Review to the manuscript „**Formation, breaching and flood consequences of a landslide dam near Bujumbura, Burundi"**

submitted by Léonidas Nibigira et al.

Reviewer: Martin Mergili

The authors present an interesting study on the possible impact of the dynamics of a landslide on flooding downstream, thereby considering the effects of breaching of a landslide dam. Much of the manuscript is well written, structured, and illustrated. Particularly the evaluation of the stability conditions of the landslide is very well described. However, coupling of landslide and flood is, in my opinion, insufficiently covered. Particularly in this context I have identified some important issues requiring improvements and therefore recommend **major revisions**. I now outline my suggestions and comments in the order of decreasing priority:

1. One of my major concerns relates to the fact that only flooding by water is considered. Breach of the landslide dam would release a huge amount of solid material (most probably deeply weathered tropical soil) that would be incorporated in the flow and could possibly lead to completely different characteristics and downstream impact of flooding, compared to clear water flow. This issue is not even discussed at all. I see two possibilities to face this challenge: (i) incorporating sediment load in the flow simulation; or (ii) a thorough argumentation and discussion why this is not necessary. Either (i) or (ii) should be an absolute requirement for the acceptance of the manuscript.
2. I do not fully understand the work flow of the flood modelling: in the first step, do you (i) simulate the base flow without the dam incorporated, or do you (ii) fill the lake behind the dam to let it flow out in the second step? The description in Sect. 2.4.3 is confusing and has to be improved.
3. A highly critical issue is also the consideration of dam breach (lowering of the dam crest and release of the impounded water) – how does this work? Please explain! I have the feeling that you spend a lot of effort in describing base flow and lower boundary conditions at a high level of detail, but do not explain some of the really important aspects at all.
4. You claim to consider flood hazard – however, it is only the possible intensity which is used for the preparation of the maps – hazard would also have to include a measure for frequency. Some rewording (e.g. flood intensity indication map?) will be necessary.
5. You resample the 10x10 m DEM to 2x2 m. it is absolutely clear to me that this is necessary for numerical reasons – still, it does not increase the level of topographic detail. How wide is the river, i.e. is an effective 10x10 m cell size sufficient to capture the topographic patterns governing the flow? Please discuss.
6. The discussion on the uncertainties involved is very short, given that the uncertainty issue is very important when it comes to computer simulations. Some further considerations would be desirable (geotechnical parameters, hydrograph, sediment transport, ...)
7. Flow depth x velocity does not result in m/s^2, but in m^2/s.

I am looking forward to see a revised version of this manuscript. The authors should feel free to contact me at martin.mergili@univie.ac.at if they disagree with my comments or in case they would like to discuss the one or the other issue.

 With best regards, Martin Mergili