COMPREHENDING DISASTER RISK MANAGEMENT STRATEGIES: A REVIEW OF BUILD BACK BETTER AND BUILD BETTER BEFORE

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ABSTRACT

The rising frequency and intensity of climate emergencies, coupled with their amplified disaster impacts, result in substantial human and economic costs. There is a deficiency in effective strategies for disaster risk management to address this destructive phenomenon. The effectiveness of Build Back Better (BBB) remains uncertain, exhibiting limitations in its implementation, especially in developing and least developed countries characterized by unique socioeconomic and societal vulnerabilities. Research on the concept of Build Better Before (BBBf) is limited, and its potential to address deficiencies in disaster risk management in underdeveloped contexts is scarce. Therefore, there is an urgency to investigate the effectiveness and applicability of these approaches and highlight the optimal option for specific contexts. The study conducted a systematic literature review following PRISMA guidelines to achieve this objective. Fourty papers were analysed regarding BBB and BBBf in recent literature (2017-2024). The literature suggests that the BBBf approach presents a viable alternative with various comparative advantages, including economic efficiency, support for bottom-up approaches, and increased involvement of local governments. The emphasis on community resilience and cost-effectiveness in the BBBf initiative enhances its viability for community adoption, promoting long-term sustainability, especially in contexts characterized by financial challenges, societal vulnerabilities, and governance complexities.

Keywords: Disaster Risk Management; Systematic Literature Review; Build Back Better (BBB); Build Better Before (BBBf)

1.   INTRODUCTION

The prevalence and severity of both natural and anthropogenic disasters are on the rise, leading to significant economic losses and increased mortality rates (Ramanathan & Crawley, 2021). Despite this, the effective implementation of strategies for managing disaster risks remains lacking (Cosson, 2020). The Build Back Better (BBB) strategy was established to guide recovery efforts, focusing on improving resilience and sustainability in post-disaster reconstruction (Der Sarkissian et al., 2023; Dube, 2020; Dube et al., 2021; Hofmann, 2022). The concept of Build Better Before (BBBf) emphasizes the construction of resilient housing and the implementation of proactive strategies to prevent and mitigate disaster risks, thereby improving preparedness before disasters occur (Dabaj et al., 2022; GFDRR, 2022; Porter, 2021). This study examines the effectiveness of BBB and BBBf in disaster risk management, focusing on their viability and appropriateness for the socioeconomic conditions of developing countries, such as Pakistan, while situating the discussion within an international context.

Pakistan ranks as the fifth most vulnerable country to the impacts of climate change (UN-Habitat, 2023). Disaster risk management in Pakistan encounters considerable challenges stemming from its distinct geographical, institutional, and socioeconomic factors (Haris et al., 2019). The country's significant susceptibility to recurrent floods, droughts, landslides, and earthquakes exacerbates these challenges (Shah et al., 2023). The country has primarily employed a reactive strategy for disaster response and has sought to implement the BBB principles for reconstruction after significant events, including the Kashmir Earthquake of 2005 and the Hindu Kush Earthquake of 2015 (Haris et al., 2019). The predominantly reactive approach to disaster risk management is hindered by governance complexities, inadequate preparedness, ineffective early warning systems, resource limitations, environmental diversity, and institutional challenges (Haris et al., 2019; Rana et al., 2021; Shah et al., 2023; Shah & Rana, 2023). These challenges underscore the need for a paradigm shift in Pakistan towards a proactive and comprehensive approach to disaster risk management.

Since its formal incorporation into policy instruments in 2006 (Collodi et al., 2021), many countries have adopted the BBB strategy for post-disaster recovery. The effectiveness of this approach is debated (refer to the Literature Review Matrix in Table 3); some experts support it (Dube, 2020; Dube et al., 2021), while others criticise its ineffectiveness in certain contexts and the challenges associated with its implementation (Haris et al., 2019; Imperiale & Vanclay, 2020a, 2020b; Maly, 2018; Neeraj et al., 2021; Su & Le Dé, 2020; Vahanvati & Rafliana, 2019). Several researchers call for a paradigm shift in disaster risk management (Cosson, 2020; Dabaj et al., 2022; Porter, 2021). The effectiveness of BBB as a strategy for disaster risk management is questionable, especially in developing and least developed countries that exhibit socioeconomic and societal vulnerabilities. There is a paucity of research regarding the BBBf concept and its potential to address deficiencies in disaster risk management in underdeveloped contexts. This study analyses the efficacy and relevance of these approaches in particular contexts.

A systematic literature review was conducted to enhance understanding of the BBB and BBBf, adhering to PRISMA guidelines (Nowell et al., 2017). This study synthesises fourty papers to analyse the concepts of "Build Back Better" (BBB) and "Build Better Before" (BBBf) in the context of disaster risk management in recent literature (2017-2024). The analysis investigated research trends in disaster risk management, including disaster preparedness, prevention, mitigation, reconstruction, short-term recovery, and long-term community resilience. This analysis assessed the significance of these concepts in enhancing community resilience in Pakistan, in light of the nation's growing vulnerability to disasters and considerable socioeconomic challenges.

This study analyses BBB and BBBf as two distinct yet complementary strategies within the disaster risk management (DRM) cycle. BBB, as described by Cosson (2020) and Neeraj et al. (2021), highlights the importance of physical, economic, and social resilience via disaster risk reduction, community recovery, and effective implementation, which corresponds with the three pillars of sustainability:

