Water shortage solution: saltwater desalination

Environment, Ecology

As a matter of scientific fact, the vast majority of the surface area of our planet is covered in water; ironically enough, however, a great deal of this water cannot be consumed by human beings in its natural state, as it is salt water, which could only be consumed by human beings after undergoing desalination. This is a process through which the ions that make water saline are removed through various means and technologies, chief among them reversed osmosis (RO), thereby making the water suitable for humans to drink.

Desalination is a process that is undertaken in sea or ocean water which by in large contains the most saline of all the water in the world. Desalination is an increasingly popular process, necessitated by shortages in domestic and industrial water supplies. For all of its present day popularity, desalination is not a new concept; rather, it is atechnologythat has been in use since the 18th century in southern Florida, which to this day hosts desalination units.

Currently, this technology is the method of choice for gulf nations that are found within dessert terrains that rarely produce any fresh water supplies for consumption, as evidenced by recent reports showing a major water crisis looming in the horizon. These reports forecast that in the next five years, at least 36 states face substantial water shortages, supported by the shrinking water levels of major dams across the states and the shrinking of the Great lakes. Fresh water sources can no longer stand up or match up with the demand of the constantly increasing population of the US.

This is most acutely felt in marine ecosystems where there is a problem in reducing the levels of salinity and also the brine discharge system, causing

an imbalance in marine ecosystems (Tonner 11). History of Water Shortage All over the world, water that is mainly found in reservoirs like dams, lakes and waterways like rivers is relied heavily upon for replenishment of municipal water supplies; these supplies provide water for both commercial and residential use.

All these are regarded as fresh water sources since the water comes naturally, mostly through rainfall. With the advent of global climatic changes, there has been a decline in the amount of rainfall; the patterns of the rains have become irregular and they rarely conform to expected time frames or the duration. The other factor that has not aided the water shortage debate is the general rise in global temperatures. This has led to increase in the rates of water evaporation from water reservoirs.

Since rainfall in most cases is declining or there is a general atmosphere of drought griping the sphere in general, meaning that the rate of water uptake from the sources (through evaporation and uptake by man) and the rate of replenishment by rain do not match. It is quite obvious that with declining input of water into the reservoirs and the increasing abstraction of water, water levels will keep declining exponentially, creating a huge problem (Tonner). Temperature problems do not end there, because rising sea levels have been occurring through melting of glaciers in the arctic and Antarctica sub-continents.

Increasing water levels serve to push saline water into the underground water supplies, thereby increasing the amount of saline in circulation and decreasing fresh water. With growth in industrialization, enormous

environmental challenges present themselves. Waste products from industries are degrading theenvironmentat an alarming rate, with these waste products usually finding their way into fresh water sources and catchments areas. The end result is unusable water and a host of other problems.

Industries themselves require enormous amount of water to operate and at the same time their effluents also requires a lot of treatment so that it can be discharged into the water ways without modification of the marine and water ecology in general. Population growth and explosion does not lessen the burden therefore it is bringing more troubles. The number of persons globally is increasing but the sources of fresh water are not increasing thereby exerting great pressures on the existing water sources.

Real estate development in general is also a part of the problem, which can be seen in the way many buildings are constructed over water catchments, leaving very little land that can allow percolation of water into the underground aquifer, which encourages the driving of the little available rain water to the ocean in order to avoid flooding. With the advent of these severe climate changes and dry spells, water levels began shrinking at an alarming rate.

This alarmed local authorities, leading them to warn the general public to conserve water and use it wisely. In order to make their pleas to be understood by the public, they resorted to the extreme measure of water rationing. When water rationing started, it was a clear warning; it was then that the general public awoke to the reality that a global crisis was at hand

(Tonner 6). After looking into all viable options of providing water to many thirsty citizens, the only option that guaranteed a steady supply and cheap means was desalination.

This was preferred after looking closely at the cost of infrastructure in terms of pipes and the cost of maintenance of the dams. In the recent times, those centrally placed states that were endowed with large water resources, used to share their water with their unfortunate neighbors in the arid regions of the south west areas. The cost of pumping that water and the maintenance of the complex piping system proved a too much burden to bear and its viability with time almost impossible.

The dwindling resources of water also were not showing sustenance of the venture in the long term. All these when combined, were pointing to desalination as the only viable option and that was current with prevailing economic circumstance. The advancement in the technology and its easy implementation has been one of the motivating factors towards its adoption as a major solution to current crisis of water shortage (Tonner). This process is drought-proof, thereby making it operational all year round, despite the dramatic climatic changes.

All that is necessary is availability of sea water and sufficient power to drive the machines that are involved in this process and which usually require a lot of energy (Tonner 11). Participants in this Venture On the fore front of desalination efforts is the UNEP (United Nations Environmental Program) which is involved with maintaining a clean environment. Support of this venture comes from themotivationof providing water to a thirst planet.

