

A Critical Review of Community Resilience Building Framework: Contexts of Climate Change and Disasters in Bangladesh

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Abstract

The concept of community resilience in the contexts of climate change and disasters draws increasing attention and interest from practitioners and researchers in recent development discourse. This paper provides a critical review of six selected frameworks of community resilience building operationalized in Bangladesh over the span of years. In other words, this study aims to contribute to the understanding of resilience through a systematic analysis of the dimensions and indicators of community resilience frameworks. The analysis shows that comprehensive and effective community resilience frameworks should incorporate the missing components linked to fundamental elements of good governance, economic growth, environmental sustainability, social transformation, and capacity development. The paper concludes by highlighting a few other areas of grave concern that need more appropriate attention, considering the severe threats posed by climate change and natural disasters in line with sustainable development goals. Finally, this study recommends further research regarding the effectiveness of these frameworks in different climatic and disaster contexts that can lead the concept into a new dimension of community resilience and sustainability.

Keywords

Community Resilience, Resilience Building Framework, Resilience Indicators, Climate Change, Disaster, Bangladesh

1. Introduction

Bangladesh is recognized globally as one of the most vulnerable countries to climate change because of its geographical position, topography, and high population density. Over the past two decades, it has been ranked seventh among the most affected nations by extreme weather events (Eckstein et al., 2021). The country's vulnerability to climate change is the result of complex interrelationships between biophysical, social, economic, and technological characteristics. This high level of physical susceptibility to extreme weather events directly affects the country's fast-growing economy. Asian Development Bank (ADB) predicts that around 36.49 percent of the country's GDP per capita will be impacted due to climate-induced loss and damage over a period from 2041 to 2059 (Auffhammer, 2020). International organizations, such as the United Nations and World Bank, recognize climate change as a hindrance to achieving sustainable development goals and identify opportunities for resilience and development offered by climate action (Dolšak & Prakash, 2018; Rahman et al., 2020).

Considering such high vulnerability, for developing countries, such as Bangladesh, adaptation is so far considered as an appropriate strategy to decrease the current and projected climate impacts and associated risks (Rahman et al., 2020; Ayers et al., 2014; Coirolo & Rahman, 2014; Vij et al., 2018). However, the carbon offset mechanism and mitigation strategy have not been excluded from the policy agenda. Accordingly, over time, Bangladesh has developed various policies and institutional frameworks to build resilience against climate change. For example, the National Adaptation Program of Action (NAPA) in 2009 (Ministry of Environment and Forest, MoEF, 2009a), the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) in 2009 (MoEF, 2009b), the Climate Change and Gender Action Plan (ccGAP) in 2013 (MoEF, 2013) and the Nationally Determined Contribution of Bangladesh (NDC) in 2015 (MoEF, 2015). Besides, the concerns of climate adaptation have been streamlined in the Bangladesh Delta Plan 2100 (Ministry of Planning [MoP], 2018) and the Eighth Five Year Plan (2020-2025) (Ministry of Planning [MoP], 2020) of the country.

Resilience is an essential aspect of sustainability for development. This concept is becoming particularly popular in the discourse of climate change adaptation and disaster risk reduction as "climate-resilient development" to tackle climate change impacts in a development context (Bahadur et al., 2010). The Intergovernmental Panel on Climate Change (IPCC), in its fifth assessment report, stated that changes in the climate system caused by the emission of greenhouse gases would increase the likelihood of severe, pervasive, and irreversible impacts on the natural and human systems on all continents. As a result of climate change, disadvantaged people and communities will face greater risk (IPCC, 2014). Recognizing the consequences of the increasing frequency and severity of disaster events over the past four decades, the concept of community resilience has gained increasing prominence in science and policy circles (Sharifi, 2016). As such, communities need to proactively and consistently prepare for and mitigate risk to build resilience for

reducing the severity of disaster impacts and recovering more rapidly from disaster losses (Saja et al., 2019).

According to the IPCC's fourth assessment report, resilience is the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, self-organisation, and the capacity to adapt to stress and change (IPCC, 2007). The diffusion of the concept of community resilience also signifies that not all threats can be avoided, and there should be mechanisms in place to ensure that disturbances are kept to a minimum (Sharifi, 2016). As the concept of community resilience has continued to evolve, the importance of developing methods and instruments for its assessment has been widely recognized. Although there is no universal approach to assessing community resilience, researchers agree that it is characterized by several dimensions of well-being, including political, social, economic, and physical (Almutairi et al., 2020). Several resilience frameworks exist in both theory and practice, specifically targeted to build community resilience in disaster and climate change settings.

