Dear reviewer,

we appreciate the constructive comments and suggestions, although some points may possibly go beyond current scope of the analysis. For word length limit of the submission type of *Short Communication*, we could not supplement all the details in the analysis, and herein we try to respond as follows, with other revisions as supplement in the new revised version of the research.

Reviewer #2:

Comment 1: *While the entropy-weighted TOPSIS method has been applied to assess urban resilience to typhoon-induced disasters, how do the authors justify the selection of this method over other potential multi-criteria decision-making techniques, such as Analytic Hierarchy Process (AHP) or Data Envelopment Analysis (DEA)? Additionally, how might the method's limitations, especially in dealing with uncertainty and qualitative data, impact the robustness of the resilience assessment?*

Response:

We select the entropy-weighted TOPSIS method on the basis of distinct advantages in multi-criteria decision-making for urban resilience assessment compared to AHP and DEA: **First,** the AHP method relies on expert judgments to construct pairwise comparison matrices by introducing subjective biases, especially when handling numerous indicators, while the entropy method derives weights from data variability. This reduced subjectivity is critical for academic rigor when data is abundant or objective metrics (e.g., flood frequency, drainage capacity). **Second,** AHP requires tedious consistency tests, which become impractical as the number of indicators grows, while the entropy weighting sidesteps this issue, making it more scalable for large indicator sets typical for urban resilience assessment in our studies (social, economic, infrastructural, and environmental dimensions). **Third**, DEA method assumes a strict input-output framework, which may not align with the holistic, multi-dimensional nature of urban resilience (e.g., qualitative indicators), while the TOPSIS could handle both positive and negative indicators directly, allowing for flexible normalization (e.g., linear scaling, vector normalization) . **Fourth,** the DEA method focuses on relative efficiency scores within a dataset, treating decision units (e.g., cities) as black boxes and potentially masking performance nuances across specific indicators. TOPSIS, however, calculates distances to ideal/non-ideal solutions, enabling granular insights into how each city performs relative to benchmarks on every indicator —a critical feature for identifying resilience (e.g., a city strong in infrastructure but weak in social capital). On the other side, the TOPSIS offers a ranking mechanism via Euclidean or Manhattan distances, which is intuitive for stakeholders compared to DEA's production frontier analysis or AHP's hierarchical synthesis. Its linear weighting scheme also facilitates sensitivity analysis, allowing researchers to test how minor weight adjustments affect rankings—an important feature for robustness checks.

However, any multi-criteria techniques has limitations including the entropy-weighted TOPSIS, especially in handling uncertainty and qualitative data. Urban resilience is context-dependent and evolves with climate change, policy shifts, or societal changes. TOPSIS provides a static snapshot, lacking mechanisms to incorporate temporal uncertainty or scenario-based sensitivity (e.g., cascading risks). Without dynamic weighting, the method may understate risks in rapidly changing environments. **For the limitations above, we take measures in the revised paper by learning other researchers to enhance robustness**: (1) adopt the fuzzy entropy-TOPSIS approach for qualitative data, by converting linguistic terms (e.g., "high," "medium," "low") into fuzzy matrices). (2) Combine entropy weights with AHP to integrate expert insights and use concordance/discordance analysis to reconcile objective and subjective weights, e.g., via multiplicative/arithmetic averaging. For ordinal qualitative data, we apply rank-based standardization to retain ordinal information without assuming interval-scale validity.

As for the word length of *short communication* for Egusphere ,we herein supplement critical references for the improvement of method section in the revised paper. See it as follows：

Ref.

Mer Ekmekciolu , K. K. B. "Stakeholder Perceptions in Flood Risk Assessment: A Hybrid Fuzzy AHP-TOPSIS Approach for Istanbul, Turkey." *International Journal of Disaster Risk Reduction* . 2021

Pathan, A. I. , Agnihotri, P. G. , Said, S. , & Patel, D. . (2022). AHP and TOPSIS based flood risk assessment- a case study of the Navsari city, Gujarat, India. *Environmental monitoring and assessment,* 194(7), 509.

Qin, R. , Shi, C. , Yu, T. et al. 2021. Comprehensive assessment of fire hazard for polyurethane foam based on AHP-Entropy-weighted TOPSIS. *Journal of Hydrology,* 19.

