

## **A Modified Solar Distillation Unit for Drinking Water Production from Saline Water**

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### **Abstract**

An experiment was carried out to increase the efficiency of the existing solar distillation unit constructed by the National Engineering Research and Development (NERD) center Sri Lanka by incorporating a sand layer for heat retention. The sand layer, due to its high thermal capacity has increased water distillation rate by 30% even though the internal temperatures of the both systems did not differ significantly. Average daily production of the solar distillation system constructed by the NERD center was 1557ml/m<sup>2</sup>/day in Mapalana (6°3'39"N 80°33' 57"E). Insertion of the sand layer to the bottom of the evaporation pan helped to increase the average production of water up to 2017.50ml/m<sup>2</sup>/day, with a recorded maximum of 2150ml/m<sup>2</sup>/day and 2780ml/m<sup>2</sup>/day in the existing and the modified distillers respectively. The average inner temperatures of available and modified solar distillers were 55.88<sup>0</sup>C and 56.54<sup>0</sup>C respectively when the average ambient temperature was 29.02<sup>0</sup>C. Evaporation of more water from the modified solar distiller was the reason for insignificant temperature differences between two solar distillers. The difference between the lowest and highest production of modified and existing distillers recorded as 270ml/m<sup>2</sup>/day and 685ml/m<sup>2</sup>/day in Mapalana.

**Keywords:** solar distillation, thermal capacity, water