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PRODUCTIVITY ENHANCEMENT OF STEPPED SOLAR STILL - PERFORMANCE ANALYSIS

ABSTRACT

Maintaining minimum depth in conventional basin type solar still is difficult, as the area is large. However this can be achieved in stepped solar still in which the area of the basin is minimized by having small trays. Very few works have been carried so far in stepped solar still and constant depth trays are used in the basin plate. In this work, a stepped still with two different depth of trays are used. The basin plate contains twenty five trays with 10 mm depth and twenty five trays with 5 mm depth. To improve the productivity, experiments were carried out by integrating small fins in basin plate and adding sponges in the trays. Theoretical and experimental analyses are made for fin type, sponge type, and combination of fin and sponge type stepped solar still. When the fin and sponge type stepped solar is used, the average daily water production has been found to be 80% higher than ordinary single basin solar still. The theoretical results agree well with the experimental. Also an economic analysis was made. The payback period of this setup is 400 days.

KEYWORDS

stepped solar still, productivity enhancement, sponge, fins

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