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Hydrology and Earth System Sciences Discussions

Interactive comment on "Staged cost optimization of urban storm drainage systems based on hydraulic performance in a changing environment" *by* M. Maharjan et al.

Anonymous Referee #3

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General comments

This paper introduces the theme of 'whole life costing' applied to sewer networks. If compared to existing papers dealing with the same subject, it certainly adds new ideas including climate change issues as well as population growth (here synonym of land use change), a fairly significant aspect in developing countries. Despite this, I feel some fundamental steps of the procedure to be too much simplified, sometimes not fully consistent. Conclusions seem to be too much extended. I would personally suggest to shorten them and to be more specific within the body of the paper, especially

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Interactive Discussion

Discussion Paper

on the hydrologic issues (rainfall pattern generation). I agree with the majority of the comments stated by the previous reviewer. These hereinafter are my additional ones.

Specific comments

Page 1483 Line 17. The choice of 1h rainfall event is not explained. Is it related to the average time of concentration for the catchment? Usually in the design of storage tanks the critical rainfall duration is slightly greater than the concentration time of the catchment.

Page 1483 Line 24/25 The advantage of this scheme is the possibility to defer investment until the necessary moment arrives. I would suggest the above sentence to be reformulated, since it may sound like: a) capability of predicting the exact occurrence of flooding events. b) Invest just once the flooding event has occurred, which I wouldn't include among the optimized strategies

Page 1487 Eq.8: 'i' is the rainfall intensity for a given duration of rainfall (please mention if in minutes or hours) and return period. How is it related to Figure 4 graph? Is the y-axis 'Rainfall(mm)' correct? If each point indeed represents a rainfall volume, on which time amount is it calculated?

Figure 5: explain what do the white circles represent (I suggest Figure 5 and 6 to be merged into a single figure

Page 1489 Line 16: Is each 'trial' representative of a different seed for random number generator? If so, please clarify it. Line 9: It is not clear how the storage is connected with the network: in-line or of-line.

Page 1492 Line 3: Substitute 'cum' with 'm3'

Are the definitions 'implement-once and operate' (Page 1482 Line 16/17), 'single stage implementation'(Page 1492 Line 9) and 'Static Design' (Figs. 10, 11, 12 and 13) equivalent? In that case, I find the sentence: 'the staged approach is indeed a better design paradigm compared to traditional 'implement-once and operate schemes' (Page 1482

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Interactive Comment

Line 16/17) to be unsupported by results shown in the paper (Figs. 10, 11, 12 and 13), since significant improvements are exhibited only if compared to the do nothing case, while negligible differences are exhibited between Static and Staged Design

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 1479, 2008.