

Water scarcity in singapore



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With the rapid development of industrialization and globalization, water issues are increasingly serious today, including water scarcity and water pollution. As a developed country, Singapore is trapped in these water issues. Although the Singapore government deals with the problem quite effectively, there are still some disadvantages about their policies such as the cost. Hence, an original solution was come up with and relative information was searched online to further illustrate it. The original solution was analyzed and evaluated. It turns out that the original solution may be effective for many reasons.

1. 0 Introduction

In order to come up with new ways to solve the water scarcity in Singapore, much information is researched to understand the situation of water scarcity in Singapore to help to make the new solution more effective. When it comes to water, fresh water is quite essential for the whole world. The freshwater used by Earth's 6 $\frac{3}{4}$ billion people for agriculture, industry, recreation, tourism and municipal use. Also, freshwaters are an important source of energy for humans and many other living things (The importance of freshwater, 2012). In terms of water chemistry, water is called the universal solvent because more substances dissolve in water than in any other chemical.

Hence, it is easy for water to dissolve different substances, including toxic substances. Also, it is easy to cause water pollution, which may do harm to human health and sharpen the water scarcity in Singapore (Helmenstine, 2008). Some other background information about water should be covered,

such as the knowledge of aquatic ecosystem. Wetlands, rivers, lakes, and coastal estuaries are all aquatic ecosystems—critical elements of Earth's dynamic processes and essential to human economies and health.

Unfortunately, global extinction rates for freshwater species are four to six times higher than those for terrestrial or marine species (Freshwater 101 Aquatic Ecosystems, 1996).

In general, Singapore is trapped in many water issues, especially water scarcity. In addition to geographical factors and population problem, the waste of industry companies is a key element to cause these problems. Hence, not like the relocation and bankruptcy, some industrial companies which use too much water and cause too much pollution or make low profit will also be forced to merge with other companies.

2. 0 Methodology

In order to create suitable solutions to solve the water scarcity in Singapore, three major water issues in Singapore and how the government deals with these issues were researched. Also, the influence of globalization on Singapore; water issues was researched. Then, assistance of international organization and technology to Singapore; water were searched online too. Furthermore, some extra information such as the amount of industrial waste water was searched and the influence on water pollution by different kinds of industrial companies was compared. After that, chart and tables were used to describe the data collected online. Finally, the methodology is effective for research purpose because it covers plenty information searched online, and

the charts and tables can make the results of data collected can help to find out the water problem and come up with new solution to solve it.

3. 0 Findings

In terms of the situation of fresh water in Singapore, there are three main water problems. First, although Singapore is close to the sea, it has few rivers. Hence, Singapore has plenty of fresh water. Second, too large of a population in its area causes the pressure of using fresh water. Last but not least, the rapid development of industry produces much industrial waste and parts of it were poured into rivers, which causes water pollution and reduces usable fresh water (The Singapore Water Story, 2010) Chart #1:

Analysis of Chart #1: Emissions of organic water pollutants are measured by biochemical oxygen demand (BOD), which refers to the amount of oxygen that bacteria in water will consume in breaking down waste. This is a standard water-treatment test for the presence of organic pollutants. From the data in chart #1, it explains that industries play an important role in water pollution in Singapore.

In order to deal with the situation of water scarcity of Singapore, the government from the 1980s to 1990s Singapore made tremendous efforts to create a comprehensive environmental management system, including water supply, control of river pollution, well-planned industrial estates, and an urban sanitation system for the whole island. More recently, the Singapore government has made “ sustainable water supply” the main target of water management, and a series of initiatives and actions have been undertaken, including importing water, making highly-purified

reclaimed water known as Newater and desalinating water (WRM Singapore experience, 2006).

With 100 percent modern sanitation, Singapore is able to collect and treat its used water and turn that into high-grade reclaimed water it calls Newater, the quality of which is well within the World Health Organization standards for drinking water. This can help reduce the lack of fresh water and deal with wasted water (Singapore Water Short No More, 2010). When it comes to globalization, the processes of globalization are having profound effects of water resources at all scales, from local to international. Globalization also contributes to the development of urban industry, this cause competition of sources of water scarcity for agricultural use and other use. Meanwhile, globalization brings about an uneven outcome such as the marketization of water.

The water marketization means that water is no longer supplied as a free, or nominally priced, public good, but instead follows the rules of the free-market. It also may cause competition of water sources, which may cause stress of using water (O'Brien and Leichenko, 2008). The Singapore International Water Week (SIWW) is the global platform to share and co-create innovative water solutions. Stakeholders from the global water industry gather at SIWW to share business opportunities and showcase the latest water technologies. SIWW is part of the strategic programme of the Singapore Government to grow the water industry and develop water technologies (About SIWW, 2014).

4. 0 Discussion

In terms of the Findings, there are three main water problems in Singapore. They are shortage of water resources, water pollution, and pressure of using water caused by a large population in small area. Based on these problems, the Singapore government took action to solve the problem by importing water, making highly-purified reclaimed water known as Newater and desalinating water (The Singapore Water Story, 2010).

The process of globalization is having profound effects of water resources from local areas to international areas. Also, it contributes to the development of urban industry, which causes competition of sources of water scarcity for agricultural use and other uses (O'Brien and Leichenko, 2008). However, globalization also helps Singapore to import water easily. Hence, globalization has both advantages and disadvantages for Singapore to deal with water scarcity. Because of globalization, international events have larger influence now.

The international event called SIWW is the global platform to share and co-create innovative water solutions and it can help Singapore government to grow the water industry and develop water technologies (About SIWW, 2014). Even though Singapore government deals with the water scarcity successfully, the cost for importing water and producing Newater is not cheap (Water Pricing in Singapore, 2012).

Hence, a new approach which is called the annexation of enterprises is considered. The annexation of enterprises means that eliminate the enterprises which make low profit and waste water resources and produce more water pollution than the majority of other companies. In this case,

Singapore can save more fields to be used for storing water. Also, it can reduce the use of water and the cause of water pollution. When it comes to the process to do the research, it is quite successful and convenient because Singapore is a famous country which deals with the water scarcity effectively. This means that the information about water scarcity and how Singapore government deals with the problems are studied by many experts and have plenty of records online.

5. 0 Conclusions and Recommendations

In terms of the original solution to water scarcity in Singapore, one main reason for Singapore's success in managing its water resources is its concurrent emphasis on supply and demand management, including wastewater and stormwater management; institutional effectiveness; and an enabling environment which includes a strong political will, effective legal and regulatory frameworks, and an experienced and motivated workforce (Water Pricing in Singapore, 2012). There is no doubt that Singapore is successful in dealing with water scarcity. However, Singapore also imports water and uses desalinated water to solve the water scarcity. These two solutions cost a lot of money, so annexation of enterprises may be a good choice to solve the problem.

To further illustrate, annexation of enterprises can eliminate the companies which run terribly and waste sources and produce waste. Hence, annexation of enterprises can help reduce the waste from industries so that reduce the water pollution and save more fresh water. Also, annexation of enterprises can help reduce the use of fresh water and field, which can also help solve

water scarcity. For Singapore which has small area and in need of fresh water, this solution may be successful.