This study primarily aims to review the existing community resilience frameworks to derive a detailed understanding of community resilience in disaster and climate change contexts. Also, this study presents an in-depth analysis of characteristics and indicators used in the existing community resilience-building frameworks developed and applied by some implementing organizations in Bangladesh. This review explicitly examines the synergies among these six selected frameworks and further discusses limitations for the future conceptualization of the community resilience framework. This study will be helpful to guide policymakers, GO, and NGO-based program formulation and implementation in the field and provide inputs for shaping policy decisions at the top regarding disaster and climate change in the contexts of the global South.

2. Analytical Framework and Methodology

2.1. Selecting a Resilience Framework

A systematic review has been conducted to identify resilience-building frameworks in the context of disaster and climate change impact in Bangladesh. The selected frameworks have been developed and implemented at the field level to build resilience in combating climate change and disaster impact. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses, PRISMA (Moher et al., 2009) method was used to select resilience-building frameworks. PRISMA focuses on ways where authors can ensure the transparent and complete reporting of systematic reviews and meta-analyses. It does not address the conduct of systematic reviews directly or in a detailed manner for which other guides are available. The PRISMA Statement consists of a 27-item checklist and a four-phase flow diagram. The checklist includes essential items for transparent reporting of a systematic review (Liberati et al., 2009). It is an established method for guiding the systematic review of academic literature and is based on four steps: Identification, Screening, Eligibility, and Inclusion. The process of selecting review papers

following these steps shown in **Figure 1**. In the proceeding section, the key steps of selecting resilience frameworks are illustrated briefly:

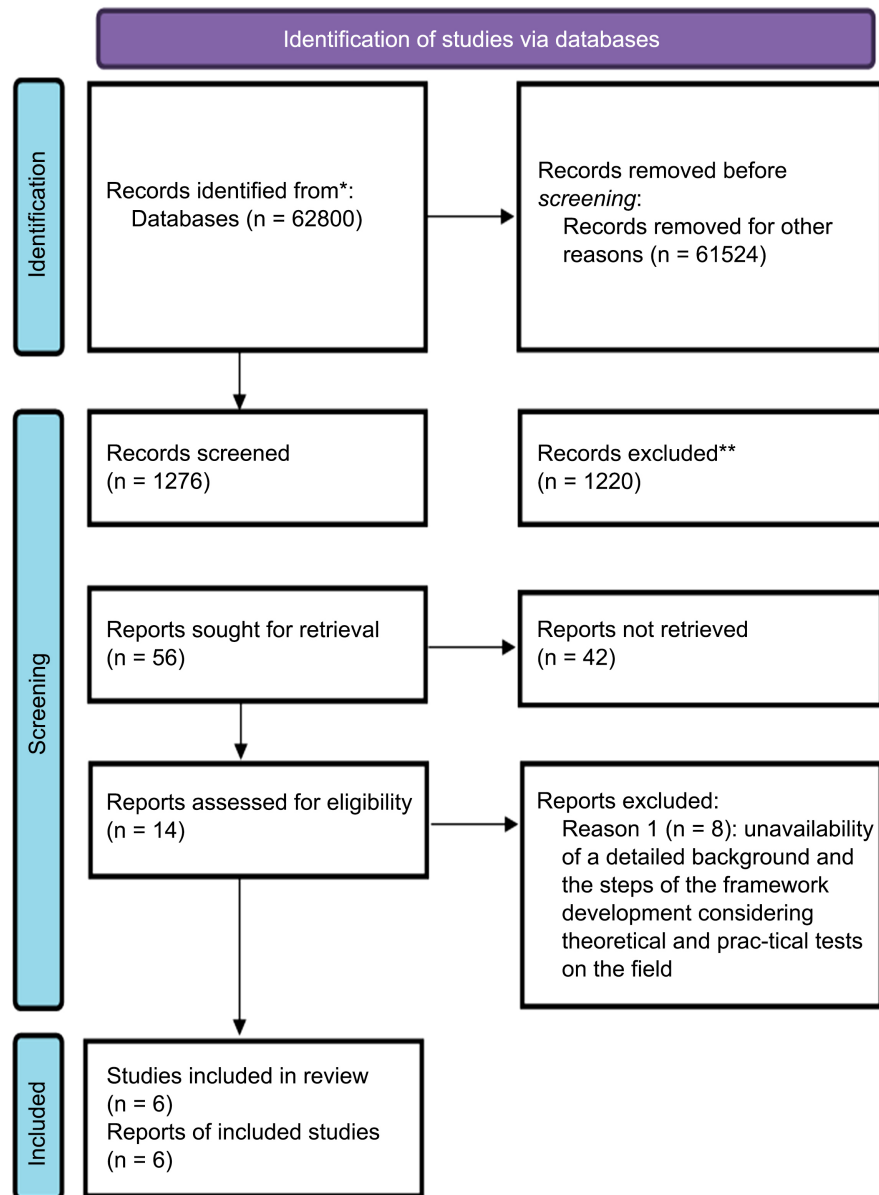


Figure 1. Step-by-step depiction of the review paper using the PRISMA technique.

