

Journal of Pandemic Disaster and Recession

Volume: 6 Issue: 2

April-June, 2026



 **KMF** PUBLISHERS

www.kmf-publishers.com/jpdr/



Article

Environmental Justice and Human Rights in Coastal Bangladesh: A Qualitative Review of the SIDR Experience

Dr Khandaker Mursheda Farhana

Associate Professor, Department of Sociology & Anthropology, Shanto-Mariam University of Creative Technology, Uttara, Dhaka-1230, Bangladesh

Tanjila Shabnam

Associate Professor, Department of Sociology, Dhaka International University (DIU), Badda, Dhaka, Bangladesh

Correspondence should be addressed to Dr Khandaker Mursheda Farhana at drfarhanamannan@gmail.com

Received: 21 March 2026 / Revised: 02 May 2026 / Accepted: 15 May 2026 / Published: 21 May 2026

Copyright: © 2026 by the authors. Licensee KMF Publishers (www.kmf-publishers.com). This open-access article is distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Abstract

This study critically examines environmental justice and human rights in coastal Bangladesh through a qualitative review of the experience of Super Cyclonic Storm Sidr. Drawing on the Human Rights-Based Approach (HRBA), Vulnerability Theory, and the Climate Justice Framework, the article analyses secondary sources, including government reports, UN documents, NGO publications, and peer-reviewed scholarship, to explore how disaster impacts intersect with structural inequalities. The findings demonstrate that Sidr was not solely a natural hazard but a socio-environmental event shaped by pre-existing patterns of poverty, gender inequality, landlessness, and political marginalisation. While Bangladesh's disaster management system has often been praised for reducing mortality, significant human rights challenges have emerged in the areas of housing, livelihood restoration, gender-based violence, equitable relief distribution, and meaningful participation. The study argues that environmental justice requires moving beyond technocratic disaster response toward rights-centred governance that addresses root vulnerabilities and historical responsibility for climate change. By situating Sidr within broader debates on climate justice and state accountability, the article contributes to scholarship linking disaster risk reduction with substantive equality and human dignity. It concludes that rights-based, participatory, and equity-oriented adaptation policies are essential to ensure that future climate-related disasters do not reproduce patterns of structural injustice in coastal Bangladesh.

Keywords: Environmental justice; Human rights; Coastal Bangladesh; Climate justice; Vulnerability; Disaster governance.

Citation: Farhana, K.M., & Shabnam, T. (2026). Environmental Justice and Human Rights in Coastal Bangladesh: A Qualitative Review of the SIDR Experience. *Journal of Pandemic Disaster and Recession*, 6(2), 1-22 DOI:

<https://doi.org/10.64907/xkmf.v.6i.2.jpdr.2>

1. Introduction

Coastal Bangladesh occupies a paradoxical position in global environmental politics: it is among the countries least responsible for global greenhouse gas emissions, yet it remains one of the most severely affected by climate-induced hazards. Situated in the world's largest deltaic system formed by the Ganges, Brahmaputra, and Meghna rivers, the coastal belt is characterised by low elevation, high population density, and widespread poverty. These geographical and socio-economic features combine to produce acute vulnerability to cyclones, storm surges, flooding, and salinity intrusion (Mallick & Vogt, 2014). Within this context, Super Cyclonic Storm Sidr (2007) stands as a watershed event that revealed both the strengths and shortcomings of Bangladesh's disaster governance regime, while simultaneously exposing deeper questions of environmental justice and human rights.

Sidr made landfall in November 2007 with devastating force, affecting millions of people across southern districts such as Bagerhat, Barguna, Patuakhali, and Pirojpur. Official reports estimated thousands of fatalities and extensive destruction of housing, crops, fisheries, and public infrastructure (Paul & Routray, 2010). While Bangladesh's early warning systems and cyclone preparedness programs significantly reduced casualties compared to earlier disasters, the scale of destruction highlighted persistent structural vulnerabilities embedded within social, economic, and political arrangements. Importantly, the impacts of Sidr were not evenly distributed.

Marginalised groups-particularly landless households, women, elderly persons, and individuals with disabilities-experienced disproportionate losses and encountered greater obstacles in accessing relief and rehabilitation services (Gain et al., 2012).

Environmental justice scholarship emphasises that environmental harms are rarely neutral or evenly shared; instead, they reflect patterns of inequality rooted in socio-economic stratification and political power (Bullard, 1993; Schlosberg, 2007). In the context of climate-related disasters, environmental justice concerns emerge when certain communities bear a disproportionate share of risks while lacking meaningful participation in decisions that affect their lives. The Sidr experience compels an inquiry beyond the physical devastation of a cyclone to examine how disaster response and recovery processes interact with existing inequalities, potentially reinforcing or challenging them.

Parallel to environmental justice, international human rights law provides a normative framework for assessing state obligations in disaster contexts. The rights to life, food, water, health, housing, and participation are recognised under international instruments such as the Universal Declaration of Human Rights and the International Covenant on Economic, Social and Cultural Rights (OHCHR, 2009). Disasters can threaten the enjoyment of these rights directly through loss of life or destruction of essential services-and indirectly, by exacerbating discrimination or excluding marginalised groups from relief and reconstruction efforts. A human rights-

based approach (HRBA) reframes disaster-affected populations not as passive recipients of charity but as rights-holders entitled to protection and dignity (UNDP, 2016).

The intersection of environmental justice and human rights becomes especially salient in climate-vulnerable settings like coastal Bangladesh. Climate change is expected to intensify the frequency and severity of cyclones in the Bay of Bengal region, amplifying existing vulnerabilities (IPCC, 2022). Although Bangladesh has developed notable disaster risk reduction strategies, including community-based warning systems and cyclone shelters, structural inequities persist in land distribution, livelihood opportunities, gender norms, and political representation. These inequities shape exposure to hazards and influence who can evacuate, who can rebuild, and who can recover sustainable livelihoods after disaster strikes.

