

Environment engineering – topography



**ASSIGN
BUSTER**

There is a potential risk that the supply water mainly from ground water resource would cause the lowering of ground water table. On the other hand, the quality of water from wells is poor with 150-MGM/L chlorides. Topography is another important factor. Watershed area is 210 with moderate and harsh slope ranging from to mum above sea level. Actually, the water scarcity is serious for Volvo. It is necessary to search for new water resource around city. After exploitation, it is estimated that there are 20 possible springs. Water demand in the future should be taken into consideration.

The data in the past decade is obtained from the Water Supply Company of Volvo and it would be inputted into the program to estimate the water demand in the next 10 or 20 years. The water demand of irrigation is estimated from Evapotranspiration conditions and the soil property. It should be carefully designed to ensure that the water use can meet the needs and relation. All the possible alternative solution should be prepared. In this particular case, there are three options including exploitation of new springs, using existing wells and dams.

New springs can be exploited as water sources and it can provide amount of over 600, Atwater that can totally meet the demand. The surface water collected by dams used for water supply is over 10*. That can cover the water for relation as well. However, the city of Volvo consists of 3 multiplicity including Volvo, Nee Ionian and Season. Political consensus between them with Water Supply Company of Volvo plays an important roles in making any decision on water management, even it may have no consensus by the end. All the possibility should be considered in this case and list advantages and disadvantages of all the preconditions.

For example, by using existing wells or new springs, consumption of ground water would increase. Finally, they decide to use the surface water collected by dams together with existing spring water to cover the need of Volvo. The water supply in this method can meet all the demand including irrigation, on the other hand, that is a sustainable way that can reduce consumption of ground water and recover the aquifer's water table as well. The water quality of the collected surface water is greatly improved than from existing wells.

In this particular case, it is critical to select a sustainable method to solve the water management problem and protect the environment. In addition, we should mainly focus on water demand management instead of supply management because the water resource is limited. Many measures are applied to control water demand and develop in a sustainable way. For instance, a new price policy of water for domestic use can decrease by 20%. All irrigation wells would be shut down and use the collected surface water from dams. Many other measures also are applied to control pumping of ground water.

Comparing to other methods, the cost of water quality management is the least and by this measure, the ground water level would increase and the over-exploited aquifer would be enriched.

2.2 Water management in Singapore

Conditions in Singapore are totally different from those in Volvo. The city area is about 700 km² with a population of 4.4 million people. As shown above, the growth rate of population in Singapore slightly increased from 1980 to 2005. The government estimated that the consumption of clean water for the population is about 1.36 billion liters of water per day. According to the climate data, rainfall is around 2000 mm/year.

It denotes that Soapier is not a water-scarce country. However, the problem in Singapore is that the area of country is limited that the rainfall can not stored effectively, although they import water from the neighbor Malaysia in the price of less than 1 cents per gazillions. In order to improve the quality of the water and increase efficiency of water management, Public Utilities Board was established to manage the entire water cycle in the country. In terms of water supply management, by 1976 it is stipulated that the waste water must be properly treated before discharging into the ocean.

That is an effective method to protect watershed. On the other hand, the efficiency of waste water disposal and reuse is another critical measure to the water supply management. They spent million on desalination plant with a capacity of minion gallons per day. That was a successful measure to increase the water supply. As a result of it, PUB decided to collect, treat and reuse the waste water and now the sewer connection can reach 100% than means all the waste water would fully treated and reused with advanced technology.

The most successful aspect in this case is water demand management in Singapore. There is a dedicate designed tariffs for water from 1997 to 2000. It includes many other fees such as Water Conservation Tax (WAC), Water Borne Fee(WFM) and Sanitary Appliance Fee As shown above, it is the tariffs policy before and on 1 997 on the water consumption. The total price depends on the water consumption per month. For the policy before 1997 if consumption is between the block 1 to 20 Water Conservation Tax would be 0, tariff is accents per and Water Borne Fee is 10.

If consumption is ranged from 20 to 40 tariff would increase to accents per , 15% WAC would applied while water consumption is over 40 the tariff would increase to 117 cents per . However, after 1 997 new policy of tariffs is applied. It is obvious that the tariff, WAC and WBI increased in a large measure. WBI is fixed on 15% and if month consumption is over 40 WAC would be 25% and 121 cents per tariff would applied. By the tariff measure applied above, domestic water consumption decreased gradually from 1997 to 2004.