Chen, Y. , Li, K. W. , & Liu, X. S. . (2009). A DEA-TOPSIS method for multiple criteria decision analysis in emergency management. *Journal of Systems Science & Systems Engineering.* 18 (4) , pp.489-507

Comment 2: *How does the study account for the potential cascading effects of typhoons, particularly in urban areas where infrastructure systems such as power grids, water management, and transportation networks are highly interdependent? Could the authors expand on how these interconnected systems may exacerbate the immediate and long-term impacts of typhoon disasters?*

Response: The cascading effects of typhoon pose a challenge in resilience-related analysis, especially in indicator-based disaster research. Static indicators often fail to adequately capture the dynamic cascading effects. In light of previous research, our revised paper endeavors to incorporate some assessment elements in the urban comprehensive resilience evaluation. Specifically, it integrates content that can reflect cascading effects from some dimensions.
(1) Direct economic loss: we quantify the value of damaged infrastructure, such as buildings, roads, bridges, and public facilities. Indirect economic loss: we measure the loss of economic output due to business disruptions, and the cost of production chains. (2) Infrastructure damage。we develop an index based on the percentage of economic loss with different levels of damage. This can be calculated by conducting statistical data and categorizing losses accordingly. • Transportation network disruption: we measure the length of roads and railways that are blocked or damaged, and delays in transportation services. • Water supply interruption: we measure the number of households or industrial users affected by water supply disruptions. (3) Flooding depth: we use hydrological data to measure the depth and extent of flooding in the affected city, which can help assess the impact on urban ecosystems, agricultural land, and water quality.。

For word length limit of *short communication type for* Egusphere, we could not extend the cascading analysis of typhoon disaster. Of course, the interconnected urban systems may exacerbate the immediate and long-term impacts, which are chiefly reflected as follows:
Immediate impacts • Power supply disruptions: in urban areas, the power grid system can be severely affected, meaning that a single point of failure can lead to blackouts in large areas. • Water supply: Heavy rains and strong winds from typhoons can damage water pipes and sewage systems. In urban systems, where water

supply networks are interconnected, a breakdown in one part could possibly affect a large number of residents. • Transportation hiccups: Typhoons can cause significant damage to roads, bridges, and railways, making it difficult for emergency vehicles to reach affected areas • Communication breakdown: Telecommunication towers and infrastructure can be damaged by typhoons, leading to disruptions in mobile and landline services. The interconnectedness of communication systems means that a widespread loss of service can occur, making it challenging to communicate with residents and reach out for help.

Long - term impacts • Economic disruptions: typhoon damages can disrupt the urban supply chains, affecting both local and regional economies. Small and medium - sized enterprises, which often have limited resources, may struggle to recover, leading to job losses and a slowdown in economic growth. • Housing issues: The damage to buildings in typhoon can have long - term consequences. In urban areas, where housing is dense, the repair and reconstruction of damaged properties can be a complex process. Additionally, the displacement of residents may lead to overcrowding in temporary shelters or other areas, putting strain on local resources. • Public health concerns: The immediate damage to urban infrastructure can lead to long - term public health issues. Contaminated water, poor sanitation, and the presence of mold and other pollutants in damaged buildings can increase the risk of diseases. • Environmental degradation: Typhoon can cause significant damage to urban green spaces, trees, and natural habitats. In cities, the loss of green spaces due to typhoon damage can have long - term environmental consequences, such as increased heat island effects and a reduction in biodiversity. Moreover, the runoff from damaged areas can carry pollutants into water bodies, further degrading the urban environment.

Comment 3: *The study emphasizes the importance of administrative capacity in enhancing urban resilience. How can the authors elaborate on the specific administrative policies or governance models that have led to significant improvements in disaster response and recovery? Are there transferable best practices that could be applied in regions with different political and administrative frameworks?*

Response:

This question seems to go beyond the scope of this research. Anyway, taking China as the context, we herein could briefly disclose special administrative policies adopted during the disaster response and post - disaster recovery. To enhance urban resilience, China addresses the administrative capacity in disaster response and recovery policies, including unified command, hierarchical responsibility, resource integration, technological support, and post-disaster reconstruction.

The central, provincial, municipal, county, and township - level disaster - relief systems in China have been basically established, which could ensure the effective guarantee of the basic living needs of the affected people within 12 hours and coordination after the disaster. The integration of national comprehensive fire rescue team has been accelerated, and six regional rescue centers have been established in the Northeast, North China, Central China, Southeast, Southwest, and Northwest regions, forming a key force adapted to the disaster of each region. In addition, the central government has increased its financial support for post - disaster recovery and reconstruction, and has issued special bonds to support related disaster response. Local governments also allocate corresponding funds to ensure post - disaster recovery and reconstruction. The role of technology are also be emphasized to enhance administrative capacity in mitigating disasters, such as the use of big data, remote sensing technology, and AI for monitoring and early warning. For instance, the "Digital China" initiative is promoted to enhance information integration and decision-making efficiency during disasters. Post-disaster policies, such as funding allocation, public-private partnerships (PPP), and community participation, are stressed by local governance innovations to accelerate recovery.

