

Assessing Community Resilience Outcomes of Flood-Vulnerable People in Bangladesh by Using a 5-Point Likert Scale: A Study on Bakshiganj Upazila

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Abstract

This study examined the perceived outcomes of resilience by investigating 16 community resilience outcome statements on a 5-point Likert scale, where 1 = Strongly Disagree and 5 = Strongly Agree. The analysis included a diverging stacked bar chart of full response distributions and a bubble mean score chart, which analyzed the central tendency and texture of community opinion. There are no scores < 3.0 in the community-wide score across all 16 outcomes, which is considered “neutral”, and many > 4.0, which is considered “agree”. The most regularly agreed-upon and highly rated answer was vulnerability mapping, with a mean of 4.29 and a 60% flow of strongly agree responses, confirming it as the first building block of community preparedness. The results of the top tier of scores, covering risk reduction through community participation (4.20), precautionary measures (4.19), sustainable livelihoods (4.17), and property damage reduction (4.16), showed this to be the case, and that the score for each of these was only 0.04 points apart, indicating that respondents’ experiences of risk-reduction efforts, precautionary measures, sustainable livelihoods, and property damage reduction are reinforcing rather than discrete program outputs. The greatest collective agreement was for precautionary measures, where 76% agreed or strongly agreed, indicating the most cross-sectional resonance in the community for taking preventive measures. The two lowest outcomes (NGO support to coping and DRM awareness) were found to be above the neutral threshold, suggesting relatively low community confidence in external support mechanisms and awareness-raising efforts. Post-disaster health safety (3.90) scored slightly below the agree threshold, highlighting ongoing post-flood poor conditions with regard to maintaining health and hygiene. The results show that there are two distinct future strengthening directions to be taken,

such as the perception of external support and health maintenance after disaster.

Keywords

Community Resilience Outcomes, Flood, Bangladesh, Likert Scale

1. Introduction

The deltaic landscape, monsoon climate, and high population density in the country leave it vulnerable to natural hazards, especially floods, cyclones, and droughts, in such a way that they are causing uneven loss of life and property compared to similar countries (Chowdhury et al., 2022; Masum, 2019; Rahman et al., 2019; Islam, 2016; Ashraful Islam et al., 2016; Toufique & Islam, 2014; Afjal Hossain et al., 2011; Monirul Qader Mirza, 2002). This is being worsened by climate change. The growing frequency and intensity of extreme weather events and the communities facing the burden of the river systems and coastal belts of Bangladesh are all hardest hit (Seneviratne et al., 2021; Zanolocco et al., 2018; Bell et al., 2018; Konisky et al., 2016; IPCC, 2014; Zwiers et al., 2013; Hay & Mimura, 2010; MoEF, 2009). The northwest is facing chronic drought, and central and northeast districts are suffering from riverine flooding for most of the year (Sarkar et al., 2024; Quader et al., 2023; Hoque et al., 2020; Roy et al., 2019; Bhattacharya et al., 2016; Habiba et al., 2012; Dey et al., 2011; Shahid, 2007). The consequences and effects that rural communities have to deal with include recurrent agricultural losses, dislocation, food insecurity, and disturbance of livelihoods, all with minimal external assistance (Alam et al., 2020; Parvin et al., 2016; Biswas et al., 2015; Rahman et al., 2007).

Vulnerability is important to understand why some are exaggerated more severely by disasters than others. Vulnerability is not just the exposure to a hazard. It is predisposed by social, economic, and political conditions, such as poverty, gender, age, land ownership, and access to resources (Syroid & Fomina, 2023; Biswas & Nautiyal, 2023; Otto et al., 2017; Birks et al., 2017; Harris, 2008; Boshier et al., 2007; Mechanic & Tanner, 2007; Adger, 2006; Wisner et al., 2004; Neil Adger, 1999). The rural poor, especially women, landless farmers, and daily wage earners, are always the most vulnerable and the least able to bounce back in Bangladesh (Mahedi et al., 2024; Morsalin & Islam, 2023; Deb & Haque, 2011; Chowdhury, 2009; Dilley et al., 2005). Women are at an extra risk since disasters also deal with their social contexts, which usually offer some level of fortification. In and after floods, women have fewer mobility options, are more likely to be hassled, and are more likely to have a heavier domestic burden (Fatema et al., 2023; van Daalen et al., 2022; Singh, 2020; Ayeb-Karlsson, 2020; Cutter, 2017; Azad et al., 2013; Bradshaw & Fordham, 2013; Sultana, 2010; Neumayer & Plummer, 2007).

The general trends are that vulnerability is contrariwise related to resilience and

that social, economic, institutional, and environmental capacities are directly related to resilience and inversely related to vulnerability (Atkinson, 2023; Proag, 2014; Young, 2010; Adger & Brown, 2009; Sapountzaki, 2007; Gallopín, 2006). Hence, the process of making communities less vulnerable by enhancing livelihoods, infrastructure, governance, and social support is essential to building a resilient community and a sustainable approach to disaster risk management (Polcarová & Pupíková, 2022; Pandey, 2019; Jones et al., 2010; Mathbor, 2007; Alexander et al., 2006; Cannon et al., 2003). However, this study assesses the community resilience outcomes of flood-vulnerable people of Bangladesh by using a 5-point Likert scale.

2. Literature Review

2.1. Vulnerability to Floods

The literature shows that there are a lot of factors influencing flood vulnerability, such as socioeconomic, demographic, environmental, institutional, and spatial factors that interact with each other. Repetitive and regular socioeconomic factors are always identified as factors of vulnerability. Factors that make people more vulnerable to the effects of flooding and limit their capacity to adapt are poverty, low income, poor housing, limited access to services, poor infrastructure, and low education (Parvin et al., 2016; Porio, 2011; Braun & Aßheuer, 2011; Hardoy & Pandiella, 2009; Moser & Satterthwaite, 2008; Brouwer et al., 2007). In the same way, Osberghaus (2021), Pathak et al. (2020), Afriyie et al. (2018), Satterthwaite et al. (2012), Cohen & Sebstad (2005), and Vatsa (2004) reported that having lower income, fewer assets, and inadequate adaptation options make people more vulnerable, while higher income and owning assets and adaptation options reduce risk. Hoq et al. (2021), Liu et al. (2020), Ado et al. (2019), Rakodi (1999) also noted that poverty and inadequate livelihood assets and coping mechanisms increase livelihood vulnerability, and that better assets and coping mechanisms increase livelihood resilience.

Other factors related to space and the environment are also important drivers of vulnerability. Some prominent studies have established that there are significant geographical vulnerabilities to flooding, with low-lying areas, riverine regions, and compact population areas being most vulnerable (Nahin et al., 2023; Edmonds et al., 2020; Roy & Blaschke, 2015; Adikari et al., 2010).

Environmental factors like flood frequency, elevation, river proximity, landscape, drainage density, rain spreading, and land-use characteristics have a significant impact on exposure to flooding (Odoh & Nwokeabia, 2024; Nahin et al., 2023; Tariq et al., 2022; Hasanuzzaman et al., 2022). Similarly, Musfike Meraz et al. (2023), Ritzema & Van Loon-Steensma (2018) found that areas near groundwater, flood-prone areas, and compact populations have greater vulnerability because they are more exposed to flooding and have less adaptive capacity.

The literature specifies that vulnerability is not only a result of physical exposure to flooding, but rather a product of the interaction of environmental factors,

socioeconomic disparities, demographic features, institutional capacity, and governance effectiveness. Poor communities with inadequate resources, poor infrastructure, social demotion, and high exposure to environmental hazards steadily show high vulnerability, whereas strong livelihood assets, adaptive capacities, and access to resources are constantly associated with reduced risks and increased resilience (Lee et al., 2021; Hoq et al., 2021; Pathak et al., 2020).

