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# Double slope solar distiller with PCM and nanofluid a future scope

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## Abstract

Fresh water drinking demands raising in the model life styles because of increased the domestic applications. Solar energy technique based desalination is practically apply for the above mentioned problem. Peoples are suffering in the rural areas for water and electricity. Our Double slope solar distiller is improve the performance through phase change materials and nanofluids. Its useful for the global challenge to achieve the purify water this chapter gives the ideas its leads to the future possibilities.

## Introduction

Rajamanickam and Ragupathy [1]. The double slope distiller achieved maximum daily productivity around 3.07 Litre/$m^2$ day aquatic deepness for 0.01m. Also impact of water movement amount mass transfer as everyday efficiency on cascaded solar distiller produced as Tabrizi et al [2]. The total purified yield was 4.30 and 7.50 kg.$m^2$.day, maximum, least movement taxes, individually. On the other hand, researchers by nanoparticles have used ameliorate performance desalination system. Sahota and Tiwari [3] investigate the special effects of $Al_2O_3$ nanoparticle at different concentration (0.04%, 0.08% and 0.12%) in Passive double slope solar stiller. The effects of 0.12% $Al_2O_3$ nanoparticle concentration achieved the protectivity of 35kg (12.2%) and 80kg (8.4%). Madhu et al[4] use $Al_2O_3$ , CuO and $TiO_2$ nanoparticles in a stepped solar still varied the concentration from m 0.05 to 0.2%. Compared to another nanomaterial $Al_2O_3$ (0.2%) improves the stepped solar still performance up to 67% Kabeel et al. [5] have investigated the result of using of cuprous oxide ratio various upto (10% to 40%) mixed with black coat and examine thermal performance of the solar distiller. Due to the nanoparticle concentration enhance heat transfer rate and attain distillate efficiency 25% for the concentration of 40% cuprous oxide.

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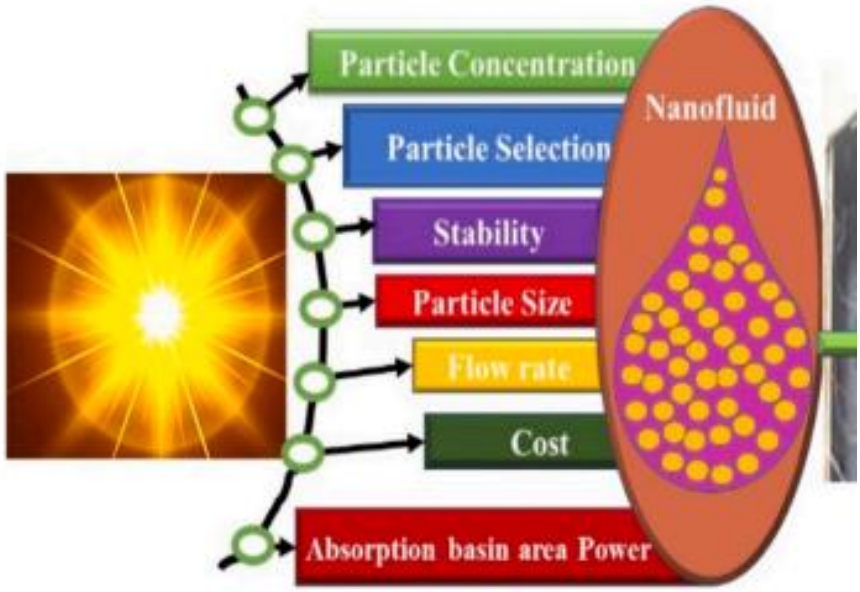