Step 1—Identification stage: The keywords “Social/community resilience framework and climate change” were used to scan academic journal databases, including Google Scholar, and ScienceDirect, based on title and abstract to identify all potential resilience frameworks and research articles. After an initial search of the literature, the study identified a total number of 1276 frameworks and research articles.

Step 2—Screening stage: In this stage, search limiters were used to find resilience frameworks developed and published by different organizations on their own

for social resilience on climate change using their own experiences of program implications for building resilience. Frameworks that were not developed by organizations were excluded; for example, we didn't include the frameworks that were developed by any particular researcher or a group of researchers without any organizational collaboration. Consequently, 56 relevant frameworks were selected.

Step 3—Eligibility stage: In this step, the frameworks that are not relevant in the context of Bangladesh have been left out. That means we only included those frameworks that were developed in the context of different climate-vulnerable communities of Bangladesh and which have been implemented in Bangladesh. Finally, 14 eligible frameworks were selected for detailed review.

Step 4—Inclusion stage: Six were selected for final analysis based on the detailed reviews of 14 frameworks. The final selection criteria were made on having a detailed description of frameworks, where the data regarding the framework development and implication were available. In this final stage, the rest frameworks were excluded because of the unavailability of a detailed background and the steps of the framework development considering theoretical and practical tests on the field. We only considered those reports that have been focused on solving the problem of climate-vulnerable people of different communities of Bangladesh with detailed background and development steps.

2.2. Selected Resilience Framework

Table 1. Basic information related to the selected community resilience frameworks.

SL	Framework Code	Name of Framework	Framework development Organization	Framework Publication Year	Author Accessed the following month
1	CRF-BRAC	Climate Resilience Framework	BRAC	2020	September 2022
2	RF-CA	Resilience Framework	Christian Aid	March 2016	September 2022
3	RF-USAID	Resilience Framework	USAID	September 2016	September 2022
4	FRD-Oxfam	Framework for Resilient Development	Oxfam	April 2016	September 2022
5	V2RF-PA	Vulnerability to Resilience Framework	Practical Action	2012	September 2022
6	RF-IR	Resilience Framework	Islamic Relief	Not mentioned	September 2022

After a rigorous systematic review using the PRISMA method, the following six resilience frameworks have been selected for critical review and analysis. Those frameworks have been developed by national and international development organizations in Bangladesh named Bangladesh Rural Advancement Committee (BRAC), Christian Aid, United States Agency for International Development

(USAID), Oxfam, Practical Action, and Islamic Relief. The agency named these frameworks based on their respective goals and policies. However, all framework's focal area of intervention is climate change and disaster. **Table 1** describes some of the basic facts and information regarding the selected community resilience frameworks.

2.3. Standardize a Framework for Analyzing Selected Community-Resilient Frameworks

A resilience framework represents a holistic approach and promotes an efficient system that ensures sustainable development, while resilience is the prerequisite for the sustainable development of a society or country. Emerging recognition is also of the fact that environmental, economic, social, capacity, and governance systems cannot be treated in isolation. For the systems to be concurrently aligned in the development paradigm focusing on resilience building, the first step is to develop a meta-metric framework that identifies indicators and their respective roles in community resilience building. A clear, comprehensive framework that not only focuses on economic indicators but includes environmental, social, capacity, and governance systems is a prerequisite. Considering this sustainable development approach, we have adopted five dimensions of a resilience framework: good governance, economic growth and sustainability, environmental sustainability, social integration & transformation, and capacity development. **Sendzimir et al. (2011)** note that good governance and resilience go hand in hand, with further emphasis on the fact that without the structures of good governance, resilience measures cannot be in place. Economic development is claimed to be a significant enabling environment for community resilience (**UNISDR, 2009**) as well as emphasized in most of the resilience-building frameworks (**BRAC, 2020; Christian Aid, 2016; Islamic Relief, n.d.; Practical Action, 2012; USAID, 2016; Oxfam, 2016**). The resilience of social systems is related in some (still undefined) ways to the resilience of the ecological systems on which social systems depend (**Adger, 2000**). Social capital is a key element of a community's resilience to disasters (**The Committee on Disaster Research in the Social Sciences of the National Research Council, 2006**) that fosters networking and social mobilization and that, in turn, creates social transformation. Capacity lies at the heart of the resilience concept (**Greijn et al., 2015**), repeatedly highlighted in national and international policy discourses and funding investment decisions.

