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SINGLE BASIN SOLAR STILL USING DIFFERENT ABSORBING MATERIAL PART: A REVIEW

Kumar Viswajeet
Department of Mechanical
Arya Institute of Eng. & Technology
Jaipur, Rajasthan, India

Bharat Kumar Yadav
Department of Mechanical
Arya Institute of Eng. & Technology
Jaipur, Rajasthan, India

Pankaj Kumar
Assistant professor
Arya Institute of Eng. & Technology
Jaipur, Rajasthan, India

***ABSTRACT*– Single basin solar stills are used for Water purification. It's the best solution for water purification. It is used where the water is unavailable. The amount of distilled water produced by solar still is very low. The purpose is to study the different absorbing material for solar still to increase the productivity of the solar still. There is some example of material which can be used as an absorbing material for solar still. Using black rubber mat will increase the daily water productivity about 38%, using black ink can increased up to 45%, and black dye can increase up to 60% which is the best choice for increasing the productivity. [2][3][3][4]**

I. INTRODUCTION

Solar still can be used for production of fresh portable water. According to Howe a person per day consumption of water is 400 litters, a small community or a group of peoples of approximate 200 people can benefit more from solar still than transporting water from another place about 33%.
Solar still consist of many parts like transparent cover, solar radiations first come to the transparent cover, then it consists bottom which consist of absorbing material and one inlet for saline water and outlet for distilled water.
There are various types of solar stills, usually they have single or double slope solar collectors. In either case they absorb solar radiation through the transparent cover, usually made of glass, which is then transmitted to water. And the production rate can be varied with the design and location of solar still. The most common study about the solar still, is the productivity of water, which can be increased by changing the absorbing material of solar still.

II. EXPERIMENTAL

The experimental set up used in the study is show below, it consists of a single-basin solar still with an effective area of 3 m^2, made of stainless steel. A glass cover was placed on a galvanized iron frame, in a tilted angle of 25 °. The entire assembly was made air tight with the help of a rubber gasket. 120 L of water was used for each run. Mainly, three types of different materials were considered. These materials were black absorbing rubber mat, black ink-in-water solution, and black dye-in-water solution. They were compared to the condition where solar distillation was carried out when no absorbing material was used with water.

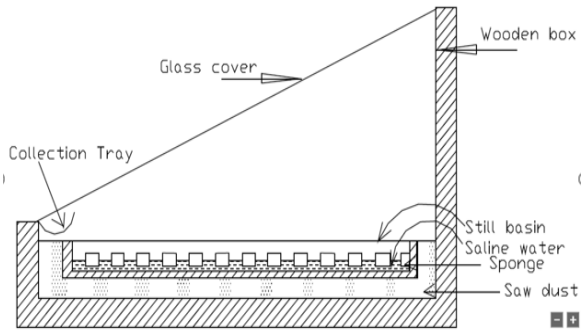

Fig1 single basin system

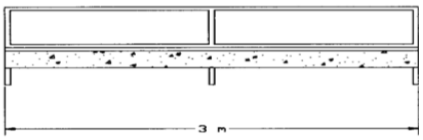

Figure 2 experimental setup [2]

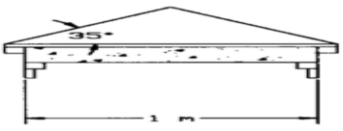

Figure 3 experimental setup [3]

III. RESULT

The production rate of the solar still will increase if we change the absorbing material. And black die is the best absorbing

material for greater production. And low production if we only used the water alone without using any absorbing material. [3]

The second method for increasing productivity is by using of extended surfaces of different shapes.

IV. REASEARCH PROGRESS

a. Wassouf et.al (2011) designed & constructed a low cost and light weight in combination of pyramidal and rectangular prism shaped solar still made of polyvinyl chloride material. Pyramidal still shows better efficiency than triangular prism solar still.
b. Taamneh and Taamneh (2012) Experimentally investigated the effect of forced convention on the performance of pyramids shaped solar still. A fan was mounted on one side of the glass for circulating the air inside the solar still. It increases the distillate output up to 25% with its cost-effective modification.

Ayoub et al. (2013,2015) modifies a conventional solar still design by introducing a hollow rotating cylinder or drum. It was cost effective and efficient design with an increase of more than 200% in productivity. Brine depth was observed to be an important factor, while the air cover the air Colling showed minimal effect on the performance of modified still solar. Water cover cooling could be tasted with the proposed still for better result.

V. SCOPE AND FUTURE IMPROVEMENT

As we know solar is the renewable source of energy and fresh water is most important for our day to day life.so by this point of view to make potable water from contaminated water utilizing abundantly and freely available solar energy. Due to various harmful effect of impure water and energy scarcity, there is an urgent need to make pure water. From the future perspective of utilizing renewable energy and providing clean water to mankind.

VI. CONCLUSION

Water productivity in a single basin solar still can be increased with the presence of some absorbing materials such as dyes, ink, and rubber mat. Increasing the productivity of water would reduce the effective insulation area of a solar still. Though the passive solar still are simple in design, fabrication and have low water production cost yet it has not been fully commercialized due to its low efficiency and productivity. Therefore more effort is required for the improvement in its existing design and to increase its performance to make this eco-friendly technique and more useful for human being.

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