

# Experimentation and Performance Analysis of Single Slope Single Channeled basin Solar Still

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**Abstract**— Sunlight based desalination is the easiest strategy for creating consumable water from harsh water. Desalination through sun based still is the helpful strategy for delivering consumable water. A few techniques had been actualized to build the productivity of the sunlight based still. This task examines about the new strategy for sun oriented desalination utilizing layered bowl. Preferences of this gadget are simplicity of creation from locally accessible materials, low and shoddy support and no gifted work required the present thought manages improvement of water efficiency acquired by changing the outline of the inward bowl of sun oriented still. The surface range of the internal bowl is expanded by making groove inside the bowl, as the crease builds, the surface zone build, which offers ascend to efficiency by tremendous vanishing of water. The entire setup is mounted at the scope of the workplace is the one of a kind component of this trial setup. The rate increment in water creation is contrasted and the current readings.

**Key words:** Solar Desalination, Evaporation, channeled Basin, Minimum Cost

## I. INTRODUCTION

Water is one among the five components of Earth which guarantees life. In our planet one fourth of the earth comprise of area surface remaining comprise of water. In the aggregate creation of water as for world situation around 90% is ocean water while just 3% is suitable for human use including farming interest. Notwithstanding that now days because of some man made impact like deforestation, globalization, urbanization the ground water level is diminished. The interest on new water expands step by step. To defeat this abnormal state request we have to actualize some successful water cleaning strategy. For this desalination is the best strategy to sanitize the water. There are numerous strategies accessible in the desalination process. Desalination procedure is done in numerous strategies, for example, single incline single bowl, twofold slant single bowl and twofold slant twofold bowl. On looking at this above strategies there is preference of arriving best strategy to build the proficiency. Any technique actualized, which has great monetary reasonability on its creation, operation and upkeep suits better to the interest of the general public.

The principle topic of our exploration is to change over harsh water like ocean water into crisp water. To achieve this, there are a few ideas were taken after. Single Slope, Double Slope desalination is more regular among them. Keeping in mind the end goal to enhance the amount and quality (pH esteem, taste, scent) of the water delivered different strategy for execution is considered. Preheating of water, including of warmth stockpiling components and including of impetuses are the different strategies. To acquire a conclusion on best water yielding approach

different relative studies on various direct in twofold is concentrated on.

Sun based desalination has turned out to be more prevalent as of late, especially in country ranges. It is a basic innovation and more conservative than the other accessible strategies. A sun powered still works like the common hydrological cycle of vanishing and buildup yet the technique happens in a little shut framework. The sunlight based vitality achieves the water in the bowl through a slanted straightforward spread. The water is warmed and afterward dissipates and gathers on the internal surface of the straightforward spread. The dissipated water leaves all defiles and organisms in the bowl and is gathered in a different holder. Numerous sort of sun based still have been created in ahead of schedule days. To consider the current framework the single incline single bowl sun powered still is the least difficult gadget which is in straightforward in development, simple to manufacture and minimal effort material is utilized. The fundamental point of preference of this framework is high measure of warm conductivity. The primary downside of this framework is low yielding which reliant on the season, the district and the force of sun based radiation. So we can beat this disadvantage by actualizing another and successful technique on the single incline sun based still.

## II. MATERIALS AND METHODS

The investigation of writing study is to expand the vanishing of the still water to build yield of the immaculate water. So to achieve this we build the channel bowl water temperature utilizing sunlight based vitality through pre warming. Additionally to build the dissipation we set the bowl water in 18° slant which expands the water temperature. To expand the channel bowl water temperature there are numerous strategies accessible. Utilizing sun powered water radiator, allegorical concentrator, skimming plates (aluminum, copper), level plate authority are the accessible strategy to enhance the bay bowl water temperature.

The objective of the present studies are

- 1) To set the basin water in 18° inclination with this we can improve the evaporation of basin water
- 2) Increasing inlet basin water temperature.
- 3) Increasing the inner area of the basin without changing the outer area of the basin.

The saline water. The bowl is shaded with Black which is utilized to retain the sun beams. At that point at long last the straightforward glass is utilized to cover the still which is utilized to gather the

## III. EXPERIMENTAL SETUP AND OBSERVATIONS

A straightforward desalination unit comprise of wood or composite material which is having great protection property, bowl, and straightforward glass. The wood is

utilized to manufacture the external shell of still. Furthermore, the bowl is utilized to keep dissipated water. In the middle of the bowl and the external shell the protecting material set to maintain a strategic distance from the warm vitality misfortune.