2.2. Community Resilience

The literature has shown that community and household resilience to climate-related hazards in Bangladesh is a multidimensional phenomenon which is influenced by social, economic, institutional, infrastructural, environmental, and governance scopes. Research indicates that there are noteworthy geographic and socioeconomic differences in resilience across regions and hazard settings. Socioeconomic variances, infrastructure, services, and social capital influence the resilience of communities to riverine floods (Paszkowski et al., 2023; Dewa et al., 2023; Laurien et al., 2020; Lwin et al., 2020; Porio, 2011).

The same was found: social unity and local adaptation practices played a positive role in increasing resilience; however, there was also a need to address the limits of infrastructure, financial resources, and institutional capacity building (Mallick & Martínez-Fabiani, 2026; Ma et al., 2023; Aldrich & Meyer, 2015; Archer et al., 2014; Brown et al., 2012).

Poverty, environmental dilapidation, limited resources, and their associated factors have been found to be key challenges that hamper resilience, while effective early warning systems, cyclone shelters, native knowledge, and the participation of communities have been identified as building blocks for improving adaptive capacity and recovery (Ganguly et al., 2026; Adebayo, 2025; Jerneck & Olsson, 2015; Béné et al., 2014; Paton & McClure, 2013; Ride & Bretherton, 2011).

Bhattacharya et al. (2026), Gopal et al. (2026), Tota et al. (2026), and Yanda et al. (2019) identified livelihoods divergence, financial resources, education, institutional support, and access to climate information as factors influencing the resilience of coastal fishing communities. Similarly, Salan et al. (2025) have revealed that community assets, such as human, social, financial, natural, physical, and institutional assets, are highly connected with climate-induced drought resilience in *Barind* Tract. The results indicate that improving livelihoods, resources, and access to them continue to be key to growing adaptive capacity and lessening vulnerability. In addition, policy interference, governance, and community involvement have been highlighted as key factors in achieving resilience (Chowdhoree, 2020; Shaw & Maythorne, 2013; Wilson, 2013).

2.3. Gaps in the Literature

It is shown in the literature that flood vulnerability is the result of the combination of complex socioeconomic, demographic, environmental, institutional, and spatial factors. In practice, the following factors have been increasingly identified as

protective: wealth, housing quality, infrastructure, education, and adaptive assets, and in contrast, dense low-lying riverine populations, weak drainage, low income, and limited livelihood assets are consistently identified as amplifying vulnerability. In turn, resilience has proven to be multi-dimensional, including physical, social, financial, and institutional capitals. However, this study attempted to fill the gap in the literature by measuring the community resilience outcomes of flood-vulnerable people in Bangladesh by using a 5-point Likert scale.

3. Methods and Materials

3.1. Study Area and Population

Bagar *Char*, Merur *Char*, and Nilakshmia union of Bakshiganj Upazila of Jamalpur district were the study areas for conducting this study. The study population was around 120,000, who were spread across the three unions of Bakshiganj Upazila of Jamalpur district.

3.2. Sampling and Sample Size Determination

This study applied a mix of purposive and random sampling techniques. The study area was determined through non-probability sampling (purposive), and on the other hand, probability sampling (random) was used to select the respondents. The study population comprised males and females of households of all the selected unions. With a 95% level of confidence and a 5% margin of error, the sample size is 383 households, but 390 households were sampled. Further buffer was added for any possible problems that could occur, such as not submitting the appropriate information or important information being lost or overwritten. 130 respondents from each union have been selected for the survey. The following criteria were applied for choosing the respondents: (a) male and female; (b) age not less than 21 years; (c) physical and mental condition to take part in the survey; and (d) a desire to take part in the survey.

3.3. Data Collection

The people of households in the selected unions were interviewed using a structured survey questionnaire to collect data on DRM awareness; risk reduction; government support to coping; NGO support to coping; vulnerability mapped; community cooperation; loss of life reduced; property damage reduced; community leaders' roles; precautionary measures; stress reduction; post-disaster health safety; sustainable livelihoods; hazard-resistant cropping; eco-friendly practices; and hazard-resilient construction. It used a 5-point Likert scale, which extended from strongly disagree (1) to strongly agree (5), to assess the respondents' attitudes. The middle alternative (3 = Neutral) was left in place to enable respondents to show true impartiality in answers to the items where neither agreement nor disagreement was expressed. The format of the questionnaire was structured, which resulted in consistency in data collection from the sample, reducing interviewer bias and discrepancies in data recording. The field interviewers were trained to con-

duct in-person interviews in a standard manner and received information about the goals of the study and the proper administration of each item. The questionnaire was planned in the language that is easily understood by the respondents to ensure clarity and comprehension. The questionnaire was tested by enumerators to ensure that they were complete and then coded for analysis. The data were collected in June 2020 to June 2021.

3.4. Data Analysis and Presentation

The collected data were coded, entered, and analyzed using SPSS. The responses from the 390 respondents were summarized using descriptive statistics (percentages and means) and considered by the 16 five-point Likert scale items. Responses were received through a 5-point Likert scale to specify their agreement with each statement, with 1 representing strongly disagree and 5 representing strongly agree. This assessment was followed by a visual representation in the form of two corresponding charts. The diverging stacked bar chart gives a breakdown by responses of where community members placed themselves in the 16 outcomes on the five scale points. The bubble mean score chart summarizes the same data in one easily comparable tool, the arithmetic mean score, which can be used to rapidly rank order the 16 statements based on the level of community ratification.

3.5. Ethical Considerations

The research was conducted in accordance with the guidelines of voluntary participation, informed consent, privacy, and protection from harm. There was no pressure for participation, and oral consent was received from all respondents who were informed about the purpose of the study. The respondents were free to decline to answer any question and to stop replying at any point without penalty. The data were anonymized and stored on password-protected devices, which were only accessible by the researcher.

4. Results and Analysis

Community Resilience Outcomes: Likert Scale Analysis

By studying the figure in detail (**Figure 1**), we can see that the most dominant place in the collective authorization of the community was in the forms of protective measures taken. This was the highest level of agreement (76%) and strongly agree (64%) by any proportion of respondents to the 16 statements. This is a noteworthy finding and reveals a deeper level of meaning, as residents believe the precautionary measures put in place in their community, whether at the community level (such as early-warning protocols or structural mitigation measures) or at the household level (such as preparedness measures), are relevant and that they are truly being applied on a day-to-day basis. Three other outcomes received good levels of firm authorization, although at slightly lower strengths. A majority (60%) of respondents strongly agreed that vulnerability mapping was significant to have hazard levels, vulnerable areas, and evacuation routes formally mapped and car-

tographically documented. Sustainable livelihoods received 53% strongly agree responses, with only just over half of the community members directly linking developments in their long-term economic resilience to community-based DRR activities. Risks reduced by community contribution did not get as few strongly agree responses as any other foremost cluster, but 51% of respondents strongly agreed, marking a clear majority that community contribution itself is a risk reduction mechanism.

