The authors would like to thank the referees for the work and time devoted to review the manuscript. The remaining comments and suggestions raised by all reviewers were useful to improve the overall quality and understanding of the work.

Lines are referred to the marked-up revised version of the manuscript.

Reviewer #1:

The MS can be considered for the publication.

The authors would like to thank the referee for reviewing the article and we sincerely appreciate the positive feedback.

Reviewer #2:

Summary

The research work presented in the paper « How to mitigate flood events similar to the 1979 catastrophic floods in lower Tagus » presents a comprehensive study of flood mitigation strategies with dam to reduce flood impacts for the Iberian Peninsula.

The Iber+ numerical model was used with different DEMs: i) to select the most relevant DEM for the study area, ii) to model the 1979 Tagus River floods, and iii) to propose a management strategy for the Alcántara dam.

Evaluation and recommendations

The manuscript is overall well-written and contains many relevant bibliographic references. The chosen structure for the paper is coherent, with a good description of the data and models used.

It should also be noted that the authors have taken into account the comments of previous reviewers very well. There are still a few minor points of detail remaining, and I recommend a minor revision for this new manuscript.

The following comments aim to guide the finalization of the paper.

Comments

l.147 – please define SCS-CN

Done.

Section 4 – Proposal for a reorganization of this section; the title is not consistent as no methods are clearly presented here. It might be preferable to add a subsection 4.4 « method » for l.175- 193.

This section was reorganized following the reviewer's comment. Thus, a new subsection *"4.4 Validation method of the hydraulic model coupled with different DEMs"* was added containing the information previously presented in lines 175-193 of the preceding version of the manuscript.

Section 4 – In general, regarding the method: a few sentences could be added about the use of current DEMs to simulate an event from 30 years ago, with the possibility of relying on historical data (photos, etc.) to validate the DEM used.

Some sentences have been added about using current DEMs to simulate the past events under scope (lines 183-191). In this new paragraph we discuss the macroscopic scope of the study, the lack of precise and well distributed older terrain data, and the need to establish a common framework to compare and evaluate the differences in flood impact under the mitigation strategies proposed.

l.194-199 – Repetition with l.56-57

Sentences were rewritten to avoid repetitions.

l.331 – Introducing abbreviations such as RMSD, for example (not defined and used in line 186).

This was revised and in this new version of the manuscript all abbreviations used were defined the first time they appear.

Section 6 – This section appears more like a summary of the work, lacking critical analysis, identified limitations, and whether the stated objectives were achieved (which are not mentioned elsewhere).

Some parts of this section were rewritten according to reviewer's suggestion.

Figure 1 – numbering the figures would aid in understanding the legend. The main affected villages could be directly presented on the main figure.

Done.

General comments:

1. It would be helpful to add hyperlinks to navigate to figures and references.

The authors also think this would be useful, but we would like to stress that this typeset choice depends on the preferences of the journal and that this should be done by the copy-editing department of the journal in case the paper is accepted for publication.

2. Replace "Tagus river" with "Tagus River."

Done.

3. Standardize abbreviations: sometimes DEM, sometimes DEMs.

DEM is used throughout the text when referring to a single Digital Elevation Model, and the plural, DEMs, is used when referring to multiple Digital Elevation Models. However, when reviewing the text in depth, we realized that in some places the abbreviation was not correct, and it was corrected throughout the entire manuscript (i.e. the term DEM is used when referring to a singular Digital Elevation Model and DEMs when referring to a several Digital Elevation Models).

4. Almost all maps presented without scale and orientation.

Scale and orientation were added in all maps.

Reviewer #3

The paper is relevant to the scope of the journal. It is well written. The results are well elaborated and cited with suitable tables and figures. The lesson learned from the past event and improved the flood mitigation is important in strategic planning. Present case, author(s) has applied for flood mitigation planning at Tagus Valley. The operation of Alcantara dam and analysis has been performed using hydraulic modeling. Useful decision-making results and conclusion has been derived to reinforce the decision-making system.

Some useful suggestions/ comments to improve the quality of the paper:

1) Author has utilized Iber+ numerical model to simulate the flow in 2D. The daily mean river flow or flood hydrograph has considered for upstream boundary, however, How the downstream boundary considered was little vague? Pl. clarify in section 4.2.

We agree with the reviewer. In the new version of the manuscript the downstream boundary conditions were better explained in the section devoted to describing the hydraulic model (Section 4.2, Hydraulic model; lines 140-142).

