

Interactive comment on “Automated landform classification in a rockfall prone area, Gunung Kelir, Java” by G. Samodra et al.

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Comments by I S Evans, for Earth Surface Dynamics, on Samodra et al. –
Automated landform classification in a rockfall prone area, Gunung Kelir, Java.

G. Samodra, G. Chen, J. Sartohadi, D. S. Hadmoko, and K. Kasama

GENERAL COMMENTS: This paper classifies slopes in a small area of Java into 7 units of the 9-unit slope model (catena), using unsupervised classification. An inventory of 521 rockfall deposits (ranging from 0.0018 to 3627 m³) is related to four of these units, and power functions are fitted to each subset.

Some of the writing is repetitive or vague. Re-writing of the paper is needed, more

C34

‘tightly’ and with more precision, with focus on the main argument pointing toward conclusions, fuller explanation of the methods, and some change in the ordering. The core of the paper seems to be the relation of rockfall (past as inventoried, and potential future) to four units of the 7-unit slope model employed. This should be more fully presented and discussed. The rockfall modelling needs to be more closely related to the rockfall inventory and to the slope units. Total rockfall volume per unit (landform class) should be tabulated, together with area of each unit.

There are quite a few grammatical and syntactic errors, most (but not all) of which are listed below: a revised paper needs to be very carefully checked. References are appropriate and sufficient, and proper credit is given to related work.

SPECIFIC COMMENTS: page/line

21/5-14 This history does not seem to be relevant, or used below: cut?

22/15 Is eq. (1) used below? Any examples of its application?

23/19 I do not think the 9-unit model “explains. . .”

p.26 and Fig. 5: are the rockfall volumes all for single boulders, or are some for groups of boulders?

27/26 are convex creep slopes REALLY potential rockfall sources? Mainly “Fall Face”?

28/18-19 Further discussion of assumptions would be useful.

28 “shape complexity” needs further definition/ explanation. In Fig. 3(d) it is simply contour / altitude layers, so how can it be useful?

32/16-22 this section should come earlier, perhaps p. 26?

32/23 – 33/7 How is this Poisson model used in this paper? Drop or apply.

33/25 – 34/10 Most of this justification (for reducing 9 units to 7) should come earlier

Table 3 I am very surprised that there are 53 rockfall deposits on the Fall Face: please

C35

discuss.

Table 3 and Fig. 6: All the R2 coefficients are very high but, given the great range of rockfall volumes inventoried, this is achieved by truncating over half the logarithmic range, using thresholds of 2 to 11 m2 for the sections fitted. Table 3 should at least give the actual numbers used for the fits.

Fig 4 and Fig. 5 cannot readily be compared, but it is highly desirable that the pattern of rockfall should be compared with that of slope units. The areas covered seem to differ: if Fig. 5 covers the right side of Fig.4, there seems to be some inversion or transposition.

Likewise Fig. 1(d) shows “elements at risk”, but how can this distribution be compared with that of boulders?

Fig. 6: Please comment on the discontinuities, at 150 for “colluvial foot slope” and 500 for “transportational middle slope”.

Fig. 6; Presumably the green diamond masks a brown triangle for the largest “transportational middle slope” rockfall?

TECHNICAL CORRECTIONS, DETAILS: “quote from paper” ‘my suggestions’

20/4-5 the sentence “DTM pre-processing. . .” seems unnecessary – it can be ‘taken as read’

20/5 ‘solely’ would be better than “merely”

20/8-9 ‘landforms into seven. . .’ [i.e. delete “. It was classified”

20/10-11 reword the sentence “The classification. . .” (as this does not “analyse” the classification)

21/1 replace “mounds and” with ‘the’

21/3 ‘maps’

C36

21/14 ‘Verstappen’

21/22 ‘geomorphological’

21/23 ‘detailed geomorphological’

22/5 ‘definition was’

22/6 ‘terminology was’

22/7 start new paragraph

22/23 and 25 move “)” to after “bed” and delete :

23/16 ‘automatically’

24/1 ‘van Bemmelen’

24/1 replace repetitive “The evolution of K P Dome was” with ‘It’

24/2 ‘with’, not “by”

24/2 ‘geosyncline’?

24/5 ‘consisting of . . . dacite intrusions.’

24/6 ‘the Menoreh’

24/8 ‘dacitic’ ‘hornblende andesite’

24/9 delete “was”

24/10 ‘and the J. . .F. . . was formed by coral . . .’

