

1. ***Redistribution of information presented in the supplementary Section S1.1:*** the supplementary information is important to understand the model and it should be moved to the main paper (Section 3.1), as it would help clarify how the utility function U and the risk perception parameter β are defined; these are critical elements that should be included in Section 3.1, to ensure that the characterization of the risk aversion and perception is more clear.

We moved supplementary 1.1 to main text and adjusted the indexing of sections and equations accordingly.

2. ***“Formulation of the Discounted Expected Utility (DEU) equations:*** the chosen formulation of DEU (Eq. 1-3) raises some questions regarding the use of the sum of all discounted economic terms over time as argument of the utility function, rather than summing the discounted utilities (U values) themselves over time, as I think it is often done in the literature (e.g., Coble and Lusk, 2010); I believe that some compensations of economic terms (income and costs) occurring at different times are possible in the current formulation. While the chosen formulation may align with the DEU theory, it is worth considering and discussing whether it properly captures the agents' preferences related to the temporal distribution of wealth, income, damages, and costs over time (within T). It would be beneficial to check and discuss this choice (and its possible advantages or limitations) in greater detail in the text, to enhance the clarity of the DEU formulation and assumptions (regarding the agents' time and risk preferences) and to strengthen the rationale of the approach regarding the disentanglement of time preferences.”

We added the following Footnote 1 in Section 3.1 to discuss this point:

“Our formulation of the discounted expected utility functions includes a summation of monetary terms that occur over time as is line with related ABM applications (e.g. Haer et al., 2019; de Ruig et al., 2022; Tierolf et al., 2023), instead of a summation of discounted utility values themselves over time (Coble and Lusk, 2010). Our approach is consistent with the use of a time discount rate estimated for monetary values instead of a utility discount rate, but may be a simplification for capturing agents' preferences related to the temporal distribution of the included monetary amounts over time. Although we do not have data on such preferences for Mozambique to directly tests for this, the model calibration and validation exercises show that our behavioural rules adequately predict observed adaptation decisions in Mozambique (see sections 3.7 and 4.2). This gives confidence in our approach.”

3. ***“Discount factor choice and suitability for rural Mozambique:*** it would be good to clarify how the value ($r=3.2\%$) has been chosen and discuss how it can reflect the time preferences of households in the case study of Mozambique, as the citation reported (Evans and Sezer, 2005) should refer to the European Union context.”

We added the following Footnote 2 in Section 3.1 to clarify this choice:

“This value of the time discount rate is based on estimates derived from the European context, since a Mozambique estimate is lacking. One could expect that the actual discount rate in Mozambique is higher than this value, resulting in a too high weight given to monetary values in the far future. However, such an effect is counteracted by our choice for a relatively short time horizon of 15 years over which future values are included in the utility calculation. Our model calibration and validated analyses demonstrate that our combined choice of behavioural parameters performs well, in a sense that modelled adaptation outcomes match those observed in Mozambique with survey data (see sections 3.7 and 4.2).”

4. ***Definition of all parameters and constants used in all equations:*** the definition of a few parameters is missing, and should be included more clearly and explicitly within the paper for the sake of clarity (not referring to possible references only); in the current version, the values

and meaning of a few parameters are not reported, i.e., ρ , $p1$ and T in Eq. 1-3 (at the moment, one can understand or guess their meaning or value, e.g. T should be 15 years, see L. 167); the terms c , d and sigma (σ) in Eq. S1-S2 are not defined.

We edited the document by adding definitions of parameters and terms.

Technical corrections

1. L. 123-126 (Section 2, Case study): *in addition to internal migration within Mozambique, the issue of out-migration flows to other countries, mainly to other southern African countries, should be mentioned here to provide a more complete context (maybe this could be incorporated after the sentence: “Internal socioeconomic-driven migration has already been an issue in Mozambique since the 1980s (First, 1983)”)*

Added apart from out-migration to other south African countries (Facchini et al., 2013)

2. L. 135: *the word ‘risk’ may be missing in the sentence ‘reduce soil salinity (risk) on their farmland by switching to a more salt-tolerant variety*

Corrected

3. L. 172.173 (Section 3.2): *clarify what is meant by ‘exclude higher return periods from our analysis’*

Mentioned the return periods (1/2 years and 1/5 years)

4. L. 179: *the wording with ‘selecting’ does not seem to be the most appropriate in the sentence ‘Synthetic future flood events are simulated by randomly selecting for each administrative unit and the exceedance probability of each flood event’ (maybe the object complement after selecting should be explicated, e.g. ‘by randomly selecting events’)*

