2014, p. 3). This makes the water scarcity issue more imperative than ever. The need for water is so great that ground water is becoming depleted in some areas. Most communities are dependent upon groundwater for everyday living because they are unaware of the benefits of rainwater harvesting. However, other communities are implementing techniques to conserve water. For example, Manassas Park Elementary School buildings are using rainwater harvesting to conserve water. "Rainwater is collected from the roof surface of both school buildings, and the harvested water is used for flushing toilets and irrigation" (Novak, 2014, p. 81).

It is estimated that 1.3 billion gallons of water will be conserved each year. This demonstrates the importance of rainwater harvesting (Novak, 2014, p. 81).

Reduction of floods and soil erosion are also an advantage of rainwater harvesting. The collection of rainwater in large tanks or barrels can help reduce floods in areas of low surfaces. As stated previously, the United Kingdom uses sustainable urban drainage systems to reduce floods and soil erosion (Capper, 2014). Intense rainfall causes homes and businesses to flood; furthermore, it causes pollution of rivers and streams. The use of these drainage systems reduces floods and allows rainwater to be recycled back into the system. Water accumulation in roads, parks, or fields can be overwhelming ("What is Rainwater Harvesting?," n.d.). Standing water can become homes to unwelcomed pests, such as insects and mosquitoes. It can be the breeding ground for contaminants and pollutants. For that reason, rainwater harvesting can be used to promote cleaner rivers and ponds. It can also reduce flooding, which results in soil erosion.

Although there are many advantages to rainwater harvesting, there are some drawbacks as well. Unpredictable rainfall is a major cause of concern. If there is no rain, how will one collect it? It is hard to predict rainfall, and one should not fully depend on rainwater alone for all of his or her needs. The environment has a direct effect on how successful rainwater harvesting will be. For this reason, the use of rainwater in areas where rainfall is scarce is not highly recommended. One could still collect rainwater for basic needs, such as non-drinking purposes and have a back-up water system set in place for other needs.

There is also concern about the initially high cost for the installation of a rainwater harvesting system. A rainwater harvesting system can be very costly due to the reconstruction of the roof and additional construction. A rainwater tank can cost anywhere between \$200 and \$2,000. However, the investment is well worth it. In the long run, rainwater harvesting will reduce the cost of one's water bill.

One does not need to necessarily spend a large amount of money on a rainwater tank because large bowls, rain barrels, or other devices can be used for rainwater catchment (“Rainwater Harvesting,” n.d.).

The maintenance of a rainwater harvesting system must be done on a regular basis. This is due to the build-up of dirt and debris on roofs. Pests and insects may also find a home in one’s rainwater harvesting system if it is not properly maintained. Many public health officials worry about the contamination of rainwater harvesting. If a roof is not properly maintained for the catchment of rainwater, chemicals and other contaminants may seep into the water. This can be especially harmful if the water is being used for gardening or drinking purposes (“Rainwater Harvesting,” n.d.). However, maintaining a clean roof should be a regular household chore. Although the maintenance may have to be done regularly, it is still an easy chore.

One can recognize the many benefits of rainwater harvesting. If local and state governments support the funding for sustainable urban drainage systems and rainwater collection, communities would be better off. Rainwater harvesting will help save money and conserve water; henceforth, making the earth a healthier place. A rainwater harvesting system can be used for non-drinking purposes. Why flush billions of water down the drain when one can recycle it back into the system? Many countries are already supporting the use of rainwater harvesting systems. Many states in America have also started to legalize bills to support it as well. People should come to recognize the importance of rainwater harvesting, and how helpful it can be overall.

In conclusion, due to the water scarcity issue in the world, rainwater harvesting is becoming more important. Local and state governments should support the funding of rainwater harvesting systems to help communities. The benefits of rainwater harvesting far outweigh the disadvantages. “It is easy to maintain, reduces water bills, reduces the demand on ground water, and reduces floods and soil erosion” (“What is Rainwater Harvesting,” 2017). Rainwater harvesting is a helpful way to rid the world of its water scarcity issues.

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