2) The author has utilized different land use data from CORINE Land cover data, However, the resolution of the land use file and classes of land use considered for modeling were missing. Furthermore, land use roughness plays a major role on arrival time and velocity of flow, the roughness vales of each land use for flood plain simulation were missing?

Following reviewer's suggestions, a new figure was added specifying the land uses and the associated manning coefficients (new Figure 2). In addition, more information, such as the resolution of the land use database, was added in the text (lines 148-150).

3) The 2D flow grid is an important simulation parameter that decides the simulation time, however, the 2D flood cell and interval the model was simulated are not presented by the applied model.

This important information was added in the new version of the text (lines 151-154). It was specified that the domain was discretized in a mesh of unstructured triangles with average side lengths that varied from 25 to 100m, surpassing 6M of total elements, and that the average computational time step was variable and was calculated following the Courant-Friedrichs-Levy (CFL) condition.

4) The downstream inline structure i.e. bridges, bridges piers affect the 2D flow, and how this feature was emitted for building the model. If it is so, elaborate the limitation in the discussion part of the paper.

Due to the macroscopic view of this study, where the main purpose was to analyse the macroscopic response of the entire Tagus valley area, the downstream inline structures were not considered in this analysis, since, additionally, they would deserve an individual and detailed analysis, and this is beyond the scope of the present article. The limitations and recommendations were also stablished and discussed in the paper, remarking the need to also consider these structures to perform local flood analyses where they are involved, and especially when high resolution information is available. This information was added in the new version of the manuscript. (lines 155-160).

5) The soil Aggradational and degradational features and its related time series analysis for flood inundation were missing in present modeling.

The aggradational and deggradational features were not considered. This was clarified in the new version of the manuscript (lines 155-157).

6) Author(S) has claimed the model accuracy and outcome depends on DEM resolution, however, the flood flow simulation depends on various parameters i.e. 2D flood cell size, DEM resolution, courant number, river and flood plain roughness, etc. Therefore, the accuracy of model outcome claimed only by DEM resolution is difficult to judge. Although, DEM resolution would be one of the parameters to improve the accuracy of the model and in this case, it would be justifiable to compare the model with different DEM resolutions.

We agree with the reviewer that the model accuracy depends on more parameters than the DEM resolution, although for the present case this may be one of the most important factors. In the new version of the manuscript, we discuss these issues and also comment on the associated limitations (lines 544-552).

Some useful literature for author(s) consideration:

Shah Z, Saraswat A., Samal D. and Patel DP (2022), "A Single Interface for Rainfall-Runoff Simulation and Flood Assessment – A Case of New Capability of HEC-RAS for

Flood Assessment and Management", Arabian Journal of Geosciences, Springer. 15, 1526(2022) https://doi.org/10.1007/s12517-022-10721-2.;

Pathan, A.I., Agnihotri P.G , and Patel, D.P. (2022) " Integrated approach of AHP and TOPSIS (MCDM) techniques and GIS for dam site suitability mapping : a case study of Navsari City, Gujarat, India. Environmental Earth Science, Springer. (2022) 81:443. https://doi.org/10.1007/s12665-022-10568-6;

Prieto C., Patel DP, and Han D (2020), "Preface: Advances in flood risk assessment and management", Nat. Hazards Earth Syst. Sci., 20, 1045–1048, https://doi.org/10.5194/nhess-20-1045-2020;

Patel DP, Jorge AR, Srivastava PK, Michaela B. and Han D. (2017). "Assessment of flood inundation mapping of Surat city by coupled 1D/2D hydrodynamic modeling- A case application of the new HEC-RAS 5". Natural Hazards, Springer, 89(1): 93-130. https://doi.org/10.1007/s11069-017-2956-6

Thanks for this valuable information. Authors have included these references and the related information, in the new version of the manuscript.

Minor comments:

1) The land use land cover map is missing.

A new figure with the land uses and the associated roughness manning values was added in the new version of the manuscript (new Figure 2).

2) The table and figure caption is too long. It usually has 1 or 2 line short title with required core information. Therefore, it would suggest to concise the table and figure caption.

Some of the table and figure captions were simplified according to reviewer's suggestion.

3) Fig. 5 scale bar is missing

Scale bar was added.

4) Fig. 6 north arrow, legend and scale bar is missing

North arrow, legend and scale bar were added.

5) Fig. 8 improves the resolution upto 400 dpi.

Done.

It is suggested to incorporate and justify the raised comments, and submit it in the revise version for further consideration.

Authors hope to have properly answered all the comments and to have added the changes and corrections proposed.