Good Governance:

The World Bank introduced the concept of good governance in 1992 as an essential complement to sound economic policies and is central to creating and sustaining an environment that fosters equitable and robust development (**World Bank, 1992**). United Nations has identified eight major characteristics of good governance: participatory, consensus-oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive, and follows the rule of law (**UNESCAP, n.d.**).

Weak governance is a critical constraint to effective and equitable resilience and adaptation planning (Fraser & Kirbyshire, 2017). Institutional inertia in political organizations and a historical tendency to top-down, centralized approaches to risk management also impede the ability to respond to a changing climate and devise contextually appropriate solutions. The core distinction of thinking about the governance of climate change-related shocks and stresses beyond thinking about governance for economic development or poverty alleviation, for example, is the emphasis on governing for long-term, uncertain futures (ibid). This measurable framework has identified five indicators essential for governance in a disaster situation: transparency, accountability, inclusive leadership, rights and entitlement, and the whole system approach (Shown in Table 2).

Table 2. Standardize dimension and indicator for community resilience building.

Dimension	Indicator
Good Governance	<ul style="list-style-type: none"> • Transparency • Accountability • Inclusive Leadership • Rights and Entitlement • Whole system approach
Economic growth & sustainability	<ul style="list-style-type: none"> • Diversified livelihood options • Access to financial resources • Private sector engagement • Strengthen the Value chain
Environmental sustainability	<ul style="list-style-type: none"> • Ecosystem service • Built environment • Renewable energy and energy-efficient technology
Social transformation	<ul style="list-style-type: none"> • Networking and partnership • Resource mobilization • Social capital
Capacity Development	<ul style="list-style-type: none"> • Knowledge enhancement • Skill development • Institutional development • Disaster risk reduction (DRR) • Research and innovation

Good governance requires credible and trustworthy institutions built on principles of transparency and accountability, where accountability goes beyond the mere responsibility of delivering a task or service. It also means answerability if a service is not delivered in a timely and efficient manner such that it becomes a burden (Riddihough, 2018). Here transparency constitutes the demand for information, the ability of citizens to obtain information, and the supply and the actual release of information by government, institutions, and NGOs (Mitchell, 1998).

Inclusive leadership exhibits qualities and skills to anticipate and be responsible for the people's rights, needs, and development challenges. Good leadership

attributes are essential in creating good governance (Bedi et al., 2014). Inclusive leaders embody a leadership approach that appreciates diversity, invites and welcomes everyone's contribution, and encourages full engagement with the processes of decision-making and shaping reality. A whole-system approach ensures that the right service is delivered to the people at the right time through bottom-up planning and implementation by empowering the local authorities. It also ensures access to the people's basic needs and empowers them to become self-sufficient and aware of any potential shocks that can be approached by climate change.

Economic Growth and Sustainability:

Sustained and inclusive economic growth can drive progress towards building resilience without compromising the environmental and social needs for the future. Resilience is the result of a holistic approach, where the ability of an economy to recover effectively from an unexpected shock is one of the central pillars of promoting resilience (Régibeau & Rockett, 2013). Environmental variability can increase the risk of being dependent on particular resources through the incidence of extreme events in nature, which is argued to increase vulnerability (Adger, 2000). Therefore, the role of economic growth and sustainability in supporting and influencing social resilience has been highlighted in scholarly works. This economic growth and sustainability are identified to be dependent on four indicators: diversified livelihood options, access to financial resources, private sector engagement, and strengthening the value chain (shown in Table 2).

Livelihood diversification of farmers' income sources can be an effective way to cope with the adverse impacts of environmental change (Roy & Basu, 2020). Diversification also refers to attempts by individuals and households to find new ways or sources to raise income (Hussein & Nelson, 1998). Access to finance is the ability of individuals or enterprises to obtain financial services, including credit, deposit, payment, insurance, and other risk management services (Demirgüç-Kunt et al., 2008). Another key aspect of economic growth is strengthening the value chain; it can be an effective instrument for fighting inequality, favoring higher incomes for producers, and a more balanced appropriation of value-added. In addition, it fosters productive diversification and expands participation in the segment of the production structure with the most incredible knowledge intensity or highest demand growth, which contributes to structural change (Padilla-Perez & Villarreal, 2017). At its final stage, economic development and sustainability mainly focus on improving and maintaining living standards while adapting to shocks stresses, and uncertainties.

