Comparison of Methods of Back-Up Water System for Future Solutions

Angelyn Labadan

Northern Marianas College

Author Note

Angelyn Labadan, English Composition 101, Section 8, Northern Marianas College

Abstract

This essay observes and compares the different methods of water back-up systems as possible solutions to future water dilemmas. The essay includes considerations such as advantages, disadvantages, costs, and overall preferability in different types of communities.

Comparison of Methods of Back-Up Water

System for Future Solutions

What planet would Earth become without water? In the past decades, the world has anxiously worried about pollution, global warming and climate change. But in this century, the real question is where will out water go during these drastic events? As the island of Saipan was recently faced with a water crisis due to Typhoon Soudelor, the question of where to obtain water echoed through the streets. The island had become heavily dependent on bottled water, though when supply became limited due to the drastic circumstances, lack of water struck panic and concern. Although community and federal assistance was made available to provide water during the crisis, back-up water systems have been on the forefront to be further examined as possible solutions to any similar issue. In the future possible back-up systems include a hydrowater plant, reverse osmosis and rainwater harvesting that can prove to be beneficial in a variety of ways in terms of utilizing water. These systems should be explored in proactive manner to improve resiliency during comparable critical dilemmas and has been highlighted in this essay and will compare the methods in search for the system most compatible to small developing communities.

One method the world has used to resolve water issues is hydropower. Hydrowater plants are commonly used throughout the world and there are different types that can be utilized for different results and environements. Hydrowater plants are capable of producing energy with the concept of hydropower, or using the force of water to generate electrity, which is efficient to run large scale or small scale environments. An example would be that hydropower is capable of running larger scale projects like a chain of factories and smaller ones for small family businesses. Although the concept of hydropower is widely accepted and utilized, there are advantages and disavantages that should be taken into consideration. Some advantages of hydrowaterplants would be minimal pollution and low costs for operation and maintenance. However some disadvantages would include unfavorable environmental impacts, such as the dismantling natural habitats, geological damage and the altering of water table levels, as well as high intial investment costs.

Another method that should be considered is a reverse osmosis system. A common use of reverse osmosis is desalination, or the desalting of sea water. The concept is similar to that of water filters, though in a more scientific sense, it is the removing of a solute from the solvent. Reverse osmosis can be found in either a community deprived from access to safe and sanitary drinking water supply and even in the common household to produce ‘better-tasting’ purified water. Although reverse osmosis is leading the world into the revolutionary ‘from toilet to tap’ concept of recycling and purifying water, there is a fair leverage between the advantages and disadvantages to regard. Some positive attributes of the reverse osmosis system is that the equipment is standardized and do not require electricity, just pressure. Following these are some negative attributes to reverse osmosis in regards to the quality of water produced and key health aspects. Since the system is removing solute from solvent, the water produced may tend to be demineralized and more acidic due to such a process. Another critical point of this system is that some of the critical contaminants in the purified water are not able to be removed. With these reasons thought over, there is the consideration of overall cost of the system. The cost is relatively cheap but must always be under constant preventative maintenance.

A more traditional method that has been around for generations and is currently being modernized is rainwater harvesting. Rainwater harvesting, as simple as the name gets, is the storing and saving of rainwater through either wells, roofs and even rivers. Rainwater harvesting systems can be used in for gardens, irrigation, wildlife and in-house water systems. The water from can also be stored for a later date and used for drinking water as well if treated properly. The overall flexibility of a rainwater harvesting system can range from home to the workplace as well. Granting these positive attributes, there are negative also ones to acknowledge. For example, positive attributes could include a decrease in water bills, reduction in erosions and floods and contributes to multi-purpose uses for both the home and business premises. Some negative attributes would be unreliable rainfall, storage limitations, roof seepage, and high-energy maintenance. Whereas rainfall itself is free, an overall generalization of the system cost is difficult to come by since there are a number of dependent factors. A major factor would be the size of the system and the initial high starting cost for investing in the system.

As the world further inspects more methods in relation to the escalating water predicaments, we observe the characteristics of the following methods. Hydrowater plants may be one of the Earth’s leading water solutions, however in comparison to reverse osmosis, is rather costly and could do more harm than good, especially to a smaller community. The construction of a dam and clearing of land is regarded as detrimental to smaller communities and could take years to recover the initial starting costs. While hydropower is a leading force in renewable energy for both developed and developing countries, reverse osmosis, with its lower costs and compatibility to smaller communities and even the typical household.

Depspite the desirable compatibility of reverse osmosis, there are also some negative aspects to it when compared to the traditional method of rainwater harvesting. Reverse osmosis does have a main focus on purifying water, but does not completely ‘purify’ and proposes possible health risks and concerns. The system itself is relatively cheap to invest in, though constant preventative maintenance easily wrings out finances from the wallet. Rainwater harvesting systems, on the other hand, can have adjustable costs and investments depending on what the system will be used for and how large the scale. Over time, water bills can decrease and maintenance costs are not as excessive. A rainwater harvesting system thus proves to be thoroughly versatile for both developed and undeveloped countries as well as home and business communities and advocates little environmental issues like the previous water system methods.

for and how large the scale. Over time, water bills can decrease and maintenance costs are not as excessive. A rainwater harvesting system thus proves to be thoroughly versatile for both developed and undeveloped countries as well as home and business communities and advocates little environmental issues like the previous water system methods.

During this time of crucial environmental issues demanding the world’s attention, sources of renewable energy and proactive ways of using water as a resource has become largely evident. Some of the communities direly affected by such are small island and developing communities, either due to environtal changes or increasing demand for better ways to conserve water and energy. The island of Saipan, through the observations of different water methods, is seen fit for the water back up system method of rainwater harvesting. The island receives a steady amount of rainfall and rainwater harvesting system investments can allow accumulating benefits for the island’s community in the future.

References

Ben Jones. (January 15, 2014). What are the advantages and disadvantages of rainwater xxxxxharvesting? Retrieved on November 29, 2015, from http://thegreenhome.co.uk/heating-xxxxxrenewables/advantages-and-disadvantages-of-rainwater-harvesting/

Idaho Water Solutions. (2015) Reverse Osmosis – Answers to the Top 20 Asked Questions. xxxxxRetrieved on November 29, 2015, from http://idahowatersolutions.com/reverse-osmosis-xxxxxfaqs/#sthash.42L0PJMv.dpuf

Kate Kersher. How Reverse Osmosis Works. Retrieved on November 29, 2015, from xxxxxhttp://science.howstuffworks.com/reverse-osmosis.htm

HydroInternational. (2015). Rainwater Harvesting – Questions and Answers. Retrieved on xxxxxNovember 29, 2015, from http://www.savetherain.info/media-centre/rainwater-harvesting-xxxxxfaqs.aspx#one

Nancy Hearn, CNC. Reverse Osmosis Water Health Advantages & Disadvantages. Retrieved on xxxxxNovember 29, 2015, from http://www.waterbenefitshealth.com/reverse-osmosis-xxxxxwater.html

Reverse Osmosis Principles and Operation – Advantages and Disadvantages. Retrieved on xxxxxNovember 29, 2015, from http://www.separationprocesses.com/Membrane/MT\_ChpRO-xxxxx9.htm

The USGS Water Science School. (2015, November). Basic information about hydroelectricity. xxxxxRetrieved on November 29, 2015, from http://water.usgs.gov/edu/wuhy.html

World Association of Technology Teachers. (2009). Advantages and disadvantages of xxxxxhydropower. Retriened on November 29, 2015, from xxxxxhttp://www.technologystudent.com/energy1/hydr2.htm