24/12 ‘jointing and large cracks. . .’

24/17-18 delete repetitious “slope gradient . . .meanwhile” also “of”

24/20 add ‘(Fig. 1d)’

24/23 ‘geomorphological’

C37

24/26 'classification based on the 9-unit'
25/14 "paddy terraces" needs definition. [also spelled 'padi' ?] Also, state the interpolation method that produced these [bilinear?]
25/16 '12.5 m' delete "the"
25/23 'by a'
25/27 delete 'parameter'
25/29 'and based'
26/10 replace "modified" by 'The' and "applied" by 'modified'
26/11 replace "into a" by 'for the' Briefly justify the exclusion.
26/14 delete "volume obey a negative power law sealing"
26/15 delete "the"
26/21 'estimate the' Delete after "value."
27/3 delete "a"
27/28 'maps'
27/12-14 sentence repeats 25/14
27/15 "sampling... are absent" makes no sense : please reword
27/18 delete 'those'
27/24-25 more repetition...
27/26 'creep slopes'
27/28 'reaches'
28/4 'to a' replace "It" with 'This'

C38

28/9-10 reword
28/11 delete "The"
28/16 'secondary derivatives'
28/17 'derivatives (i.e. ...aspect angle)...'
28/22 not "rather" but 'very' !
28/23 'are influenced by' ?
28/25-26 'movements, meaning that the rockfall boulders are deposited there.'
28/28 delete the strange sentence "It forms ... channel."
29/1 I do not understand.
29/2-3 this is not what Fig. 3(d) shows...
29/6 This is a truism: cut?
29/11-15 This does not seem helpful or relevant. Cut?
29/19-20 'exhibits'
29/22 'statistics' Reword whole heading.
29/23 replace "obtained from a" with 'in our'. [I hope that is true !]
29/24-25 reword
29/25-28 combine sentences
29/27 'distributions'
29/ 28 'by power laws with...'
30/2 'of the boulder'
30/4 'to the rollover'

C39

30/12 delete 'the'
30/13 move first bracketed numbers to after 'higher b values'
30/14 'is a'
30/21 delete "compared to another landform"
30/22 'events'
30/25 'surface,'
30/26 'variables,' Delete "in a generic landform". Replace "Formerly," with 'Initially'
31/1 'slope (Table 3). But the trend only' [?]
31/5 'frequency of'
31/16 'orders of'
31/19 'volume of rockfall deposits'
31/20 give actual volumes
31/22 'magnitude on lower'
31/25 'than on'
32/1 delete second "the"
32/1 'hazards'
32/2 'from' not "on"
32/5 'approaches'
32/5-6 delete vague sentence "Furthermore. . ."
32/7-8 Delete "Fall face . . . lower slope" Move 'each exhibits scale specificity' to follow "respectively" on line 10.

C40

32/11 'statistics' Also reword sentence: "can pose" ???
32/14-16 delete repetitive sentence "It . . . landform."
32/24 'rockfalls'
33/13-14 'it will improve cost efficiency by optimizing design.' [-that is how it affects the budget. . .]
33/15 'on landforms'
33/22 'a reasonable'
34/6 'in such an area'
34/7 'because both are more related. . .' [i.e. delete "interfluves . . . classification is"]
34/11 'similar genesis'
37 Table 1: These coefficients need fuller definition, probably in the text.
38 Table 2 Why does "colluvial foot slope" have energy but not velocity? Other units have either both zero or both positive.
39 Table 3 Error margins on the b coefficients would aid their interpretation in the text.
40 Fig. 1 (d) 'Gunung Kelir area viewed from . . .[direction] : red rectangles are elements (buildings and roads) at risk.
41 Fig. 2 These tiny 'postage stamp' illustrations are difficult to read: cut or redesign?
42 Fig.3 Note the contoured pattern of "shape complexity", and the almost identical patterns of velocity and energy
43 Fig. 4 "Interfluve" areas seem more like plateau.
44 Fig. 5 This is very useful, but could it be paired with a map of land units at the same scale? It is difficult to compare a map with (Fig. 4) a perspective view.

C41

- Dr. I.S. Evans, Durham University, 12 March 2014.

Interactive comment on Earth Surf. Dynam. Discuss., 2, 19, 2014.

C42