Moreover, the Sidr experience must be situated within broader debates on climate justice. Climate justice highlights the moral and political dimensions of climate change, emphasising that those who have contributed least to global emissions often suffer the most severe consequences (Schlosberg & Collins, 2014). Bangladesh's limited contribution to global carbon emissions contrasts sharply with its extreme exposure to climate impacts, raising questions about global responsibility, adaptation finance, and equitable burden-sharing. Thus, Sidr was not merely a national disaster; it was also part of a global climate injustice dynamic.

This study aims to critically analyse the Sidr experience through the combined lenses of

environmental justice and human rights. Specifically, it asks: How did patterns of vulnerability and institutional response during and after Cyclone Sidr reflect or challenge principles of environmental justice and human rights in coastal Bangladesh? By synthesising secondary data through qualitative analysis, this research examines differential exposure, relief distribution, participation in decision-making, gendered experiences, and long-term livelihood recovery.

The significance of this inquiry lies in its contribution to interdisciplinary scholarship linking disaster studies, environmental governance, and human rights law. While previous studies have assessed the economic and social impacts of Sidr (Paul & Routray, 2010; Gain et al., 2012), fewer analyses have explicitly integrated environmental justice theory with human rights norms to evaluate disaster governance outcomes. By bridging these perspectives, this article seeks to illuminate how structural inequalities shape disaster impacts and to propose pathways for rights-based, justice-oriented climate resilience.

As climate hazards intensify in the coming decades, Bangladesh's experience offers important lessons for other vulnerable regions. Ensuring resilience is not solely a technical challenge of building embankments or shelters; it is equally a normative challenge of ensuring fairness, accountability, and dignity. Therefore, understanding Sidr through the prism of environmental justice and human rights is both an academic endeavour and a practical necessity for

shaping equitable adaptation strategies in an era of accelerating climate change.

2. Theoretical Framework

This study adopts an integrated theoretical framework combining the Human Rights-Based Approach (HRBA), Vulnerability Theory, and the Climate Justice Framework. Together, these perspectives provide normative and analytical tools to evaluate environmental disasters not merely as natural hazards but as socially mediated events embedded within structures of inequality and governance.

2.1 Human Rights-Based Approach (HRBA)

The human rights-based approach is grounded in international human rights law and emphasises that development and governance processes must align with universal human rights standards (OHCHR, 2009). HRBA is guided by key principles: universality, indivisibility, equality and non-discrimination, participation, accountability, and transparency (UNDP, 2016). These principles transform policy beneficiaries into rights-holders and assign states and relevant institutions the role of duty-bearers responsible for respecting, protecting, and fulfilling rights.

In disaster contexts, HRBA requires that preparedness, response, and recovery policies safeguard rights to life, health, food, water, housing, education, and participation. The right to life is implicated in evacuation planning and early warning dissemination; the right to adequate housing concerns safe shelter and reconstruction; and the right to

participation demands inclusive involvement in relief and rehabilitation decisions.

Importantly, HRBA shifts the discourse from humanitarian charity to legal obligation. Disaster-affected individuals are not passive victims but active rights-holders entitled to dignity and equality. In Bangladesh, where disaster management policies have evolved significantly, applying HRBA enables critical evaluation of whether relief distribution was equitable, whether marginalised communities had a meaningful voice, and whether accountability mechanisms addressed grievances.

Moreover, HRBA recognises the interconnectedness of civil, political, economic, social, and cultural rights. For example, the destruction of livelihoods after Sidr affected not only economic security but also social dignity and community cohesion. Thus, analysing Sidr through HRBA foregrounds structural dimensions of rights realisation beyond immediate humanitarian relief.

2.2 Vulnerability Theory

Vulnerability theory provides an analytical lens for understanding why certain individuals and communities are more susceptible to environmental harm than others. Cutter et al. (2003) conceptualise vulnerability as comprising exposure, sensitivity, and adaptive capacity. Exposure refers to the degree to which populations are physically at risk; sensitivity concerns the extent to which they are likely to be affected; and adaptive capacity reflects their ability to cope and recover.

In coastal Bangladesh, vulnerability is shaped by intersecting factors including poverty, landlessness, gender norms, limited infrastructure, and ecological fragility (Gain et al., 2012). For example, households living in remote char areas face greater exposure to storm surges, while limited financial resources reduce their capacity to rebuild after a disaster.

Vulnerability theory also highlights the social production of risk. Disasters are not solely “natural” phenomena; they are socially constructed through development patterns, governance decisions, and power relations (Wisner et al., 2004). Land-use policies, inadequate embankments, and unequal access to cyclone shelters contribute to the differential distribution of risk. Thus, vulnerability theory complements HRBA by explaining structural conditions that hinder rights realisation.

From a gender perspective, vulnerability is mediated by patriarchal norms restricting mobility and resource access. Women’s caregiving responsibilities and limited ownership of assets often constrain evacuation options and post-disaster recovery. Vulnerability theory, therefore, underscores the need for intersectional analysis when evaluating environmental justice outcomes.

2.3 Climate Justice Framework

Climate justice extends environmental justice principles into the domain of global climate change. Schlosberg (2007) identifies three dimensions of justice: distribution, recognition, and participation. Distribution concerns equitable allocation of

environmental benefits and burdens; recognition emphasises respect for diverse identities and experiences; participation ensures inclusive decision-making processes.

Climate justice adds a global ethical dimension, arguing that countries least responsible for emissions should not bear disproportionate impacts (Schlosberg & Collins, 2014). Bangladesh’s minimal contribution to historical emissions contrasts sharply with its vulnerability to intensified cyclones and sea-level rise (IPCC, 2022). This imbalance underscores the importance of international adaptation finance and equitable climate governance.

At the local level, climate justice intersects with national and subnational inequalities. Relief allocation after Sidr, for instance, reflects distributive justice concerns if resources are disproportionately favoured by politically connected groups. Recognition justice is implicated when local knowledge systems or marginalised voices are overlooked in adaptation planning. Procedural justice becomes central when affected communities lack meaningful participation in rehabilitation programs.

Climate justice also incorporates intergenerational equity. Rebuilding coastal infrastructure and strengthening resilience mechanisms are not only present obligations but future-oriented responsibilities to safeguard upcoming generations.