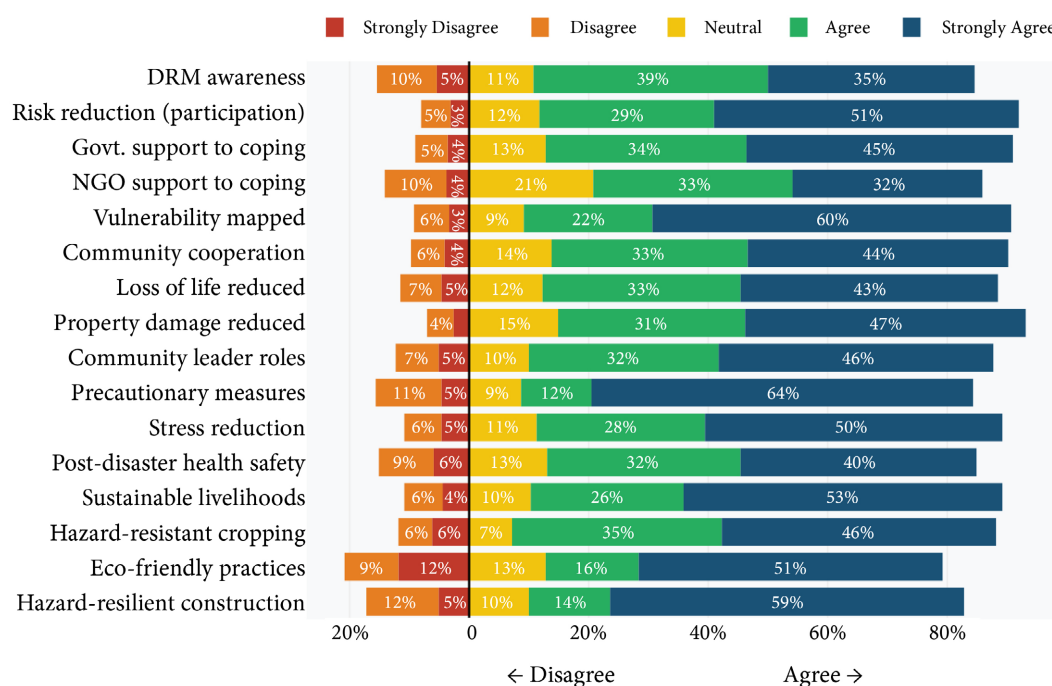


Figure 1. Community resilience outcomes—Diverging Likert chart.

As can be seen in **Figure 2**, the mean scores for all 16 statements of outcomes were in a fairly limited range of 3.79 - 4.29. Outstandingly, the majority of items were at or above “agree” (4.0 or higher on a five-point Likert scale), whereas none of the items was below “neutral” (3.0 or lower). This pattern suggests that the community was not just standing or accepting interventions as such, but showed a clear and reliable leaning to affirm tangible benefits that have been delivered by the interventions. Upon closer review of the mean scores, a clear order of the perceived outcomes becomes deceptive. Vulnerability mapping was the most popular outcome as it acknowledged the highest mean score of 4.29. This finding is especially important as it designates a very high level of community agreement that there is a systematic process of identifying, documenting, and mapping hazard levels, geographic areas of vulnerability, and selected evacuation ways within the community. Four other statements assembled closely together in a narrow range of agreement were second on the list of leading outcomes. First, the mean score for risk reduction due to community participation was 4.20, indicating that residents feel that there has been a positive impact on their communities’ security

directly as a result of them being part of the risk management activities. Second, the mean score for precautions taken was 4.19, reflecting, generally, that there has been recognition that the necessary defensive action has been taken at the community level. Third, sustainable livelihoods had a mean score of 4.17, representing that the participants recognize the linking between disaster risk reduction activities and sustainable economic livelihoods of their households and community. Four, this highly similar mix of outcomes closed with property damage reduction, at around 4.16, thus representing that interventions have produced real perceptible protection of physical assets. The close alignment of these four outcomes—with a difference of only 0.04 points—indicates that disaster risk reduction, preventive behavior, livelihoods sustainability, and asset protection are seen as intensely consistent outcomes and not separate outcomes. The findings, taken together, suggest that the level of involvement in disaster risk management in the local community has led to multidimensional welfares and these benefit the normal lives of community members.

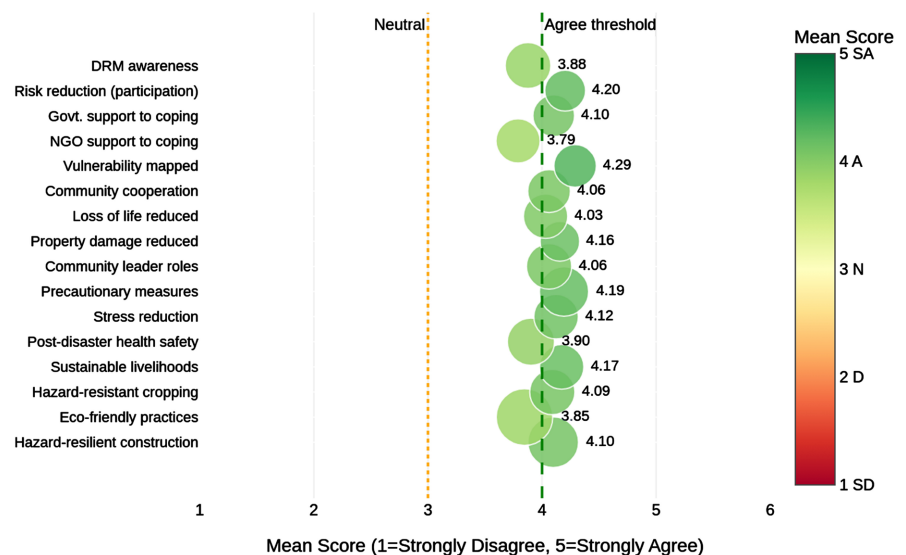


Figure 2. Mean agreement scores for community resilience outcomes.

A diverging stacked bar chart provides a far more detailed view of these same data, not only showing the central tendencies but also the full range of community responses for each of the five Likert responses. The diverging chart reveals the consistency of community perception, going beyond the single numeric summary provided by the bubble chart and showing the number of respondents who expressed ambiguity, mild reservation, or disagreement. This richer visualization allows for a more nuanced interpretation of disaster risk management experiences for the intended recipients of a community-based DRM system, as opposed to average ratings. Coping and DRM awareness (Mean 3.88 and 3.79, respectively) had the lowest mean ratings of the study. While both scores are above the neutral verge of 3.0 and thus not considered to be a sign of program failure, these lower

scores are best interpreted as representing comparatively weak levels of community confidence in two areas: community support mechanisms provided outwardly to the program, and the extent to which awareness-raising activities have reached the community. Lower mean scores in these specific indicators are particularly important, as low scores can be due to visibility or accessibility problems, or lack of trust in actors outside the disaster risk management outline and not to a lack of the concept itself. A second insight related to health safety, which was the outcome of post-disaster health safety, scored a mean score of 3.90. This score is just below the common “agree” score of 4.0, but the difference is, however, a meaningful one, although numerically small. The outcome shows that even if communities were able to cope with flood events, they were struggling to maintain health and hygiene, indicating the ongoing challenges faced by communities. From a practical perspective, this means that in the community, preparedness for disaster and risk reduction is seen to be effective, whereas the post-disaster phase is a comparatively sensitive space in the community’s resilience profile that may not have seen the same level of capacity building in the other outcomes measured as per preparedness and risk reduction. Disaster risk management activities at the community level have generally shown perceived improvements across most of the 16 outcome domains, with the highest levels of endorsement being given to the core activities of precautionary action and vulnerability mapping.

