

# Example of report on water provision techniques for arid regions

[Environment](#), [Water](#)



### - Introductory Information

Fresh Water shortage is a serious concern in arid regions of the world which are defined as dry, sandy regions where rainfall is rare and suffers from sparse vegetation and extreme temperatures. With 80% of the arid regions having serious droughts and nearly 40% of the population of this world residing these regions this is a serious issue transpiring (Prudhomme, 2002). High intensity and less rainfall increases crisis of water as wetlands, reservoirs and river get empty. Global warming adds to the uncertainty in these regions over the availability of water in future. It is becoming evident that techniques of water conservation are required in these regions to ensure water requirements of population are met.

### - Background

In arid regions of the world, deteriorating water quantity and scarce water supplies represent grave contemporary concerns for most industries, municipalities, agriculture and the environment. It is becoming essential for invention of technologies which store and provide arid regions with fresh water supply. As per several studies, Water reclamation and Reuse & Solar distiller desalination are two provisions or technologies for fresh water supply in arid regions.

### - Presentation of Options

## **The two important techniques of Water provision in arid regions are:**

### - Solar Distiller Desalination

The first technique of fresh water creation is Solar Distiller desalination which uses fresh water and salty sea water with utilizing sunshine. To be clearer,

this process used solar energy for distilling fresh water from brackish or saline water for the purpose of daily use (Bachir, 2003). Inside a solar distiller, water dislodged in a container evaporates under sunshine with higher temperature compared to ambient heat. It operates under a transparent cover of the distiller with greenhouse effect playing the catalyst role. An addition was made to the system as the distiller works on solar energy and the output changes in the positioning of sun and atmosphere transparency, the system of battery back-up was proposed for installation to ensure continuing power supply for production of fresh water (Dan, 2001).

#### - Water Reclamation and Reuse

Second technique of water provision is water reclamation and reuse for fresh water supply in arid region. The method used for water reclamation and reuse involves using Wastewater and making it reusable for purposes like industrial cooling and agricultural irrigation. This process involves taking waste water and processing it to the level to which it can be reused it purposes other than human consumption. This water is considered suitable for reuse in applications where reused water is used. The process of water reclamation is started with collection of waste water and activation is done through a sludge process which is followed with tertiary treatments which consist of ozonation for odor purpose, medium granular filtering, removal of color and disinfection with chlorine (Asano, 1998). Direct use of water needs piper and other conveyance systems for delivery of reclaimed water for usage purposes. For indirect reuse of water, discharging of sewage for assimilation of water and downstream withdrawal are considered as relevant methods but they are not considered as methods for planned reuse of water

(Metcalf & Eddy, 2003).

#### - Presentation of Requirements

This paper is on the topic of water provision techniques in arid regions. The first section of this paper will discuss this issue and the following section will cover the background of this topic. Third section will discuss the water provision techniques and modes of their operation. The fourth section will compare the methods of water provision on the basis of their output, quality costs of water conservation. The final sections will include the conclusion of the report and recommendations which will help in better water provisions for future generations.

#### - Comparison of Techniques

##### 5. 1 Comparison of Techniques

These techniques can be compared on the basis of quality, output and cost. Solar distiller desalination costs much less than the technique of Water reclamation and reuse due to its lower installation cost. In case of output, water reclamation and reuse is more efficient as the solar distiller depends upon climate and position of sun. The quality of water in case of water reclamation is low as the water can only be used for special purposes on the basis of its quality.

##### 5. 2 Functions of Solar Distiller Desalination

The advantages of solar distiller used for fresh water supply in arid areas are low cost of installation, Independent production of water at usage point and no requirement of maintenance staff and training (Bachir, 2003). There are superiority on the basis of economic feasibility have been figured (Ali, 2001). Usage of solar energy for operation of seawater distillation system in arid

areas is often compared with the traditional methods like usage of fossil fuels. To specify, the water generated with use of solar system has been shown being cheaper than from the water generated from the conventional system where diesel oil is used at rate of \$50/ Giga Joule but it is considered higher than water generated with conventional system and use of diesel oil at lower rate of \$10/ Giga Joule. There are some drawbacks of this technique too such as efficiency is low, problem with salt deposits, corrosion and scale deposits (Bachir, 2003).

### 5. 3 Functions of Water Reclamation and Reuse

There are two main advantages of Water Reclamation and reuse firstly, Effluent after treatment is used as resource for beneficial reasons and Secondly, This Effluent is kept away from lakes, beaches and streams thus ensuring the groundwater and surface water is not polluted (Asano, 1998). Water reclamation and reuse technique serves as viable and unique opportunity for augmentation of conventional water supply. The reuse of water helps bridge the gap between wastewater disposal and water supply. For effective reuse of water, reclaiming functions of water supply and water integrating is needed. For successful development of a water resource which can be depended upon close examining and synthesis of all elements involved like facilities and infrastructure planning, reliability of treatment process, financial and economic analysis, management of water utility and wastewater sitting of treatment plan (Asano, 1998).

## Conclusion

Both the techniques have its advantages and disadvantages. In some cases one technique will be beneficial whereas in some cases might suit the other. Arid regions are perfect for solar desalination technique as they have great potential to generate solar energy. Although, they have low output and require huge land areas for installation purposes. Productivity rate of solar distiller is dependent upon solar radiation and as the water generation capacity increases with increase in solar radiation. Water reclamation and reuse technique benefits only for t needed or special use and it helps in reducing the pollution levels. With combination of these two technologies the problem of fresh water supply to arid regions will be resolved. The quality and output of water supply needs to be aided in case of solar distiller desalination technique and the reclaimed water's quality has to be good enough for usage in purposes of industrial cooling and irrigation.

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