2.4 Integrative Analytical Model

By integrating HRBA, vulnerability theory, and climate justice, this study constructs a multidimensional analytical model:

- **Normative Evaluation (HRBA):** Were human rights standards upheld in disaster response and recovery?
- **Structural Diagnosis (Vulnerability Theory):** What socio-economic and political factors shaped differential exposure and adaptive capacity?
- **Ethical and Political Assessment (Climate Justice):** How were burdens and benefits distributed, and were marginalised voices recognised and included?

This integrated framework allows for a holistic evaluation of the Sidr experience. HRBA provides normative benchmarks; vulnerability theory explains structural inequalities; and climate justice situates these findings within broader ethical and global contexts.

Together, these frameworks emphasise that disaster resilience must be rights-centred, equity-driven, and participatory. Without addressing underlying vulnerabilities and justice deficits, climate adaptation risks reinforcing existing inequalities. Thus, theoretical integration strengthens analytical rigour and supports policy recommendations grounded in fairness, accountability, and human dignity.

3. Literature Review

The following literature review situates the Sidr experience within broader interdisciplinary debates on disaster studies, environmental justice, climate vulnerability, and human rights governance. It synthesises scholarship on coastal Bangladesh, climate-induced displacement, gendered

vulnerability, and post-disaster recovery to identify conceptual and empirical gaps. By engaging with global frameworks such as the Hyogo and Sendai disaster risk reduction agendas and human rights instruments, the review highlights how disaster impacts are socially produced rather than merely natural phenomena (Wisner et al., 2004; UNDRR, 2015). This section critically evaluates existing research to demonstrate the need for a theory-driven, rights-centred qualitative synthesis that integrates environmental justice with disaster governance analysis in the context of Sidr.

3.1 Environmental Risk, Deltaic Vulnerability, and Coastal Bangladesh

Bangladesh's coastal zone is widely recognised as one of the most hazard-prone regions in the world due to its deltaic geomorphology, high population density, and socio-economic constraints. The Ganges–Brahmaputra–Meghna delta system creates fertile but fragile landscapes highly exposed to cyclones, tidal surges, river erosion, and salinity intrusion (Mallick & Vogt, 2014). Climate projections indicate increased intensity of tropical cyclones in the Bay of Bengal and rising sea levels, exacerbating existing environmental stresses (IPCC, 2022).

Scholars emphasise that exposure alone does not explain disaster outcomes; rather, the interaction between environmental hazards and socio-economic conditions determines vulnerability (Wisner et al., 2004). Coastal Bangladesh is characterised by high poverty rates, limited access to infrastructure, and

dependence on climate-sensitive livelihoods such as agriculture and fisheries. These structural conditions amplify disaster impacts and reduce recovery capacity (Gain et al., 2012). Thus, environmental risk in Bangladesh is inseparable from patterns of socio-economic marginalisation.

3.2 Cyclone Sidr in Historical and Policy Context

Super Cyclonic Storm **Sidr** struck Bangladesh on 15 November 2007, making landfall along the southwestern coast. The cyclone caused widespread devastation, affecting approximately 8–9 million people and resulting in thousands of deaths (Paul & Routray, 2010). Although Bangladesh's Cyclone Preparedness Programme (CPP) and early warning systems reduced mortality compared to earlier catastrophic events such as the 1970 Bhola cyclone, Cyclone Sidr nonetheless exposed significant gaps in preparedness, infrastructure, and equitable service delivery.

Post-Sidr analyses highlight both progress and persistent challenges. On the one hand, the government's disaster management reforms-particularly investments in cyclone shelters and community-based early warning dissemination- were credited with saving lives (Mallick & Vogt, 2014). On the other hand, relief distribution processes were criticised for delays, political favouritism, and exclusion of remote or marginalised communities (Begum et al., 2016). This dual narrative suggests that while Bangladesh has strengthened its disaster risk reduction (DRR) capacity, structural inequities remain embedded within governance mechanisms.

3.3 Disaster Governance and Human Rights

Disaster governance scholarship increasingly incorporates human rights perspectives, arguing that disasters often generate or exacerbate rights violations (OHCHR, 2009). Rights to life, food, water, housing, and health are particularly implicated in climate-induced disasters. Inadequate evacuation planning may threaten the right to life; insufficient shelter infrastructure may undermine the right to adequate housing; and prolonged livelihood disruption may compromise the right to food and work.

The human rights-based approach (HRBA) reframes disaster response as a legal obligation rather than humanitarian discretion (UNDP, 2016). Within Bangladesh, constitutional guarantees and international treaty commitments impose duties on the state to protect citizens during emergencies. However, literature suggests that implementation gaps often arise due to bureaucratic inefficiencies, corruption, and lack of participatory mechanisms (Ahmed & Neelormi, 2011).

In the aftermath of Sidr, human rights concerns were evident in temporary displacement, limited sanitation facilities in shelters, gender-specific vulnerabilities, and inequitable access to rehabilitation resources. Studies document that women and children faced heightened risks of violence and health insecurity in overcrowded shelters (Hasan et al., 2015). These findings underscore the need to evaluate disaster governance through a rights lens that centres dignity, equality, and accountability.

3.4 Social Vulnerability and Structural Inequality

Vulnerability theory provides a foundational perspective for understanding differential disaster impacts. Cutter et al. (2003) conceptualise social vulnerability as the susceptibility of social groups to harm due to limited resources, political marginalisation, and socio-demographic characteristics. In Bangladesh, poverty, landlessness, and limited educational attainment significantly shape adaptive capacity (Gain et al., 2012).

Research indicates that households lacking land ownership often reside in more hazard-prone areas, such as riverbanks or coastal embankments, where cyclone impacts are intensified (Wisner et al., 2004). Additionally, social hierarchies based on gender, age, and disability affect access to evacuation resources and post-disaster aid. Women, for instance, may face mobility constraints due to cultural norms, caregiving responsibilities, or lack of independent income (Mallick & Vogt, 2014).

The literature thus suggests that disasters are “socially constructed” events in which pre-existing inequalities shape outcomes. Rather than being equalisers, cyclones like Sidr magnify structural disadvantages and expose systemic governance shortcomings.