Some China's practices in disaster response can also be applied to regions with different political

and administrative frameworks:•(1)Strengthening monitoring and early warning: The application of advanced technologies such as satellites and the remote sensing is a universal practice that can be learned from by different regions. By establishing a set of monitoring systems and early warning, potential disaster risks can be detected in a timely manner, and the time for disaster response can be advanced. (2)Enhancing public awareness of disaster prevention: No matter what kind of political and administrative framework a region has, enhancing public awareness of disaster prevention and improving the public's ability to respond to disasters are of great significance. Through publicity, training, and drills, the public can better understand disaster - prevention knowledge and emergency response methods, so as to reduce casualties and property losses in the event of a typhoon disaster. (3) Establishing a coordination mechanism: The establishment of an efficient coordination mechanism for typhoon disaster response is also applicable to different regions. Different sectors need to work together and coordinate with each other in the process of disaster response to form a joint force, as was better reflected in covid-19 pandemics. This requires the formulation of clear division of responsibilities and cooperation to ensure the orderly progress of disaster - relief work.

Comment 4: *Given the escalating risks posed by climate change, how does the study incorporate future climate projections, particularly in terms of increased frequency and intensity of typhoons? Could the authors provide a detailed explanation of how the resilience scores might shift under different climate scenarios, and what role these projections should play in long-term urban planning?*

Response:
This question seems to go beyond the scope of analysis in this communication report, however, it has implications for future research, and herein we tend to briefly respond. Climate projections are to predict future climate trends, including changes in typhoon frequency and intensity. Urban resilience research could incorporate these points into the adaptation strategies. In specific, it could use climate models to simulate typhoon scenarios, such as sea level rise and storm surge impacts, and then assess a city's vulnerability and response capacity. Additionally, the integration of climate projections into urban resilience requires interdisciplinary collaboration, and challenges may include climate model predictions and data uncertainty. For this, IPCC reports or regional climate assessments may provide relevant data supporting. Urban resilience frameworks, such as those developed by the Rockefeller Foundation's 100 Resilient Cities initiative, might include guidelines for integrating climate projections, which could involve risk assessments, scenario planning, and adaptive management.

For the second question, we believe that it is necessary to analyze how different climate scenarios could influence urban response or resilience. For example, under a high-emission climate scenario with intensified global warming, this could increase the pressure on coastal cities' infrastructure, potentially reducing its robustness scores. Rising sea levels may exacerbate storm surges, threatening low-lying areas. Conversely, under a low-emission climate scenario, typhoon intensity and frequency may decrease, and cities could enhance resilience performance through adaptation measures However, specific data—such as changes in typhoon parameters (frequency, intensity, path) under different climate scenarios—are difficult to accurately assess the impact on resilience scores. This requires searching for relevant climate projection data sources, particularly on coastal regions.

Additionally, for the role of climate projections in long-term urban planning, urban planners need to consider climate change risks when formulating policies, such as adjusting infrastructure standards, relocating vulnerable populations, or strengthening ecological restoration. Resilience score projections, as taken in our communication report, can help reflect urban capacity, guide fund priorities, and inform adaptation strategies. For example, cities with projected score declines may need to accelerate infrastructure upgrades or develop early warning systems. It is important to note that the urban resilience score is not static and can improve through proactive adaptation measures. Even under high-emission scenarios, cities that invest in flood-resistant buildings or wetlands restoration might maintain or improve their resilience scores. Moreover, urban resilience involves multiple dimensions—social, economic, environmental, and institutional—and climate scenarios may affect these dimensions differently. Economic resilience might be impacted by property damage and business interruptions, while social resilience could depend on community support systems. Thus, long-term urban planning could consider climate projections by considering these interconnections.