Actually, government has implemented many other relevant policies to keep equity among citizens especially for the low income people. For example, social financial assistance is applied for the families living in 1 or 2 room flat. It make sure that poor people can receive ore subsidy from governments to cope with the high tariffs contained in the water bills. The high tariff on the over used water consumption is an effective way on water management. On the other hand, there are no subsidy for the commercial and industrial water use. As a result of it, factories are encouraged to use less water to reduce the cost.

Management Of water company is another factor Of its success . There is a common problem in most Asia company that managers often are selected by the political consideration rather than their professional skill. Therefore, they re not able to solve any management problem in different situations.

Definitely, Soapier case is an successful water quality management in the world. Nowadays, all the people in Soapier can access to drinking water and sanitation. They just balance all the consideration such as water quality, water supply and demand, economic factors and external water resources

during the whole process of water quality management. . 3 Water management in Riyadh The city of Riyadh is located in the middle of Arabian Peninsula. Due to the dramatically increase in oil revenue in 1974, the whole country developed rapidly. The population in the Kingdom increase by 300% from 1970 to 2004. For the city Riyadh, the population rise from 20,000 to 4.26 million in 2004. It is transformed from a small city with area less than 1 into a large modern city with area about 1600. The climate there is hot and rainfall is only about mm per year which is extremely low.

The issue in this case is that due to the extremely rapid development both on infrastructure and population, infrastructure and sanitation can hardly cover the demand of population in the city. In addition, the high cost of sanitation services is another problem. Without a proper design and advanced technology, the water leakage during the transportation in the pipe reaches 20%-30% which can be reduced in a large measure and the huge losses of waste water could be treated and reused. Several measures have been taken in this case by 4 different agencies.

First of all, considering the scarcity of water resources, all the agencies plan to use ground water and treat the waste water by desalination and reuse it. Actually, it is estimated that it can cover the 35% needs of the booming population. Secondly, water leakage is a serious problem that needs to be assessed and addressed properly. Thirdly, some regulation such as water tariffs can be made to minimize the waste water. However, the continuing increase of booming population will cause an increase of water demand in the future.

By 2001, a new Ministry was established to manage the water in the Kingdom. It is of an integrated water resources management. Many policy would be applied to protect Water resources. For example, implement a new water tariff, restrict amount and digging of wells and regulate the depth of well to protect ground water. The Ministry has taken many measures to achieve the sustainability of water sources and great water management. They spent 1 Smiling on the improvement of water fixture in families such as taps, showers and toilet.

It is estimated that these measures can decrease the in door waste water consumption by 25%-35%. Many projects like desalination plants, waste water treatment plants are implemented for domestic use.. It should also consider the demands in different period. In period of low water requirement, it is necessary to store the water for drinking or irrigation. It is indeed a challenge for Riyadh city to cover the needs of continuing increasing population. In this situation, it should be mainly focus on water supply management rather than water demand management.

As a result of it, more attention should be paid on water leakage from the neurons. Further more, wastewater needs to be reused after numeral treatment. Ground water is also an option of water resources but it can not be exploited without any regulations. All of these measures is to management water supply and it is aimed to exploit new water resources as water supply. Finally, in practical engineering, all the designed implementation is based on sufficient financial support that ensure the time and success in the whole recess of project. The supervising agency should be applied during implementation. . Conclusion Water quality management is a

complex discipline for human being. There are totally different situation in many countries, according to which it should consider various factors as mentioned on cases above. In Volvo case, the ground water was used for a long time and the ground water table decreased. In order to solve this problem, many method was developed. However, in Volvo there are 3 municipalities that any decision of water management should be made a consensus. It is impossible to conduct the est. design due to the interest balance between them.

In Soapier case, because of the scarcity of water resources, they mainly focus on collecting, treating and reusing waste water with advanced technology in the past decade. It is an innovative approach to develop new water resources. On the other hand, government also play an important roles in management. A well- designed water tariff is applied all over the country while government offers huge subsidy to poor people in terms of month water bill. Actually, it is a totally successful case in the water quality arrangement.