3.5 Environmental Justice and Climate Justice

Environmental justice theory emerged from grassroots movements highlighting disproportionate environmental burdens borne by marginalised communities (Bullard, 1993). Schlosberg (2007) expanded the concept beyond distributive justice to include

recognition and participation, emphasising that justice entails acknowledging diverse identities and ensuring inclusive decision-making processes.

Climate justice builds on these principles by foregrounding ethical questions about global responsibility and intergenerational equity (Schlosberg & Collins, 2014). Bangladesh contributes minimally to global greenhouse gas emissions yet experiences severe climate impacts. This asymmetry illustrates distributive injustice at the global scale. International adaptation finance mechanisms, such as the Green Climate Fund, aim to address these imbalances, but access and adequacy remain contested issues (IPCC, 2022).

Within national contexts, climate justice concerns arise when adaptation projects fail to equitably distribute benefits or meaningfully involve affected communities. Research on post-Sidr rehabilitation suggests that while reconstruction programs improved infrastructure, some marginalised groups lacked adequate voice in planning processes (Begum et al., 2016). This gap points to procedural injustice that may undermine long-term resilience.

3.6 Gendered Dimensions of Disaster and Justice

Gender scholarship emphasises that disasters are experienced differently by men and women due to social roles, access to resources, and power relations (Hasan et al., 2015). In Bangladesh’s coastal areas, women often manage household responsibilities, including water collection and caregiving, tasks that become more burdensome after

cyclones. Moreover, limited property rights and financial autonomy restrict women's recovery options.

Post-Sidr reports identified inadequate privacy and sanitation facilities in cyclone shelters, increasing risks to women's safety and dignity. Such conditions implicate both recognition justice and human rights principles. Integrating gender-sensitive planning into disaster governance is therefore essential for equitable resilience.

3.7 Gaps in Existing Scholarship

While substantial literature exists on cyclone impacts, vulnerability, and disaster governance in Bangladesh, fewer studies explicitly integrate environmental justice theory with human rights frameworks to analyse the Sidr experience. Many analyses focus on economic losses or technical adaptation measures without fully addressing normative dimensions of fairness, accountability, and participation.

This study addresses that gap by synthesising interdisciplinary scholarship and applying an integrated theoretical framework. By examining Sidr through the lenses of environmental justice, human rights, and vulnerability theory, the research seeks to illuminate how structural inequalities shape disaster outcomes and to identify pathways for rights-centred adaptation.

4. Research Methodology

The research methodology section outlines the qualitative design underpinning this study. Relying exclusively on secondary data, the study adopts a documentary and thematic analysis approach to interpret policy

documents, legal instruments, institutional reports, and peer-reviewed scholarship. This methodological choice enables a critical examination of state obligations, governance structures, and lived vulnerabilities without relying on primary field data (Bowen, 2009). By integrating the Human Rights-Based Approach, Vulnerability Theory, and Climate Justice perspectives into the analytical framework, the methodology ensures coherence between theory and empirical interpretation. The section explains data selection criteria, analytical procedures, and limitations, emphasising transparency and rigour consistent with qualitative research standards.

4.1 Research Design

This study adopts a qualitative research design grounded in secondary data analysis. Qualitative inquiry is particularly suitable for examining normative concepts such as justice, rights, and vulnerability, which require interpretive understanding rather than purely quantitative measurement (Creswell & Poth, 2018). By synthesising documentary sources, this research seeks to construct a comprehensive narrative of the Sidr experience through an environmental justice and human rights lens.

The design is exploratory and analytical. It does not aim to measure statistical correlations but to interpret patterns of inequality, governance response, and rights realisation embedded in documented accounts.

4.2 Data Sources

Secondary data were drawn from multiple sources to ensure triangulation and credibility (Bowen, 2009):

- **Government Documents:** Policy reports from Bangladesh's Ministry of Disaster Management and Relief, post-Sidr rehabilitation plans, and national adaptation strategies.
- **International Organisation Reports:** Publications from the United Nations, World Bank, and humanitarian agencies assessing Sidr's impacts and recovery efforts.
- **Peer-Reviewed Academic Literature:** Articles addressing vulnerability, disaster governance, environmental justice, and climate adaptation in Bangladesh.
- **NGO Assessments and Media Reports:** Field-based evaluations documenting community experiences, relief distribution processes, and gender-specific challenges.

Triangulating these diverse sources enhances reliability and reduces bias inherent in any single dataset.

4.3 Data Analysis Strategy

The research employed thematic content analysis, following systematic coding procedures (Bowen, 2009). Analysis proceeded in three stages:

Stage 1: Open Coding

Key themes were identified across documents, including:

- Right to life and evacuation
- Access to shelter and housing
- Food and livelihood recovery
- Gendered vulnerability
- Participation and accountability
- Distribution of relief resources

Stage 2: Axial Coding

Themes were organised according to the three theoretical lenses:

- HRBA (rights realisation, accountability)
- Vulnerability Theory (structural inequalities, adaptive capacity)
- Climate Justice (distributional, procedural, recognition justice)

Stage 3: Interpretive Synthesis

Findings were synthesised to identify cross-cutting patterns linking structural vulnerability with justice deficits and human rights outcomes. This analytical structure ensured coherence between empirical evidence and theoretical frameworks.

4.4 Validity and Reliability

Qualitative rigour was ensured through:

- **Triangulation:** Comparing findings across academic, governmental, and NGO sources.
- **Transparency:** Clearly documenting coding categories and interpretive steps.
- **Theoretical Consistency:** Aligning findings with established frameworks in environmental justice and human rights scholarship.

Although secondary analysis limits direct engagement with affected communities, it allows a broad synthesis of existing empirical work and policy documentation.

4.5 Ethical Considerations

The study relies exclusively on publicly available documents and published research. Ethical integrity was maintained by:

- Accurate citation of all sources
- Respectful representation of vulnerable populations
- Avoidance of sensationalising suffering

The research recognises that disaster narratives often involve sensitive experiences; thus, care was taken to contextualise findings within broader structural analysis rather than individualising blame.

