Comments by Reviewer n. 1 and Replies by Authors

General comments

The authors have largely properly addressed comments of the review, however there are some exceptions, listed below:

REPLY: Thank you for your review. We have replied to the comments here below.

Section 5.4.1: despite writing in the response that the authors will add information on adjustment of losses, it was not provided.

REPLY: Apologies for that, we have expanded the description on adjustment of losses.

Section 5.4.2: the authors clearly don't understand the issue and seem unable to interpret economic data, and the revision only adds confusion. If the authors only consider change in price levels, then the information that should be used inflation (based on GDP deflator) in Tajikistan between 2005 and 2022 was 410% (factor of 5.1), while the local currency lost 71.8% of its value compared to the US dollar (factor 0.282). Multiplication of those two factors gives the correct adjustment factor (1.44), i.e. 44% increase. If the authors adjust from both price change and economic growth, then the correct approach is to adjust the 2005 value by change in nominal GDP expressed in US dollars, which increased from 2.311 bln USD in 2005 to 10.493 bln USD in 2022, i.e. a factor of 4.54. The information the authors in paragraph supposedly based on IMF data are incorrect. Please carefully recheck your economic analysis. Also, results section uses 2020 exposure, so why 2022 here?

REPLY: While we acknowledge that there might have been some misunderstanding between the reviewer and the authors regarding this topic, the sentence "the authors clearly don't understand the issue and seem unable to interpret economic data" seems out of place in a paper review, especially when it is directed to 16 respectable professionals of the risk assessments, and given that the authors have manifested a strong willingness to implement all the changes and suggestions of the reviewer in the first round of review.

We have modified the section using the data provided by the WB GDP deflator for GDP and by xe.com for currency rates against USD, and using values for 2020 instead of 2022. Apologies for the typo (i.e., "2022" instead of "2020"). We have removed the reference to IMF data.

Section 6.3: it's fine that authors want to keep their combined scenario. But there are other comments on the section that were not implemented.

REPLY: Our apologies. Here your comments and our replies:

A lot of the information in this section repeats the methods, or should be included in that part of the paper.

We believe we have addressed this already in the previous round of review.

There are 3 tables here showing the details on different scenarios. They should be rather in the supplement, while a table (or graphs) should contrast the scenarios with each other.

We have removed two of the three tables and added a figure instead.

Further, the use of per mille should be rather replaced by percentages (also next to numbers), making the results more self-explanatory.

Done.

Section 7.1 and 7.2: no changes were made based on my review

REPLY: Regarding the "Strengths" section to be placed in the introduction or conclusion, respectfully, we do not agree with this comment, and we decided to keep this part in the discussion. We think that identifying strengths and limitations of a study is a rather standard part of a paper discussion section.

Regarding expanding the "Limitations" section (also) with parts from other sections of the paper, this has already been done in the previous round of review. Same with respect to "Information about availability of the data should be in the Data availability section in the end.". We have removed a link to the World Bank repository.

Lastly, we do not see the benefits of putting the bullet-point list of strengths and limitations in plain text. Rather, we think it is clearer as a bullet-point list.

Geographical names: the naming convention used by authors elsewhere or by the World Bank is not an argument. The names should conform with the standards and conventions of field and journal. Please apply the changes as in my review.

REPLY: We have replaced Oblast with region, also following the suggestion of the other reviewer.

We have not found any NHESS journal guidelines on geographical naming conventions other than a generic reference to "United Nations naming conventions", which to us seems consistent with the naming in our paper. If indeed the journal has specific geographical naming conventions which we have missed, please do show them to us. In general, we think that the geographical names we have used are quite uncontroversial and widely used. Can you please provide an example of a name that we have used wrongly and would lead to confusion/controversy?

Aside, we do think that consistency with other companion papers is very important, as well as consistency with the rest of the project guided by the World Bank, whose ultimate goal is to be usable by decision makers. Inconsistency in names among these sources might lead to more confusion than using some other standards.

Furthermore, we have shared the final report of the project (from which this and other papers are stemming) with numerous stakeholders (including government counterparties) from the five countries object of study, none of which has objected to the geographical naming we used. We understand that this is no argument to use in a rebuttal of a review, but it strengthens our belief that the naming conventions used are correct and perfectly understandable.

We also ask the editor to assist us in this matter.

Terminology: here, also please apply the changes as in my review.

