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# Prioritising indicators of success

## In 'Build Back Better' Post-Disaster Frameworks

# Prioritising Indicators of Success

in ‘Build Back Better’ Post-disaster Frameworks

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A thesis submitted in partial fulfilment of
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Dedicated to,

Jimmy Ballantyne,

My Goose.

## Abstract

This study explores the challenges and significance of indicator selection for key decision-makers in post-disaster response, recovery, and reconstruction efforts. When a community is overwhelmed in the aftermath of a disaster - various entities, including aid organisations, local authorities, and national agencies, are mobilised to provide emergency response and support in the subsequent response and recovery phases. These decision-makers rely on choosing appropriate indicators to evaluate the effectiveness of their interventions, track progress, and decide on appropriate actions and activities. Guided by the principle of "Build Back Better," which advocates for a comprehensive and holistic approach to resilience, practitioners need to comprehend the intricate relationships and dependencies among indicators to make informed decisions regarding their selection. This aspect has been identified as a significant weakness in the implementation process for all stakeholders. Employing a novel methodology, this thesis utilises the Hierarchical Decomposition Algorithm to analyse the priority of and the relationship between indicators proposed by the 2016 ‘Build Back Better Framework’, a synthesised framework reflecting a unified approach in disaster management. Empirical evidence from forty case studies examining key decision makers experiences of implementing disaster response efforts validates these findings. The study concludes with a rational process and workflow for determining indicator selection which considers the diverse nature of response and recovery in the pursuit to effectively build back better.

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# Chapter One, Introduction

## 1.0 Introduction

This chapter sets the context for a study focusing on selecting appropriate indicators to guide decision-makers in building back better after a disaster. It tracks the shift from a fatalistic perspective to one where human agency plays a central role in disaster recovery and mitigation. Key terms like hazard, exposure, and vulnerability highlight the factors contributing to disaster risk, focusing on the weight of human decisions. The chapter examines how disasters can overwhelm local capacity, emphasising the critical roles of local authorities, national agencies, and aid organisations, the key decision-makers involved in recovery efforts. The "Build Back Better" concept advocates for a holistic approach to resilient and sustainable outcomes. This chapter discusses the research questions, objectives, Encompassing the overarching issue that that despite ongoing efforts, disaster frequency and severity trends show that achieving sustainable solutions remains elusive.

## 1.1 Dimensions of Disaster

### 1.1.1 From Fatalism to Human Agency

The word ‘disaster’ originates from the early Italian word ‘disastro’ with ‘*dis*’ and ‘*astro*’ being a combination and evolution of the Latin term ‘*astrum sinistrum*’.In English, this translates to "ill-starred" or "unlucky star" (Harper, 2021). The celestial etymological roots imply a strong connection to the concepts of fate and inevitability, and this reflects the earliest perceptions of disasters and their impacts as inevitable, destined to repeat, and entirely unavoidable. However, this literal interpretation fails to recognise the fundamental role of human decisions in contributing to a community's exposure and vulnerability—the factors of societal hamartia or fatal flaws that allow disasters to occur (Guha-Sapir et al., 2004). In Shakespeare's tragedy *Julius Caesar*, Cassius stated, "The fault, dear Brutus, is not in our stars, but in ourselves..." invoking the notion that the burden of blame lies not with fate but within our own choices (Shakespeare, 2001).

It was not until 1989 that The United Nations (UN) resolution 44/236 (1989) officially recognised the importance of human agency in disasters, declaring that "fatalism about natural disasters is no longer justified" and calling for action to reduce the impacts of disasters

worldwide. The resolution marked a shift from viewing disasters as unavoidable "acts of nature" to understanding them as events influenced by human activity.

Today, contemporary definitions of disasters emphasise the terms ‘hazard’, ‘exposure’, and ‘vulnerability’ to reflect human agency in shaping disaster outcomes. This shift has caused the term "natural disaster" to fall out of favour among experts, who argue that it continues to imply unavoidability instead of focusing on how human decisions contribute to or mitigate disasters, which offers a more nuanced and proactive approach (Mora, 2009; O'Keef et al., 1976; Puttick et al., 2018).