economic viability, environmental protection, and social equity. The BBB framework is widely acknowledged as a fundamental principle for disaster recovery and has been incorporated into various international frameworks (Collodi et al., 2021; Cosson, 2020; Der Sarkissian et al., 2023; Dube, 2020; Dube et al., 2021; Hofmann, 2022; Maly & Suppasri, 2020). In contrast, BBBf is a more recent concept that emphasises pre-disaster preparedness by incorporating socioeconomic viability, capacity building, community engagement, resilience building, and governance into preventive strategies (Coppola, 2020; Dabaj et al., 2022; Der Sarkissian et al., 2023; Edgington, 2022; GFDRR, 2022; Porter, 2021; Ramanathan & Crawley, 2021). The BBB approach is significant in international frameworks, including the Sendai Framework, and is being increasingly integrated into policy and practice contexts in Pakistan. A comparative analysis of the outcomes of the BBB and BBBf is presented in Table 4. The conceptual positioning of the BBB and BBBf within the DRM cycle is illustrated in Figure 1.
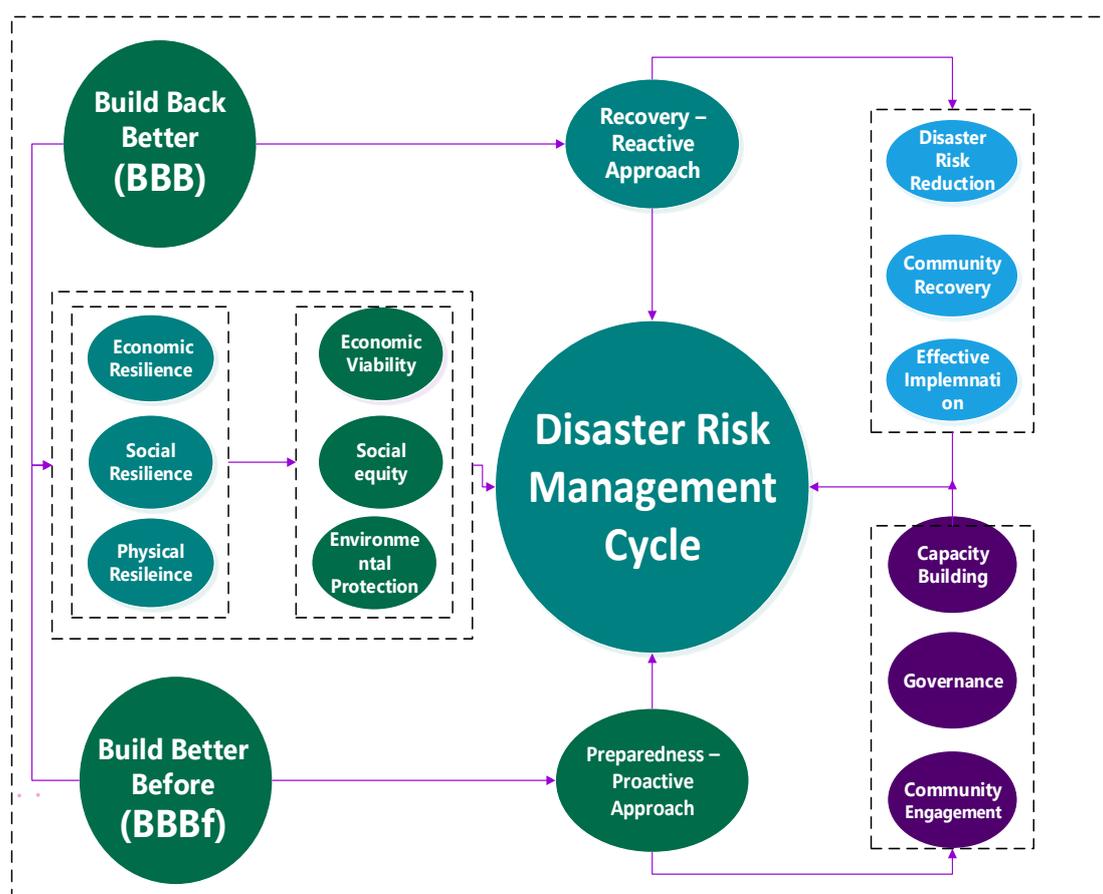

Figure 1: Conceptual Model of the BBB and BBBf within the DRM Cycle

The following paragraphs outline research methods for the literature search and selection process, adhering to the SLR-PRISMA guidelines (Moher et al., 2009; Nowell et al., 2017). The subsequent sections present the results from both approaches, culminating in a comprehensive discussion and conclusion.
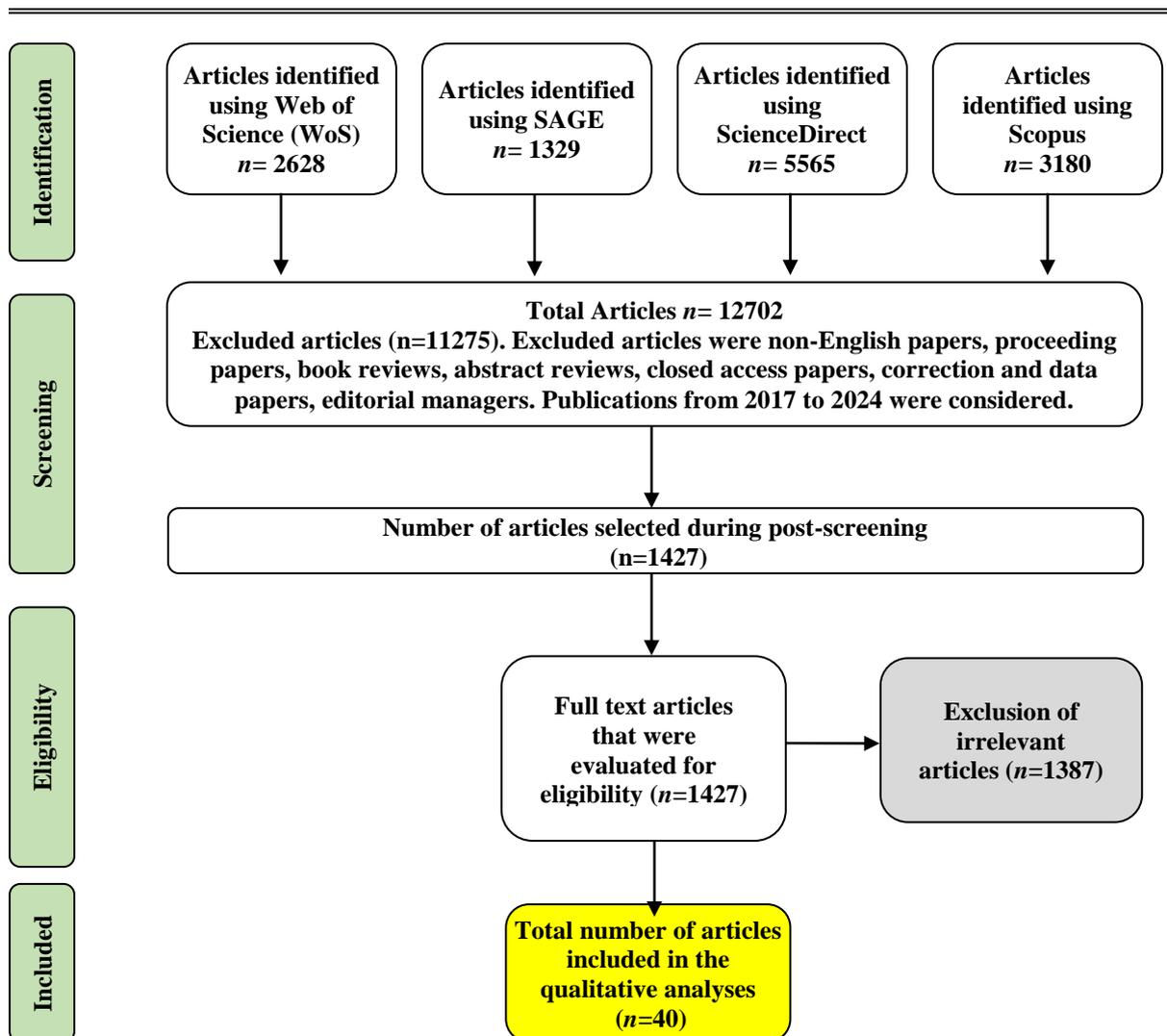
Figure 2: The flowchart illustrating the adherence to PRISMA guidelines in the systematic literature review (Source: Adapted from Moher et al., 2009)

