ZIBELINE INTERNATIONAL PUBLISHING

Water Conservation and Management (WCM)

DOI : *http://doi.org/10.26480/wcm.02.2019.15.17*

ISSN: 2523-5664 (Print)
ISSN: 2523-5672 (Online)
CODEN : WCMABD

RESEARCH ARTICLE

SUSTAINABLE WATER TREATMENT MANAGEMENT

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ARTICLE DETAILS

Article History:

Received 10 August 2019
Accepted 17 September 2019
Available online 21 October 2019

ABSTRACT

Water, an essential element for life, makes up 71% of the planet's surface. Paradoxically, 3.5% of this water is suitable for human consumption and other use, to be found in lakes, rivers, and springs to supply our physical and hygienic needs. Only 1% is available for drinking. The remaining 97.5%, located in seas and oceans, is not drinkable due to its high level of salinity. Raw water goes through a special method by dosing lime, bleaching powder and ferrous sulfate for treated water. On the other hand, Reverse, Osmosis is a membrane-based method technology to purify water from oceans and no need extra chemical. Reverse Osmosis technology is employed to get rid of dissolved solids, color, organic contaminants, and nitrate from the feed stream. It is low costing, energy-efficient also produce blue current. There is 1 square meter and with only 30% of its surface covered with Nano port we could reach 1 megawatt it's enough to run fifty thousand standard energy-saving light. In this method, we can get available drinkable water also producing blue current. There is no other sustainable method all over the world to produce current without sunlight, turbine, or fossil fuel. Water desalination is the only way to get pure water and produce electric current both with low costing.

KEYWORDS

Treated water, Grey water, Reverse Osmosis water, Water desalination.

1. INTRODUCTION

Water is at the core of property development and is crucial for- socio-economic development, healthy ecosystems and for human survival itself. It's very important for reducing the worldwide burden of illness and rising the health, welfare, and productivity of populations. The water business is ever-changing quickly, adapting to raised population pressure and global climate change. There's goodly pressure on business and domain to develop property water management methods and technologies. This paper in short highlights a range of treated water, greywater, reverse osmosis water, water desalinization extremely relevant to sustainable water management. Indicating the necessity for adequate adaptation and mitigation methods supported by property technology and engineering principles could be a special purpose of this chapter. As an example, the usage of the waste product should facilitate to handle water shortages within the agricultural sector. What is more, a brand new idea to find out to measure with water desalinization has been introduced. Finally, associate integrated approach to property water management in urban and rural areas has been advocated.

2. MATERIALS AND METHODS

2.1 Methods of desalination

Some processes of Desalination has been developed that involves heating seawater and forcing it through membranes to remove the salt from the water. This method is called Membrane reverse osmosis method. One of the leading methods for desalination is the multi-stage flash distillation. This is a traditional process used in these operations such as Vacuum distillation. Essentially the boiling of the water is at less than our atmospheric pressure and a much lower temperature than the normal temperature. This is only because the boiling of a liquid occurs when the vapor pressure increases with the temperature. This is because of the reduced temperature. When this is done energy is being saved.

3. WATER DESALINATION

Desalination is when you remove salt from groundwater or seawater to make fresh water for you to drink. When you desalinate you heat the water leaving the salt behind condensing fresh water from the vapor or stream which has been used for thousands of years. The filtered water then enters the reverse osmosis plant. Here it is forced under pressure through special membranes that act like strainers. The pores in the membranes are really tiny that bacteria, viruses and other impurities and salt are left behind as freshwater flows through.

3.1 How will desalination help the community?

Desalination is used where it is needed most such as desert cities. However, the world lives on only less than 1% of water, that means the world has more demand for water for poor countries and countries that are running low on water. Desalination would be a big help for the community because we don't have to suck it out of our rivers and lakes, we can use seawater as well.

3.2 Membrane Desalination Processes

Saltwater is constrained through film sheets at high weights. Layer sheets are intended to catch salt particles. The procedure creates clean water and saltwater. Model: Reverse Osmosis. Saltwater is constrained through a layer at 600 to 1000 psi. Numerous layers of films expel however many of the salt particles as could be expected under the circumstances.

4. GREYWATER

Greywater or sullage is characterized as wastewater created from wash hand bowls, showers, and showers, (yet not from a kitchen sink or can) which can be reused nearby for utilizations, for example, Water Closet (WC) flushing, scene water system, and built wetlands.

4.1 Greywater (GW) treatment

GW treatment is the removal of unwanted suspended material from the greywater collected and disinfecting the same to make it useful for toilet flushing or irrigation or discharging to sewer lines according to the local laws applicable.