### 1.1.2 Hazards, Exposure, Vulnerability, and Resilience

This section elaborates on the terms ‘hazard’, ‘exposure’,‘vulnerability’, and ‘Resilience’ to demonstrate how human agency impacts disaster outcomes. It reveals how decisions shape the level of disaster risk by influencing the contributing factors of a disaster and the capacity of a community or population to recover, highlighting the importance of resilience.

Hazards are the omnipresent pressures that frame the aforementioned ‘societal hamartia’. A hazard is not a disaster but a threat that has the potential to cause significant disruption or damage to the social and economic process; thus, it can be described as the triggering factor (UNDRR, 2015).

Hazards may present as singular, sequential, or combined during an event, and it is not uncommon for one to be the driver of another. They are classified into three broad categories: natural, anthropogenic, and socio natural. Table 1.1 shows a complete list of hazard categories and subcategories defined by the International Science Council, United Nations Office of Disaster Risk Reduction (UNDRR), and the Centre for Research on the Epidemiology of Disasters (CRED).

Natural hazards include biological, climatological, extraterrestrial, geophysical, hydrological, and meteorological subcategories. They occur regardless of human presence, within a short timeframe, cause an immediate effect, and have unintentional impacts. This category includes earthquakes, extreme weather events, landslides, pandemics, tsunamis, volcanic activity, and wildfires, to name a few.

| **Source** | **CRED, EM-DAT** | **International Science Council** | **UNDRR** |
|---|---|---|---|
| **Category** | ***Natural Hazard Subcategories*** | | |
| **Subcategories** | Meteorological | Meteorological & Hydrological | Geological or Geophysical |
| | Hydrological | Geohazards | Hydrometeorological |
| | Geophysical | Biological | Biological |
| | Climatological | Extraterrestrial | |
| | Biological | | |
| | Extraterrestrial | | |
| **Category** | ***Anthropogenic Hazard Subcategories*** | | |
| **Subcategories** | Industry Accident | Chemical | Technological |
| | Transport Accident | Technological | Societal |
| | Miscellaneous Accident | Societal | Uncategorised |
| **Category** | ***Socionatural Hazards*** | | |
| **Subcategories** | | Environmental | Environmental |

***Table 0.1*** *Categorisation and Subcategorisations of Hazard Types*

Anthropogenic hazards are any hazard entirely or predominantly induced by human activity and choices. There are several subcategories: chemical, societal, technological, industrial accidents and transport accidents. These encapsulate events such as explosions, pollution, and cyber-attacks like phishing. War and social tensions are occasionally included here, but these are more frequently considered as a category unto themselves and are decidedly more complex. Unlike natural hazards, anthropological hazards often develop gradually, have warning signs that foreshadow an event, and are not guaranteed to happen as they are dependent on the human factor.

Socionatural hazards combine natural and anthropogenic elements to explain the impacts of human activity on naturally occurring phenomena. This encapsulates a subcategory called environmental hazards that consider human activity in the natural environment, such as improper land use, deforestation, and soil degradation. These are frequent drivers of what is assumed to be naturally occurring hazards, including flooding, landslides, loss of biodiversity and salinisation. Similarly, socio-natural hazards incorporate the human activity that has contributed to climate change, Increasing the temperatures of the earth's oceans and atmosphere and leading to more frequent extreme weather events.

Another example is the unprecedented and long-lasting impacts of COVID-19. Pandemics are inherently a natural hazard, emerging from the interplay of viruses and environmental conditions regardless of human presence. However, they are increasingly recognised as anthropogenic hazards due to the significant influence of human activity on their spread and impact. Globalisation, for instance, accelerates the transmission of pathogens across borders, as increased travel and interconnected trade networks facilitate the rapid movement of people and goods. This amplifies the reach and severity of pandemics, illustrating how human actions and systems exacerbate what would otherwise be natural occurrences.

Understanding the different types of hazards and their root causes illustrates that human activity plays a significant role in creating or amplifying them. The extent of a hazard's impacts depends on a community's exposure and vulnerability. Exposure refers to tangible assets (housing, infrastructure, and people) and systems (power grids, water supplies, or communication systems) crucial for daily life and economic stability within hazard-prone areas, which have the potential to be lost during a disaster (UNDRR, 2015).

