

Interactive comment on “Multi-objective optimization using evolutionary algorithms for qualitative and quantitative control of urban runoff” by S. Oraei Zare et al.

Anonymous Referee #2

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The manuscript presents an application of multi-objective optimization for best management practices selection in Tehran (Iran).

My overall impression on the paper is divided. On one hand, the paper deals with a very interesting issue for water engineers and management agencies: optimal selection of BMPs for sustainable urban drainage. Nevertheless, in my opinion, the paper does not clearly show any novel or significant contribution to hydrologic science. Moreover, the paper is not clearly presented, nor well written. English grammar and syntax is to be seriously improved.

General comments

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1. English must be seriously revised to reconsider the paper publication. There are too much syntax and grammar mistakes. Since Referee #1 has reported a very detailed list of items to be corrected, I will not go through it again.
2. Objectives and novel contributions of the paper are not clear at all in the abstract, introduction and conclusions sections.
3. Hydrological and hydraulic modelling. Hydrological, hydraulic and water quality parameters have been calibrated and validated in the study area? Could these parameters strongly affect the optimization results?
4. Definition of decision variables and objective functions. Section 3.4 is unclear. Too many ideas and formulations are supposed to be obvious, so that, it's quite difficult for readers to go through the paper easily.
5. Results and discussion. In my opinion, this section is very poor and should be enlarged and improved since new ideas and contributions of the paper must be highlighted and justified here. Conclusions must be clear, sound and backed up by results.

Specific comments

1. P778 L10. "...aimed at finding optimal solution..." What is the aim of this optimal solution? What are the objectives that justify the optimization the authors performed?
2. P782 L3-4. Why the authors use the kinematic wave approximation of full Saint-Venant equations?
3. P782 L22. "Mass is expressed..." Do the authors really think that these kinds of clarifications are necessary?
4. P783 L23. An initial screening of BMPs alternatives seems to have been done since optimization only deals with rain barrels, porous pavements and bio-retention. What criteria have been used to do that?
5. P785 and P786. Equations 5 to 10. Some variable units are not properly defined.

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6. P788. Equations 11 to 14. Some variables are undefined.
7. P790 L12-15. This conclusion is obvious. In my opinion, there is no need of a multi-objective optimization to conclude that using solutions that promote infiltration will reduce runoff production. . .
8. P790 L24. "... since the build-up and wash-off parameters depend on land use". Again an obvious statement. . .
9. P792 L7-9. "The MOPSO and NSGAI are...management" What do the authors refer to? This sentence is confusing.
10. Tables 3, 4, 5 and 6 are not referred in the text.
11. Tables 7 and 8. The SI symbol for litre is "l". The SI symbol for kilogram is "kg". Please correct "Lit" and "Kg". Also add units for standard deviation.
12. Figure 3, 5, 6 and 11. These figures are not cited in the text.
13. Figure 4. This figure is not cited in the text. Moreover this figure is copied from SWMM manual and in my opinion is not necessary.
14. Figure 7. In my opinion this figure is not necessary.
15. Figures 8, 9, 11 and 13. The SI symbol for litre is "l". The SI symbol for kilogram is "kg". Please correct "Lit" and "Kg".
16. Figure 11. I suppose "LID" refers to Low Impact Developments. Please explain or clarify.
17. Figures 14 and 15. What do these figures add? Are they relevant to conclude?

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