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Discussions

# *Interactive comment on* "All-in-one model for designing optimal water distribution pipe networks" *by* Dagnachew Aklog and Yoshihiko Hosoi

**Anonymous Referee #2**

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Thank you for the chance to review this manuscript. The manuscript is generally well written. My major concern is the practicality of this all-in-one model and the innovation of the study. Please refer to my detailed comments below.

1) The authors developed a common user interface for three simple WDS optimizers that have been developed in previous studies. There is no new method/concept developed in this study.

2) Stochastic optimization methods, such as a GA, are often sensitive to parameter values. Multiple runs are often required to find an optimal set of parameter values for the GA to converge to near-optimal solution(s). In the developed all-in-one model, how is this issue handled? Is there any function in the all-in-one model that can be used to



help the users to determine the optimal parameter values of the methods used?

3) The authors claim that the all-in-one model can be used to compare the results of different optimizers. However, if there is no guarantee that the best performance of the optimizers has been achieved, it is a comparison between "an apple and an orange".

4) This all-in-one model can only be used to optimize for one objective. However, water distribution system optimization has developed far beyond a single objective. In real-world practices, multiple objectives including cost and reliability, are often considered. Can the OBORM optimizer handle multi-objective optimization problems?

5) There are better methods of handling constraints in a GA than the use of a penalty function.

6) The authors claim that the all-in-one model was developed for practical purposes. However, as the authors acknowledged that the model has not been tested on real-world case studies. Also, the optimizers in the model was compared with a few studies from a couple of decades ago. WDS optimization has advanced significantly in the past two decades. Without tests on real-world case studies and comparisons with newer optimizers, the practicality of the all-in-one model is not justified.

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