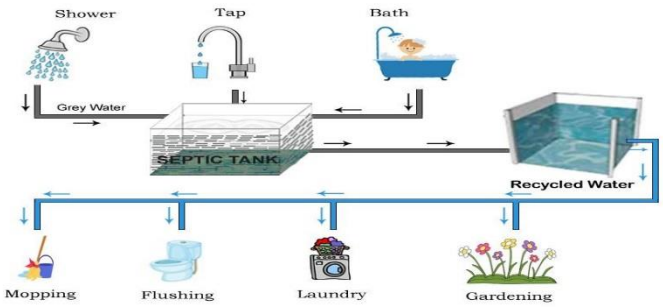


Figure 1: Greywater Recycling

4.2 Greywater (GW) Reuse

GW Recycling can set aside to 30-35% of water utilization inside a private structure by reusing shower and bowl water for the utilization of latrine flushing, water system, vehicle washing, cleaning, and so on. Ordinary pipes frameworks discard greywater by means of septic tanks or sewers. The numerous disadvantages of this training incorporate over-burdening treatment frameworks, defiling common waters with inadequately treated emanating and high biological/monetary cost u Instead, you can reuse this water. The most widely recognized reuse of greywater is for the water system. Indeed, even a greywater transfer framework has a more positive effect than septic/sewer transfer.

4.3 8 Advantages of GW Recycling & Reuse

1) Save water and money 2) Reduce the demand on your reservoir/toilet distribution pumps 3) Increase the lifespan of your septic system 4) Less the strain on public sewage treatment system 5) Reduction in energy use by the municipality 6) Increase points to reach LEED certification goals 7) Groundwater recharge 8) Reclamation of otherwise wasted nutrients.

5. RESULT AND DISCUSSION

5.1 Greywater

Greywater Save water (30-35% reduction in consumption) save money and also recharge groundwater level. Reduces the demand on our reservoir/toilet distribution pumps and Increases the lifespan of our septic system Greywater Reduction in energy use by the municipality also Increase points to reach LEED certification goals. This system helps Groundwater recharge.

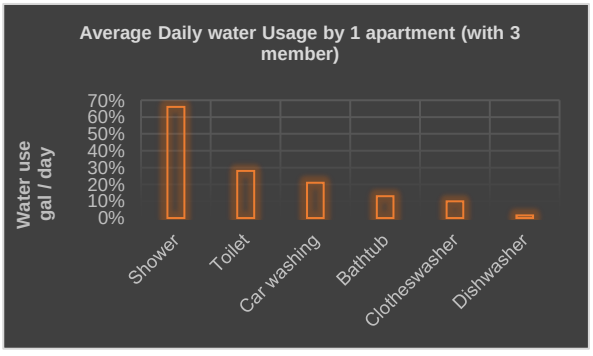


Figure 2: Daily water usage

Table 1: Feed Volume to GW system

Parameters	Value	Unit
Total volume of wastewater generated from 1 apartment	240	Gal / day
Volume of Toilet Flushing	28	Gal / day
Volume of Greywater (actuals)	240 – 28 = 212	Gal / day
Volume of Greywater (rounded off)	220	Gal / day
No. of apartments in the building	225	Nos.
Total volume of Greywater for 1 building	220 x 225 = 49,500	Gal / day
	49,500 x 30 = 1,485,000	Gal / day

Table 2: Savings Projection

Description	Value	Units
Freshwater required for GW usage (before recycling)	1,485,000	Gal / month
Cost of water*	20996.90	USD / month
Freshwater required for GW usage (after recycling)	965,340	Gal / month
Cost of water*	13638.11	USD / month
Savings	7358.79	USD / month
	88,305.48	USD / year

5.2 Desalination

Desalination will be a big help to the lakes and rivers on getting freshwater and not sucking lakes and rivers dry. And also we will have plenty of water to supply us and other countries that are low on water. There is 1 square meter and with only 30% of its surface covered with Nano port we could reach 1 megawatt it's enough to run fifty thousand. This work started to look at whether or not, given the relative distribution of access to the sea for desalination and accessible open areas necessary for large-scale renewables, water-energy exchanges offer a possible for promoting property development to fulfill growing resource demands.

6. CONCLUSIONS

The countries of the study region area unit progressively turning towards desalination to supply recent water to their growing populations. Likewise, the countries have committed to the assembly of renewable energy, that necessitates comparatively massive tracts of lands given current technologies and therefore the scale of demand anticipated. Reverse Osmosis technology is low costing, energy-efficient also produce blue current. Primary stage it's expensive but there is no other sustainable method all over the world to produce current without sunlight, turbine, or fossil fuel. Water desalination is the only way to get pure water and produce electric current both with low costing.

FUNDING

This research was funded by Bo-Ching Chen, Dean of science faculty Nanhua University, Taiwan.

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