4.6 Limitations

Several limitations warrant acknowledgement:

- **Dependence on Secondary Data:** The study relies on previously collected information, which may reflect the authors' biases or incomplete coverage.
- **Temporal Scope:** Focus on Sidr may not capture evolving governance reforms after subsequent cyclones (e.g., Aila, Amphan).
- **Absence of Primary Fieldwork:** Direct interviews could provide deeper insight into lived experiences and participatory justice concerns.

Despite these limitations, the qualitative review offers a valuable interdisciplinary synthesis and normative analysis relevant for policy and scholarship.

5. Findings

This section presents the findings of the qualitative review, organised around key themes derived from thematic content analysis of secondary sources. The analysis integrates the Human Rights-Based Approach (HRBA), Vulnerability Theory, and Climate Justice Framework to evaluate the lived and institutional realities following Super Cyclonic Storm Sidr in coastal Bangladesh. The findings demonstrate that while Bangladesh achieved notable progress in disaster preparedness, structural inequalities shaped differential exposure, relief access, recovery trajectories, and long-term resilience outcomes.

5.1 Differential Exposure and the Social Production of Risk

One of the most consistent patterns emerging from the literature is the uneven distribution of disaster impacts. Although Sidr affected millions across multiple districts, the severity of harm varied significantly depending on socio-economic status, geographic location, and access to resources. Vulnerability theory emphasises that disasters are not purely natural events but socially constructed through patterns of inequality and governance decisions (Wisner et al., 2004).

In coastal Bangladesh, many of the worst-affected households were landless or marginal farmers residing in low-lying or embankment-adjacent settlements. These

communities faced heightened exposure to storm surges and wind damage due to substandard housing structures made of bamboo, thatch, and corrugated tin (Mallick & Vogt, 2014). Wealthier households with reinforced structures or access to transport had greater capacity to evacuate and protect assets.

Socio-economic vulnerability also intersected with geographic remoteness. Char areas (riverine islands) and isolated coastal villages reported delayed relief access due to damaged roads and limited communication infrastructure (Paul & Routray, 2010). These findings align with Cutter et al.'s (2003) framework of social vulnerability, where exposure is compounded by sensitivity and limited adaptive capacity.

From an environmental justice perspective, this pattern reflects distributive injustice: those already marginalised bore disproportionate burdens of environmental risk. The destruction of homes and productive land among poor households perpetuated cycles of poverty and displacement, raising concerns about equitable risk governance.

5.2 Right to Life and Early Warning Systems

Bangladesh's investment in cyclone preparedness significantly reduced mortality compared to previous decades. The Cyclone Preparedness Programme (CPP), community volunteers, and early warning dissemination saved thousands of lives (Mallick & Vogt, 2014). From a human rights perspective, this progress represents partial fulfilment of the right to life, as states have an obligation to

take preventive measures against foreseeable threats (OHCHR, 2009).

However, secondary reports indicate that evacuation was not uniformly accessible. Women, elderly individuals, and persons with disabilities often faced barriers in reaching cyclone shelters due to mobility constraints, caregiving responsibilities, and cultural norms limiting women's public movement (Hasan et al., 2015). In some communities, insufficient shelter capacity meant that families were forced to choose which members would evacuate, undermining universal protection.

Additionally, communication gaps in remote areas delayed warning dissemination. Although national systems functioned effectively in many regions, disparities in local implementation reveal procedural weaknesses (Paul & Routray, 2010). These findings suggest that while Bangladesh made significant strides in fulfilling the right to life, structural inequities constrained universal access to protective measures.

5.3 Right to Shelter and Housing Reconstruction

Housing destruction was among the most visible consequences of Sidr. Millions of homes were partially or fully destroyed, leaving families displaced or living in makeshift shelters for extended periods (Mallick & Vogt, 2014). The right to adequate housing, recognised under international human rights law, extends beyond mere shelter to include security, privacy, habitability, and cultural adequacy (OHCHR, 2009).

Post-disaster reconstruction programs provided housing grants and materials. However, evidence suggests that distribution was uneven. Politically connected households or those with formal land ownership often accessed assistance more readily than landless or informal settlers (Begum et al., 2016). This disparity reflects both distributive and recognition injustice: informal settlers, despite their vulnerability, were sometimes excluded due to a lack of legal documentation.

Cyclone shelters, while critical during the emergency phase, were frequently overcrowded and lacked gender-sensitive facilities such as separate sanitation areas for women (Hasan et al., 2015). Overcrowding compromised privacy and dignity, particularly for women and adolescent girls. From an HRBA standpoint, the absence of adequate facilities implicates not only the right to housing but also rights to dignity and non-discrimination.

Long-term reconstruction further revealed structural vulnerabilities. Many rebuilt homes remained fragile due to limited financial resources, perpetuating a cycle of vulnerability to future storms. Thus, recovery did not always translate into resilience, underscoring the importance of integrating justice considerations into reconstruction planning.

5.4 Livelihood Destruction and the Right to Food and Work

Sidr devastated agriculture, fisheries, and small enterprises—the backbone of coastal livelihoods. Salinity intrusion destroyed rice paddies and freshwater ponds, while

livestock losses undermined household food security (Gain et al., 2012). For many families, the cyclone represented not only immediate loss but prolonged economic insecurity.

The right to food encompasses availability, accessibility, and adequacy. Post-Sidr relief operations distributed food rations, but long-term livelihood rehabilitation lagged behind the immediate humanitarian response (Paul & Routray, 2010). Small-scale fishers and farmers often lacked access to credit or inputs necessary for recovery, prolonging dependence on aid.

Vulnerability theory explains that households with diversified income sources or savings recovered more rapidly, while poorer families fell deeper into debt. Microcredit institutions provided some financial support, but repayment pressures sometimes exacerbated stress (Gain et al., 2012). From a climate justice perspective, these dynamics highlight unequal adaptive capacity shaped by socio-economic status.

The destruction of livelihoods also affected migration patterns. Some households resorted to temporary or permanent migration to urban centres in search of work, reflecting adaptive strategies but also social dislocation. Migration in this context raises questions about the right to work, social protection, and long-term resilience planning.

5.5 Gendered Impacts and Recognition Justice

Gender emerged as a critical axis of vulnerability. Women's mortality rates in past cyclones were often higher due to mobility constraints and caregiving roles, though

mortality patterns during Sidr showed improvement compared to earlier disasters (Mallick & Vogt, 2014). Nevertheless, post-disaster burdens disproportionately affected women.