5. Discussion

This is the most comprehensive and thoughtful analysis of community resilience outcomes, using the Likert scale. The mean scores of all 16 outcome items were higher than the “3.0” agree score, and most of these items scored higher than “4.0”. The highest rated outcomes were vulnerability mapping (4.29), risk reduction through participation (4.20), and precautions taken (4.19), where there was good community confidence in the capacity to identify risks and take precautions. This is a collection of ordinal data, which can be used to create a baseline for measuring the development of institutions and to support a comparative analysis of investment in resilience across different institutions (Paszkowski et al., 2023). Moreover, adding stakeholder-weighted metrics to these Likert-based assessments adds value to the results for local decision-making, resulting in more impartial resource allocation based on the practical capacity and the community’s priorities (Morelli et al., 2021). They are combined outlines that can help to carry out a more rigorous analysis of DRR issues, linking theory on resilience capacities to practical disaster performance (Pescaroli et al., 2020). However, there is no generally established, overall measurement framework yet (Campbell et al., 2019; Asadzadeh et al., 2017), and this indicates a need for a shift towards the development of meta-level assessment tools to match these dissimilar data formats. The two lowest scoring items, NGO support for coping mechanisms (3.79) and DRM awareness (3.88), should be discussed. These gaps indicate that these interventions are not sufficient to develop long-term independent coping mechanisms among the local population

(Almutairi et al., 2020). Considering this need for context-sensitive approaches, practical evidence highlights the need for qualitative tools to grasp the complexity of identity, social media influence, and local job availability throughout disaster recovery (Koliou et al., 2018). Specifically, the qualitative insights that are added to the survey data overcome some of the limitations of outlines that focus only on theory-of-change metrics but neglect to include other sources of information that may be more contextually appropriate (Keating et al., 2017).

6. Conclusion

The aim of this study was to assess disaster risk management at the community level by analyzing 16 community resilience outcome statements among the residents of the selected unions affected by flood. The most widely appropriate finding is that all sixteen outcomes have mean scores between 3.79 and 4.29, which are meaningfully above the neutral score of 3.0, and many of them are above the agree score of 4.0. This pattern is an indication of community-wide authorization, as participants were not only contented with interventions, but they also saw them as having an impact on the community. The highest mean score (4.29) and the highest percentage (60%) of “strongly agree” were given to vulnerability mapping, which identified hazards, vulnerable areas, and evacuation ways as the biggest benefits of the program and to support mapping as a first step in disaster preparedness. Four additional outcomes clustered closely together within a 0.04-point band (4.20, 4.19, 4.17, 4.16), indicating that residents do not see the outcomes relating to disaster risk management, disaster prevention, livelihood sustainability, and asset protection as isolated attainments, but rather as one package of community resilience. Outcomes with the highest level of agreement were precautionary behavior (76% agree or strongly agree), sustainable livelihoods (53%), and risk reduction through participation (51%). However, two weak links arose as separate that needed programmatic efforts. While both coping and DRM awareness score above neutral, support from NGOs suggests that the communities do not fully trust external coping mechanisms or that awareness-raising efforts may be less visible or available. Post-disaster health safety (mean = 3.90) also suggests that health infrastructure, sanitation, and continuity of medical care are comparatively under-developed facets of the community’s health resilience profile. Together, the results show that there is a resilience pathway that starts from knowledge (mapping) and then moves to the prevention stage, followed by livelihood and asset protection, but there are also two salient points that are apparent: the loss of trust in outside support and the failure in health care in the post-flood period.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

- Adebayo, W. G. (2025). Resilience in the Face of Ecological Challenges: Strategies for Integrating Environmental Considerations into Social Policy Planning in Africa. *Sustainable Development*, 33, 203-220. <https://doi.org/10.1002/sd.3113>
- Adger, W. N. (2006). Vulnerability. *Global Environmental Change*, 16, 268-281. <https://doi.org/10.1016/j.gloenvcha.2006.02.006>
- Adger, W. N., & Brown, K. (2009). Vulnerability and Resilience to Environmental Change: Ecological and Social Perspectives. In N. Castree, D. Demeritt, D. Liverman, & B. Rhoads (Eds.), *A Companion to Environmental Geography* (pp. 109-122). Wiley. <https://doi.org/10.1002/9781444305722>
- Adikari, Y., Osti, R., & Noro, T. (2010). Flood-Related Disaster Vulnerability: An Impending Crisis of Megacities in Asia. *Journal of Flood Risk Management*, 3, 185-191. <https://doi.org/10.1111/j.1753-318x.2010.01068.x>
- Ado, A. M., Savadogo, P., & Abdoul-Azize, H. T. (2019). Livelihood Strategies and Household Resilience to Food Insecurity: Insight from a Farming Community in Aguié District of Niger. *Agriculture and Human Values*, 36, 747-761. <https://doi.org/10.1007/s10460-019-09951-0>
- Afjal Hossain, M., Imran Reza, M., Rahman, S., & Kayes, I. (2011). Climate Change and Its Impacts on the Livelihoods of the Vulnerable People in the Southwestern Coastal Zone in Bangladesh. In W. Leal Filho (Ed.), *Climate Change and the Sustainable Use of Water Resources* (pp. 237-259). Springer. https://doi.org/10.1007/978-3-642-22266-5_15
- Afriyie, K., Ganle, J. K., & Santos, E. (2018). 'The Floods Came and We Lost Everything': Weather Extremes and Households' Asset Vulnerability and Adaptation in Rural Ghana. *Climate and Development*, 10, 259-274. <https://doi.org/10.1080/17565529.2017.1291403>
- Alam, G. M. M., Alam, K., Mushtaq, S., Sarker, M. N. I., & Hossain, M. (2020). Hazards, Food Insecurity and Human Displacement in Rural Riverine Bangladesh: Implications for Policy. *International Journal of Disaster Risk Reduction*, 43, Article ID: 101364. <https://doi.org/10.1016/j.ijdrr.2019.101364>
- Aldrich, D. P., & Meyer, M. A. (2015). Social Capital and Community Resilience. *American Behavioral Scientist*, 59, 254-269. <https://doi.org/10.1177/0002764214550299>
- Alexander, B., Chan-Halbrendt, C., & Salim, W. (2006). Sustainable Livelihood Considerations for Disaster Risk Management: Implications for Implementation of the Government of Indonesia Tsunami Recovery Plan. *Disaster Prevention and Management: An International Journal*, 15, 31-50. <https://doi.org/10.1108/09653560610654220>
- Almutairi, A., Mourshed, M., & Ameen, R. F. M. (2020). Coastal Community Resilience Frameworks for Disaster Risk Management. *Natural Hazards*, 101, 595-630. <https://doi.org/10.1007/s11069-020-03875-3>
- Archer, D., Almansi, F., DiGregorio, M., Roberts, D., Sharma, D., & Syam, D. (2014). Moving towards Inclusive Urban Adaptation: Approaches to Integrating Community-Based Adaptation to Climate Change at City and National Scale. *Climate and Development*, 6, 345-356. <https://doi.org/10.1080/17565529.2014.918868>
- Asadzadeh, A., Kötter, T., Salehi, P., & Birkmann, J. (2017). Operationalizing a Concept: The Systematic Review of Composite Indicator Building for Measuring Community Disaster Resilience. *International Journal of Disaster Risk Reduction*, 25, 147-162. <https://doi.org/10.1016/j.ijdrr.2017.09.015>