The typical single bowl single incline sunlight based still is having ordinary bowl which is set in parallel to the surface. The typical still just the glass spread is set in 18° slant. Yet, here we utilize wooden external shell, straightforward glass spread and the layered bowl which is utilized to keep up the saline water in 18° slant. Here we can set the aggregate setup in the slant point of neighborhood environment. The measurement of the present trial setup is 60cm×90cm in external bowl and 60cm×100cm in inward bowl, the external covering glass of size 52cm×104cm and the length of the external shell is 106cm and breath is 55cm and the thickness is 10cm, additionally here we can utilize 3mm Thermocol protection is utilized between the bowl and external shell. The addition of internal region of the bowl builds the dissipation rate of the saline water. Additionally the bowl slant is to expand the sunrays assimilation. Because of this sun beams assimilation is likewise build the temperature of the water. The evaporative heat transfer rate of a single slope solar still is given by

$$q_{ew} = h_{ew}(T_w - T_{ci})$$

Then the hourly yield can be found as

$$\dot{m} = \dot{q}_{ew} \times 3600L$$

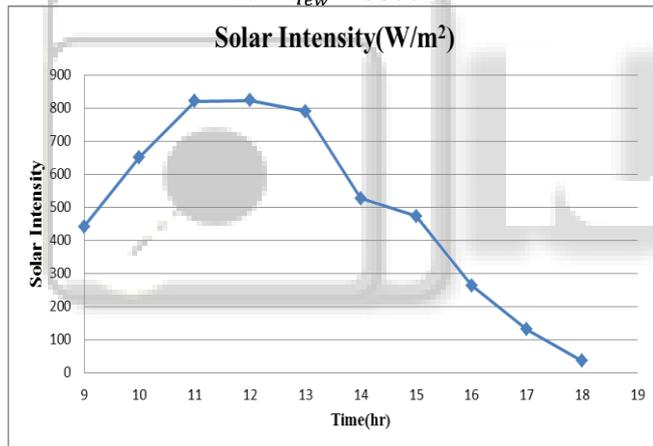


Fig. 1: Solar Intensity vs. Time

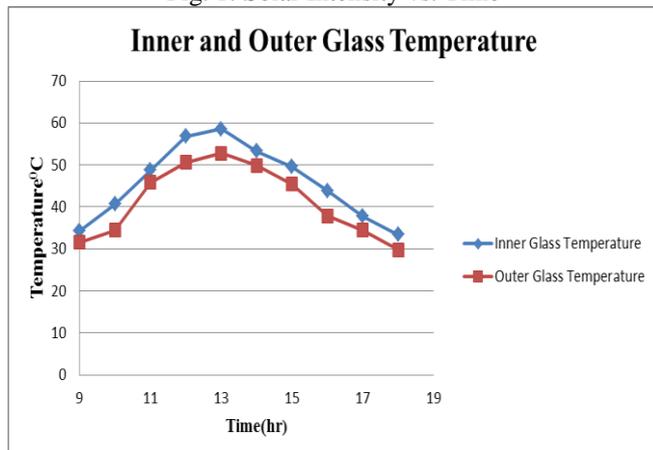


Fig. 2: Inner and Outer Glass Temperature with respect to time

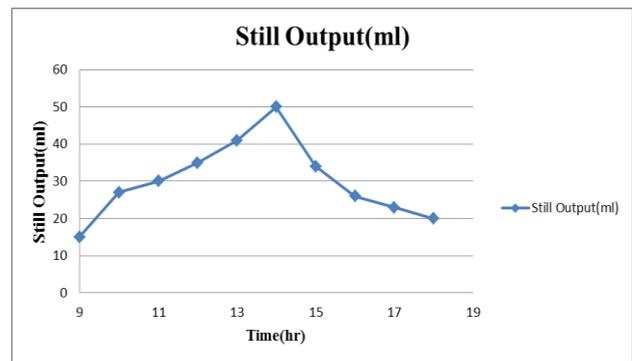


Fig. 3: Still Output vs. Time

#### IV. RESULTS AND DISCUSSION

The experimental model for the current test setup i.e. Single incline sun powered as yet utilizing with folded bowl has been produced from Twari et.al. The yield of the setup which is the amount of water for 60 minutes is observed to be the measure of water gathered from consolidating spread. The graphical representation of variety of temperature with time and relative chart on hypothetical and exploratory information has appeared in figure.

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