Exposure is dynamic and becomes more complex as communities evolve. Population growth and increasing cultural, spiritual, or economic connections lead to greater significance, dependency, and value placed on assets and systems. Consequently, exposure to risk generally increases over time, making communities more susceptible to loss or damage from hazards.

Hazard-prone areas, such as coastlines, floodplains, and volcanic slopes, have historically been the site of human settlements for access to fertile soil and water. Consequently, a level of physical exposure (in the common sense of the word) to hazards is inherent to many communities, to varying degrees, though this is considered vulnerability.

Understanding vulnerability requires recognising it has three primary drivers: social, economic, and environmental. These drivers operate on multiple scales—individual, community, regional, and global. This highlights why some hazards may acutely affect some communities while others weather the same event with relatively minor consequences.

Communities with limited resources and support systems to utilise in a disaster are highly vulnerable and often experience longer recovery times. Because of this, vulnerability's

propensity to both exacerbate and mitigate the risk of a disaster underscores the influence of human involvement in taking appropriate action in disaster preparedness and in addressing vulnerability at its roots. This involves tackling the underlying social, economic, and environmental inequities that make certain groups more exposed and vulnerable to hazards.

Reducing exposure and vulnerability requires building resilience. Resilience is more than the ability to withstand and bounce back from a disruptive event. It is about how communities, systems, and societies anticipate, absorb, and adapt to change while continuing to function and grow. Building resilience means creating conditions that reduce vulnerability and exposure to risk, but it also involves supporting the capacity to adjust, reorganise, and even transform in response to challenges.

The United Nations Office for Disaster Risk Reduction describes resilience as the ability of a system, community, or society exposed to hazards to resist, absorb, accommodate, and recover from the effects of a hazard in a timely and efficient manner while maintaining essential structures and functions (Sorensen et al., 2006). This definition provides a useful starting point, but resilience goes beyond returning to what was. It also includes the capacity to learn from disruptions and to build forward in ways that reduce future risk and strengthen wellbeing.

In practice, resilience is shaped by a range of interconnected factors, including governance, infrastructure, livelihoods, social networks, and access to resources. It is not just about hardening systems, but about enabling people to make decisions that reflect their priorities and realities. A resilient approach values inclusion, recognises the importance of equity, and supports communities to lead their own recovery and adaptation pathways. It sees resilience as a process that is constantly evolving, rather than a fixed outcome.

How these factors of resilience are connected across sectors is less clear. While many sectors have made progress in strengthening their own systems, resilience does not sit neatly within one discipline or domain. It is shaped by the relationships between them. For example, the ability of a community to recover from a disaster is not only a question of emergency response or infrastructure. It also depends on access to healthcare, education, housing, livelihoods, and the strength of local institutions. These areas are deeply interconnected, yet are often planned and managed in isolation. Without a shared understanding of how decisions in one sector affect outcomes in another, efforts to build resilience risk becoming fragmented or short-lived. A

more integrated approach, grounded in collaboration and systems thinking, is needed to make resilience work in practice.

### 1.1.3 Definitions of 'Disaster'

This greater understanding of the nuances of terms allows for a deeper consideration when reading generally accepted definitions of disaster. The United Nations Office of Disaster Risk Reduction (UNDRR) defines a disaster as,

*'A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and may impact'* (UNDRR, n.d)

Another widely accepted definition comes from the 'Centre for Research on the Epidemiology of Disaster' (CRED), which defines disasters as,

*'A situation or event that overwhelms local capacity, necessitating a request to the national or international level for external assistance … an unforeseen and often sudden event that causes great damage, destruction, and human suffering. Though often caused by nature, disasters can have human origins'* (EM-DAT, n.d.).

From a humanitarian perspective, the International Federation of the Red Cross (IFRC) defines a disaster as.