Environmental Sustainability:

Environmental sustainability could be defined as a condition of balance, resilience, and interconnectedness that allows human society to satisfy its needs while neither exceeding the capacity of its supporting ecosystems to continue to regenerate the services necessary to meet those needs nor by our actions diminishing biological diversity (Morelli, 2011). Many ecologists argue that resilience is the key to biodiversity conservation and that diversity itself enhances resilience,

stability, and ecosystem functioning (Schulze & Mooney, 1993; Mooney & Ehrlich, 1997; Tilman, 1997, as cited in Adger, 2000). This measurable framework has identified three indicators to evaluate all the selected frameworks: ecosystem service, built environment, renewable energy, and energy-efficient technology (Shown in **Table 2**).

Energy efficiency and renewable energy technology solutions can bridge action across climate change mitigation and resilience by reducing GHG emissions and supporting the electric power sector's adaptation to increasing climate risk. Renewable energy is a significant power generation source since we can use these resources repeatedly to produce sound energy (Kumar, 2020). Ecosystem services can be divided into provisioning services that provide food and water; regulating services that provide clean air, moderate extreme events, and regulate the local climate; supporting services that help maintain biodiversity and infectious disease control; and cultural services (Lindgren & Elmqvist, 2017). For environmental sustainability, the most crucial function of the built environment is protecting and enhancing life (civic ecology), whether in disaster-resilient design and construction practices or disaster recovery and reconstruction activities (Bosher et al., 2016). The built environment includes all physical parts of where we live and work, e.g., homes, buildings, streets, open spaces, and infrastructure (Glanville, 2004).

Social Transformation:

Social transformation implies an underlying notion of how society and culture change in response to such factors as economic growth, war, or political upheavals (Castles, 2001). Through this transformation, society moves from an ascribed status to resilient status. This measurable framework has identified three indicators to evaluate all the selected frameworks: networking and partnership, resource mobilization, and social capital (Shown in **Table 2**).

Social networks improve disaster recovery for residents, communities, and the nation; moreover, three types of social capital, i.e., bonding, linking, and bridging, contribute to community resilience (Aldrich, 2017). It can enable collective action that can lead to the provision of needed aid and services (Partelow, 2021). It also enables communities to organize in the aftermath of a disaster (Kerr, 2018). Resource mobilization refers to all activities involved in securing the existing new and additional resources for the community. It also involves better using and maximizing existing resources (Seltzer, 2016). Community resilience requires some specific constructs such as "connection and caring through social integration and networking," "resource mobilization" and "community empowerment" considering cultural diversities in order to increase local capacity, social support & resources and to decrease the risk for the community (Preker et al., 2013).

Capacity Development:

Capacity development is how individuals, organizations, and societies obtain, strengthen, and maintain the capabilities to set and achieve their development objectives over time (UNDP, 2007). At the same time, resilience is generally considered

a capacity to act and adapt in the face of adversity or constraint and is the result of a complex interplay of risk and protective factors (Danaher et al., 2014). Thus, capacity development is essential to reduce the dependency of a community on outsiders from forming and encourages local people to take action on local issues themselves to reduce disaster risk and to be prepared for an emergency. This measurable framework has identified five indicators to evaluate all the selected frameworks: knowledge enhancement, skill development, institutional development, Disaster Risk Reduction (DRR), and research and innovation (shown in Table 2).

The recently adopted Sendai Framework for Disaster Risk Reduction 2015–2030 addresses knowledge and skill development-related issues and emphasizes the critical role of knowledge and skill development in disaster risk reduction to build resilience (Weichselgartner & Pigeon, 2015). Capacity development of a community not only focuses on enabling all members of the community to develop skills and competencies but also focuses on institutional development with the institutional engagement of different stakeholders to take greater control of their own lives. It also contributes to inclusive local development to build a resilient community (The University of Memphis, n.d.) Institutional Development means creating or reinforcing an organization's capacity to generate, allocate, and use human and financial resources effectively to attain development objectives, either public or private (Buyck, 1991). Innovation through research leads to economic diversification, which increases the ability of economies to adapt to shocks. Innovation in infrastructure protects against failure and negative impacts on communities. Moreover, new research and innovative products and services could decouple economic development from environmental degradation, promoting environmental sustainability (UNCTAD, 2019).

3. Results

Evaluation of Community Resilience Frameworks: Synergies and Gaps

Different frameworks define the resilience approach from different angles, and accordingly, the components or elements of resilience-building are chosen for analyzing the frameworks. Nevertheless, the resilience components of these six selected frameworks can be analyzed under five dimensions, i.e., good governance, economic growth & sustainability, environmental sustainability, social transformation, and capacity development. These five major components are further divided into three to five potential sub-components that describe the key components. The first key component of good governance comprises transparency, accountability, inclusive leadership, rights & entitlement, and the whole system approach as essential sub-components. Under the economic growth and sustainability component, diversification of livelihood, access to financial resources, private sector engagement, and value chain strengthening are considered fundamental elements. Accordingly, ecosystem service, built environment, and renewable energy & energy efficient technology fabricate environmental sustainability,

whereas networking & partnership, resource mobilization, and social capital edge social transformation. Finally, capacity development assembles five sub-components, i.e., knowledge enhancement, skill development, institutional development, disaster risk reduction, and research & innovation. The components of resilience are analyzed here in **Table 3** to identify which features were included or excluded in each of the six selected frameworks targeted to build resilience in the context of climate change and disaster.

