Dear Authors,
I was invited to review the Manuscript Number: "*Global Disaster Risk Assessment from Emergency Events Database (2013–2023)*""

The paper addresses an important topic by proposing the Accumulated Risk Index (ARI) as a means to quantify regional risk levels at the global scale using EM-DAT records from 2013 to 2023. The effort to integrate disaster occurrence data into a composite indicator is commendable and the study could make a valuable contribution to global disaster risk assessment. However, in its current form, the paper lacks clarity in its objectives, methodological rigor, and critical interpretation of results. Substantial revisions are required before the manuscript can be considered for publication.

The manuscript has several strengths that deserve to be acknowledged:

- the paper leverages EM-DAT, a well-established and widely used global disaster database.
- the focus on multi-hazard and compound events is relevant and aligns with ongoing research trends in disaster risk reduction.
- the attempt to provide a spatially explicit global perspective (5°×5° grids) has potential to inform comparative regional analyses.
- the integration of remote sensing datasets and the availability of open data on Zenodo is a positive step toward transparency and reproducibility.

However, the manuscript also raises several major concerns that need to be addressed before it can be considered for publication:

1. Clarity of objectives: the manuscript does not sufficiently articulate the purpose of ARI. The authors should clearly state what decisions or actions this index is intended to inform. How can policymakers, practitioners, or researchers use ARI in practice? Without a clear statement of utility, the value of the index remains uncertain.
2. Methodological rigor and transparency:
   2.1. The methodology section is fragmented and lacks coherence. It introduces three elements—identification of 344 major events, the ARI itself, and remote sensing data—without explaining how they are connected. A clear workflow is needed.
   2.2. The threshold of 50 fatalities to identify "major events" appears arbitrary. A sensitivity analysis should be conducted to explore how results change when this threshold is varied.
   2.3. Similarly, the choice of 5°×5° spatial grids requires justification. Alternative grid sizes should be tested to assess robustness.
3. Use of WRI and ARI definitions: the ARI is described as a simple aggregation of the World Risk Index (WRI) within fixed spatial units. Since the WRI methodology is not fully transparent in terms of input data and weighting, the implications of spatial aggregation are difficult to interpret.
4. Results and interpretation:
   4.1. The results are descriptive and primarily spatial distributions of event types. They do not sufficiently engage with the implications of the findings.
   4.2. The conclusions (Line 188) are too strong relative to the evidence provided. The statement that "*traditional risk assessment methods may underestimate risks in high-risk areas and overestimate them in low-risk areas*" is not convincingly supported by the presented results. A more cautious and better-argued interpretation is required.
   4.3. A dedicated Discussion section should be added, critically evaluating the robustness of the findings, uncertainties in the data, and implications for disaster risk management.
5. Integration of remote sensing data: the role of remote sensing imagery in the analysis is unclear. While the data collection effort is commendable, the manuscript does not explain how these

datasets contribute to or validate the ARI results. This section currently feels disconnected from the core analysis.

Minor comments:

1. Line 107: “percentages reflect approximate contributions to global damage and losses from 2013 to 2023” → add a reference.
2. Line 115: provide a table with examples of how textual descriptions of event locations were translated into latitude/longitude coordinates. This is crucial for validating spatial accuracy, especially when events span multiple grid cells. Clarify how multi-cell events were handled.
3. Equation 1: the risk formulation omits the exposure component, which limits its alignment with established risk theory (as WRI dose). This should be acknowledged and discussed.
4. Chapter 3 (supplement of remote sensing data): clarify its role in the study. does it serve as validation, contextual information, or a complementary dataset? Currently, its integration is not explained.

The manuscript tackles a relevant topic but requires **major revisions** to clarify objectives, strengthen methodological transparency, critically discuss results, and ensure consistency with established risk assessment frameworks.