**Fig.1 Review based material and properties**

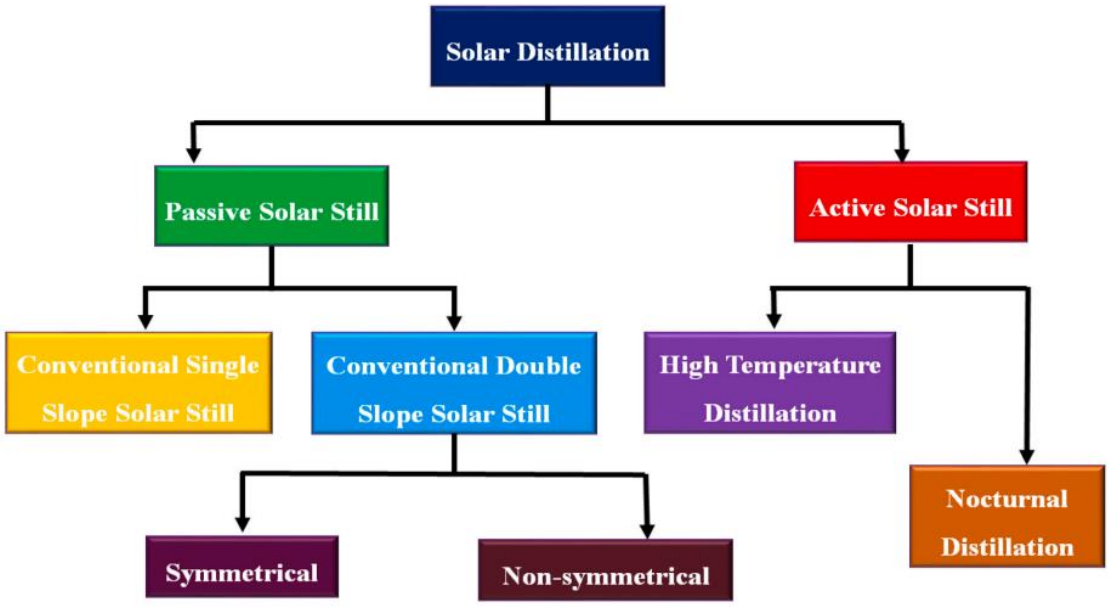


**Fig.2 Classification - Solar distiller**

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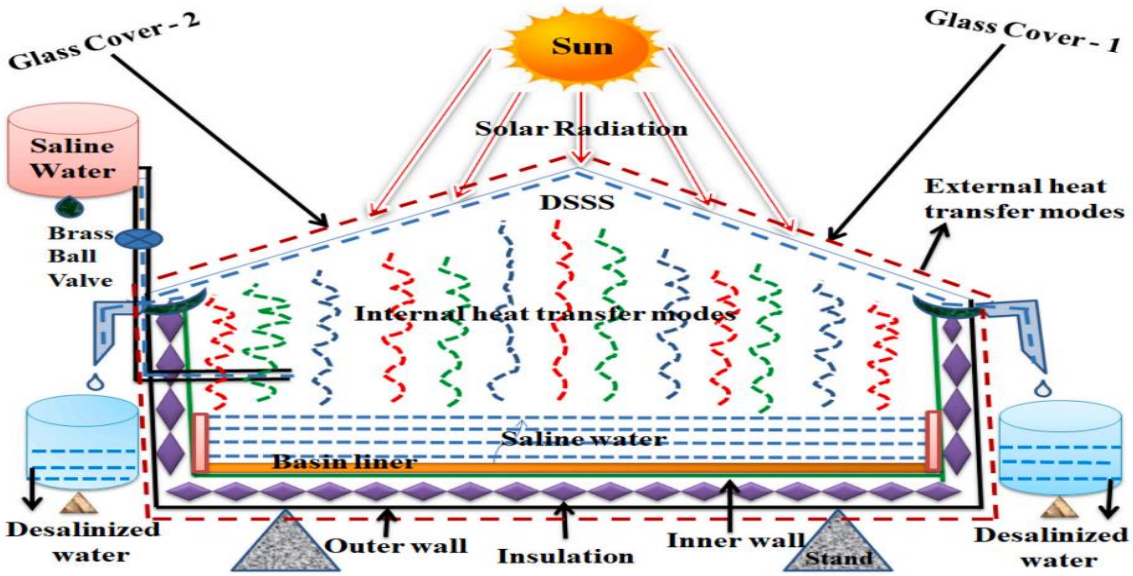