*'… A serious disruption to the functioning of a community that exceeds its capacity to cope using its resources… caused by natural, man-made and technological hazards, as well as various factors that influence the exposure and vulnerability of a community.'* (IFRC, n.d)

In 2015, researchers Mayner and Arbon examined 128 different definitions of disaster. Obtained from glossaries found in books, reports, and internet sites, they were analysed for consistent language, tone, and phrasing. Their finding culminated in a consistent and concise definition of disaster as,

*'The widespread disruption and damage to a community that exceeds its ability to cope and overwhelms its resources"* (Mayner & Arbon, 2015)

Given the broader understanding of what constitutes a disaster, it is evident that a core element is the significant disruption of a community's normal functioning, often exceeding its capacity to cope. This underlines the need for responses beyond local capabilities, requiring national and international aid to respond to crises effectively. This realisation leads to a critical discussion about the key decision-makers—local authorities, national agencies, and aid organisations—and their roles when responding to a disaster.

### 1.1.4 Phases of a Disaster

These definitions focus on the initial impact that disrupts community functioning when a disaster occurs. The process that follows is often described in a series of consecutive phases. Haas et al. (1977) proposed three distinct periods. The first is the Restoration Period, lasting from several weeks to a few months, which involves restoring primary services like communication and transportation. This phase is crucial for re-establishing essential community functions and for further recovery.

The second period is the Replacement Reconstruction Period, during which the physical environment is rebuilt to pre-disaster levels. This phase focuses on restoring infrastructure and returning social and economic activities to their previous state.

The final phase is the Commemorative, Betterment, and Developmental Reconstruction Period, which extends beyond restoration to include commemorative activities, future growth improvements, and more resilient infrastructure construction. Haas was among the first to introduce the idea of "betterment" into the recovery process, emphasising that recovery should not only rebuild what was lost but also create opportunities for enhancement.

Many disaster management plans recognise some variation of these phases, most commonly represented as mitigation, preparedness, response, and recovery and illustrated as a continuous cycle (Mannakkara, 2014).

However, the reality is more complex. Phases may overlap, interrupt, or require revisiting due to new events or evolving circumstances. This underscores the need for flexibility in disaster management, with practices that can adapt to unpredictable changes.

Wilkinson's model (2017) offers an alternative perspective by outlining five stages of disaster recovery: Chaos, Realisation, Mobilisation, Struggle, and the New Normal. This model acknowledges that disaster recovery is not always linear and can involve chaotic transitions before reaching a new state of normalcy.

Human agency and decision-making are crucial throughout every phase of disaster management, shaping the course of recovery for affected communities. The unpredictability and fluidity between these phases require a flexible approach. Decisions made at any stage—before, during, or after a disaster—can significantly affect the overall success and sustainability of recovery efforts.

## 1.2 Key Stakeholders

Key decision-makers play crucial roles at various governance levels throughout disaster phases. Local authorities, typically municipal or regional governments, are primarily responsible for crafting and executing disaster response plans that guide essential activities such as evacuations, shelter establishment, and services to affected populations within their jurisdiction. Additionally, they serve as the central communication link among communities, aid organisations, and higher levels of government.

Humanitarian and aid organisations are often at the forefront of immediate disaster relief. Groups like the Red Cross Society and the Salvation Army have regional chapters deeply embedded within community networks, enabling them to assess needs and respond effectively. Their structure allows them to react quickly and provides the flexibility to scale their efforts as required, from a local to a national or even international level. They offer essential services such as shelter, food, water, and healthcare, ensuring that urgent needs are met. Additionally, they work closely with local and national authorities to maintain coordination, promoting a more cohesive disaster response.

When an event surpasses local capabilities, national agencies like the National Disaster Management Office (NDMO) step in to broaden the response. These agencies develop policies, coordinate among stakeholders, and mobilise resources for immediate relief and long-term recovery. They gather and analyse data to understand trends and community needs, shaping future preparedness strategies. When even national resources are stretched, national governments invite international partners and aid organisations to provide additional support.

Finally, international development organisations such as Oxfam, Save the Children, and the World Food Programme (WFP) have a broader focus on global issues such as poverty, hunger, education, and health. While they engage in immediate relief during crises, their approach extends beyond emergency response to encompass long-term development goals and advocacy for systemic change. Similarly, many UN agencies operate at a higher governance level, providing unified goals, approaches, and strategies for national agencies to follow for a more cohesive approach.

