

# ***Interactive comment on “Inclusion of Tank Configurations as a Variable in the Cost Optimization of Branched Piped Water Networks” by Nikhil Hooda and Om Damani***

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Dear Anonymous Reviewer, thanks for taking the time to review our paper and providing us with constructive suggestions and comments.

1. The objectives considered for minimization are total pipe cost and total tank cost. Since in gravity fed branched network these are conflicting, the authors minimize the sum of the two objectives, implying that total pipe and tank costs are equally important. It would be interesting to show the trade-offs between the two objectives, by solving a sequence of ILPs where each problem considers a weighted sum of pipe cost and tank cost, with weights varying between 0 and 1.

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Response: We did not consider weighing the pipe and tank cost separately since they are both part of the capital cost of a scheme. The capital cost is budgeted from the same source and as such does not differentiate between the individual components of the capital cost. If for other considerations, certain tank or pipe configuration needs to be fixed, the JalTantra system provides the designer the option to do so.

2a. In addition, also other objectives functions like operational cost (related to the action of valves and pumps) can be included in such multiobjective framework, providing the decision maker with a tool for a complete cost-benefits analysis of different design solutions.

Response: We agree that considering pumps and therefore the operational cost will result in a more complete analysis. We mention this in our future work section and since the CCWI 2016 conference (where this paper was presented), we have indeed extended our JalTantra system to include pumps. Both capital and operational cost are now considered.

2b. Note also that each ILP can be solved efficiently by standard MILP solvers like Gurobi [3], which is freely available for academics.

Response: We use CBC as our MILP solver, since it's free to use even for non-academic purposes and the intention is that the system JalTantra will be available for practicing water scheme designers.

3. Finally, the manuscript presents several issues in terms of clarity of notation.

Response: We agree with the notation suggestions and are thankful for the same. All of them will be incorporated in a revised submission.

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