Women frequently assumed additional responsibilities in securing water, food, and shelter for families. Damage to water infrastructure increased the time spent collecting potable water, exposing women to health and safety risks (Hasan et al., 2015). Limited ownership of property reduced women's access to compensation and reconstruction support.

Recognition justice requires acknowledging and valuing diverse experiences and identities (Schlosberg, 2007). However, disaster policies often framed households as homogenous units, overlooking intra-household inequalities. The lack of gender-sensitive design in shelters and relief processes demonstrates a failure of recognition, where women's specific needs were insufficiently addressed.

Moreover, reports of harassment and insecurity in overcrowded shelters reveal violations of dignity and bodily integrity. Integrating gender-responsive disaster planning remains essential for equitable resilience.

5.6 Participation, Transparency, and Procedural Justice

Procedural justice emphasises inclusive participation in decision-making processes. Bangladesh's disaster management framework formally recognises community participation, yet evidence suggests gaps in implementation (Begum et al., 2016). Relief

allocation decisions were sometimes influenced by local political dynamics, limiting transparency and accountability.

Marginalised groups often lacked a meaningful voice in rehabilitation planning. Participation was frequently consultative rather than deliberative, with limited capacity to influence resource allocation. From an HRBA perspective, participation is not optional but a fundamental right linked to dignity and empowerment (UNDP, 2016).

The absence of robust grievance mechanisms further constrained accountability. Although civil society organisations monitored relief distribution, institutional channels for redressing inequities were limited. These procedural shortcomings risk entrenching distrust and undermining long-term resilience efforts.

5.7 Climate Justice and Global Responsibility

The Sidr experience must also be contextualised within global climate justice debates. Bangladesh's contribution to global emissions remains minimal, yet its coastal populations endure disproportionate climate risks (IPCC, 2022). This asymmetry underscores the ethical imperative for international adaptation finance and loss-and-damage mechanisms.

Post-Sidr reconstruction received international donor support, but funding adequacy and accessibility remain persistent challenges. Climate justice advocates argue that adaptation assistance should prioritise the most vulnerable and be delivered transparently (Schlosberg & Collins, 2014). The uneven recovery trajectories observed

after Sidr highlight the importance of aligning global climate finance with rights-based principles.

Intergenerational justice also emerges as a concern. Rebuilding without addressing structural vulnerability may expose future generations to repeated cycles of loss. Thus, climate justice requires transformative adaptation strategies that address the root causes of inequality.

Across thematic domains-exposure, evacuation, housing, livelihoods, gender, and participation-the Sidr experience reveals a complex interplay between progress and persistent injustice. Bangladesh demonstrated institutional learning in reducing mortality through early warning systems. Yet distributive inequities, recognition failures, and procedural gaps constrained the full realisation of human rights.

The integrated theoretical framework highlights three key conclusions:

- **Structural Vulnerability Shapes Rights Outcomes:** Poverty, landlessness, and gender norms significantly influenced exposure and recovery capacity.
- **Disaster Governance Reflects Justice Trade-offs:** Technical improvements in preparedness did not always translate into equitable relief distribution.
- **Climate Change Intensifies Ethical Imperatives:** As cyclone intensity increases, embedding justice and rights in adaptation planning becomes increasingly urgent.

Ultimately, Sidr serves as both a cautionary tale and a learning opportunity. While Bangladesh has made notable strides in disaster risk reduction, ensuring environmental justice and human rights requires deeper institutional reforms, inclusive participation, and equitable resource allocation.

6. Discussion

The findings of this qualitative review reveal that the impacts and aftermath of Super Cyclonic Storm Sidr cannot be adequately understood through a purely technocratic disaster-management lens. Instead, the Sidr experience demonstrates how environmental hazards intersect with entrenched socio-economic inequalities, institutional structures, and global climate politics. By synthesising insights from the Human Rights-Based Approach (HRBA), Vulnerability Theory, and the Climate Justice Framework, this discussion advances a multidimensional interpretation of environmental justice in coastal Bangladesh.

6.1 From Hazard Event to Socially Mediated Disaster

A central theoretical insight emerging from vulnerability scholarship is that disasters are not “natural” events but socially mediated outcomes (Wisner et al., 2004). Sidr’s meteorological intensity was undeniable; however, the scale and distribution of its impacts were conditioned by pre-existing structural vulnerabilities- poverty, landlessness, gender inequality, fragile housing, and limited infrastructure. These

factors shaped exposure, sensitivity, and adaptive capacity (Cutter et al., 2003).

The qualitative evidence indicates that households lacking secure land tenure or residing in embankment-adjacent areas experienced disproportionate losses. From a vulnerability perspective, such patterns illustrate how risk is socially produced through development trajectories and policy choices. Coastal settlement patterns, limited enforcement of building standards, and inadequate land-use planning contributed to concentrated exposure in hazard-prone zones (Mallick & Vogt, 2014).

The HRBA reframes this observation as a matter of state obligation. When risk accumulation is foreseeable, governments have a duty to adopt preventive and protective measures that safeguard rights to life, housing, and security (OHCHR, 2009). Bangladesh's improvements in early warning systems and evacuation protocols reflect partial fulfilment of these duties. However, gaps in equitable access reveal that universal rights protection remained incomplete.

6.2 Partial Success: The Right to Life and Institutional Learning

Bangladesh's disaster governance regime has often been cited as a success story in reducing cyclone mortality through community-based early warning dissemination and expanded cyclone shelter networks (Mallick & Vogt, 2014). Compared to earlier cyclones such as the 1970 Bhola disaster, Sidr's mortality rate, though tragic, was significantly lower relative to storm magnitude.

From an HRBA perspective, this progress demonstrates institutional learning aligned

with the right to life. States are obligated to protect life through anticipatory measures when hazards are foreseeable. Investments in the Cyclone Preparedness Programme (CPP) illustrate compliance with this preventive duty.