This network of local authorities, national agencies, aid organisations, and international development organisations collectively addresses the challenges disasters pose. Therefore, coordination among these stakeholders is crucial for effective and sustainable post-disaster response, recovery, and resilience building. The collaborative approach, where roles and responsibilities are clearly defined, ensures that resources and expertise are efficiently utilised, leading to a more effective response even in large-scale or cross-border disasters.

## 1.3 Towards a Unified Approach

The concept of a unified approach to disaster response has evolved and has been shaped by multilateral governance agencies and international aid organisations. Institutions such as the International Bank for Reconstruction and Development (IBRD) and the Organisation for European Economic Development (OEED) were established after World War II, primarily focusing on funding and governance of European infrastructure reconstruction.

Many earlier organisations aimed at international betterment became defunct or collapsed due to geopolitical upheaval (Eilstrup-Sangiovanni, 2020; Schmitt, 2020). In contrast, institutions like the International Monetary Fund (IMF) and The United Nations (UN), established around

the same time, had a broader focus on global peace, governance, and economic cooperation, with less emphasis on infrastructure development (Cheek & Chmutina, 2022; Oliver, 2008).

During the 1950s, the IBRD and OEED expanded their mandate to a global scale and were renamed the World Bank and the Organisation for Economic Co-operation and Development, respectively. This shift reflected their new focus on worldwide infrastructural development and poverty reduction. The cultural shift towards addressing disasters and their impact on development was reflected in a UN resolution, which called for increased assistance from UN organisations, the Red Cross, and other aid agencies to assist governments in protecting economic and social development from the impacts of disasters (Scott, 2015; UN General Assembly, 1986).

By the 1970s, resolutions called for coordinated approaches between international organisations and agencies in disaster situations. Resolution 3345 (XXIX) urged research on the relationship between populations, resources, environment, and development to better address complex problems like disaster displacement. In the late 1980s, the World Commission on Environmental and Development highlighted the need for new approaches to dealing with environmental factors, including “natural disasters” (UN General Assembly, 1974).

This led to the Hyogo Framework for Action (HFA), which The UN proposed following the mid-term review of the 'International Decade for Natural Disaster Reduction' (United Nations, 1987). All UN members formally adopted the framework and its goals at the Second World Conference on Disaster Risk Reduction in 2005. The HFA is recognised as the world's first unified plan to explain, describe, and detail the work required by different sectors and key stakeholders to reduce disaster losses (UNDRR, 2007). The same year, the first 'Humanitarian Overview Report' highlighted the lack of clearly defined approaches in disaster responses and the urgent need to develop benchmarks and indicators to measure and guide performance (Adinolfi et al., 2005). Subsequently, The UN released its first guidelines, 'Indicators of Progress: Guidance on Measuring the Reduction of Disaster Risk and the Implementation of the Hyogo Framework for Action' in 2007. These guidelines aimed to provide comprehensive action-oriented guidance for implementing risk reduction strategies in emergency preparedness, response, and recovery programs. The document identified 22 core indicators

across the HFA's five priorities for action and 109 possible additional indicators across 33 components (UNISDR, 2008).

Frameworks like the HFA have a structured organisation. They identify overarching objectives or "Priorities for Action" and then break them into components or standards that define specific themes. By addressing these components, the objectives of the principles can be accomplished. Depending on the size and complexity of the framework, additional tiers may be included to refine the themes to be addressed further. A comprehensive suite of indicators is used in the framework to offer guidance throughout the decision-making and implementation processes (Bilau et al., 2018).

Figure 1.1 below illustrates the typical organisational structure of a framework. Action priorities are disseminated into components or standards, which ultimately are themes of indicators, which are always at the lowest organisational level.