Table 3. Analysis of community resilience frameworks based on components and sub-components.

	CRF-BRAC	RF-CA	RF-USAID	FRD-Oxfam	V2RF-PA	RF-IR
Good Governance						
Transparency	-	-	√	√	-	-
Accountability	√	√	√	√	√	-
Inclusive Leadership	√	√	-	-	-	-
Rights and Entitlement	√	Partial-health	√	√	Partial	Partial-safety net
Whole system approach	√	√	√	√	√	√
Economic growth & sustainability						
Diversified livelihood options	√	√	√	√	√	√
Access to financial resources	√	√	√	√	-	-
Private sector engagement	-	-	√	√	-	-
Strengthen Value chain	-	√	√	√	√	√
Environmental sustainability						
Ecosystem service	√	√	Partial	√	√	√
Built environment	√	√	-	√	-	√
Renewable energy and energy-efficient technology	-	-	-	Partial	Partial	√
Social transformation						
Networking and partnership	√	√	-	√	√	√
Resource mobilization	√	√	-	-	-	√
Social capital	√	√	√	√	-	√
Capacity Development						
Knowledge enhancement	√	√	√	√	√	√
Skill development	√	-	√	√	√	√
Institutional development	√	√	-	-	-	√
Disaster risk reduction (DRR)	√	√	√	√	√	√
Research and innovation	√	-	-	√	-	√

Good Governance: Good governance, being the heart of any system, holds priority attention in each of the six selected frameworks. All frameworks comprise the components of the whole system approach followed by accountability in the five successive frameworks except the resilience framework of Islamic Relief. The elements of rights and entitlement are included in CRF-BRAC, RF-USAID, and FRD-Oxfam. This component is also partially addressed in RF-CA, V2RF-PA, and RF-IR as these three frameworks focus on some segmented aspects only, i.e., social safety net, and access to health services. Finally, transparency and inclusive leadership are highlighted in RF-USAID, FRD-Oxfam, and CRF-BRAC, RF-CA, respectively.

Economic growth and sustainability: Sustainable economic growth is one of the essential prerequisites of resilience building that broadly comprises diversification of livelihood options, access to finance, private sector engagement, and value chain strengthening. Maintaining a stable income flow throughout the year is fundamental to being resilient, emphasized in all six selected frameworks by embodying diversified livelihood options. Value chain-related interventions obtain the second-highest priority in the five frameworks except for CRF-BRAC. Successively, access to finance gets weighted in CRF-BRAC, RF-CA, RF-USAID, and FRD-Oxfam. However, private sector engagement for economic growth is considered only in the frameworks of USAID and Oxfam.

Environmental sustainability: The selected frameworks are formulated primarily considering the context of climate change and disaster. As a result, environmental sustainability features purposefully occupy a good position in the frameworks. First, ecosystem service, which ensures both nature's benefits to humans and the protection of the environment, is adopted in all the frameworks. At the same time, RF-USAID partly includes it by addressing environmental security aspects in its framework. As for the built environment, CRF-BRAC, RF-CA, FRD-Oxfam, and RF-IR concentrate on green and protective infrastructure. However, the integration of renewable energy and energy-efficient technology is partially found in FRD-Oxfam as it includes the clean energy aspect, while V2RF-PA only mentions the importance of technologies for livelihood improvements.

Social Transformation: This component encompasses three sub-components, i.e., networking & partnership, resource mobilization, and social capital. All the frameworks amount to strengthening and better utilization of social resources to facilitate the process of resilience except V2RF-PA. Similarly, networking & partnership accounted for five frameworks except for RF-USAID. Finally, BRAC, Christian Aid, and Islamic Relief frameworks commonly integrate resource mobilization as an essential aspect of social transformation.

Capacity Development: As reflected in the frameworks, capacity development is of utmost importance to foster the transformation towards resilience-building. Here, capacity development comprises five sub-components, i.e., knowledge enhancement, skill development, institutional development, disaster risk reduction, and research & innovation. Capacity development, knowledge enhancement, and

Disaster Risk Reduction are two top-priority issues included in all six frameworks. Successively, skill development is identified as an essential element for being resilient reflected in five frameworks except for RF-CA. At the same time, CRF-BRAC, RF-CA, and RF-IR frameworks include institutional capacity development, while CRF-BRAC, FRD-Oxfam, and RF-IR count on research & innovation as part of capacity development initiatives.