Comment 5: *While the composite resilience score provides a holistic view of urban resilience, what are the inherent limitations of using such an aggregated measure? How might the study benefit from a more disaggregated analysis that examines individual dimensions (e.g., social, economic, environmental) in greater detail, and how could these results influence tailored policy recommendations for specific urban contexts?*

Response:

1. We use the composite resilience score to assess urban resilience , which has certain limitations mainly reflected as follows: (1) The construction of the composite score depends on the weighted integration of multi-dimensional indicators (economy, society, environment, infrastructure, etc.), in which the weight is more subjective and may lead to deviation. (2) Multi - dimensional data is compressed into a single value through dimensionality reduction (such as standardization). This process neglects the heterogeneity within each dimension, and fails to capture the non - linear relationships between dimensions (such as the conflict between infrastructure and community resilience). (3) The composite score is mostly based on static cross - sectional data, making it difficult to capture the dynamic evolution characteristics of resilience and reflect the "time - lag effect" .
2. Disaggregating resilience into social, economic, and environmental dimensions emphasize specific areas of city vulnerability or strength that might be obscured in aggregated scores. For example: ◦ A city with high overall resilience might still have social vulnerabilities (e.g., unequal access to healthcare) or environmental weakness. Conversely, a city with low aggregate resilience might excel in economic diversity (strength) but lack social cohesion (weakness). In the reality, cities differ drastically in their challenges: a coastal city may prioritize environmental resilience (flood adaptation), while a post-industrial city may focus on economic resilience. Thus, disaggregated analysis that examines individual dimensions (social, economic, environmental) is conductive to yield from bare rankings into actionable insights.
3. The urban resilience assessment based on multi-dimension indicators could to a certain degree influence tailored policy recommendations for specific urban contexts. Briefly, by identifying which dimensions are interdependent (e.g., environmental degradation threatening economic productivity), policies can be designed to address multiple challenges simultaneously. For instance, to enhance social resilience in low community connectivity, policies might focus on Investing in affordable housing and public services to reduce inequality, strengthening community sectors to enhance disaster response coordination. In flood-prone cities affected by typhoon, policies might prioritize in retrofitting infrastructure (e.g., permeable pavements, flood barriers) to enhance environmental resilience. By identifying context-specific vulnerabilities, interdependencies, policymakers can design targeted, adaptive, and holistic interventions that address the unique challenges of each city from more dimensions—whether mitigating disaster, fostering technical innovation, or adapting to climate risks. This approach ensures that policy recommendations are not just "resilient in theory" but practically relevant to the complex, multifaceted realities of urban life.

Comment 6: *Urban resilience to typhoon disasters is inherently dynamic, evolving with changes in environmental, social, and infrastructure conditions. How does the study incorporate this dynamic nature into its resilience assessments, and what recommendations can the authors make for cities to track and enhance their resilience over time, accounting for changes such as population growth, urbanization, and climate change?*

Response:
This is a sharp question, which has been mentioned in the part of research limitations in this communication report. Also as responded in the Comment 2, multi-dimension static indicators (social, environmental, and infrastructure) may possibly fail to capture the dynamic conditions such as the cascading effects. In light of previous research, we will introduce other system-based methods (eg. dynamic simulation) in future research to make up for current weakness.

For recommendations raised by the referee, we make the following response: To track and enhance resilience over time, cities need a dynamic monitoring system integrating real-time data (e.g., sensors for air quality, traffic flow) and periodic assessments (e.g., annual typhoon reports). Indicators should be regularly updated to reflect changing conditions. Among this, stakeholder collaboration is a key point, involving government, businesses, and civil society. Public-private partnerships (PPPs) could fund resilience projects, while citizen initiatives might gather grassroots data. Capacity building is another priority—training officials in resilience strategies and educating the public on typhoon disaster preparedness. For technological innovation, AI for risk prediction or blockchain for supply chain transparency, might be adopted to improve urban resilience for typhoon disaster. Regarding population growth and urbanization, cities may face resource strain, increased demand for public services, and environmental pressures. Climate change could bring more extreme weather events, rising sea levels, etc. In sum, specific recommendations must align with local contexts in cities.

Comment 7: *I believe that incorporating relevant and recent academic sources could further strengthen your paper's validity and provide readers with more context and background on the topic. As follows:* https://doi.org/10.1016/j.egyr.2022.08.226;
https://doi.org/10.1371/journal.pone.0190701.

Response: Thanks for the advice. Apart from sources above, we also absorb some other new sources of information in the revised communication, mainly including the following research.

Rui Yang, Yang Li (2022). Resilience assessment and improvement for electric power transmission systems against typhoon disasters: A data-model hybrid driven approach. Energy Reports Vol.8.
Song, J. , Huang, B. , & Li, R. . (2018). Assessing local resilience to typhoon disasters: a case study in Nansha, Guangzhou. Plos One, 13(3).

Finally, we again appreciate the time and efforts that the editor/reviewer have engaged, hoping the response will be appropriate. The revised one will be submitted through the egusphere system later on entrusted by the AE.

Best wishes!