- Ashraful Islam, M., Mitra, D., Dewan, A., & Akhter, S. H. (2016). Coastal Multi-Hazard Vulnerability Assessment along the Ganges Deltaic Coast of Bangladesh—A Geospatial Approach. *Ocean & Coastal Management*, 127, 1-15. <https://doi.org/10.1016/j.ocecoaman.2016.03.012>
- Atkinson, C. L. (2023). Research Trends in Resilience and Vulnerability Studies. *Encyclopedia*, 3, 1208-1222. <https://doi.org/10.3390/encyclopedia3040088>
- Ayeb-Karlsson, S. (2020). 'I Do Not Like Her Going to the Shelter': Stories on Gendered Disaster (Im)mobility and Wellbeing Loss in Coastal Bangladesh. *International Journal of Disaster Risk Reduction*, 50, Article ID: 101904. <https://doi.org/10.1016/j.ijdrr.2020.101904>
- Azad, A. K., Hossain, K. M., & Nasreen, M. (2013). Flood-Induced Vulnerabilities and Problems Encountered by Women in Northern Bangladesh. *International Journal of Disaster Risk Science*, 4, 190-199. <https://doi.org/10.1007/s13753-013-0020-z>
- Bell, J. E., Brown, C. L., Conlon, K., Herring, S., Kunkel, K. E., Lawrimore, J. et al. (2018). Changes in Extreme Events and the Potential Impacts on Human Health. *Journal of the Air & Waste Management Association*, 68, 265-287. <https://doi.org/10.1080/10962247.2017.1401017>
- Béné, C., Newsham, A., Davies, M., Ulrichs, M., & Godfrey-Wood, R. (2014). Review Article: Resilience, Poverty and Development. *Journal of International Development*, 26, 598-623. <https://doi.org/10.1002/jid.2992>
- Bhattacharya, B., Islam, T., Masud, S., Suman, A., & Solomatine, D. P. (2016). The Use of a Flood Index to Characterise Flooding in the North-Eastern Region of Bangladesh. *E3S Web of Conferences*, 7, Article 10003. <https://doi.org/10.1051/e3sconf/20160710003>
- Bhattacharya, S., Das, B. K., Ray, A., Ghosh, B. D., Parida, P. K., Nayak, P. K. et al. (2026). Adaptive Co-Management and Future Resilience of Coastal Winter Migratory Bag Net Fisheries in Indian Sundarbans: Ensuring Livelihood Sustainability Amidst Climate Change. *Sustainable Development*, 34, 1217-1237. <https://doi.org/10.1002/sd.70288>
- Birks, L., Powell, C., & Hatfield, J. (2017). Adapting the Capacities and Vulnerabilities Approach: A Gender Analysis Tool. *Health Promotion International*, 32, 930-941.
- Biswas, A. K. M. A. A., Sattar, M. A., Hossain, M. A., Faisal, M., & Islam, M. R. (2015). An Internal Environmental Displacement and Livelihood Security in Uttar Bedkashi Union of Bangladesh. *Applied Ecology and Environmental Sciences*, 3, 163-175.
- Biswas, S., & Nautiyal, S. (2023). A Review of Socio-Economic Vulnerability: The Emergence of Its Theoretical Concepts, Models and Methodologies. *Natural Hazards Research*, 3, 563-571. <https://doi.org/10.1016/j.nhres.2023.05.005>
- Bosher, L., Penning-Rowsell, E., & Tapsell, S. (2007). Resource Accessibility and Vulnerability in Andhra Pradesh: Caste and Non-Caste Influences. *Development and Change*, 38, 615-640. <https://doi.org/10.1111/j.1467-7660.2007.00426.x>
- Bradshaw, S., & Fordham, M. (2013). *Women and Girls in Disasters*. UK Department for International Development.
- Braun, B., & Aßheuer, T. (2011). Floods in Megacity Environments: Vulnerability and Coping Strategies of Slum Dwellers in Dhaka/Bangladesh. *Natural Hazards*, 58, 771-787. <https://doi.org/10.1007/s11069-011-9752-5>
- Brouwer, R., Akter, S., Brander, L., & Haque, E. (2007). Socioeconomic Vulnerability and Adaptation to Environmental Risk: A Case Study of Climate Change and Flooding in Bangladesh. *Risk Analysis*, 27, 313-326. <https://doi.org/10.1111/j.1539-6924.2007.00884.x>
- Brown, A., Dayal, A., & Rumbaitis Del Rio, C. (2012). From Practice to Theory: Emerging

- Lessons from Asia for Building Urban Climate Change Resilience. *Environment and Urbanization*, 24, 531-556. <https://doi.org/10.1177/0956247812456490>
- Campbell, K. A., Laurien, F., Czajkowski, J., Keating, A., Hochrainer-Stigler, S., & Montgomery, M. (2019). First Insights from the Flood Resilience Measurement Tool: A Large-Scale Community Flood Resilience Analysis. *International Journal of Disaster Risk Reduction*, 40, Article ID: 101257. <https://doi.org/10.1016/j.ijdrr.2019.101257>
- Cannon, T., Twigg, J., & Rowell, J. (2003). *Social Vulnerability, Sustainable Livelihoods and Disasters* (pp. 1-63). Report to DFID Conflict and Humanitarian Assistance Department (CHAD) and Sustainable Livelihoods Support Office.
- Chowdhoree, I. (2020). External Interventions for Enhancing Community Resilience: An Overview of Planning Paradigms. In I. Chowdhoree, & S. Ghani (Eds.), *External Interventions for Disaster Risk Reduction* (pp. 3-21). Springer. https://doi.org/10.1007/978-981-15-4948-9_1
- Chowdhury, M. A., Zzaman, R. U., Tarin, N. J., & Hossain, M. J. (2022). Spatial Variability of Climatic Hazards in Bangladesh. *Natural Hazards*, 110, 2329-2351. <https://doi.org/10.1007/s11069-021-05039-3>
- Chowdhury, M. I. (2009). *Impact of Increasing Landlessness on Access to Food: Experience of Small and Marginal Farmers in Rural Bangladesh*. Unnayan Onneshan-The Innovators. <https://www.unnayan.org>
- Cohen, M., & Sebstad, J. (2005). Reducing Vulnerability: The Demand for Microinsurance. *Journal of International Development*, 17, 397-474. <https://doi.org/10.1002/jid.1193>
- Cutter, S. L. (2017). The Forgotten Casualties Redux: Women, Children, and Disaster Risk. *Global Environmental Change*, 42, 117-121. <https://doi.org/10.1016/j.gloenvcha.2016.12.010>
- Deb, A. K., & Haque, C. E. (2011). 'Sufferings Start from the Mothers' Womb': Vulnerabilities and Livelihood War of the Small-Scale Fishers of Bangladesh. *Sustainability*, 3, 2500-2527. <https://doi.org/10.3390/su3122500>
- Dewa, O., Makoka, D., & Ayo-Yusuf, O. A. (2023). Measuring Community Flood Resilience and Associated Factors in Rural Malawi. *Journal of Flood Risk Management*, 16, e12874. <https://doi.org/10.1111/jfr3.12874>
- Dey, N. C., Alam, M. S., Sajjan, A. K., Bhuiyan, M. A., Ghose, L., Ibaraki, Y., & Karim, F. (2011). Assessing Environmental and Health Impact of Drought in the Northwest Bangladesh. *Journal of Environmental Science and Natural Resources*, 4, 89-97. <https://doi.org/10.3329/jesnr.v4i2.10141>
- Dilley, M., Chen, R. S., Deichmann, U., Lerner-Lam, A. L., Arnold, M. (2005). *Natural Disaster Hotspots: A Global Risk Analysis*. World Bank. <http://hdl.handle.net/10986/7376>
- Edmonds, D. A., Caldwell, R. L., Brondizio, E. S., & Siani, S. M. O. (2020). Coastal Flooding Will Disproportionately Impact People on River Deltas. *Nature Communications*, 11, Article No. 4741. <https://doi.org/10.1038/s41467-020-18531-4>
- Fatema, S. R., East, L., Islam, S., & Usher, K. (2023). Gender-Based Vulnerabilities for Women during Natural Disasters in Bangladesh. *Frontiers in Communication*, 8, Article 1180406. <https://doi.org/10.3389/fcomm.2023.1180406>
- Gallopin, G. C. (2006). Linkages between Vulnerability, Resilience, and Adaptive Capacity. *Global Environmental Change*, 16, 293-303. <https://doi.org/10.1016/j.gloenvcha.2006.02.004>
- Ganguly, A., Ghosh, P., Mitra, K., Mitra, S., & Bhor, M. (2026). Resilience Capacities of Multi-Hazard-Prone Coastal Communities: An Empirical Insight from the Indian Sundarbans Delta Region. *Human Ecology*, 54, Article No. 44.