4. Discussion

Among different social resilience-building approaches, this paper focuses on six community resilience-building frameworks that can be put under the hierarchical (specific-level) framework category (Saja et al., 2019). These frameworks include common yet critical resilience attributes, and being flexible enough to adapt to specific conditions that are the prominent characteristics of the hierarchical approach (ibid). Furthermore, these frameworks are mostly practitioner-oriented, primarily based on the experience gathered in implementing program activities. As a result, these frameworks use lessons learned best practices and follow an integrated approach to disaster and climate change while including the essential components, characteristics, and possible resilience indicators. Though all the six selected frameworks in this study revolve around these elements, the emphasis scale varies, as shown in Figure 2.

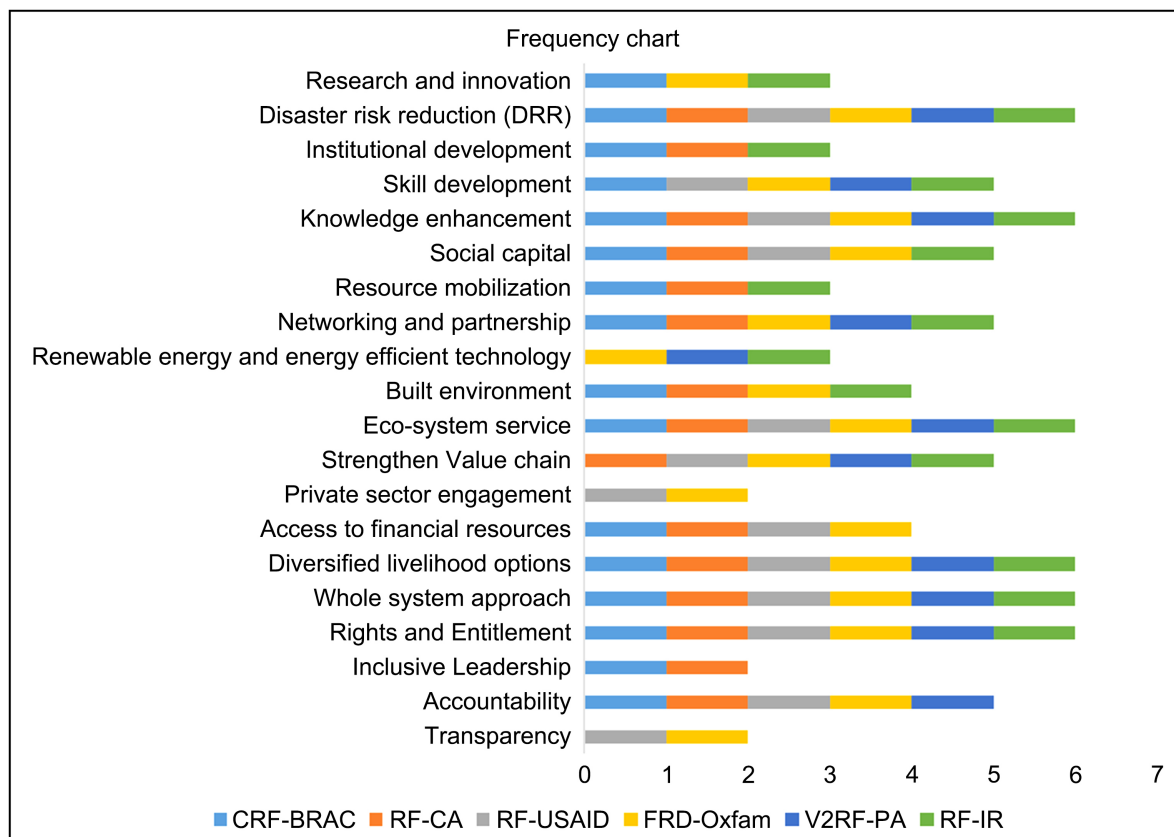


Figure 2. Percentage distribution of the frequency of indicators under each framework (Author develops this figure).

The study shows that social transformation is regarded as one of the core components of community empowerment. Broadening networks & partnerships, strengthening social capital, and mobilizing resources are likely to be key strategies of social transformation that pave the way for building community resilience, particularly in crisis/disaster contexts. A strong base of social capital in the form of trust, norms, and networks would lead to a high degree of coordination and cooperation in the community, resulting in more equitable access to resources, leading to greater resilience (Bahadur et al., 2010).