2. RESEARCH METHODS

This research utilises a Systematic Literature Review (SLR) method following PRISMA guidelines (Nowell et al., 2017) to examine recent research on BBB and BBBf. The SLR identifies significant findings, underscores existing knowledge gaps, and directs future research through a rigorous and transparent methodology (Hijriyah et al., 2024; Ismail et al., 2021). The PRISMA guidelines are widely employed across various fields, including disaster preparedness (Ramanathan & Crawley, 2021), build back better initiatives (Carrasco & O'Brien, 2023), and walkability studies (Hijriyah et al., 2024), providing a structured approach for systematic literature reviews. This study followed the four main stages of PRISMA: identification, screening, eligibility, and data extraction and analysis (Ismail et al., 2021), as illustrated in Figure 2.

2.1 Identification

This study conducted a systematic literature review using four reputable databases: Web of Science, SAGE Journals, ScienceDirect, and Scopus. The chosen databases were selected based on their established reputation and proven reliability within the academic and scientific research community

(Hijriyah et al., 2024; Ismail et al., 2021). The primary search terms utilised included "build back better", "build better before", "disaster risk management", "disaster preparedness", "prevention", "reconstruction", "disaster recovery", "disaster mitigation", and "adaptation". Boolean and proximity operators, including "AND", "OR", and "NOT", were utilised to improve the accuracy of the search results. Initially, 12,702 articles were identified: 2,628 from Web of Science, 1,329 from SAGE Journals, 5,565 from ScienceDirect, and 3,180 from Scopus databases. The identified articles underwent a comprehensive screening process.

2.2 Screening

The screening process included the relevant articles, utilising established inclusion and exclusion criteria. The primary criterion was to include the most recent articles published in the journals of four major databases: Web of Science, SAGE Journals, ScienceDirect, and Scopus, to facilitate the analysis of the latest information and state of knowledge regarding the research issue. The analysis included only journal articles published between 2017 and 2024. Only peer-reviewed and open-access articles were selected to ensure the inclusion of high-quality, credible sources that are academically rigorous and readily accessible for verification and transparency. The included articles discuss strategies for disaster risk reduction and management, along with concepts such as BBB and BBBf. Articles included those focusing on developing countries, specifically Pakistan. Articles written in the English language were included. Articles that did not meet the criteria were excluded during the screening process. A total of 11,275 articles were excluded during the screening process. Excluded were the non-English papers, proceeding papers, book reviews, abstract reviews, closed access papers, correction and data papers, editorial managers, and publications prior to 2017. The initial screening process lasted over two weeks and included 1,427 journal articles, which were manually reviewed based on the predetermined eligibility criteria.

2.3 Eligibility

The eligibility stage comprised a manual review of 1,427 journal articles, in accordance with PRISMA guidelines (Ismail et al., 2021; Nowell et al., 2017). The criteria established by the authors primarily pertain to the direct alignment of articles with the study's focus. At this stage, all shortlisted articles were meticulously screened by analysing their titles and abstracts to evaluate their relevance to the core research themes of BBB and BBBf. Articles were included if they directly aligned with the study's focus on disaster preparedness, post-disaster recovery frameworks, or comparative analysis of BBB and BBBf. The studies deemed irrelevant, off-topic, or lacking substantial engagement with key concepts were excluded. At this stage, 1,387 articles were excluded for not addressing disaster risk management strategies. Forty articles were selected for data abstraction and qualitative analysis. As the research adhered to PRISMA guidelines to ensure a transparent and systematic selection of pertinent literature. All shortlisted articles were reviewed and critically assessed by the authors based on their titles and abstracts, with inclusion determined by their relevance and alignment with the core themes of BBB and BBBf. We adopted a standardised approach in the screening and inclusion/exclusion phases to minimise bias and ensure consistency in the selection of relevant articles.

2.4 Data Abstraction and Analysis

The data abstraction and analysis phase constitutes the fourth step in a systematic literature review following PRISMA guidelines (Hijriyah et al., 2024; Ismail et al., 2021; Nowell et al., 2017). After selecting forty eligible studies according to the PRISMA framework, a thematic and narrative synthesis was performed to examine the effectiveness and applicability of the BBB and BBBf approaches, as well as to identify the optimal option for specific contexts, including Pakistan. The analysis employed a structured, multi-stage process, beginning with familiarisation, during which each included study was thoroughly read to achieve a comprehensive understanding of its focus, scope, methodology, and findings. The key concepts, statements, and findings pertinent to the BBB and BBBf were initially

highlighted and coded manually. Codes were generated inductively from the literature while being informed by the established research objectives. The theme development involved grouping related codes into preliminary categories, which were subsequently refined into broader themes through an iterative process. The identified themes were evaluated to confirm their alignment with the study's objectives of comparing BBB and BBBf and examining their application in disaster recovery contexts. The validation involved revisiting the themes in relation to the original studies to ensure accuracy and reduce misinterpretation. Overlaps and ambiguities were addressed through iterative comparisons with the source material. A narrative synthesis was employed to compare and integrate the similarities, differences, and contradictions in the findings.

This process resulted in nine primary themes and sub-themes, including the Global Perspective on BBB; Challenges in Implementing BBB; Global Perspective on BBBf; Global Practices of BBB and BBBf; Costs and Benefits Analysis of BBB and BBBf; Community Resilience; Disaster Governance; Urbanisation and Climate Induced Disasters; and Disaster Risk Management in Pakistan. Themes delineate the structure of the results section and are directly associated with the research objectives, thereby ensuring the transparency and replicability of the analysis.