- <https://doi.org/10.1007/s10745-026-00705-1>
- Gopal, N., Anakha, K. S., Abhishek, K. H., Geethalakshmi, V., De Silva, D. A. M., Sajeev, M. V. et al. (2026). Climate Finance to Address Climate Vulnerability and Increase Resilience: A Review. *Fishery Technology*, 63, 42-57. <https://doi.org/10.56093/ft.v63i1.168828>
- Habiba, U., Shaw, R., & Takeuchi, Y. (2012). Farmer's Perception and Adaptation Practices to Cope with Drought: Perspectives from Northwestern Bangladesh. *International Journal of Disaster Risk Reduction*, 1, 72-84. <https://doi.org/10.1016/j.ijdrr.2012.05.004>
- Hardoy, J., & Pandiella, G. (2009). Urban Poverty and Vulnerability to Climate Change in Latin America. *Environment and Urbanization*, 21, 203-224. <https://doi.org/10.1177/0956247809103019>
- Harris, L. M. (2008). Water Rich, Resource Poor: Intersections of Gender, Poverty, and Vulnerability in Newly Irrigated Areas of Southeastern Turkey. *World Development*, 36, 2643-2662. <https://doi.org/10.1016/j.worlddev.2008.03.004>
- Hasanuzzaman, M., Adhikary, P. P., Bera, B., & Shit, P. K. (2022). Flood Vulnerability Assessment Using AHP and Frequency Ratio Techniques. In B. Pradhan, P. K. Shit, G. S. Bhunia, P. P. Adhikary, & H. R. Pourghasemi (Eds.), *Spatial Modelling of Flood Risk and Flood Hazards* (pp. 91-104). Springer International Publishing. https://doi.org/10.1007/978-3-030-94544-2_6
- Hay, J., & Mimura, N. (2010). The Changing Nature of Extreme Weather and Climate Events: Risks to Sustainable Development. *Geomatics, Natural Hazards and Risk*, 1, 3-18. <https://doi.org/10.1080/19475701003643433>
- Hoq, M. S., Raha, S. K., & Hossain, M. I. (2021). Livelihood Vulnerability to Flood Hazard: Understanding from the Flood-Prone Haor Ecosystem of Bangladesh. *Environmental Management*, 67, 532-552. <https://doi.org/10.1007/s00267-021-01441-6>
- Hoque, M. A., Pradhan, B., & Ahmed, N. (2020). Assessing Drought Vulnerability Using Geospatial Techniques in Northwestern Part of Bangladesh. *Science of the Total Environment*, 705, Article ID: 135957. <https://doi.org/10.1016/j.scitotenv.2019.135957>
- IPCC (2014). *Climate Change 2014: Impacts, Adaptation, and Vulnerability*. Cambridge University Press. <https://doi.org/10.1017/CBO9781107415379>
- Islam, S. N. (2016). Deltaic Floodplains Development and Wetland Ecosystems Management in the Ganges-Brahmaputra-Meghna Rivers Delta in Bangladesh. *Sustainable Water Resources Management*, 2, 237-256. <https://doi.org/10.1007/s40899-016-0047-6>
- Jerneck, A., & Olsson, L. (2015). Adaptation and the Poor: Development, Resilience and Transition. *Climate Policy*, 8, 170-182. <https://doi.org/10.3763/cpol.2007.0434>
- Jones, L., Jaspars, S., Pavanello, S., Ludi, E., Slater, R., Grist, N., & Mtisi, S. (2010). *Responding to a Changing Climate: Exploring How Disaster Risk Reduction, Social Protection and Livelihoods Approaches Promote Features of Adaptive Capacity*. Working Paper 319. Overseas Development Institute.
- Keating, A., Campbell, K., Szoenyi, M., McQuistan, C., Nash, D., & Burer, M. (2017). Development and Testing of a Community Flood Resilience Measurement Tool. *Natural Hazards and Earth System Sciences*, 17, 77-101. <https://doi.org/10.5194/nhess-17-77-2017>
- Koliou, M., van de Lindt, J. W., McAllister, T. P., Ellingwood, B. R., Dillard, M., & Cutler, H. (2018). State of the Research in Community Resilience: Progress and Challenges. *Sustainable and Resilient Infrastructure*, 5, 131-151. <https://doi.org/10.1080/23789689.2017.1418547>
- Konisky, D. M., Hughes, L., & Kaylor, C. H. (2016). Extreme Weather Events and Climate

- Change Concern. *Climatic Change*, 134, 533-547.
<https://doi.org/10.1007/s10584-015-1555-3>
- Laurien, F., Hochrainer-Stigler, S., Keating, A., Campbell, K., Mechler, R., & Czajkowski, J. (2020). A Typology of Community Flood Resilience. *Regional Environmental Change*, 20, Article No. 24. <https://doi.org/10.1007/s10113-020-01593-x>
- Lee, D., Ahmadul, H., Patz, J., & Block, P. (2021). Predicting Social and Health Vulnerability to Floods in Bangladesh. *Natural Hazards and Earth System Sciences*, 21, 1807-1823.
<https://doi.org/10.5194/nhess-21-1807-2021>
- Liu, W., Li, J., Ren, L., Xu, J., Li, C., & Li, S. (2020). Exploring Livelihood Resilience and Its Impact on Livelihood Strategy in Rural China. *Social Indicators Research*, 150, 977-998.
<https://doi.org/10.1007/s11205-020-02347-2>
- Lwin, K. K., Pal, I., Shrestha, S., & Warnitchai, P. (2020). Assessing Social Resilience of Flood-Vulnerable Communities in Ayeyarwady Delta, Myanmar. *International Journal of Disaster Risk Reduction*, 51, 101745. <https://doi.org/10.1016/j.ijdrr.2020.101745>
- Ma, C., Qirui, C., & Lv, Y. (2023). "One Community at a Time": Promoting Community Resilience in the Face of Natural Hazards and Public Health Challenges. *BMC Public Health*, 23, Article No. 2510. <https://doi.org/10.1186/s12889-023-17458-x>
- Mahedi, M., Shaili, S. J., & Shihab, A. R. (2024). Livelihood Diversification as a Reduce to Rural Vulnerability in Bangladesh: A Review. *Development Research*, 4, 32-43.
- Mallick, B., & Martínez-Fabiani, M. (2026). Rethinking Environmental Non-Migration and Immobility: Conceptual Distinctions and Considerations. In B. Ahmed, & B. Mallick (Eds.), *Handbook on Climate Mobility* (pp. 458-478). Edward Elgar Publishing.
<https://doi.org/10.4337/9781035329939.00035>
- Masum, J. H. (2019). *Climatic Hazards in Bangladesh: A Literature Review*. Coastal Development Partnership (CDP), Coastal Development Partnership (CDP).
- Mathbor, G. M. (2007). Enhancement of Community Preparedness for Natural Disasters: The Role of Social Work in Building Social Capital for Sustainable Disaster Relief and Management. *International Social Work*, 50, 357-369.
<https://doi.org/10.1177/0020872807076049>
- Mechanic, D., & Tanner, J. (2007). Vulnerable People, Groups, and Populations: Societal View. *Health Affairs*, 26, 1220-1230. <https://doi.org/10.1377/hlthaff.26.5.1220>
- MoEF (2009). *Bangladesh Climate Change Strategy and Action Plan 2009*. Ministry of Environment and Forests, Government of Bangladesh.
- Monirul Qader Mirza, M. (2002). Global Warming and Changes in the Probability of Occurrence of Floods in Bangladesh and Implications. *Global Environmental Change*, 12, 127-138. [https://doi.org/10.1016/s0959-3780\(02\)00002-x](https://doi.org/10.1016/s0959-3780(02)00002-x)
- Morelli, A., Taramelli, A., Bozzeda, F., Valentini, E., Colangelo, M. A., & Cueto, Y. R. (2021). The Disaster Resilience Assessment of Coastal Areas: A Method for Improving the Stakeholders' Participation. *Ocean & Coastal Management*, 214, Article ID: 105867.
<https://doi.org/10.1016/j.ocecoaman.2021.105867>
- Morsalin, S. S., & Islam, M. R. (2023). Landlessness as the Key Challenge to Climate Change Adaptation of the Rural Poor in Bangladesh: An Empirical Study. *Asian Geographer*, 40, 121-143. <https://doi.org/10.1080/10225706.2021.2015694>
- Moser, C. O., & Satterthwaite, D. (2008). *Towards Pro-Poor Adaptation to Climate Change in the Urban Centres of Low- and Middle-Income Countries (Vol. 3)*. IiED.
- Musfike Meraz, M., Riad Hossain, M., Sultana, R., & Esraz-Ul-Zannat, M. (2023). Flood Prediction and Vulnerability Assessment at the South-Western Region of Bangladesh. *Environmental Monitoring and Assessment*, 195, Article No. 794.

