

Experimental Studies on Active and Passive Solar Stills for High Yield

The necessity of fresh water is growing exponentially in industrial as well as domestic sector, resulting in more contamination of natural water resources and creating a shortage of drinking water. Additionally, the numbers of parched and desert regions on the world map which already face the lack of rainfalls and ground water. The problem is substantially increased as most of the water bodies like rivers, lakes are saline and brackish which are not suitable for drinking purpose. In recent past, solar desalination has been found to be a sustainable and cost-effective way of generating the fresh water to supply the need of drinking water at large. The combination of photovoltaic (PV) technology and solar thermal technology has been a very appealing option for developers and researchers. Desalination is widely adopted in Middle east, Arab countries, North America, Asia, Europe, Africa, Central America, South America and Australia to meet their fresh water and process water demands.

In this desalination, the productivity is influenced by the temperature difference between condensing and evaporating areas. Previous researches determined that increasing the difference between water–glass temperatures enhances the daily productivity of solar stills (active and passive). To maintain this temperature difference high, fans, condensers, storing materials, reflectors, and the glass cover cooling were utilized. Continuous supply of air or water film over the glass cover leads to diminish the temperature of glass. Also, various storage materials such as phase change materials (PCM), thermal energy storage materials (TESM) were incorporated in still basin for creating huge temperature difference and thereby to yield high distillate.

. Now, my work is to analyze the existing investigate active and passive solar stills, and also to develop, investigate new active and passive solar stills for better performance in terms of fresh water production and thereby increasing the overall efficiency.

Candidate Signature