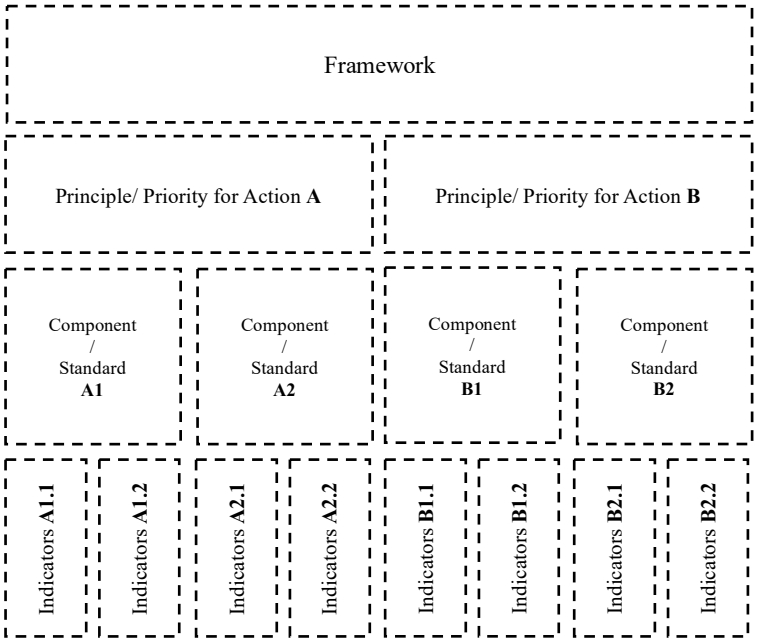


***Figure 0.1*** *Typical Framework Organisation, By Author*

Predefined indicators play a crucial role. First, they simplify complex situations by providing a synthesised view of past circumstances, aiding decision-making processes and highlighting areas that require attention. Second, indicators are used to measure the progress and success of interventions. Decision-makers can comprehensively understand an intervention's

effectiveness or shortcomings by analysing multiple indicators. Therefore, selecting the right indicators is critical in dynamic and rapidly changing disaster environments (Brown et al., 2008; Dwyer & Horney, 2014).

The Hyogo framework incorporated different types of indicators, including benchmark indicators (quantitative) and success indicators (qualitative). Benchmark indicators set minimum standards to be achieved and are often objective based. On the other hand, success indicators, also known as process, progress, or performance indicators, provide insights into what a successful intervention should look like (UNDRR, 2007).

Twigg (2007) was commissioned by six NGOs to compose the 'Characteristics of a Disaster Resilient Community: A Guidance Note.' developed through a desk study with input from leading experts, this document aimed to provide additional support for the successful implementation of the HFA at a local level. The guidance notes reflected on what a utopian disaster-resilient community should look like and identified the necessary components for achieving it. Each component had unique characteristics that reflected a resilient community, accompanied by a set of characteristics of an enabling environment that allowed the community to attain and maintain such attributes. While the characteristics were not explicitly named as indicators, they functioned similarly. The second edition, published in 2009, included several amendments based on practitioner feedback and case study reflections, proposing 28 components with 167 unique characteristics (Twigg, 2009).

The commissioning of additional guidance suggests that the HFA did not offer the detailed guidance required by decision-makers to effectively select appropriate indicators and implement disaster risk reduction strategies at the community level.

The HFA was superseded in 2015 when the Sendai Framework for Disaster Risk Reduction (SFDRR) was adopted at the Third UN World Conference on Disaster Risk Reduction. The SFDRR introduced seven global targets, four priorities for action, and 13 guiding principles. The Sendai Framework made significant changes from its predecessor. Firstly, it shifted the focus from disaster management to risk management, emphasising its application across all sectors. Secondly, it included considerations of man-made, technological, and environmental hazards alongside natural. Thirdly, it acknowledged the major gaps in establishing and

selecting appropriate indicators at the local level within the HFA, posing significant challenges for decision-makers. As a response, the 'Words into Action' (WiA) series was established alongside the Sendai Framework (UNISDR, 2017; UNDRR, 2016).

The WiA guidelines provide practical and specific advice on implementing a people-centred approach to disaster risk reduction in line with the Sendai Framework. There are currently fourteen guides in the series, published between 2017 and 2022. The guidelines are designed to be flexible, allowing users to focus on relevant sections based on their interests and needs. Each guide discusses its relevance to specific targets or priorities within the framework and frequently references additional material. Some guides present clear process indicators, while others do not, adding further complexity to understanding the explicit indicators of the Sendai Framework. Moreover, when clear indicators are listed, they are categorised by institutions, including regional and national governments, local governments, and non-governmental organisations embracing the full network of key decision-makers (UNDRR, n.d.).