3. RESULTS

The increasing frequency and intensity of disasters necessitate advanced disaster risk management strategies that include prevention, mitigation, preparedness, response, and recovery (Zhou et al., 2022). The UN Office for Disaster Risk Reduction (UNDRR) advocates for the BBB approach to enhance disaster resilience, focusing on equitable and universally accessible strategies for response, recovery, reconstruction, and development (Cosson, 2020; Hofmann, 2022; Maly & Suppasri, 2020). However, this approach emphasizes reactive measures to prevent future disaster risks and enhance community resilience (Dube, 2020; Neeraj et al., 2021). Instead, Porter (2021) emphasises the significance of proactive strategies to enhance resilience against future disasters. Ramanathan and Crawley (2021) advocate for a transition from reactive disaster recovery to proactive disaster preparedness.

The thematic analysis of the forty selected papers, conducted per the methodology outlined, identified nine major themes related to BBB and BBBf. Table 1 displays the frequency and proportion of studies across each theme, offering a quantitative summary of the thematic distribution. Table 2 presents a comparative analysis across various contexts, detailing findings by region, approach, and typical impact patterns. Several studies examined various themes, with Disaster Governance exhibiting the highest representation at 35.0%, followed by Community Resilience at 32.5%, and Global Practices of the BBB and BBBf at 27.5%. Table 3 provides a summary of the literature review. The literature demonstrates both consistency and inconsistency, as well as divergent opinions regarding the BBB.

Table 1: The frequency of themes identified in the selected articles (n=40) is presented.

Theme	No. of articles	% of total articles
Global Perspective of BBB	10	25.0%
Challenges in Implementing BBB	6	15.0%
Global Perspective of BBBf	4	10.0%
Global Practices of the BBB and BBBf	11	27.5%
Costs and Benefits Analysis of BBB and BBBf	2	5.0%
Community Resilience	13	32.5%
Disaster Governance	14	35.0%
Urbanization and Climate Induced Disasters	5	12.5%
Disaster Risk Management in Pakistan	10	25.0%

Table 2: Findings' Summary Organised by Theme, Region, Approach, and Typical Impact Patterns

Theme	Main regions Covered	Approach	Typical Impact Patterns
Global Perspective of BBB	Global, Japan, Caribbean, India	BBB	Mostly positive but with some implementation concerns
Challenges in Implementing BBB	Asia, Caribbean, USA, Italy, India, Pakistan, Japan	BBB	Mostly negative or mixed due to governance & resource issues
Global Perspective of BBBf	Global, France, Colombia, Netherlands, China	BBBf	Positive, proactive resilience benefits
Global Practices of the BBB and BBBf	Global, Asia-Pacific, Sri Lanka, Nepal, India	BBB and BBBf	Mixed – effectiveness varies by governance & resources
Costs and Benefits	USA, France, Japan, India, Nepal	BBB and BBBf	Positive in long term, concerns over short-term costs
Community Resilience	Asia-Pacific, Africa, USA, India, Bangladesh	BBB and BBBf	Mostly positive – stronger social recovery and adaptation
Disaster Governance	Global, Caribbean, India Pakistan, Ghana, Indonesia	BBB and BBBf	Mixed – governance gaps hinder effectiveness
Disaster Risk Management in Pakistan	Pakistan	BBB and BBBf	Mixed – policy implementation and resource gaps, flood management gaps
Urbanization	Pakistan, South Asia, Global	BBB and BBBf	Mixed – urban growth increases exposure, but urban planning offers resilience opportunities

Table 3: Literature Review Matrix - Build Back Better (BBB)

Authors	Concept Overview	Global Perspective	Potential Advantages	Implementation Challenges
(Cosson, 2020)	BBB promotes eco-friendly, and disaster-resilient projects	Sendai Framework guides countries for the effective implementation of BBB principles	It restores losses and improves built conditions to create a more resilient normality.	It faces challenges in implementation of post disaster recovery at local level.
(Dube et al., 2021)	It emphasizes that post-disaster recovery must address pre-existing risks and rebuilding	It aligns with SDGs, and an inclusive strategy to improve social, physical, and economic conditions	BBB approach develop new infrastructure & facilities that strengthens community resilience	Historic events underscored the deficiencies in past recovery strategies, of community resilience
Jones, 2022	It prioritizes community stabilization over rebuilding	It is globally acknowledged for disaster recovery and resilience	BBB concept supports DRR and disaster recovery in certain contexts	Post-disaster recovery frequently exhibits deficiencies
(Maly, 2018)	BBB seeks local improvement and disaster risk reduction.	It is featured in the Sendai Framework and has become dominant in post-disaster recovery.	It is increasingly adopted to articulate various disaster recovery objectives.	It does not adequately address housing recovery and the needs of residents.
(Neeraj et al., 2021)	It is a disaster recovery process that reconstruct and rehabilitate	It is prioritized in the Sendai Framework for DRR to enhance disaster recovery.	It supports community involvement in disaster recovery	The intricacies of socio-ecological and political contexts are frequently neglected

	communities.			
Su & Le Dé, 2020;	It highlights the enhancement of infrastructure and livelihoods while promoting sustainability	It became prominent after the 2004 Indian Tsunami, emphasizing sustainable disaster recovery	BBB framework advocates for sustainable development and risk reduction following disasters.	It demonstrates a deficiency in local knowledge, resulting in ineffective recovery efforts
(Vahanvati & Rafliana, 2019)	BBB originated following the 2004 tsunami to guide recovery initiatives	World Bank, and other have adopted BBB in recovery initiatives	The framing of BBB can influence the reconstruction approach.	implementation often neglect participatory processes and local knowledge
Zhou, 2022	It supports long-term sustainability in recovery efforts	It is included in the Sendai Framework for DRR	It promotes disaster recovery processes	Insufficient stakeholder engagement in disaster recovery

3.1 Global Perspective of BBB

Ten studies from selected articles (25.0%) provided a global perspective on BBB, highlighting it as a key instrument in international policies, with cases spanning Japan, the Caribbean, and other international contexts. The studies primarily underscored the conceptual strengths of BBB in post-disaster recovery, while also emphasising the necessity for context-specific adaptation. The BBB emerged following the 2004 Indian Ocean tsunami and provides a comprehensive framework for post-disaster reconstruction that emphasises physical, economic, and social resilience (Cosson, 2020; Dube, 2020; Dube et al., 2021; Hofmann, 2022; Maly, 2018; Mendis et al., 2022; Neeraj et al., 2021). Since its formal adoption in international policy instruments, BBB has become significant in disaster risk management research, aligning with the Sustainable Development Goals (SDGs) and the Sendai Framework by addressing vulnerabilities and improving community resilience in post-disaster recovery (Collodi et al., 2021; Der Sarkissian et al., 2023; Dube, 2020; Maly, 2018; Sarkissian et al., 2021). Critics posit that the BBB lacks prioritisation for housing recovery, does not adequately support people-centered approaches, and insufficiently addresses the complexities of socio-ecological and political contexts. (Maly, 2018; Su & Le Dé, 2020; Vahanvati & Rafliana, 2019).