REPLY: We have already replied to this comment in the first round of review.

Figures: the authors have decreased, rather than increased consistency of the figures. Please check them according to my final comment of the review.

REPLY: We have included a scale in the maps that were missing one and cited the background images.

Comments by Reviewer n. 2 and Replies by Authors

The Authors made a substantial effort to clarify the description of methods and results and to add the details required by the reviewers, so the manuscript reads much better now.

In my opinion, the manuscript still requires some minor edits to improve the clarity of some sections, which I list below. After these have been addressed, I believe that the manuscript can be published.

REPLY: Thank you for your review and for your positive words. We have replied to the comments here below. As some of the comments are simply suggestions for rearranging paragraphs or sections, we have taken the liberty not to implement a few of them, explaining why we did not, mainly for the sake of the readability of the paper. Obviously, there is some subjectivity in how a paper should be structured, so if the reviewer or the editor feel that our decision is not the correct one, please let us know and we will modify the paper accordingly.

Abstract: "The largest relative expected annual damages are found in Kazakhstan and Tajikistan..." relative to GDP? please specify.

REPLY: Relative to the total exposure. We have now specified.

line 40: I would replace "oblast" with "region" here. As a general comment, I saw that the use of Oblast was questioned by one of the other reviewers. If you want to use this term, please provide a clear definition early in the text so that readers can understand it.

REPLY: We have replaced Oblast with region.

lines 42-45: this paragraph would be better placed immediately after lines 25-31.

REPLY: Moved.

lines 320-382: I don't fully get this explanation, could perhaps provide an example for a city?

REPLY: We have simplified the explanation to make it more straight-forward.

lines 612-613: My understanding is that authors performed a sort of manual calibration , but It is not clear which indices were used to assess the model skill , did you use the ones in Table 4, or others? Please specify.

REPLY: We have specified it.

Section 4.1.2 : Lines 631-637 read like a summary of the remainder text in this section, please check to avoid repetitions

REPLY: We have removed repetitions.

Section 4.1.4 I suggest moving the results of validation of modelled hazard maps (i.e. figure 4 and lines 777-779) in section 6.2

REPLY: moved.

Figure 4: Please add a legend on left-hand map. Also, the legend on right-hand map is not readable, perhaps a white background would help.

REPLY: Unfortunately, we do not have an editable version of the right side figure and we can't change the background. We have added an explanation of the colours in the caption.

Lines 874-880: This list is rather long, not much clear and perhaps not necessary. Suggest either to rearrange it or remove it

REPLY: We have removed it.

Lines 924-935: this description would be more appropriate in Section 5.2

REPLY: moved.

Section 5.4 I suggest moving the validation of risk estimates to Section 6.3, as they are part of the results

REPLY: We understand this comment, but in order to avoid a very short risk model validation part in section 6, which would alter the flow of the paper and result a little bit odd, we have finally preferred to keep this part in section 5.4.