**Fig. 3 Schematic (DSSS) diagram**

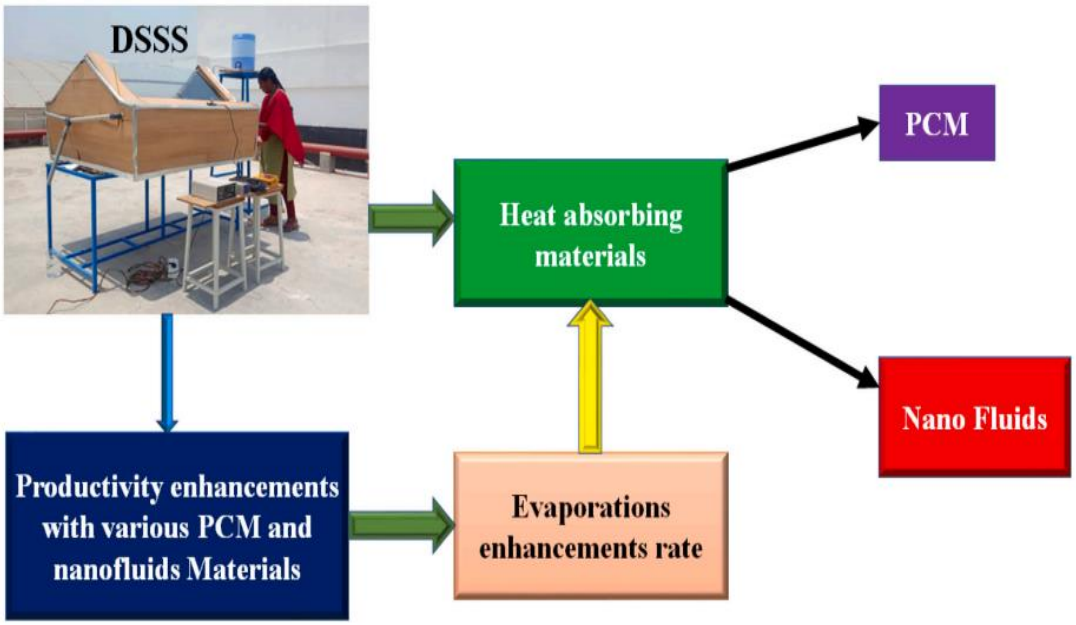


**Fig. 4 Productivity enhancement through PCM & nanofluid**

**Table 1:**

| S.No | Author | work done | Results |
|---|---|---|---|

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| | | | |
|---|---|---|---|
| 1 | Rajamanickam et al | DSSS Used charcoal | Thermal efficiency(49.47 %) and distillate yield(3025 ml/ day) at a water depth 0.01 m |
| 2 | Shanmugan and Krishnamoorthi | Honeycomb (transparent) type structure | Productivity increased by 30 % compared with conventional DSSS |
| 3 | Kalidasa Murugavel | DSSS (different absorbing materials) | Thermal performance increased by 52 % |
| 4. | Tabrizi &Sharak | Heat reservoir integrated with DSSS | Productivity of DSSS (3.89 L/m2 ) |
| 5 | Gajendra Singh et al. | DSSS- PVT | Distillate output 17.5 % increased |
| 6 | Tuly et al. | Paraffin Wax used in DSSS | Minimizes the heat losses and increases the productivity |

## Conclusion

The DUSS outperformed the CDUSS by 64% with a total distillate output of 14.92 l/$m^2$ day and an average efficiency of 38.73%. With more investigation, glass may be replaced with other materials without sacrificing performance. In comparison to the DUSS coated just with BP, the BP-coated DUSS has the maximum BPACNP loading (20 wt%), an all-day average USB temperature of 15.8%, and a mass output of 16.91%. At 1 p.m., when the system's entropy changed more significantly, the maximum instantaneous efficiency of 58.98% was attained.

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