

Dear Editor,

Please find enclosed, the revised manuscript entitled "BN-FLEMO_Δ: A Bayesian Network-based Flood Loss Estimation Model for Adaptation Planning in Ho Chi Minh City, Vietnam". All the comments/suggestions raised by the reviewers have been carefully addressed in the revised version. Below, all our replies are given in bold typeface. Moreover, all the changes have been highlighted in blue in the revised manuscript.

We would like to take this opportunity to express our appreciation for the work of the Editor, the anonymous Associate Editor, and two Reviewers who provided very relevant and constructive comments and suggestions. We have addressed all the requests and amended the manuscript accordingly. The provided comments and suggestions led us to considerably improve the manuscript.

- **Reviewer 2:**

The manuscript presents a new probabilistic multi-variable loss model for residential buildings in Ho Chi Minh City (HCMC). The model is based on a set of about 1000 newly collected loss data and Bayesian Network methods. The topic fits within the scope of the journal. The structure of the paper is clear, the methodology and results are clearly explained, and results are supported by data. In my opinion, the paper can be accepted for publication after minor points are clarified/addressed.

Response: We appreciate Reviewer 2 for his/her valuable comments which helped us to enhance the quality of the manuscript.

Minor concerns:

1. Page. 4 "Nevertheless, 467 out of 1530 data points contained missing values in flood loss predictors" → Do authors refer to water depth?

Response: We clarify that this statement refers to missing values in any of the predictors used for flood loss estimation, not just water depth. The text has been revised to remove any ambiguity.

Households were asked to report on two flood events (i.e., the most recent event and the most serious event in terms of impact within the last 10 years). Out of 1000 households, 530 provided information on both types of events, while the remaining households reported only one event (in these cases, the recent event was also the most serious). This resulted in 1530 records of flood loss data. Among these records, 467 contained missing values in one or more of the flood loss predictors (e.g., water

depth, inundation duration) or target variable (rlloss). To ensure the integrity of the analysis, we adopted a complete-case approach by excluding all records with missing values. Subsequently, 16 loss-influencing variables were selected based on an extensive literature review and consultations with domain experts in Ho Chi Minh City (Table 1).

2. Table 1 → Could authors better explain how these 16 variables have been selected? And why physical vulnerability of buildings (e.g. building structure) has not been considered? Could all buildings in the affected considered similar from this perspective?

Response: The 16 variables were selected based on an extensive literature review and consultations with domain experts in Ho Chi Minh City. Although physical vulnerability factors, such as building structure, are important, our dataset does not include this information for the study area.

3. Page. 11 “In comparison with studies conducted in Europe (Kreibich et al., 2017; Wagenaar et al., 2018; Mohor et al., 2021), we observe significantly higher importance of renovation and elevation of the building, as to our knowledge these variables have not been identified as relevant loss-influencing variables there” → I do not agree with this sentence. Many loss models include building elevation and level of maintenance/renovation as independent variables.

Response: We acknowledge that several European studies include building elevation and renovation as predictors. However, our analysis indicates that these factors have an even more pronounced influence in the context of HCMC. That said, to avoid any potential confusion, we have removed the sentence from the manuscript.

4. Page. 13 “Consequently, it is a valuable tool for supporting decision-makers in developing adaptation strategies in data-scarce and rapidly evolving environments like delta cities” → Could authors supply some examples of how the models can be used in practice by decision makers? I am afraid that this kind of models are hardly transferable to decision makers.

Response: We appreciate the reviewer’s feedback. We agree that highlighting practical applications is essential. This is precisely why approaches like the proposed BN-FLEMO $_{\Delta}$ are valuable, they not only provide a graphical representation that facilitates communication with decision-makers and stakeholders but also allow users to verify whether the results align with physical flood processes (e.g., understanding the relationships between independent and dependent variables, as illustrated in Figure 1). Furthermore, as noted in the conclusion, the model quantifies uncertainty, enabling users to incorporate this information

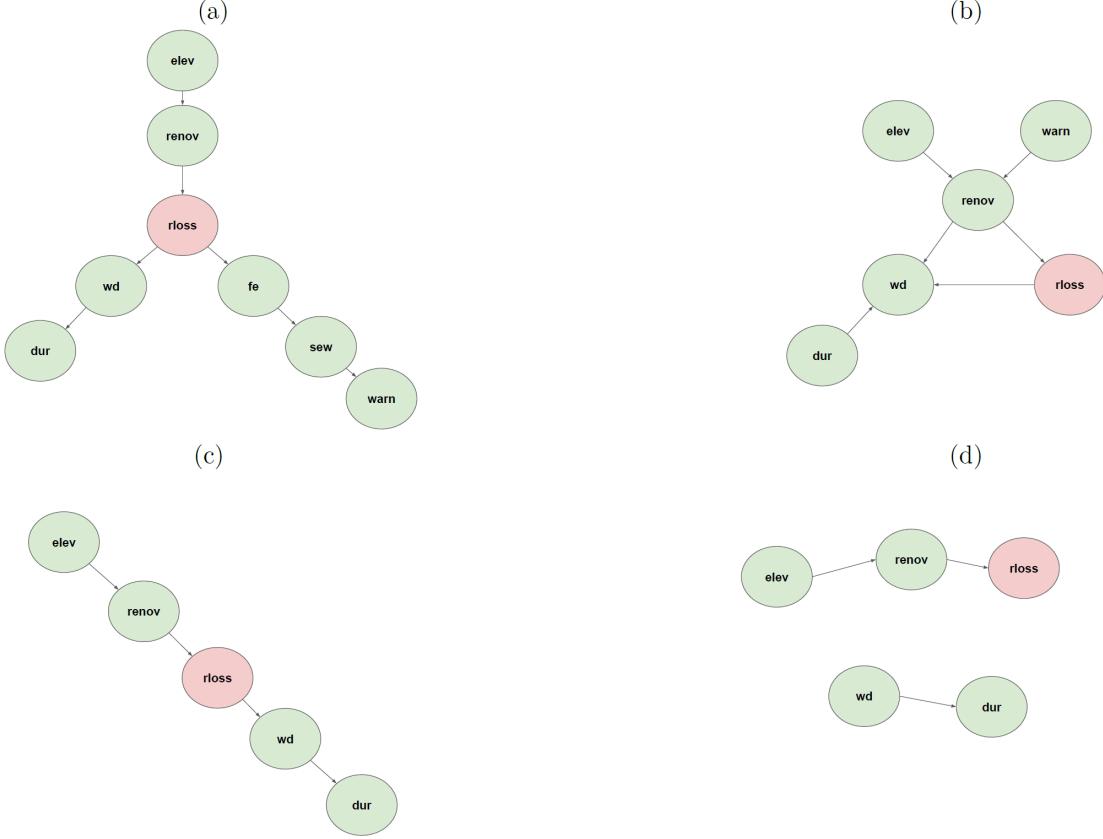


Fig. 1: The Bayesian networks learned from (a) hc, (b) iamb, (c) mmhc, and (d) rs2max.

into the decision-making process. To further demonstrate the practical application of BN-FLEMO $_{\Delta}$, the model has also been made available to flood risk experts through the DECIDER Decision Support Tool. We have now included this additional information in the manuscript as follows:

To this end, BN-FLEMO $_{\Delta}$ is provided for application by flood risk experts via the DECIDER Decision Support Tool (DST), complemented by descriptions and data. To ease the model application, a precomputed lookup table is provided, which associates all possible combinations of predictor variable values with the building loss that the Bayesian network predicts.