- <https://doi.org/10.1007/s10661-023-11418-z>
- Nahin, K. T. K., Islam, S. B., Mahmud, S., & Hossain, I. (2023). Flood Vulnerability Assessment in the Jamuna River Floodplain Using Multi-Criteria Decision Analysis: A Case Study in Jamalpur District, Bangladesh. *Heliyon*, 9, e14520. <https://doi.org/10.1016/j.heliyon.2023.e14520>
- Neil Adger, W. (1999). Social Vulnerability to Climate Change and Extremes in Coastal Vietnam. *World Development*, 27, 249-269. [https://doi.org/10.1016/s0305-750x\(98\)00136-3](https://doi.org/10.1016/s0305-750x(98)00136-3)
- Neumayer, E., & Plümper, T. (2007). The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981-2002. *Annals of the Association of American Geographers*, 97, 551-566. <https://doi.org/10.1111/j.1467-8306.2007.00563.x>
- Odoh, B. I., & Nwokeabia, C. N. (2024). Impact of Drainage Density and Geological Factors on Flood Risk: A Comprehensive Study of Abia State. *Researchers Journal of Science and Technology*, 4, 1-21.
- Osberghaus, D. (2021). Poorly Adapted but Nothing to Lose? A Study on the Flood Risk—Income Relationship with a Focus on Low-Income Households. *Climate Risk Management*, 31, Article ID: 100268. <https://doi.org/10.1016/j.crm.2020.100268>
- Otto, I. M., Reckien, D., Reyer, C. P. O., Marcus, R., Le Masson, V., Jones, L. et al. (2017). Social Vulnerability to Climate Change: A Review of Concepts and Evidence. *Regional Environmental Change*, 17, 1651-1662. <https://doi.org/10.1007/s10113-017-1105-9>
- Pandey, C. L. (2019). Making Communities Disaster Resilient: Challenges and Prospects for Community Engagement in Nepal. *Disaster Prevention and Management: An International Journal*, 28, 106-118. <https://doi.org/10.1108/dpm-05-2018-0156>
- Parvin, G. A., Shimi, A. C., Shaw, R., & Biswas, C. (2016). Flood in a Changing Climate: The Impact on Livelihood and How the Rural Poor Cope in Bangladesh. *Climate*, 4, Article 60. <https://doi.org/10.3390/cli4040060>
- Paszowski, A., Laurien, F., Mechler, R., & Hall, J. (2023). Quantifying Community Resilience to Riverine Hazards in Bangladesh. *Global Environmental Change*, 84, Article ID: 102778. <https://doi.org/10.1016/j.gloenvcha.2023.102778>
- Pathak, S., Panta, H. K., Bhandari, T., & Paudel, K. P. (2020). Flood Vulnerability and Its Influencing Factors. *Natural Hazards*, 104, 2175-2196. <https://doi.org/10.1007/s11069-020-04267-3>
- Paton, D., & McClure, J. (2013). *Preparing for Disaster: Building Household and Community Capacity*. Charles C Thomas Publisher.
- Pescaroli, G., Velazquez, O., Alcántara-Ayala, I., Galasso, C., Kostkova, P., & Alexander, D. (2020). A Likert Scale-Based Model for Benchmarking Operational Capacity, Organizational Resilience, and Disaster Risk Reduction. *International Journal of Disaster Risk Science*, 11, 404-409. <https://doi.org/10.1007/s13753-020-00276-9>
- Polcarová, E., & Pupíková, J. (2022). Analysis of Socially Vulnerable Communities and Factors Affecting Their Safety and Resilience in Disaster Risk Reduction. *Sustainability*, 14, Article 11380. <https://doi.org/10.3390/su141811380>
- Porio, E. (2011). Vulnerability, Adaptation, and Resilience to Floods and Climate Change-Related Risks among Marginal, Riverine Communities in Metro Manila. *Asian Journal of Social Science*, 39, 425-445. <https://doi.org/10.1163/156853111x597260>
- Proag, V. (2014). The Concept of Vulnerability and Resilience. *Procedia Economics and Finance*, 18, 369-376. [https://doi.org/10.1016/s2212-5671\(14\)00952-6](https://doi.org/10.1016/s2212-5671(14)00952-6)
- Quader, M. A., Dey, H., Malak, A., & Rahman, Z. (2023). A Geospatial Assessment of Flood

