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Pankaj Dumka, Dhananjay R. Mishra



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# Experimental investigation of Modified Single Slope Solar Still Integrated with Earth (I) & (II): Energy and exergy analysis

Pankaj Dumka, Dhananjay R. Mishra\*

*Department of Mechanical Engineering, Jaypee University of Engineering and Technology,  
A.B. Road, Guna - 473226, Madhya Pradesh (India).*

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## Abstract

In this article, an attempt has been made to examine the experimental and theoretical results of two newly developed Modified single slope solar stills integrated with earth (MSSIE) viz. MSSIE(I) and MSSIE(II), using Dunkle, Kumar & Tiwari, Clark, modified Spalding's mass transfer theory and Tsilingiris models. In MSSIE(II) the polythene covering has substantially elevated the energy of nearby ground which results in 11.2% higher distillate yield than MSSIE(I). Kumar & Tiwari model gives good agreement with the results obtained from the experimentation. It has deviation of 3.53 and 4.03% for MSSIE(I) and MSSIE(II) respectively. Total internal and exergy efficiency (Kumar & Tiwari model) of MSSIE(II) leads by 5.06 and 76.64% as compared to MSSIE(I) respectively. Maximum exergy destruction has been recorded in the basin area. MSSIE(II) shows a reduction of 2.96% in exergy destruction as comparison to MSSIE(I). From experimental and theoretical results it has been observed that, the proposed model (MSSIE(II)) maintain its lead throughout the experimentation and hence can be a good option for potable water production in coastal areas.

*Keywords:* Desalination, Earth solar still, Exergy analysis, Passive solar still

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\*Corresponding author

*Email address:* dhananjay.mishra@juet.ac.in (Dhananjay R. Mishra)

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