3.2 Challenges in Implementing BBB

The BBB often faces significant challenges during implementation, despite being a comprehensive approach for post-disaster recovery. Six studies (15.0%) investigated the challenges associated with implementing BBB, focusing mainly on regions including Asia, the Caribbean, the USA, Italy, India and Pakistan. The BBB has inadequately addressed the practical challenges associated with its implementation, particularly in the context of housing reconstruction programmes (Maly, 2018; Vahanvati & Rafliana, 2019). The implementation of this approach has faced several challenges, such as inadequate financial resources, maladaptation, political instability, insufficient community engagement, and governance complexities (Dabaj et al., 2022; Haris et al., 2019; Imperiale & Vanclay, 2020b; Maly, 2018; Porter, 2021; Vahanvati & Rafliana, 2019).

The recovery of Japan from the 2011 earthquake and tsunami faced financial limitations that hindered the achievement of BBB standards (Cosson, 2020). The recovery from the 2016 Appalachian flood in the United States also encountered obstacles stemming from inadequate financial resources and coordination challenges (Poling & Shealy, 2024). The recovery efforts following the 2016 flood in Paris failed to achieve the objectives of the BBB (Dabaj et al., 2022). The centralised recovery efforts in Italy after the 2016 L'Aquila earthquake, marked by insufficient disaster risk reduction measures, intensified vulnerabilities and failed to enhance community resilience (Imperiale & Vanclay, 2020a). The response

to Cyclone Idai in Zimbabwe in 2019 was deficient in BBB considerations, attributed to limitations in resources and institutional capacity (Dube et al., 2021). Building code violations significantly hindered Nepal's rehabilitation efforts following the 2015 earthquake disaster (Shrestha et al., 2021). India's 2018 Kerala flood recovery exhibited deficiencies in economic and social planning (Neeraj et al., 2021). After Cyclone SIDR in Bangladesh in 2007, the post-disaster housing reconstruction initiative did not adequately address the preferences, needs, and expectations of the affected individuals (Harun-Or-Rashid et al., 2022). In Pakistan, the post-disaster reconstruction following the 2005 Kashmir and 2015 Hindukush earthquakes encountered impediments due to financial limitations, geographical barriers, insufficient public awareness, and governance complexities, failing to materialise the objectives of "Build Back Better (Haris et al., 2019). These examples illustrate the challenges associated with implementing the BBB strategy and highlight the necessity for improved solutions.

3.3 Global Perspective of BBBf

Four articles (10%) examined the proactive resilience concept of BBBf, emphasising global applications. The studies indicated favourable results, especially in mitigating housing and infrastructure losses prior to the occurrence of disasters. The World Bank Group's Global Facility for Disaster Reduction and Recovery (GFDRR) has recently reintroduced the concept of 'Build Better Before' within its Global Program Resilient Housing (GFDRR, 2022). This initiative underscores the importance of proactive disaster risk management strategies. The significance of disaster preparedness, mitigation, and prevention, particularly regarding housing resilience, is substantial (Dabaj et al., 2022; GFDRR, 2022; Porter, 2021). Proactive measures, such as preparedness and prevention, minimise disaster impacts, reduce costs, and enhance response and recovery effectiveness (Coppola, 2020; Porter, 2021; Wahba et al., 2018).

Colombia's recent national housing programme has enhanced earthquake resilience by subsidising structural and seismic retrofits for more than 246,000 housing units and vulnerable structures (GFDRR, 2022). Early warning systems and nature-based solutions, such as the structural defences in the Netherlands and China's "Sponge Cities" initiative, represent innovative approaches to flood mitigation (Ruidas et al., 2024). British Columbia, Canada, is similarly emphasising hazard identification and mitigation in disaster management (Edgington, 2022). Khyber Pakhtunkhwa province in Pakistan is transitioning from reactive to proactive disaster management by investing in institutional frameworks, infrastructure, and livelihood initiatives aimed at disaster risk preparedness, prevention, and enhancing community resilience (Khan et al., 2022).

Table 4: Build Back Better vs. Build Better Before: A Comparative Analysis of Outcomes

Comparative Analysis of Outcomes	Build Back Better (BBB)	Build Better Before (BBBf)
A Comparative Analysis of International Practices	Primarily been examined in developed countries, leading to a lack of focus on developing nations with distinct socioeconomic, cultural, political, and governance contexts (Zhou et al., 2022; Maly, 2018)	Its emphasis on proactive measures and resilience-building aligns well with diverse contexts. However, empirical validation is necessary to assess its real-world effectiveness (Imperiale & Vanclay, 2020b).
Analysis of the Costs and Benefits of the Approaches	It enhances community resilience and sustainability, resulting in reduced long-term costs (Landaeta & Richman, 2023) and enhances short-term economic recovery (Poling & Shealy, 2024)	It is a cost-effective approach (Porter, 2021). Prevention reduces recovery costs and enhances economic stability (Dabaj et al., 2022).
Social Dimensions and Community Resilience	It often suffers from insufficient local awareness and expertise, leading to ineffective recovery outcomes (Su & Le Dé, 2020). Post-disaster recovery often overlook the preferences and demands of inhabitants, diminishing their effectiveness (Zhou et al., 2022)	It emphasizes the importance of inclusive planning and social protection programs aimed at assisting vulnerable populations in adapting to disasters (Jones et al., 2022). Community engagement and empowerment in disaster preparedness and recovery ensures that local needs and preferences are respected for more effective and sustainable outcomes (Imperiale & Vanclay, 2020a)
Governance for Disaster Risk Management	The Hyogo and Sendai Frameworks for disaster risk reduction highlight the importance of local governance and proactive disaster risk management (Wani et al., 2024).	Disaster risk management require enhancement through proactive institutional measures that engage all stakeholders, including civil society organizations (Ibrahim et al., 2023; Kalogiannidis et al., 2023; Wani et al., 2024).

