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Comment on hess-2021-387

Anonymous Referee #3

Referee comment on "Compound flood impact forecasting: integrating fluvial and flash flood impact assessments into a unified system" by Josias Láng-Ritter et al., Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2021-387-RC3, 2021

Review comments :

Compound flood impact forecasting : Integrating fluvial and flash flood impact assessments into a unified system

This manuscript addresses the assessment of socio-economic flood impacts in the specific case of a compound flood which combines a flash flood and a fluvial flood. This event, the DANA event, occurred in Southeast Spain in September 2019. The introduction presents a brief state of the art of flood forecasting methods, and methods developed to transform the hazard forecasts into expected socio-economic impacts. The case study event and the methods used to assess the impacts of this compound flood are then presented. The central part of the manuscript deals with the estimation of the socio-economic impacts of the compound flood and its evaluation by comparing the estimated flood impacts to the reported impacts.

The subject is suitable to HESS. I agree with RC1 and RC2 that the manuscript is interesting and original and deserves a publication in HESS. I have therefore several minor concerns about the proposed methods and their evaluation:

- The methods employed in the manuscript are intended for civil protection and emergency services. It would be interesting that the authors recall the needs of these authorities in that field for the two flood types addressed in the manuscript : fluvial floods and flash-floods.

- The reading of the manuscript would be easier if the authors presented how these methods can be used in an operational and “real-world” context according to the type of

flood.

- It is not clear if the assessment of flood impacts is performed from forecasts, simulations or observations.

- It would have interesting to study the sensitivity of the obtained to forecast uncertainties, especially for flash-floods where these uncertainties are often very large.

- As noticed by the authors, a fluvial flood and a flash flood display very different dynamics which could result in different applications conditions. How the authors deal with this point to estimate of a compound flood ?