Since this organization is involved with the environment, it is in the organization’s best interest to make sure that all the technologies that are enacted for use in providing essential services will not lead to the biodegrading of the environment and adding of more problems rather than solving the already existing problems. This institution will be involved in putting down the necessary legislation that will act as the guideline when it comes to issues that are pertinent to the environment and its preservation.

Closely following the proceedings and implementation of this program is the Intergovernmental Panel onClimate Change(IPPC) which knows very well the side effects of the climatic change and the need to address the shortage of water around the globe. For the process to gain popularity around the world, IPPC has to do a lot of campaign on the viability of the project and trying to silence the proponents that will argue in the favor of the impacts that the project it would have on the environment and the ecosystem especially the marine ecosystem.

Ocean conservancy is another very instrumental organization that has to be consulted in order to give the project a go head as the proposed project would be drawing its raw material (water) from the ocean, the negative impacts on the ecology and marine organisms notwithstanding. At the top of the list of concerns is whether water is a basic human right or it will be turned into an economic resource, only available to those few members of the society who can afford it (Tonner). The program will see the disruption of the normal saline environment for marine organisms which may lead to loss of endemic species that are unique to that area.

However big the reward of this proposed project is, the negative impacts on other organisms cannot be overlooked because the reality would soon hit home and would therefore end up in creating a bigger problem than the one that is there. The other organizations involved in this venture fully are the Water Management Boards of respective Counties in the individual states. These boards are at the centre ofthe stormsince they must provide water to the thirsty masses. Innovation comes as the core business of the boards in order to look into neo ways of circumventing the problems bedeviling them (Tonner 7).

Resolving the Water Shortage Issue Clearly, as the research has indicated, there is a massive water shortage that will have an increasingly negative effect on the people of the world, especially in light of growing human populations, increased use of water by households and industry, andpollutionwhich is harming the environment and decreasing available water supplies. Therefore, the question of how to resolve the water shortage issue is an increasingly important one to answer. Of course, the water supply on the earth is limited, in both fresh and salt water varieties.

Therefore, the focus in stopping water shortages is to simultaneously make as much fresh and salt water available for both industrial and home users, which is possible through a variety of means (Tonner). First, the fresh water that is available on the planet must be conserved, which can be achieved through several different methods. Conservation starts with every home and business water user; simple steps to avoid wasting water in the first place

will go a long way in terms of reducing the amount of water that literally goes down the drain every day.

This, however, is not enough. In both homes and businesses, it is essential that the equipment that uses water be kept in prime working condition, with broken or inefficient equipment being replaced in favor of equipment that will not waste water. Also, as discussed earlier, there are environmental steps which can be used to prevent the wasting of fresh water, including smart real estate development, the prevention of the pollution of water supplies by individuals and industry, and the like.

All of these steps will in fact help to save fresh water supplies to a large extent. Another water supply which has been discussed in this paper is desalinized salt water which can be used for human consumption once it has been properly prepared via the many desalinization plants that are found across the US today. Since there is vast salt water to be found on earth today, if it is properly desalinized, there is a great deal of available water. Once again, however, this must be conserved for the good of the growing society.

Preserving the Environment In any case, wherever water comes from, the environment must be protected at all costs, for if there is no planet left for people to enjoy, there is little point in trying to do anything with water, as the human race will not be around to reap the benefits of the water itself. This reflects back to the previous discussion in regard to fresh and salt water supplies; there are in fact ways to be able to provide sufficient water supplies without destroying the environment.

This will, of course, require the involvement of international, national, state and local authorities all working together. This is especially important considering the fact that pollution from other parts of the world certainly affects the US, and vice versa. Therefore, the world community must in fact act as a sort of environmental police force so that those who would cause damage to the environment are held accountable, not only for the sake of the planet but also for the sake of the water supplies that are now in the process of being conserved (Tonner).

Overall, what is seen in the relationship between a safe environment and clean water supplies is the fact that neither can exist without the other. If people abuse water supplies, the planet will eventually be unable to sustain human life. On the other hand, if the planet is destroyed, water availability immediately becomes a non-issue. As such, this immediately becomes everyone’s problem, and of course, everyone must play a role in the solution of the problem. These solutions are both big and small, but all important just the same. Conclusion

Water desalination is the only way out for the water crisis that is facing US and the rest of the world at large. However there are underlying issues that need to be addressed before the implementation of national projects. These issues range from environmental to humanhealthissues. Fundamental questions have to be addressed as to why should our solution to the current water problem lie in the seas and oceans whereas there are waivers that are granted according to the clean water act which allows agriculture to continue polluting our water catchments areas with fertilizers.

Before moving our pollution to the ocean, we must address the mess that we have caused on land, as this problem will not go away by itself. The most common excuse that has been circulating around is that cleaning of pollution is very costly and expensive. However this pollution has been caused by man and before handing the mandate of polluting the ocean now to the private sector, first we should deal with the mess on land.