The Sendai Framework presents its four priorities of action, accompanied by notes intended for implementation at local, national, regional, and global levels. There are 91 unique points to consider. However, if the WiA guides are included, this number will vary depending on their relevance to the practitioners' sector.

Additional consideration must also be given to the Sustainable Development Goals (SDGs), established in 2015. Sustainable development and disaster risk reduction are closely related, as disaster impacts can hinder development. Therefore, there is significant collaboration between these two policy instruments. The Sendai Framework complements three of the 17 SDG goals by compiling 11 specific indicators. The SDG has 231 target indicators in total to monitor 169 set targets.

This comprehensively considers the shift towards a unified approach in disaster management from a governance perspective, led by international organisations and adopted by national agencies.

From a humanitarian perspective, aid organisations also evolved in response to global crises, growing in number throughout the 20th century (Esman & Cheever, 1967; Osa, 2012). While

some organisations ceased to exist or adapted to address different issues, the vast majority adopted common principles of humanitarianism rooted in the efforts of the International Committee of the Red Cross and the National Red Cross/Red Crescent Societies. These principles have been widely adopted and guide over 492 international humanitarian organisations, ensuring consistent practices and ethical frameworks for effective crisis response and assistance to affected populations (Rysaback-Smith, 2015). Importantly, these principles were formally embraced and endorsed by the United Nations in resolutions 46/182 (1991) and 58/114 (2004), aligning global humanitarian efforts with a unified approach to development-based crisis management and relief (UN General Assembly, 1991; UN General Assembly, 2004).

Besides Twigg's CDRC, other humanitarian agencies developed indicators to guide a unified approach, such as the Sphere Projects, 'Humanitarian Charter and Minimum Standards in Disaster Response' (Sphere). Sphere was created in 1997 to improve the effectiveness of assistance and accountability of all agencies responding to disasters. Revised editions were released in 2000, 2004, 2011, and 2018. Each revision was updated through consultations with experts, NGOs, governments, and United Nations agencies. The latest edition of Sphere presents four technical chapters, further divided into components and standards. Each standard includes key indicators, which are quantitative minimum target indicators alongside key action indicators that suggest practical steps to achieve the minimum standard and are comparable to the outcome or progress indicators. The latest edition comprises 53 standards and 249 key actions (Sphere Association, 2018).

The HFA, SFDRR, CDRC, and Sphere collectively represent the evolution and development of widely subscribed frameworks that promote a coordinated approach among national, regional, and aid organisations. Notably, all UN member states agreed upon the United Nations frameworks, currently totalling 193 nations. Therefore, in theory, 193 national authorities commit to implementing the framework, adopting its goals, and guiding principles. Including to 'Build Back Better'. The Sphere standards have 47 members, including the International Federation of the Red Cross, who have 189 national societies; the Salvation Army, present in 131 countries; and Oxfam International, composed of a confederation of 19 organisations in 90 countries. Smaller independent non-profits, such as the ACT Alliance, which is comprised of 152 churches (Sphere, 2022; United Nations, 2022).

Adopting such frameworks among local, national, and international entities marks a shift from isolated responses to more integrated and collaborative strategies. However, examining these frameworks and their accompanying implementation guides makes it apparent that their scale is significant. The substantial number of indicators are designed to assist numerous decision-makers operating in multiple sectors across various phases for any given context with a common goal of improving resilience and 'betterment.' This poses significant challenges in determining which indicators are relevant. This is further exacerbated by the framework advocating for a holistic approach.

## 1.4 Build Back Better

The phrase 'Build Back Better' (BBB) emerged in disaster management in the early 2000s, marking a shift towards a holistic approach to resilience (Geis, 2000; Monday, 2002). This term encompasses the idea of using the reconstruction phase not only to restore but to enhance a community's physical, social, environmental, and economic conditions, thereby fostering greater resilience against future disasters (Mannakkara & Wilkinson, 2014; Khasalama, 2009; Clinton, 2006).