However, the findings also underscore that access to protection was uneven. Gender norms restricting mobility, insufficient shelter capacity, and delayed communication in remote regions created disparities in evacuation outcomes (Hasan et al., 2015; Paul & Routray, 2010). Vulnerability theory clarifies that adaptive capacity is socially stratified; thus, the benefits of improved warning systems were mediated by socio-economic position.

This tension highlights an important theoretical insight: institutional effectiveness does not automatically translate into distributive justice. While Bangladesh improved aggregate safety outcomes, the distribution of protective benefits remained unequal. Justice-oriented disaster governance must therefore go beyond aggregate mortality reduction to examine who benefits and who remains excluded.

6.3 Housing Reconstruction and the Limits of Distributive Justice

The right to adequate housing encompasses more than physical shelter; it includes security of tenure, habitability, privacy, and cultural adequacy (OHCHR, 2009). Post-Sidr reconstruction initiatives provided grants and materials for rebuilding homes. Yet qualitative evidence suggests that distribution processes were influenced by

land ownership documentation and local political dynamics (Begum et al., 2016).

Vulnerability theory indicates that landless and informally settled households often reside in the most hazard-prone locations. When reconstruction assistance is tied to formal land tenure, those most vulnerable may be excluded. This dynamic represents a convergence of distributive and recognition injustice (Schlosberg, 2007).

Climate justice scholarship expands the analysis by situating housing insecurity within broader patterns of adaptation inequality. Reconstruction that merely restores pre-disaster vulnerabilities perpetuates cyclical risk. Justice-oriented adaptation must address structural determinants- such as secure land tenure and resilient construction standards-rather than short-term rebuilding alone (Schlosberg & Collins, 2014).

Thus, the Sidr case illustrates the limits of distributive interventions unaccompanied by structural reform. Housing grants may alleviate immediate hardship, but without addressing systemic inequities, long-term resilience remains fragile.

6.4 Livelihood Disruption, Economic Rights, and Adaptive Capacity

Livelihood destruction following Sidr profoundly affected rights to food, work, and an adequate standard of living. Salinity intrusion and crop failure undermined agricultural productivity, while damaged fishing infrastructure disrupted coastal economies (Gain et al., 2012).

From an HRBA standpoint, the right to food requires states to ensure the availability and accessibility of adequate nourishment. Emergency food distribution met short-term needs; however, prolonged livelihood insecurity indicates partial realisation of economic rights. Vulnerability theory explains this gap through differential adaptive capacity: households with savings, diversified income sources, or social capital recovered more quickly than landless or indebted families (Cutter et al., 2003).

Climate justice adds another layer by highlighting the global asymmetry underlying these impacts. Bangladesh's minimal historical emissions contrast with its exposure to intensified cyclones and salinity intrusion (IPCC, 2022). Thus, livelihood losses reflect not only domestic vulnerability but also global climate injustice. Adaptation finance mechanisms are therefore ethically justified as reparative instruments aimed at enhancing resilience among climate-vulnerable populations.

This intersection of local inequality and global injustice underscores the need for multilevel governance solutions that integrate rights-based adaptation with international climate finance.

6.5 Gendered Vulnerability and Recognition Justice

The Sidr experience underscores the gendered dimensions of disaster impacts. Women often bore disproportionate caregiving responsibilities, faced mobility constraints, and lacked equal access to property and compensation (Hasan et al., 2015).

Recognition justice requires acknowledging distinct identities and lived experiences in policy design (Schlosberg, 2007). Yet shelter infrastructure frequently lacked gender-segregated sanitation facilities, compromising dignity and safety. Such deficiencies reflect a failure to incorporate gender-sensitive planning into disaster governance.

HRBA principles of non-discrimination and equality mandate proactive measures to address systemic gender inequalities. Merely treating all citizens identically does not achieve substantive equality when structural disadvantages persist. Integrating gender-responsive budgeting, female participation in disaster committees, and targeted livelihood support is essential for rights realisation.

This analysis reveals that recognition justice is not peripheral but central to resilience. Without acknowledging differentiated needs, disaster governance risks reinforcing patriarchal structures that heighten vulnerability.

6.6 Procedural Justice, Participation, and Accountability

Participation is a cornerstone of both HRBA and environmental justice. Procedural justice demands inclusive, transparent decision-making processes (Schlosberg, 2007). Bangladesh's disaster management policies formally emphasise community participation, yet implementation gaps persist (Begum et al., 2016).

Relief allocation reportedly reflected local political hierarchies in some areas, limiting equitable voice. Vulnerable groups often lacked access to grievance mechanisms

capable of addressing distributional inequities. From an HRBA perspective, accountability mechanisms are indispensable for ensuring rights compliance (UNDP, 2016).

The Sidr case, therefore, demonstrates that resilience is not solely a function of infrastructure but also of democratic governance quality. Strengthening participatory planning and institutional transparency enhances both justice and effectiveness.

6.7 Climate Justice, Global Solidarity, and Intergenerational Equity

Climate justice situates Sidr within global ethical debates. Bangladesh's vulnerability reflects structural inequities embedded in international climate politics. As climate hazards intensify, justice requires equitable allocation of adaptation finance and recognition of loss and damage claims (IPCC, 2022).

Intergenerational equity further complicates the picture. Failure to address root vulnerabilities risks perpetuating cyclical disasters that burden future generations. Sustainable adaptation must therefore integrate rights-based principles with long-term ecological planning.

The Sidr experience underscores the moral imperative for global solidarity. Justice in coastal Bangladesh is inseparable from broader climate governance reforms aimed at mitigating emissions and financing adaptation.

6.8 Synthesis: Toward Justice-Oriented Resilience

Synthesising across theoretical frameworks, the discussion reveals three core insights:

- **Resilience Without Justice Is Incomplete:** Technical improvements reduce mortality but may leave structural inequalities intact.
- **Rights Realisation Is Stratified:** Socio-economic status, gender, and land tenure mediate access to protection and recovery.
- **Local and Global Justice Are Interconnected:** Domestic vulnerability reflects global climate asymmetries.

Justice-oriented resilience thus requires integrating distributive fairness, recognition of diversity, participatory governance, and global ethical responsibility. The Sidr experience provides both cautionary lessons and pathways for reform.

