

Interactive comment on “The catastrophe of the Niedów dam – the dam break causes, development and consequences” by Stanisław KostECKI and Robert Banasiak

Anonymous Referee #1

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This paper documents an important dam breach event (Niedów dam-breach) that occurred in 2010 during an extreme synoptic rainfall event that involved a large watershed. The test case is interesting although it could be better documented. Regarding the methods, some empirical equations are used to model the dam breach and a widely used 2D hydrodynamic model is used for the simulation of the flood wave in the long stretch of the river downstream of the dam. In spite of the interest of the test case, the paper is not well written and it is not clear what are its scientific reasons of interest. The inadequacy of empirical dam breach formulas to represent such a complex situation is not a surprise and the meaning of the claim of “propagation with an (sic) reversed solution of the upper boundary hydrographs” is not clearly understandable, because too

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many points in the paper are presented in a rather confusing and non-reproducible way. Much of the reasoning is based on Eq. 1 that however is a wrong transient mass balance equation because it disregards storage in the floodplain flooded area, which must be relevant in the particular case. However, no variation of the stored water volume appears in this equation, where inflow hydrographs equate, at each time step, the output hydrograph. Finally, even without being an English mother tongue, I would say without fail that this paper will certainly benefit from a careful and overall improvement of the text that, as it is, is not suitable for an international Journal. In the following (see attached list) I provide a wide set of examples but many more are still present throughout the paper.

Accordingly, in my opinion, in its current form the paper is not suitable for publication.

Apart from these considerations, in many places the description of the different issues is involved and logically wrong (e.g., see lines 85 and 87 to better understand what I mean). As I said the test case is interesting and I invite the Authors to write a better paper to document it. Apart from the fundamental issue of scientific correctness and methodological clarity, it could be better documented for instance with pictures showing the different phases of the event, maybe provided as additional material. From a technical point of view, an undiscussed aspect is why they waited so long to open the gates (see Table 1 progression of the opening of gates I,II and III) As a final note, I would recommend using the term dam breach throughout the paper in place of dam break, a term that in the field of hydraulics is related to the impulsive collapse of a dam, as typical for reinforced concrete or masonry structures.

I enclose a pdf file with a detailed list of my observations

Please also note the supplement to this comment:

<https://nhess.copernicus.org/preprints/nhess-2020-372/nhess-2020-372-RC1-supplement.pdf>

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