



Economical evaluation of Solar Distillation Practice for Water Desalination Systems

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Abstract

People can survive for days, weeks or months without food, but cannot live for more than a week without water. The body uses water for digestion, absorption, circulation, transporting. Within a generation from today, the world's population will go up to an estimated 8 billion people and the amount of water will remain the same or may be less therefore it needs a great challenge. Solar stills are typically most appropriate in hot climates and also where the total water need is 3 m³/day or less. Conditions that favor the use of solar stills are as follows: 1. Salt water available, other sources fully exploited. 2. Total water need is less than a few m³/day. 3. Hot climate (plentiful sunlight). A solar still has also some difficulties, which sometimes limit the use of this technique for large-scale production: 1. large solar collection area requirements. 2. High capital cost. 3. Vulnerability to weather-related damage. To invest in a solar distillation unit, we should understand the economic payback and cost per liter on the investment, even if there may be strong non-economic (e.g. environmental) factors driving the purchase decision. It is important to note that the cost of distilled water per unit volume obtained from solar distillation is cheaper for the water requirement of capacity less than 1 m³ per day. The cost of distilled water per unit volume is further reduced by having rainwater- harvesting arrangement integrated with solar still.

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