Likely, ecosystem services, as well as the built environment, account mostly for building community resilience. Natural resources provide goods and services to communities, such as providing food, protecting from natural hazards, and creating cultural diversity (UNISDR, 2009). Reducing risks and vulnerabilities from natural hazards can also be achieved by constructing and better managing the infrastructure, e.g., embankments, cyclone shelters, etc. (Djalante & Thomalla, 2011). Renewable energy technologies might significantly shield the energy demand with a huge potential for emission reduction (Kumar & Majid, 2020). It is essential to increase community resilience by deploying sustainable energy sources. In this regard, however, mitigation practice can be regarded as a behavioral adaptation to new technologies. Nevertheless, the study finds that incorporating renewable energy and energy-efficient technology is still a gap in resilience-building frameworks.

A community's ability to prepare for and recover from disasters is strongly influenced by its economic strength and livelihood diversification (Djalante & Thomalla, 2011). Adger (2000) argues that stable livelihoods contribute to social resilience. Stable livelihoods are derived from sustained economic growth. Over the long term, economic growth is also promoted by the "equitable distribution of assets within populations" (Adger, 2000, as cited in Djalante & Thomalla, 2011).

Other than diversified livelihood options, improving access to finance is integral to achieving sustained economic growth, inclusion, and elimination of poverty (World Bank, 1992). The review shows that all the frameworks primarily emphasize diversified income generation opportunities accompanied by access to finance and value chain strengthening for sustainable economic growth with a robust local economy. At this point, as an essential part of the economy, the private sector holds the potential to either exacerbate or minimize the impact of future disasters through their decision-making, investments, and business practices today and thus to hinder or contribute to the attainment of global sustainable development goals (SDGs) (Abe et al., 2019). However, engaging the private sector is not included in most of the framework, which could be traced as a limitation of effective and sustainable economic growth.

The resilience concept is associated with the capacity of individuals, groups, and society as a whole to cope, adapt, and transform in the face of man-made and natural shocks (Greijn et al., 2015). Capacity development is an essential strategy

for resilience since it helps build and maintain people, organizations, and societies to manage risks successfully by themselves (Djalante & Thomalla, 2011). Furthermore, knowledge and information are critical to climate change preparedness; involving knowledge actors and bridging science and policy is essential for climate resilience (Fraser & Kirbyshire, 2017). This paper argues that research & innovation could bring new and additional knowledge that will contribute to performing informed actions and making people one step forward to achieve resilience, which is yet to be incorporated.

There are two ways in which governance can provide an enabling environment for resilience: it can provide an integrated framework for institutions from bottom to top levels and encourage multi-stakeholder participation and engagement in disaster risk reduction activities (Djalante & Thomalla, 2011). In order to ensure good governance, all six frameworks engage different levels of stakeholders from local to national in planning, decision-making, and the following steps. Regarding rights and entitlement, the focus needs to be on safeguarding human rights, which is often partially touched by program focus. However, every right matters as it creates necessary conditions for a resilient community. Addressing only one or two rights cannot bring the desired state of resilience. Nevertheless, transparency and inclusive leadership were found less focused on the resilience framework irrespective of social strata.

5. Conclusion

This study presents a comprehensive review of six selected community resilience frameworks designed to enhance the resilience of populations in climate-vulnerable regions. Through critical analysis, these frameworks are evaluated across five key dimensions: good governance, economic growth and sustainability, environmental sustainability, social transformation, and capacity development. The purpose of this analysis is to identify synergies, gaps, and areas for improvement within the frameworks to better support community resilience in the face of climate change and disaster risks.

Key Findings

- **Common Elements Across Frameworks:** Each of the six frameworks contains similar resilience components due to the shared focus on climate change and disaster risk reduction, particularly in the Global South context.
- **Gaps in Good Governance:** Most frameworks show a limited focus on transparency and inclusive leadership, which are critical for robust governance structures essential to resilience building.
- **Lack of Renewable Energy Focus:** Few frameworks incorporate renewable energy and energy-efficient technologies, despite their importance in enhancing environmental sustainability and reducing vulnerabilities.
- **Private Sector Engagement:** The involvement of the private sector, which can play a pivotal role in promoting economic resilience, is notably absent from

many of the frameworks.

- **Research and Innovation:** There is a lack of emphasis on research and innovation, which is crucial for generating new knowledge and adaptive strategies to cope with evolving climate challenges.
- **Rights and Entitlement:** While some frameworks address rights and entitlements, this focus is often partial, neglecting the broader scope of human rights necessary for comprehensive community resilience.

Further research is needed to explore the effectiveness of these frameworks in different climatic and disaster-prone contexts. Expanding the scope of resilience frameworks to include renewable energy, private sector engagement, and research and innovation will be vital for more holistic community resilience. Additionally, research should investigate how frameworks can better integrate local needs and priorities to ensure a multidimensional and cross-sectoral approach that is applicable in diverse settings.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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