THERMAL PERFORMANCE AND ECONOMIC FEASIBILITY ANALYSIS OF A BASIN TYPE SOLAR STILL

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ABSTRACT :

With the increased awareness about global warming and environmental constraints it is becoming imperative to use alternative energy sources. Solar energy is one such low grade energy which can be used to save high grade energy. There are many areas where solar energy can be used. Distillation of water using solar still is one such area. By using solar still, the initial investment is low but maintainance is much more difficult as compared to other conventional method where electricity is used for distillation of water.

In the present work variation of, thermal losses and temperature of water, ambient air and basin plate is observed with time. The variation of solar radiation is also observed for a day. In second part previous parameters of a financial analysis of the solar still has been carried out taking the initial capital investment, maintainance cost and distillate output over the life period of the solar still at Pantnagar.

The cost of distillate output per liter during first year is found to be Rs. 0.98, it decreases year by year and it's value for the fifteenth year is Rs. 0.38. A comparison of the cost has been made with electrical distillation unit in which disillate output cost (considering operating cost i.e. electricity bill only) is coming to be Rs. 5.16 per liter of distillate output. Thus, the pay-back period of solar still when compared with electrical distillation unit is coming two years only.

Keywords: global warming, solar energy, solar still, distillation, basin.