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Factors Affecting the Performance of Solar Still

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ABSTRACT: The global demand for potable water is increasing due to industrial growth, population and agriculture, resulting in water leaks that have already reached critical levels in many parts of the world. To overcome this problem, there is a need for more unsupported sources of water purification. Solar is still an important tool that can be used to purify salt and salt water for drinking purposes. In this article, a review of the factors affecting sustainable solar production (weather conditions, performance and design parameters) A simple device used to obtain fresh water from salt water using the process of solar heating is still known as solar. The simple sun still gives out 3 to 5 liters per square foot per day during bright sunny hours. So much research is being done by scientists and researchers to improve the performance of the sun still by examining various design parameters (water depth, coverage, durability and inclination, type of sun), climate parameters (wind speed, temperature, solar radiation), operating parameters. Water salts affect the level of solar production still.
In this review paper we have made an effort on climate and the performance of boundaries that affect the performance of solar still.

Keywords: Global demand of water, solar still, Climatic factors, effect on productivity

I INTRODUCTION:

The demand for drinking water in the world is growing and providing safe drinking water is a daunting task [1]. Improving efficiency and water purification technology to produce clean water and protect the environment in a sustainable manner is considered a major challenge of the 21st century [2]. In salt extraction technology the salty water is eliminated by the use of solar energy and the steam is collected and condensed as a desired product.

Demand for clean water for domestic use has skyrocketed, especially in some areas of water shortages in remote, remote, remote areas, islands, arid areas, or areas with polluted water and salt resources. Therefore, the development and production of water extraction equipment from alkaline, chemical or saline water sources thus providing clean water to people in the affected areas is a serious problem in many countries that shortages of clean water occur occasionally or permanently. Water is a basic human need for life on earth. The water available in the world is high compared to the surface. Most water is saline

Indian water is found in the sea. A small amount of clean water is available in the form of rivers, lakes etc. And there is rapid industrial growth, population growth, agricultural production and much more public demand for clean drinking water. Many diseases in men wake up from drinking unclean water. Due to the declining supply of fresh water and the rapid increase in demand for clean water it is necessary to obtain clean water from wastewater. This aspect of solar heating is one of the most important ways to get clean water from unsafe water with the help of solar radiation and the tool needed to make this process known as solar still.

There are many factors that affect the production of the sun still such as solar radiation, wind speed, natural temperature, hole location and depth of water, inlet temperature, inclination of glass, temperature between water and glass etc. Solar radiation, wind speed, and natural temperatures are uncontrollable as are metrology elements. Other parameters can vary to improve solar production even now

II FACTORS AFFECTING THE PERFORMANCE OF SOLAR STILL

Distillate emissions depend on whether parameters such as solar radiation, wind speed, temperature, etc. Also with design parameters such as brine depth, separation, coverage and size, the tendency of glass cover and performance parameters such as feed water temperature, water salt affecting solar crop still. Therefore the main purpose of this review paper is to reflect the research done on the different designs, weather and performance affecting the solar still.

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Glass–water temperature difference

Increasing the temperature difference between the glass cover and the bowl water leads to an increase in the natural circulation of air weight within the solar system. Increases evaporation and heat transfer from water in a bowl to a glass cover. The temperature difference between the glass cover and the water is considered to be the driving force of the reduction process. Increasing the temperature difference between the glass and water cover can be achieved by using regenerative power still [3], with double mirrors [4,5] and a triple bar still [5].

Free surface area and deepness of water

The rate at which water evaporates from the sun is still directly proportional to the level of the exposed water. As a result, increasing the surface free of water in the well improves solar energy production. To achieve this, a sponge is used in bath water [6]. The depth of the water in the pond has a significant impact on the production of the basin, as the depth of the water is proportional to the static production [7 - 10]. It has been found that at lower water depths, the product is more accessible. If a little sun depth is still maintained, a dry area will occur. For this reason maintaining a small depth in the sun is still considered very difficult. The Wick stills type of solar, tramples solar and purified plastic water. The effect of different sun depths is still being developed by Caliph and Hamood [11]. The worst case scenario for the operation of shallow solar panels was reported by Porta et al. [12].

Inlet water temperature

The temperature of the salt water controls the evaporation rate as this increase increases with the increase in the temperature of the untreated water. Parabolic concentrators, a collector of plates, a small solar pool connected to the sun still continues to increase its temperature. Extensive energy may be needed to increase the temperature of all stagnant solar water. The evaporation rate is directly proportional to the temperature of the waterless zone. Therefore, we can use temporarily suspended mitigation strips to enlarge the water-free area [13]. The amount of condensed water depends largely on the temperature difference between the glass cover and the water style and the temperature varied. And increasing the temperature difference between the glass and brine cover causes an increase in production [14 - 19]. While the temperature difference increased from 6 ° C to 11 ° C, production increased from 0.1 kg / m2 / h to 0.85 kg / m2 / h. With a similar temperature difference of 10 ° C, a product of 0.8 kg / m2 / h was obtained when the brine temperature was 70 ° C, and the product was reduced to 0.1 kg / m2 / h when the brine temperature it starts at 30 ° C [20].