3.4 Global Practices of the BBB and BBBf

Eleven studies (27.5%) examined real-world practices of BBB and BBBf across various regions, including India, Sri Lanka, Nepal, and the Asia-Pacific. The findings were varied, with effectiveness closely linked to governance capacity and resource availability. Zhou et al. (2022) assert that Build Back Better has primarily been examined in developed countries, leading to a lack of focus on developing nations with distinct socioeconomic, cultural, and political contexts. This narrow focus restricts the generalisability of insights gained and the applicability of sustainable recovery frameworks across various disaster contexts (Maly, 2018; Vahanvati & Rafliana, 2019). Even in some developed countries, the transition from theoretical frameworks to practical implementation of Build Back Better has frequently encountered challenges (Cosson, 2020; Dabaj et al., 2022; Edgington, 2022; Imperiale & Vanclay, 2020b; Poling & Shealy, 2024). Also, the Build Back Better initiative often faces obstacles in developing, least developed, and Small Island Developing States, stemming from various vulnerabilities such as societal, socioeconomic, and governance complexities (Dube et al., 2021; Haris et al., 2019; Harun-Or-Rashid et al., 2022; Neeraj et al., 2021; Shrestha et al., 2021). The limitations of BBB highlight the necessity for a proactive disaster risk management strategy as a viable alternative to address these constraints in various contexts (Imperiale & Vanclay, 2020b; Jones et al., 2022; Ma et al., 2021; Porter, 2021; Ramanathan & Crawley, 2021). This reinforces the notion of BBBf. Its emphasis on proactive measures and resilience-building aligns well with diverse contexts. However, empirical validation is necessary to assess its real-world effectiveness. Table 4 presents a comparative analysis of the outcomes of both the concepts of BBB and BBBf.

3.5 Costs and Benefits Analysis of BBB and BBBf

Two articles (5.0%) examined the economic trade-offs associated with BBB and BBBf, focusing on costs and benefits. Both approaches were deemed cost-effective in the long term; however, concerns regarding substantial initial investment requirements were acknowledged. Each approach presents unique economic implications in both the short term and the long term. The BBB enhances community resilience and sustainability, resulting in reduced long-term costs (Landaeta & Richman, 2023) and enhanced short-term economic recovery (Poling & Shealy, 2024), yet it generally requires disaster risk finance for effective implementation (Jones et al., 2022). On the other hand, minimising economic losses associated with disasters makes the BBBf a cost-effective approach (Porter, 2021). Prevention decreases recovery costs by over tenfold compared to reconstruction (GFDRR, 2022) and improves economic stability (Dabaj et al., 2022; GFDRR, 2022).

3.6 Community Resilience

Thirteen studies (32.5%) emphasised the significance of BBB and BBBf in strengthening community resilience, with illustrations from the Asia-Pacific region, Africa, and the United States. The majority of findings indicated positive outcomes, highlighting enhanced social cohesion and adaptive capacity among affected populations. Engagement and empowerment of the community are critical for addressing risks associated with disaster preparedness and resilience (Dabaj et al., 2022; Imperiale & Vanclay, 2020a). Community participation is essential for rehabilitation, as neighbours and residents often provide significant support during disasters (Ramanathan & Crawley, 2021). The BBB often suffers from insufficient local awareness and expertise, leading to ineffective recovery outcomes (Su & Le Dé, 2020; Vahanvati & Rafliana, 2019). Post-disaster recovery efforts often overlook the preferences and demands of inhabitants, thereby diminishing their effectiveness (Harun-Or-Rashid et al., 2022; Zhou et al., 2022). Whereas, the BBBf approach emphasises the importance of inclusive planning and social protection programmes aimed at assisting vulnerable populations in adapting to disasters (Jones et al., 2022). These strategies are essential for bolstering community resilience, improving residents' preparedness, and ultimately reducing disaster risks (Ma et al., 2021). Community engagement and empowerment in disaster preparedness and recovery ensure that local needs and preferences are respected for more effective and sustainable outcomes (Imperiale & Vanclay, 2020a).

3.7 Disaster Governance

Fourteen articles (35.0%) focused on governance issues in disaster management, examining contexts including Pakistan, Ghana, Indonesia, and global frameworks. The studies consistently highlighted governance gaps, institutional fragmentation, and weak policy enforcement as significant barriers to effective implementation. Hofmann (2022) posits that conventional disaster governance often inadequately supports long-term recovery efforts. Effective governance, characterised by leadership, engagement with civil society, and international collaboration, is essential for enhancing disaster risk reduction (Das & Patil, 2023; Kalogiannidis et al., 2023). This requires a strong focus on prevention, preparedness, and risk mitigation, which can be accomplished through local leadership, integrated risk management, community engagement, and collaborative planning (Das & Patil, 2023; Hossain, 2023; Ibrahim et al., 2023; Wani et al., 2024). The Hyogo and Sendai Frameworks highlight the importance of local governance and proactive disaster risk management (Cosson, 2020; Wani et al., 2024).

The top-down approach to managing disaster risks in response efforts has been prevalent (Wani et al., 2024). Often, the BBB strategy led to top-down interventions that neglected social dimensions (Imperiale & Vanclay, 2020b). Zhou et al. (2022) argue that top-down risk management can hinder local participation and that policies misaligned with local needs are likely to be ineffective in enhancing community resilience. Outcomes in disaster risk management require enhancement through proactive institutional measures that engage all stakeholders, including civil society organisations (Ibrahim et al., 2023; Kalogiannidis et al., 2023; Wani et al., 2024).

3.8 Urbanization and Climate Induced Disasters

Five studies (12.5%) identified urbanisation as a significant factor influencing disaster risk and resilience, particularly regarding its intrinsic connection to climate-induced risks, such as urban flooding. The articles examined Pakistan, South Asia, and global contexts, revealing that rapid urban growth can heighten vulnerability to hazards like urban flooding due to unplanned expansion and inadequate infrastructure. However, it also offers opportunities for resilience when incorporated into disaster risk reduction strategies via urban planning, zoning regulations, and investments in resilient infrastructure. Rapid and frequently unplanned urban growth in Pakistan has been associated with increased flood vulnerability and governance challenges (Rana et al., 2021; Shah & Rana, 2023; UN-Habitat, 2023). The studies identify shortcomings in infrastructure, zoning enforcement, and institutional coordination that increase hazard exposure in growing urban areas. Khan et al. (2021) establish a link between climate change effects and flood risks driven by urbanisation, highlighting the necessity for integrated urban planning in disaster management strategies. Masud and Khan (2024) identify urbanisation pressures at the policy level as a barrier to effective climate adaptation, highlighting the discrepancy between urban development trajectories and resilience planning. The findings suggest that failing to integrate rapid urban growth factors into BBB and BBBf frameworks could undermine long-term resilience goals, given the concentration of populations and assets in areas vulnerable to hazards.