Section 6.1 . A map with the correlation and bias values would be more informative. Also, can the authors elaborate on the resulting skill of the model, considering the quasi-continental scale of the model and the consequent limitations?
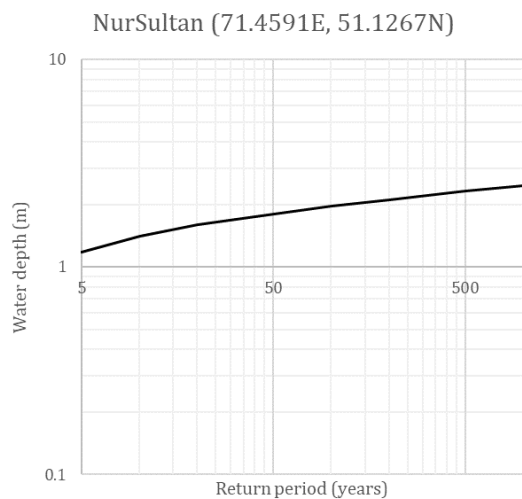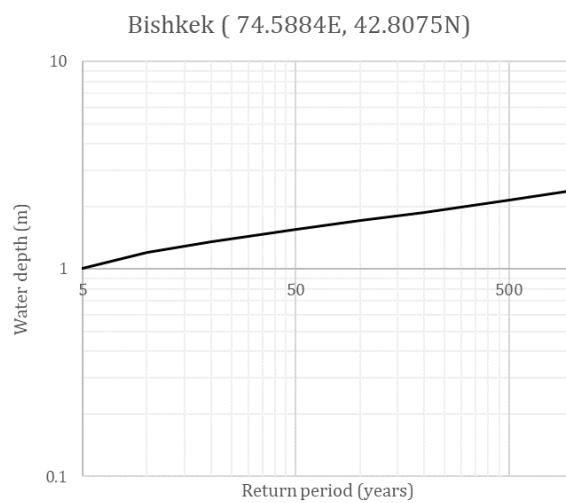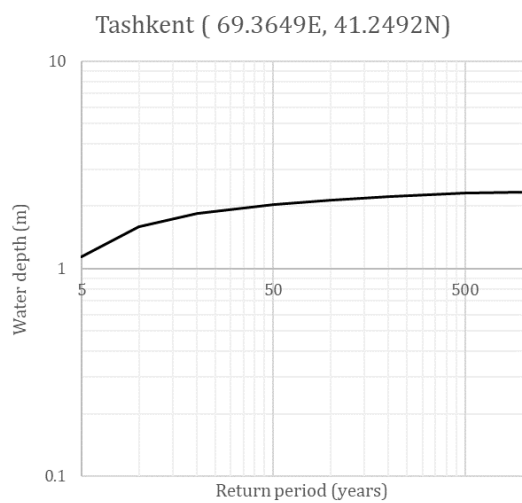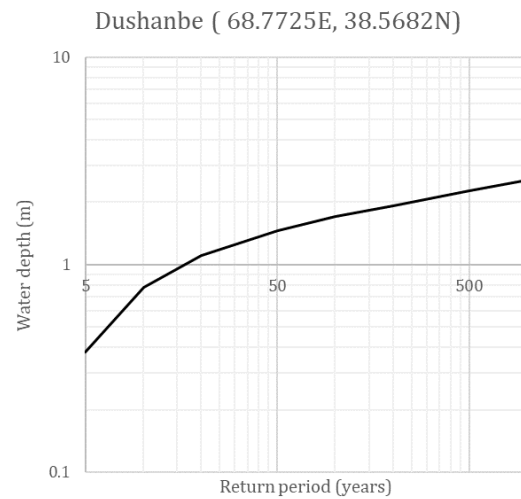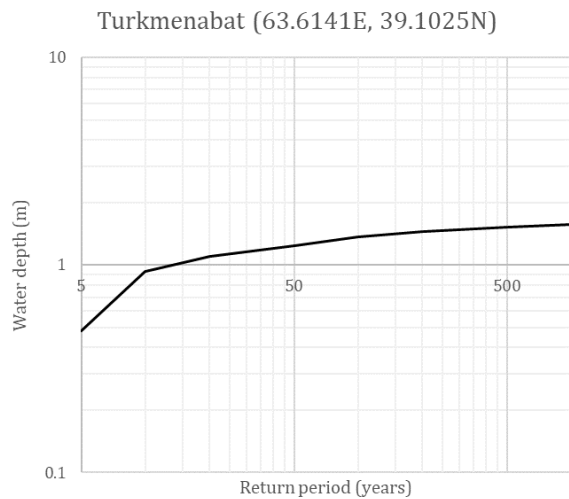
REPLY: Despite trying, we have not been able to create a map with the necessary quality and informative value to replace Table 4 and to be included in section 6.1. However, we believe that all the information is already in section 6.1. We have added some considerations on the skills of the model.

Lines 1221-1222: this should go in Data Availability section

REPLY: These lines refer to model results, not input data, therefore we think they should be in the results section.

Figure 9: in my opinion the graphs would be more informative with a logarithmic x-axis

REPLY: Here below you can see our best version of the log-log plots. After internal discussion, we think that the non-log version in the paper is better than this one. If the reviewer or the editor think otherwise, we are totally willing to change them.

Turkmenabat (63.6141E, 39.1025N)

Dushanbe (68.7725E, 38.5682N)

Tashkent (69.3649E, 41.2492N)

Bishkek (74.5884E, 42.8075N)

NurSultan (71.4591E, 51.1267N)

Lines 1685-1707: this interesting paragraph reads like a discussion of the results of risk model validation (now section 5.4), so perhaps they could be put together.

REPLY: We see this section belonging more to the discussion rather than to the results, so we would like to keep it here.