Added ‘an event type (by return-period)’ to clarify

5. *Missing definitions of acronyms, check and clarify all abbreviations and special notations (e.g., ECE, line 37 of introduction and Figure 2; EAD in Figure 6 labels; $t+=1$ should be $t=t+1$, in Figure 2, avoiding special informatic notation)*

Corrected the figure and defined EAD as Expected Annual Damage in the text

6. L. 151: *I think that ‘per county’ should be ‘per district’ in the Mozambique context*

Right, modified the word

7. L. 348: *In the sentence ‘We first present the results of salt intrusion and asset losses under a full behavioural setting.’, it would be good to specify in Section 4.1 for consistency with the rest.*

Mentioned the section index

8. L. 391: *The sentence “With a GDP of USD \$17.8 billion (World Bank 2022), an investment of USD \$1212.5 million to cover the loss would be ...” can be better linked and clarified in the context of the results presented (e.g., specifying that \$1212.5 is the annual loss expected by 2080 in the RCP8.5 scenario; moreover, for consistency, I would suggest reporting the same number (\$1212.5) at L. 385.*

Added a sentence ‘experienced under RCP 8.5 scenario in year 2080’

9. L. 478-480: *these sentences can be improved and clarified ("However, some households face financial constraints as only 6% of the annual income can be used for building adaptation and 50% for reducing yield loss and cannot adapt. Whereas, some richer households who showed migration intentions under full behaviour shows adaptation.")*

Modified the sentence for clarification

10. L. 480: *typo in 'Thew lowest'*

Modified to 'Moreover, lowest'

11. L. 500-501: *this sentence can be improved ("It can be observed in figure 10c that 65 percent household in Sofala floodplain cannot afford adaptation because of budget constraints, this was also observed in the survey where 67.31 percent households reported they cannot afford adaptation."), e.g., maybe '... which is in line with the survey...'*

Modified, now it flows better, thanks

12. L. 600: *I would suggest that 'unaffordability of adaptation' would read better*

We previously define 'spending capacity or affordability' as a characteristic of a household and would like to stick with that

13. L.625-626: *"The results show that the coastal farmers in Mozambique face total losses of \$5 million per year under baseline climate scenario ..." – it would be good to remind here (in a parenthesis maybe) that this scenario refers to no SLR*

Right, added in the text

14. Section 5.2: *a sentence could be added here to remind the limitation of considering a single fixed flood protection standard (with a return period of 10 years), as this seems an important simplification of possible spatial and temporal changes in the coastal protection standards that may influence the uncertainty of the results*

Added a sentence 'Moreover, the current model is limited to constant flood protection standards and a government agent could be modelled which can interact with hazard and coastal households to upgrade flood protection standards.' to define limitation of the model and room for further improvement.

15. Table 3: *I would suggest reporting the farming households percentage in the Table caption or in a separate line (for consistency with the other table entries reporting percentages of households that have adapted or indent to); also, in the first line, consider adding the word 'houses' in 'Adapted with elevating houses'*

Changed to Adapted with elevating houses

16. Table 4: *the caption can be improved, e.g. "Sensitivity of the number of coastal population in the year 2080 to five key model parameters ..."*

Modified the caption to 'Sensitivity of the number of coastal population in the year 2080 to five key model parameters under three climate scenarios coupled with socio-economic scenarios.'

17. *Reference lists in both the main paper and Supplementary material, check and proof-read, e.g. remove the double entry for Schiavina et al. (2019) from the SI list; complete the information missing for Duijndam, S. J. (2024) (Floods of movement: Drivers of human migration under sea-level rise and flood risk. [PhD-Thesis - Research and graduation internal, Vrije Universiteit Amsterdam]. <https://doi.org/10.5463/thesis.705>)*

Completed the reference

18. Check that the references to figures in the Supplementary material are clear with continuous consistent numbering and format within the Supplementary material (e.g., Figures S1 to S8), i.e., probably Figures 12 and 13 should appear as Figures S7 and S8

Checked and modified

References:

Coble, K. H., & Lusk, J. L. (2010). At the nexus of risk and time preferences: An experimental investigation. *Journal of Risk and Uncertainty*, 41, 67-79.

De Ruig, L.T., Haer, T., de Moel, H., Brody, S.M., Botzen, W.J.W., Czajkowski, J., Aerts, J.C.J.H. (2022). How the U.S. can benefit from risk-based premiums combined with flood protection. *Nature Climate Change*, 12: 995-998.

Facchini G, Mayda AM, Mendola M (2013) South-South migration and the labour market: evidence from South Africa. *J Econ Lit*:1–24

Haer, T., Botzen, W.J.W., Aerts, J.C.J.H. (2019). Advancing disaster policies by integrating dynamic adaptive behaviour in risk assessments using an agent-based modelling approach. *Environmental Research Letters*, 14:4.