3.9 Disaster Risk Management in Pakistan

Ten studies (25.0%) examined disaster risk management in Pakistan, highlighting flood risk reduction, institutional capacity, and policy coherence. The findings were varied, demonstrating advancements in planning while highlighting constraints in policy implementation and coordination. Disaster Risk Management in Pakistan has progressed through the adoption of the Hyogo Framework for Action and the Sendai Framework for Disaster Risk Reduction (Shah et al., 2020). Pakistan's national disaster management legislation comprises the 2006 Disaster Management Ordinance, the 2010 Disaster Management Act, and the 2012 National Climate Change Policy (Masud & Khan, 2024; Shah et al., 2020). These legal instruments guide a governance framework for disaster management at the federal, provincial, and district levels (Shah et al., 2020). However, resource allocation and coordination

challenges result in the infrequent enforcement of these legal and policy instruments (Masud & Khan, 2024; Shah et al., 2020). Top-down management rooted in federalism has led to misinterpretations by policy interpreters and misunderstandings by policy implementers regarding policy objectives, especially at the provincial and district levels (Masud & Khan, 2024). The absence of essential stakeholder involvement and community engagement in policy formulation and development results in this disconnect (Khan et al., 2022; Masud & Khan, 2024). Consequently, institutional deficiencies, inadequate governance, and coordination challenges hinder disaster risk management (Khan et al., 2021; Rana et al., 2021). Please refer to Figure 3 for the institutional arrangements for climate change action and disaster risk management in Pakistan.

Pakistan implemented the BBB framework after the 2005 Kashmir and 2015 Hindukush earthquakes; however, it has not achieved success (Haris et al., 2019). Despite advancements in disaster risk reduction, local institutions in Pakistan continue to utilise reactive disaster risk management strategies (Rana et al., 2021). District authorities often depend on line departments for technical assistance; however, many of these departments exhibit insufficient preparedness and response capabilities, and there is a lack of interdepartmental coordination (Shah et al., 2020). Nevertheless, proactive disaster management strategies are evolving in specific areas, as the Khyber Pakhtunkhwa (KP) province in Pakistan is shifting its approach from reactive to proactive. This transition emphasises the enhancement of investments in risk management and preparedness, encompassing community resilience, institutional strengthening, infrastructure development, and livelihood programmes (Khan et al., 2022). Khan et al. (2021) recommend that the country should forecast future flood risks, improve disaster preparedness, and modernise relevant departments to reduce future disaster losses.
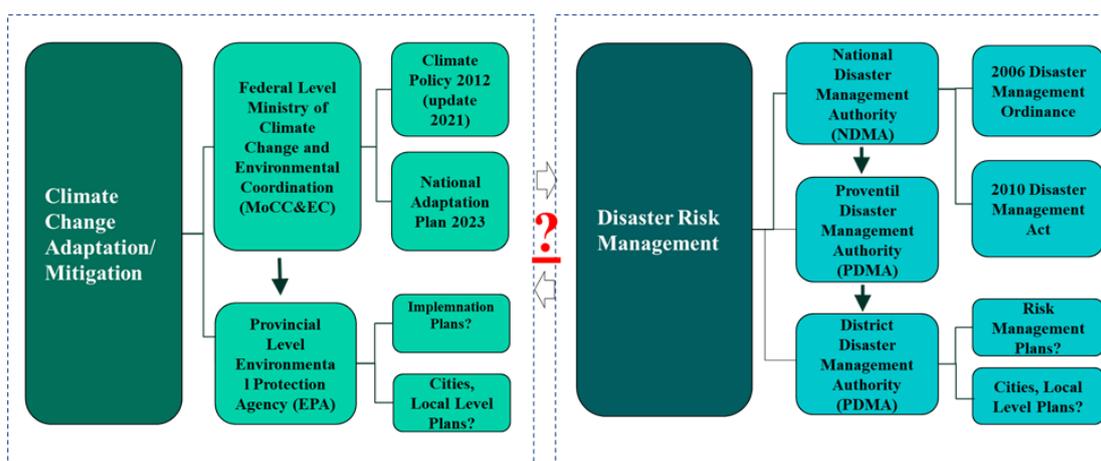

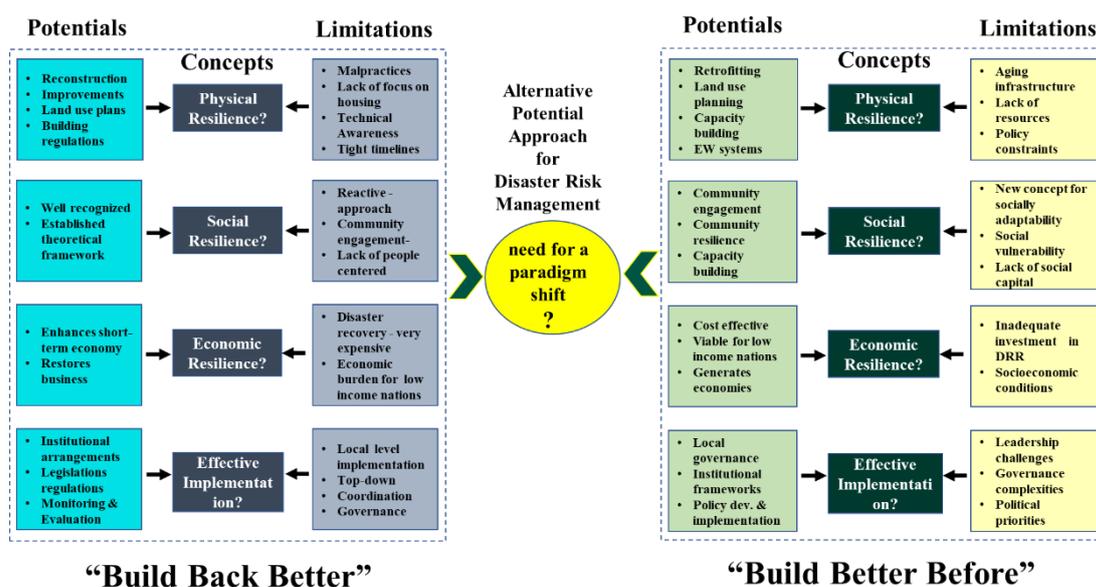Figure 3: Pakistan's Institutional Arrangements for Climate Change and Disaster Risk Management

Figure 4: Potentials and Limitations of Build Back Better and Build Better Before

4.   DISCUSSION

The results show that BBB remains the dominant paradigm, but governance capacity, funding, and community involvement significantly influence its efficacy. BBBf, despite its limited representation, provides distinct preventive advantages but experiences low policy adoption. Both BBB and BBBf exhibit increased success under conditions of robust governance, availability of resources, and the integration of urban planning within recovery frameworks and policy implementation contexts. In contrast, environments characterised by institutional fragmentation or unplanned urban expansion encounter significant challenges when implementing these approaches.

