

Interactive comment on “Infiltration well to reduce the impact of land use changes on flood peaks: a case study of Way Kuala Garuntang catchment, Bandar Lampung, Indonesia” by D. I. Kusumastuti et al.

Anonymous Referee #3

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The article deals with the investigation of storm events at a specific site at Sumatra Island, Indonesia. After data evaluation design rain intensity is delineated. Land use change on flood peaks was investigated by developing different scenarios. Finally, the applicability and the spatial distribution of infiltration wells were investigated to reveal the advantages of using this recharge method for flood peak reduction. This article is very interesting and especially important since the authors point out that on the one hand floods have a high destructive potential at the site and land use is changing rapidly at the city of Lampung. Measures to ensure protection of human and property

C2003

is critically needed and the authors contribute to this by a straightforward calculation of flood peak reduction by infiltration wells. The overall writing of the article is technically fine and approach and results are clearly explained. Some minor typing mistakes should be edited and language should be checked for minor mistakes. However, the authors are requested to check some comments about the validity of their approach and include this into the manuscript. Main questions are the applicability of the rational method for such a large catchment and the effect of short rainfall events on the overall amount of rain. Please see comments following and specific comment on typing in the end:

In the abstract it should be more clearly stated what is the overall question. There are three subgoals and I wonder, if there is a ranking. If the overall objective is the feasibility of infiltration wells for the flood peak reduction (as stated in the title), I would state this and call the other points as the steps toward this.

Page 5489 line 4: I would point out that especially a combination of these factors may lead to extreme high flood events. Flooding is a natural process, but destructive effects of flooding and peak discharges are increased due to anthropogenic impacts such as land use changes. Also references may help the reader to get more general information on these impacts.

Page 5489 line 18: Give examples of how land use change may have an impact on groundwater?

Page 5489 line 18: The content of the current article should be combined in the end of the introduction.

Page 5489 line 25: design of what?

Page 5490 line 16: Please provide the reader with reference for this.

Page 5490 line 15 and Fig 1: More different infiltration wells and infiltration techniques seem suitable depending on climate conditions, objective of recharge, water convey in-

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frastructure and sealed surface distribution, for example infiltration via basins, trenches and deeper wells (see e.g. Bouwer 2002). The authors state this in the end at page 5500 line 13.

Page 5490 line 26: Please explain rational method or give a reference to literature or other section of the manuscript.

Page 5491 line 11: Reference for Quantum GIS?

Page 5491 line 18: How the validity of the method was proven in the study. The authors investigated the effect coming from land use change but will the method provide valuable insights if not applicable? In equation 1 and section 2.1.2 it is obvious that a single averaged coefficient is used to account for all impacts of surface on the runoff which seems not appropriate for a large catchment of some kilometers. Interaction between the flows at the surface is somehow mixed and only a summed influence is investigated which may not allow delineation of practicable measures. Beside this in page 10 all results are given in a resolution of 2 decimal digits which may lead somebody to believe in a high certainty which is not supported by the method used.

Page 5493 line 20 to 22: Is this scenario sustainable for the region?

Page 5494 equation 2: Add V in the list of symbols.

Page 5495 line 12 and figure 4: I doubt that a decreasing trend can be seen from this data. Changing slightly a point may reverse trend easily.

Page 5495 line 18: Refers that to the storm depth of a single event, despite the duration?

Page 5495 line 20 to 23: When storm duration events less than 3 hours duration are neglected, are these included into the next longer storm event? Summing the percentages in figure 4 leads to 100 %, but I am not sure this small events may have an effect on flood evolvement when temporarily close to larger rain events? For the other event duration it looks like storm depth is most in the beginning, so maybe short events are

C2005

important with high storm depths.

Page 5496 line 26: How it was decided which area of the catchment changes to trading area in scenarios 3 and 4? Figure 7 shows the areal distribution of the land uses but spatial distribution will not affect flood peaks, but only the percentage of land use area.

Page 5498 line 7 and figure 10: This is only the suitable area for based on permeability, slope and groundwater level. However, land use may also lead to limitations for suitable positioning of wells. Next to this, at sealed area a lot of water has to be infiltrated on a small area and an even distribution cannot be applied since water has than conveyed to the infiltration wells.

Page 5498 line 25: 4000 m2 should be 500 m2

Specific comments:

Title: please check, if it should be called infiltration wells (plural) since the article deals with multiple wells 1st affiliation "engineerring" should be "engineering"

Page 5488:

Abstract: line 6 impact should be replaced by a more appropriate word such as "contribution" of infiltration wells for flood peak reduction line 13 depending

Introduction: line 22 Sumatra line 23 delete approximately or use an approximate number line 26 Is this a relevant information?

Page 5489:

Line 3 "some" sounds strange Line 13 models instead of model Line 19 contribute "to" Line 19 space after sentence Line 25 delete "to"

Page 5490:

Line 9: Indonesia Line 20: Idriatmoko, 2010? Line 22 "it" has

Page 5491 line 11 "it" replace by "to" Page 5493 line 3: Triatmodjo, 2008? Page 5495

C2006

line 25 “trends” and “durations” plural?

Page 5498 line 12: “Figure 10” Page 5498 line 24 space is missing

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 5487, 2014.

C2007