- Hazard in North-Eastern Depressed Basin, Bangladesh. *Singapore Journal of Tropical Geography*, 44, 277-299. <https://doi.org/10.1111/sjtg.12476>
- Rahman, A. A., Alam, M., Alam, S. S., Uzzaman, M. R., Rashid, M., & Rabbani, G. (2007). *Risks, Vulnerability and Adaptation in Bangladesh*. Human Development Report.
- Rahman, S., Islam, A. K. M. S., Saha, P., Tazkia, A. R., Krien, Y., Durand, F. et al. (2019). Projected Changes of Inundation of Cyclonic Storms in the Ganges-Brahmaputra-Meghna Delta of Bangladesh Due to SLR by 2100. *Journal of Earth System Science*, 128, Article No. 145. <https://doi.org/10.1007/s12040-019-1184-8>
- Rakodi, C. (1999). A Capital Assets Framework for Analysing Household Livelihood Strategies: Implications for Policy. *Development Policy Review*, 17, 315-342. <https://doi.org/10.1111/1467-7679.00090>
- Ride, A., & Bretherton, D. (2011). Conclusion: Community Resilience in Natural Disasters. In A. Ride, & D. Bretherton (Eds.), *Community Resilience in Natural Disasters* (pp. 169-193). Palgrave Macmillan US. https://doi.org/10.1057/9780230339323_7
- Ritzema, H. P., & Van Loon-Steensma, J. M. (2018). Coping with Climate Change in a Densely Populated Delta: A Paradigm Shift in Flood and Water Management in the Netherlands. *Irrigation and Drainage*, 67, 52-65. <https://doi.org/10.1002/ird.2128>
- Roy, B., Islam, A. K. M. S., Islam, G. M. T., Khan, M. J. U., Bhattacharya, B., Ali, M. H. et al. (2019). Frequency Analysis of Flash Floods for Establishing New Danger Levels for the Rivers in the Northeast Haor Region of Bangladesh. *Journal of Hydrologic Engineering*, 24, Article ID: 05019004. [https://doi.org/10.1061/\(asce\)he.1943-5584.0001760](https://doi.org/10.1061/(asce)he.1943-5584.0001760)
- Roy, D. C., & Blaschke, T. (2015). Spatial Vulnerability Assessment of Floods in the Coastal Regions of Bangladesh. *Geomatics, Natural Hazards and Risk*, 6, 21-44. <https://doi.org/10.1080/19475705.2013.816785>
- Salan, M. S. A., Hasan, J., Wakil, M. A., & Khan, S. A. (2025). The Role of Community Capitals in Shaping Resilience to Climate-Induced Drought: Lessons from the Barind Tract, Bangladesh. In *2025 IEEE International Women in Engineering (WIE) Conference on Electrical and Computer Engineering (WIECON-ECE)* (pp. 497-502). IEEE. <https://doi.org/10.1109/wiecon-ece69386.2025.11525970>
- Sapountzaki, K. (2007). Social Resilience to Environmental Risks: A Mechanism of Vulnerability Transfer? *Management of Environmental Quality: An International Journal*, 18, 274-297. <https://doi.org/10.1108/14777830710731743>
- Sarkar, S. K., Das, S., Rudra, R. R., Ekram, K. M. M., Haydar, M., Alam, E. et al. (2024). Delineating the Drought Vulnerability Zones in Bangladesh. *Scientific Reports*, 14, Article No. 25564. <https://doi.org/10.1038/s41598-024-75690-w>
- Satterthwaite, D., Huq, S., Reid, H., Pelling, M., & Lankao, P. R. (2012). Adapting to Climate Change in Urban Areas: The Possibilities and Constraints in Low- and Middle-Income Nations. In D. Dodman, J. Bicknell, & D. Satterthwaite (Eds.), *Adapting Cities to Climate Change* (pp. 3-47). Routledge.
- Seneviratne, S. I., Zhang, X., Adnan, M., Badi, W., Dereczynski, C., Luca, A. D., & Allan, R. (2021). Weather and Climate Extreme Events in a Changing Climate. In V. Masson-Delmotte, et al. (Eds.), *Climate Change 2021: The Physical Science Basis: Working Group I Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 1513-1766). Cambridge University Press.
- Shahid, S. (2007). Spatial and Temporal Characteristics of Droughts in the Western Part of Bangladesh. *Hydrological Processes*, 22, 2235-2247. <https://doi.org/10.1002/hyp.6820>
- Shaw, K., & Maythorne, L. (2013). Managing for Local Resilience: Towards a Strategic Ap-

- proach. *Public Policy and Administration*, 28, 43-65.
<https://doi.org/10.1177/0952076711432578>
- Singh, D. (2020). Gender Relations, Urban Flooding, and the Lived Experiences of Women in Informal Urban Spaces. *Asian Journal of Women's Studies*, 26, 326-346.
<https://doi.org/10.1080/12259276.2020.1817263>
- Sultana, F. (2010). Living in Hazardous Waterscapes: Gendered Vulnerabilities and Experiences of Floods and Disasters. *Environmental Hazards*, 9, 43-53.
<https://doi.org/10.3763/ehaz.2010.si02>
- Syroid, T., & Fomina, L. (2023). Approaches to Understanding the Concept of Vulnerability: International Legal Aspect. *Journal of International Legal Communication*, 9, 7-15.
<https://doi.org/10.32612/uw.27201643.2023.9.pp.7-15>
- Tariq, A., Yan, J., Ghaffar, B., Qin, S., Mousa, B. G., Sharifi, A. et al. (2022). Flash Flood Susceptibility Assessment and Zonation by Integrating Analytic Hierarchy Process and Frequency Ratio Model with Diverse Spatial Data. *Water*, 14, Article 3069.
<https://doi.org/10.3390/w14193069>
- Tota, W., Abdul Maulud, K. N., Md Noor, N., Ariffin, E. H., & Ahmad, A. (2026). Systematic Literature Review on Climate Change Adaptation Strategies of Coastal Communities in Southeast Asia. *Climate Research*, 96, 1-14.
<https://doi.org/10.3354/cr01766>
- Toufique, K. A., & Islam, A. (2014). Assessing Risks from Climate Variability and Change for Disaster-Prone Zones in Bangladesh. *International Journal of Disaster Risk Reduction*, 10, 236-249. <https://doi.org/10.1016/j.ijdr.2014.08.008>
- van Daalen, K. R., Kallesøe, S. S., Davey, F., Dada, S., Jung, L., Singh, L. et al. (2022). Extreme Events and Gender-Based Violence: A Mixed-Methods Systematic Review. *The Lancet Planetary Health*, 6, e504-e523. [https://doi.org/10.1016/s2542-5196\(22\)00088-2](https://doi.org/10.1016/s2542-5196(22)00088-2)
- Vatsa, K. S. (2004). Risk, Vulnerability, and Asset-Based Approach to Disaster Risk Management. *International Journal of Sociology and Social Policy*, 24, 1-48.
<https://doi.org/10.1108/01443330410791055>
- Wilson, G. A. (2013). Community Resilience, Policy Corridors and the Policy Challenge. *Land Use Policy*, 31, 298-310. <https://doi.org/10.1016/j.landusepol.2012.07.011>
- Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2004). *At Risk: Natural Hazards, People's Vulnerability and Disasters* (2nd ed.). Routledge.
- Yanda, P. Z., Mabhuve, E., Johnson, N., & Mwajombe, A. (2019). Nexus between Coastal Resources and Community Livelihoods in a Changing Climate. *Journal of Coastal Conservation*, 23, 173-183. <https://doi.org/10.1007/s11852-018-0650-9>
- Young, O. R. (2010). Institutional Dynamics: Resilience, Vulnerability and Adaptation in Environmental and Resource Regimes. *Global Environmental Change*, 20, 378-385.
<https://doi.org/10.1016/j.gloenvcha.2009.10.001>
- Zanocco, C., Boudet, H., Nilson, R., Satein, H., Whitley, H., & Flora, J. (2018). Place, Proximity, and Perceived Harm: Extreme Weather Events and Views about Climate Change. *Climatic Change*, 149, 349-365. <https://doi.org/10.1007/s10584-018-2251-x>
- Zwiers, F. W., Alexander, L. V., Hegerl, G. C., Knutson, T. R., Kossin, J. P., Naveau, P. et al. (2013). Climate Extremes: Challenges in Estimating and Understanding Recent Changes in the Frequency and Intensity of Extreme Climate and Weather Events. In G. Asrar, & J. Hurrell (Eds.), *Climate Science for Serving Society* (pp. 339-389). Springer.
https://doi.org/10.1007/978-94-007-6692-1_13