Despite the extensive implementation of Build Back Better, it has faced hurdles in achieving its objectives in diverse contexts. The identified challenges often stem from socioeconomic constraints, governance complexities, inadequate community engagement, maladaptation, and leadership issues (Dabaj et al., 2022; Haris et al., 2019; Imperiale & Vanclay, 2020a, 2020b; Maly & Suppasri, 2020; Neeraj et al., 2021; Poling & Shealy, 2024; Porter, 2021; Su & Le Dé, 2020; Vahanvati & Rafliana, 2019). Overall, the BBB initiative provides a theoretical framework; however, its implementation in various contexts, especially in developing and least developed countries, faces considerable challenges, often leading to deviations from its intended objectives.

On the other hand, the BBBf approach, although it offers potential benefits, has not been fully utilised due to various influencing factors. The factors include leadership challenges, political priorities, social vulnerabilities, limited social capital, and inadequate investment in disaster risk reduction, policy constraints, ageing infrastructure, and socioeconomic conditions (Yuniarti et al., 2024). Nonetheless, the BBBf approach presents a compelling alternative, especially in developing nations such as Pakistan. The comparative advantages, including economic efficiency, support for bottom-up approaches, and promotion of local government and community engagement, position it as a significant contender for enhancing resilience and sustainability.

While the BBB outlines a strategy for immediate economic recovery (Poling & Shealy, 2024). The BBB emphasises prevention and resilience, providing a sustainable and cost-effective long-term solution (Porter, 2021). In Pakistan, financial constraints at both national and district levels hinder the implementation of the National Disaster Management Plan and associated initiatives (Shah et al., 2020).

The focus on resilience and cost-effectiveness of BBBf establishes it as a pragmatic choice for communities, especially those with limited socioeconomic resources, like Pakistan. Investing in preparedness and prevention can significantly reduce financial challenges, rendering BBBf a viable approach for disaster risk management. Please refer to Figure 3 for the potential and limitations of both BBB and BBBf.

The findings indicate that the implementation of BBB in various contexts faces challenges primarily due to social inequalities, complex governance structures, and socioeconomic disparities. These factors increase individuals' vulnerability to disasters. Increased community engagement, better resource allocation, and enhanced disaster preparedness demonstrate the necessity for a proactive BBBf approach to improve disaster management. Focusing on prevention and preparedness can significantly enhance Pakistan's resilience to disasters, thereby improving community well-being and fostering sustainable development. This approach effectively addresses the specific vulnerabilities and challenges faced by the communities at risk. Prioritising the elements of the BBB, such as capacity building, land use planning, seismic retrofitting for vulnerable housing, strengthening critical infrastructure, and modernising early warning systems, can significantly reduce the impacts of future disasters.

5.   CONCLUSION

This paper presents a comprehensive synthesis of the recent literature on BBB and BBBf, identifying nine themes that influence their conceptualisation and implementation. The BBB is predominant in the literature; however, it encounters governance and resource challenges. Conversely, BBBf exhibits significant preventive potential, yet lacks robust policy integration. The conceptual model presented in this study offers a clear theoretical framework for BBB and BBBf within the disaster risk management cycle, highlighting their complementary roles and shared enabling conditions.

The BBB serves as a comprehensive theoretical strategy for disaster recovery, particularly effective in reactive contexts. It has received international recognition and secured support from multiple global organisations, including the United Nations and the World Bank. It improves the built environment during reconstruction, strengthens infrastructure, and influences land use plans and building regulations in the context of post-disaster recovery while promoting immediate economic recovery and restoring businesses' operations and livelihoods. However, implementation of this approach in diverse contexts encounters challenges primarily stemming from social inequalities, complex governance structures, and socioeconomic disparities. Challenges arise in local implementation and community engagement in disaster recovery efforts. It is characterised by malpractice, insufficient technical knowledge and skills, and inadequate quality building materials. Displacement, trauma, and various social issues arise from disaster impacts, hindering optimal community engagement and the addressing of their priorities. Disaster recovery incurs significant costs, making it unaffordable for countries with financial constraints, which often rely on donor funding. The existence of these factors increases the susceptibility and exposure of nations to future disaster risks, particularly in the context of underdevelopment.

BBBf emphasises prevention and resilience, providing a sustainable and cost-effective long-term solution. The approach offers significant benefits by effectively reducing human, economic, and capital losses resulting from disasters. It improves physical resilience through retrofitting, building regulations, and land use planning, while promoting social resilience through community engagement, capacity building, and awareness-raising as elements of disaster preparedness. The approach is cost-effective, supports economic resilience, and generates economies, making it a viable option for low-income nations. It facilitates local governance, institutional frameworks, and the development and implementation of policies. However, it lacks substantial research and empirical cases. Ageing infrastructure, insufficient resources, and the absence of policies and institutional frameworks impede its efficacy. This approach also faces challenges related to social vulnerability and insufficient social capital, all of which can impact its performance. Insufficient investment in preparedness and prevention

initiatives can hinder their implementation. Leadership challenges, governance complexities, and political priorities can impede its applicability and performance in specific contexts.

Overall, the BBBf initiative has the potential to enhance disaster management by improving preparedness, optimising resource allocation, and increasing community participation, thereby underscoring the importance of a proactive approach. It offers a significant alternative, particularly in developing countries like Pakistan. The comparative advantages encompass economic efficiency, endorsement of bottom-up approaches, and facilitation of local government and community engagement. A shift towards the BBBf approach can help disaster-prone countries such as Pakistan protect lives and livelihoods while promoting a more resilient and sustainable future. To accomplish this, the country should allocate resources toward policy research and development, alongside establishing institutional mechanisms that facilitate this strategy.

This study spots several policy implications: the integration of BBB and BBBf into national disaster management strategies, the strengthening of governance capacity and coordination for improved disaster management, the development of sustainable financing mechanisms to enhance responses to pre- and post-disaster situations, the promotion of active community participation for improved disaster management outcomes, and the enhancement of policy integration in Pakistan to advance and expand evidence on BBBf.

This study was limited to scientific literature in accordance with PRISMA protocols, thereby excluding local grey literature that provides additional localised data on disaster management strategies. Future empirical research must incorporate region-specific databases of grey literature to obtain valuable local insights regarding specific disaster contexts. Further investigation is needed to compare the outcomes of BBB and BBBf in urban and rural settings while also analysing the relationship between urbanisation trends and the implementation of BBB and BBBf, particularly in the context of escalating climate emergencies.

6.   REFERENCES

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