7. Conclusion and Policy Implications

The analysis of Super Cyclonic Storm Sidr demonstrates that environmental disasters are deeply embedded within social, political, and economic structures. While Bangladesh has achieved notable progress in reducing cyclone mortality through improved preparedness and early warning systems, significant justice gaps remain in housing reconstruction, livelihood recovery, gender-sensitive planning, and participatory governance.

Applying the Human Rights-Based Approach reveals that rights to life, housing, food, and participation were partially realised but unevenly distributed. Vulnerability theory explains these disparities through structural inequalities in land ownership, poverty, and gender norms. The Climate Justice Framework situates Sidr within broader global inequities, emphasising Bangladesh's disproportionate exposure despite minimal emissions responsibility.

Policy Implications

- **Institutionalising Rights-Based Disaster Governance:** Disaster risk reduction policies should explicitly integrate human rights principles, ensuring non-discrimination, accountability, and transparency.
- **Targeted Support for Structurally Vulnerable Groups:** Landless households, women-headed families, and persons with disabilities should receive prioritised access to housing reconstruction and livelihood grants.
- **Gender-Responsive Infrastructure and Planning:** Cyclone shelters must include safe, private, and accessible facilities. Women's representation in local disaster committees should be strengthened.
- **Participatory Adaptation Planning:** Community consultation mechanisms must evolve from symbolic inclusion to meaningful deliberation with enforceable grievance systems.
- **Integration of Climate Finance and Justice Principles:** Bangladesh should leverage international

adaptation funds to address structural vulnerabilities, aligning projects with equity and rights benchmarks.

- **Long-Term Structural Reform:** Secure land tenure, resilient housing standards, and diversified livelihoods are essential to break cycles of disaster-induced poverty.

Ultimately, achieving environmental justice in coastal Bangladesh requires a paradigm shift from reactive relief to transformative adaptation grounded in rights, equity, and global solidarity. As climate change intensifies hazards, embedding justice at the core of resilience planning is not only ethically necessary but pragmatically essential for sustainable development.

References

- Adger, W. N. (2006). Vulnerability. *Global Environmental Change*, 16(3), 268–281.
<https://doi.org/10.1016/j.gloenvcha.2006.02.006>
- Adger, W. N., Huq, S., Brown, K., Conway, D., & Hulme, M. (2003). Adaptation to climate change in the developing world. *Progress in Development Studies*, 3(3), 179–195.
- Ahmed, S., & Neelormi, S. (2011). Climate change in Bangladesh: Human rights and legal responses. *Journal of Environmental Law*, 23(2), 345–363.
- Alston, P. (2019). *Climate change and poverty: Report of the Special Rapporteur on extreme poverty and human rights*. United Nations Human Rights Council.
- Begum, R. A., Rahman, M. M., & Alam, M. J. (2016). Participation and inequity in post-disaster relief: Lessons from Cyclone Sidr in Bangladesh. *Disasters*, 40(1), 105–126.
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27–40.
- Blaikie, P., Cannon, T., Davis, I., & Wisner, B. (1994). *At risk: Natural hazards, people's vulnerability and disasters*. Routledge.
- Bullard, R. D. (1993). *Confronting environmental racism: Voices from the grassroots*. South End Press.
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design* (4th ed.). Sage.
- Cutter, S. L., Boruff, B. J., & Shirley, W. L. (2003). Social vulnerability to environmental hazards. *Social Science Quarterly*, 84(2), 242–261.
- Gain, A. K., et al. (2012). Vulnerability and adaptation to climate change in Bangladesh. *Climate and Development*, 4(4), 300–311.
- Hasan, M. et al. (2015). Shelter access and spatial inequalities in Bangladesh's cyclone preparedness strategy. *International Journal of Disaster Risk Reduction*, 13, 93–102.
- Huq, S., & Ayers, J. (2007). Critical list: The 100 nations most vulnerable to

- climate change. *Sustainable Development Opinion Papers*.
- IPCC. (2022). *Climate change 2022: Impacts, adaptation and vulnerability*. Cambridge University Press.
- Islam, R. (2011). Climate change, disaster risk reduction and human rights in Bangladesh. *Asian Journal of Environment and Disaster Management*, 3(1), 1–14.
- Islam, S. N., & Walkerden, G. (2015). How bonding and bridging networks contribute to disaster resilience and recovery. *International Journal of Disaster Risk Reduction*, 10, 281–291.
- Islam, M. S., & Sado, K. (2012). Salinity intrusion and food security in coastal Bangladesh. *Environmental Hazards*, 11(4), 335–350.
- Kabeer, N. (1994). *Reversed realities: Gender hierarchies in development thought*. Verso.
- Mallick, B., & Vogt, J. (2014). Cyclone impacts in coastal Bangladesh: Vulnerability, resilience, and adaptation. *Journal of Environmental Management*, 135, 86–95.
- Mallick, B., Vogt, J., & Schröder, D. (2011). Social vulnerability and Cyclone Sidr. *Environmental Hazards*, 10(2), 99–116.
- OHCHR. (2009). *Report on Human Rights and Climate Change*. United Nations Human Rights Council.
- Paul, B. K., & Routray, J. K. (2010). Cyclone Sidr's impacts on rural livelihoods in Bangladesh. *Natural Hazards*, 54(2), 615–635.
- Schlosberg, D. (2007). *Defining environmental justice: Theories, movements, and nature*. Oxford University Press.
- Schlosberg, D., & Collins, L. B. (2014). Climate justice and resilience. *Environmental Politics*, 23(3), 401–417.
- Sen, A. (1999). *Development as freedom*. Oxford University Press.
- UNDP. (2010). *Human Development Report 2010*. United Nations Development Programme.
- UNDP. (2016). *Human Rights-Based Approach to Development*. United Nations Development Programme.
- UN General Assembly. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development*.
- UNDRR. (2015). *Sendai framework for disaster risk reduction 2015–2030*. United Nations Office for Disaster Risk Reduction.
- United Nations. (1948). *Universal Declaration of Human Rights*.
- Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2004). *At risk: Natural hazards, people's vulnerability and disasters* (2nd ed.). Routledge.

World Bank. (2010). *Economics of adaptation to climate change: Bangladesh*. World Bank.