

## ***Interactive comment on “Potentials and limits of urban rainwater harvesting in the Middle East” by J. Lange et al.***

**Anonymous Referee #1**

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This paper discusses the potential of rainwater harvesting in the Middle East based on a quantification of expected rooftop runoff volumes under normal and drought conditions. The paper presents a new model and questionnaire on rooftop rainwater harvesting (RWH) for a district in the City of Ramallah. The results of the quantitative / qualitative analyses are then extrapolated to entire Ramallah as well as the Lower Jordan River Basin. The limitations of the analysis (including the extrapolation) are adequately explained in the discussion section. The conclusions follow logically from the analysis. Proper reference is made to related work.

My main comments are: > The expected rooftop runoff volumes under drought conditions seem to be very uncertain as shown by the weak correlation found in Fig. 5.

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It would be helpful to show uncertainty ranges for the RWH potential in Tables 1 and 2. That is: instead of using deterministic values only (e.g., 190mm and 480 mm), the authors could use uncertainty ranges. > The authors advocate the use of RWH for drinking water purposes (see for example the abstract and conclusions). To support this, they state on page 10381 (line 10) that: "our data suggest that also in Ramallah there is no basic impediment to use harvested rooftop water for any purpose, including drinking. Almost three quarters of the cistern users reported good or excellent water quality (Fig. 6)". My concern with this observation and the questionnaire is that the grades given (by the residents) to the water quality will be related to the designated use of the harvested water. For example: the water quality may be excellent for irrigation purposes, but fair or poor for drinking. As only 3% of the residents use the harvested water for drinking, the conclusion that there is no impediment (based on the results of the questionnaire) to use the harvested rooftop water for drinking could be contested. > In relation to the above, the authors could make more of the potential to use RWH for emergency water supply (i.e., not as a replacement but complementary to piped water supply). How could this (according to the authors) be done in an appropriate and relatively cheap manner (since it will only be used during emergency conditions, such as when there are failures of the normal supply)? Given that (i) 97% of the residents have access to public water supply and (ii) 79% of the rooftops are flat, concrete, how should the roofs be adapted, if at all? Or: which additional measures are required to provide safe emergency drinking water?

Specific comments are: > P 10370, line 22 & P10383, line 10: This statement could be seen as wishful thinking, if not supported by a potential way forward. It is not clear how regular checks of water quality and regulations (and in particular the maintenance of those regulations) could be implemented in practice? Who should be the responsible authority and does this authority have sufficient capacity to implement these regular checks of water quality and compliance with regulations? How to organize this? > P 10372, line 16: Should be "US. Water". > P 10373, line 6: "Increased" instead of "elevated". > P 10379, line 12: the perceived quality of the rooftop runoff will depend on

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the use of the harvested water. > P 10382, line 5: Isn't the type of roof also important for the reliability of the regional estimates? This could be a fifth limitation, or not if the roof types are similar in the entire basin.

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