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Drinking Water Engineering and Science Discussions

Interactive comment on "Optimization analysis of active solar still using design of experiment method" *by* Mohammad Omar Abu Abbas et al.

Mohammad Omar Abu Abbas et al.

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Dear Referee, Thanks for considering my article for possible publication in your journal. I would like to thank all the effort made by you and your staff and the referee's thoughtful comments. A revised version was prepared considering all issues that have been raised by the reviewer. kindly find the updated file attachment below.

(1) In the Abstract, the last sentence Line 40 is not clear which parameter is the most influences for the saline water temperature and the condenser cover temperature. This sentence should be rephrased. Author Response: It has been reviewed and modified.

(2) In the Nomenclatures: # Linees 57 and 58, the symbol (Qcb-w) is repeated two times. Author Response It has been reviewed and modified. # Line 59, to is missed.

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Author Response It has been reviewed and modified. # Line 62, Ski is English mistake. Author Response It has been reviewed and modified.

(3) In the introduction: # Line 79, to is missed in varies from person to another. Author Response: It has been reviewed and modified.

Line 96 and 101, The two references Bataineh and Abu Abbas (2020) should be distinguished by a and b. Author Response: It has been reviewed and modified.

Line 105 the dot after Manokar et al (2020) should be removed. The same in case of Khalifa et al (2009) in Line 110. Author Response: It has been reviewed and modified.

Line 117, authors did not mention anything about the location of the referred system. Author Response: It has been reviewed and modified.

Line 125, what is M.S.basin? M.S. should be identified. Author Response: it is a spelling mistake and it has been reviewed and modified.

Line 136, phase change material should be deleted as you identify PCM in the previous sentence. Author Response: It has been reviewed and modified.

The introduction did not cover the papers that deals with study many factors that affect solar still system. Authors should cover this, for instance Poblete et al evaluated the influence of several factors, such as the basin heating, the material of the cover (glass or polycarbonate), the existence of a mirror, the activation of an air extractor, and the existence of a black painted floor in the solar still, in terms of their contribution to brine evaporation. The experiments were conducted with a factorial design approach. “Poblete et al, Investigation of the factors influencing the efficiency of a solar still combined with a solar collector. Desalination and Water Treatment, 57 (2016) 29082–29091.” Author Response: The reference has been added.

(4) In the Methodology: # The number of lines overlapped with the equations, which did not made these equations unreadable. Author Response: It has been reviewed and modified.

Many symbols in the equations did not identified such as Pt, Ab, Tb, mb, CPb, mw, CPw, Qcw-c1. What is the difference between Tb and Tc, and also mb and mw. Author Response: The symbole has been identified in the manuscript. Tb is Basin temperature (Co), Tc is Condenser temperature (Co),mb is basin mass (Kg), mw is Inlet water mass (Kg), and mc is Condenser mass (Kg)

In Equation 4, the convection heat transfer from outer condenser cover to sky is written in Nomenclature as Qrc2-s and in Equation 4 as Qrc2-sk, please unify. Author Response: It has been reviewed and modified.

(5) In Results: # Line 317, Fig. 5, authors used different materials such as glass and steel what is the response in between these two factors represent? How you can consider the material as a parameter with a definite value? The same for air blowing, what are the values in between without and with air blowing meant? Author Response: The difference between glass and steel according to their thermal conductivity regarding air blowing The difference between with and without air blowing according to air speed with blowing= 20m/s, without blowing = 0m/s

In Section 4.1, authors should give explanations for why this factor has the highest effect on the responses. This can be done by comparing with what is found in the literature and to give strong evidences to support their findings. The same is for Section 4.2. Generally, discussion is not sufficient in these two sections. Author Response: The reason behind that can be explained in terms of the evaporation rate. As increasing the amount of external power, the basin water temperature increase. Therefore, the evaporation rate will be increased. Consequently, distilled water is boosted (Ahmed et al 2012). Moreover, as decreasing the basin water depth, the basin water temperature increases faster. Hence, the evaporation rate will be improved, and water productivity is enhanced (Agrawal et al. 2017). Furthermore, when increasing basin water area, the amount of distilled water is increased due to fact that the evaporation rate of the water in the solar still is directly proportional to the exposure area (V. Velmurugan and K. Srithar 2011). Also, as increasing the air speed on the upper condenser layer, the convection

heat transfer is increased and then the condenser temperature will be decreased (El-Sebaii et al 2004). Author Response for section 4.2 the sufficient explanation has been added

In Optimization Design Section (Line 384), authors mentioned the conditions in Table 2&3 to achieve the optimal value for the responses. These conditions did not confirmed by any experimental data. This is also did not make any validation for all the results obtained by DOE method. I recommend to do an experiment with these optimal conditions to compare with the theoretical findings. Author Response: we agree with referee that making an experiment with these optimal conditions to compare with the theoretical findings. In future we will conduct the validation to support our results, thank you for your recommendation

(6) In the References: # Agrawal et al (2017) is not present in the reference list, while it present in the Introduction section Line 144. # Some references are not given in full such as Manokar et al, the volume and issue no. are missed and Abu Abbas & Al-Abed Allah, the no. of pages is missed. # The reference of Al-harahsheh is repeated two times. # Some references are not given by DOI. Author Response: It has been reviewed and modified.

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