Environmental air temperature

The effects of environmental factors vary according to the opinions of different researchers. Voropoulos et al. [21] reported that productive production was achieved by reducing environmental air temperatures. Badran [22] and El-Sebaii [23] improved the product by increasing the wind speed but Nafey et al. [24] reported that the high-yielding product was exposed to low-speed wind. The cause of this variation may be that the reduction of air temperature in the environment or an increase in wind speed leads to a higher temperature difference between the glass and brine cover. In addition, the heat loss around it increases. As a result, lowering the air temperature in the environment has a positive effect on production, while increasing the wind speed has a negative effect. The results showed that a very small 3% increase in solar station performance was due to a natural temperature of 5 ° C [25]. Also, this was supported by Al-Hinai et al. [26] reported that an increase in environmental air temperature by 10 ° C improved output by 8.2%.

Angle, thickness and material for glass cover

Singh and Tiwari [27] reported that the annual solar yield was still at its peak when the sloping glass slope was proportional to the width of the area. In India, Kumar et al conducted a similar study at (latitude 28.36 ° N) [28]. According to their numerical analysis, the best performance can be made from the slope of the 15 ° glass slope. Akash et al. [29] found that a 35 ° angle of inclination led to a high yield in May. In Jordan, Caliph and Hamood conducted experiments at (latitude 31.57 ° N) and investigated the effects of solar thermal activity. It has been found that tilting the covers alone can change output by about 63% [30]. Heat transfer through the glass cover improved when its temperature decreased and the thermal conductivity increased. Experimental results have shown that solar yields are still 16.5% improved with a 3 mm glass cover than 6 mm thick [4]. The choice of material for solar panels is very important; the cover can be made of plastic or glass. Glass is preferred because of its large exposure to the sun at various angles and its long-term use, and plastic (such as polyethylene) can be used for temporary use.

Wind velocity

The temperature of the cover is affected by the speed of the air. The high wind speed creates

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an increase in the transfer of the corresponding heat from the cover to the atmosphere due to the increase in the uniform transfer of the corresponding heat between the cover and the air. This effect increases water uptake, condensation levels and continuous yields [3,31]. However, it was found that total yield was reduced by 13% when wind speeds increased from 1 to 9 m / s [25].

Insulation solar still

Significance and thickness of insulation [32 - 34] are important in solar still. Al-Karaghouli and Alnaser [32] reported that the monthly average released in June was 2.46 kg / m2 / d of unplanned area and; was 2.84 kg / m2 / d of compact brick. Khalifa and Hamood [34] suggested that an 80% increase in production could be achieved by choosing the right partition.

Area of basin and depth of water

The evaporation rate of the sun is still exactly the same as that of the solar system, while the water depth is about the same as the evaporation rate. The effect of different sun depths is still being developed by Caliph and Hamood and concluded that the product has reached a much lower depth. [35 - 39]

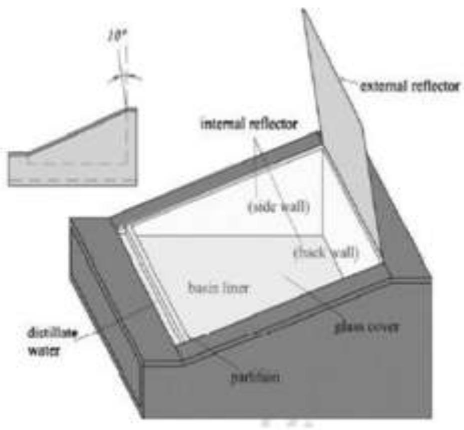

Fig No 01 Solar still with external mirror

Inlet water temperature

An increase in the temperature of the water in the sun still increases the evaporation rate. Parabolic concentrators, flat plate collectors, small solar pools, extruded tubes combined with ordinary sun are still used to increase the temperature of incoming water.

Glass cover inclination and thickness

Singh and Tiwari [40] concluded that solar production was still high when the propensity for glass was proportional to the width of the space. India Kumar et al. [41] conducted a study in the range 28.360N and concluded that the current efficiency is greater than 150.Kashetal [42] found that the yield of the sun was still high at 350 per cent of the glass in the month of May. Jordan, Caliph and Hamood conducted experiments on the sun at (latitude 31.570N) and investigated the effect of tilting cover on the still active solar and concluded that the tilt cover changed the effect by 63% [43].

Temperature gradient between water and glass

Increased temperature fluctuations between the glass cover and the bowl water lead to an increase in evaporation and thickening within the still sun, this temperature gradient acts as a magnetic field. Increased temperature fluctuations between the glass cover and the water can be achieved by using still solar energy [3], which still has double mirrors [44,45]

III CONCLUSIONS:

Major factors affecting solar production still Key factors affecting solar production still by solar energy, wind speed, ambient temperature, the difference between water and glass temperature, water depth, inlet temperature, planetary melting point and angle glass cover. Metrological parameters such as solar intensity, wind speed and environmental temperature cannot be controlled.

It also analyzes factors affecting the current distillate outflow, including natural materials (external or natural) and structural and functional (independent) materials

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