Monday's article on 'Building Back Better' discusses mitigating the impacts of future hazards by linking vulnerability reduction, environmental sustainability, and social resiliency within a framework (Monday, 2002). While the concepts articulated in Monday's framework were not entirely new, articulating them as BBB quickly resonated with key stakeholders. The alliteration added emphasis, interest, and memorability, leading to its quick adoption and remembrance (Hass et al., 1977; Clinton, 2006).

The 2004 Indian Ocean Earthquake and Tsunami, considered the largest international disaster in modern history, garnered an unprecedented response. The overwhelming number of actors involved likely accelerated the colloquial use of BBB in post-disaster recovery (Kennedy, et al., 2008; CARE, 2014).

The unofficial legitimisation of BBB came with the publication of 'Lessons Learned from Tsunami Recovery: Key Propositions for Building Back Better' authored by the Special Envoy of the United Nations Secretary-General, William (Bill) Clinton. The report provided initial

observations and recommendations on the international response to the disaster (Clinton, 2006; Maly, 2017; Fernandez & Ahmed, 2019; Vahanvati & Rafliana, 2019). It was regarded as one of the first publications to outline the concepts of BBB, emphasising a holistic approach (Mannakkara & Wilkinson, 2014).

Monday's article stressed that a holistic recovery takes full advantage of the opportunity disaster brings and facilitates rebuilding with betterment in mind rather than simply restoring things to their pre-disaster state as quickly as possible. This approach calls for consideration of all aspects of community improvement. It highlights the need for equal consideration of various social, economic, environmental, physical, and systems for a successful and sustainable recovery.

As the popularity of BBB grew, more organisations incorporated elements of these themes and concepts into their guidelines (Kennedy et al., 2008; Khasalama, 2009; Neeraj, 2022). However, many continued to narrowly define BBB as physically restoring infrastructure with loose concepts of what 'better' meant for beneficiaries in other aspects. This often resulted in a singular focus that neglected components of social and economic recovery and demonstrated a poor understanding of the importance of the holistic concept, the fundamental factor at the core of BBB (Mannakkara et al., 2018; Twigg, 2009; Lyons & Schilderman, 2010).

The term has increasingly entered mainstream media, moving from disaster management spheres to pivotal policy instruments. Most notable cases include politicians who have used it to signal their commitment to meaningful change. For example, President Joe Biden's 2020 Build Back Better Act in the United States of America, and Prime Minister Boris Johnson's use of the term in the United Kingdom reflect broad agendas for economic reform and infrastructure investment, aiming to create jobs and promote sustainability. These policies that adopt the BBB ethos are intended as instruments of systemic change, rooted in building resilience within their key sectors by addressing various facets in a holistic manner (Young, 2020; The White House, 2021).

In New Zealand, both Prime Minister Jacinda Ardern and her successor, Christopher Hipkins, have also cited BBB in the media. During the 2020 election and subsequent severe flooding in 2023, they stressed the need for a holistic approach to resilience and sustainability. However,

these commitments often lacked detailed implementation plans, raising concerns about their practical execution (McConnell, 2023; Larsson, 2020).

Such widely publicised policies contribute to the colloquialisation of the term, threatening to weaken its intended meaning. The dilution of the term can result in its misuse or overuse in contexts where the rigorous, comprehensive strategies and principles it originally encompassed are not fully applied or understood. This can undermine the intended impact of BBB policies and lead to scepticism or complacency regarding their implementation. Consequently, the term's power to drive genuine, systemic change may be weakened.

Thus, without clear guidance on implementing the holistic principles, these commitments risk sounding more symbolic than substantive. In contrast, disaster management frameworks like CDRC, SFDRR, and Sphere, which provide guidance, fully acknowledge the importance of interconnectedness and promote holistic responses; however, there are apparent issues.

J. Twigg (2007), in the 'Characteristics of a Disaster Resilient Community: A Guidance Note,' noted that not all the characteristics of a disaster resilient community were equally important. Implementing these indicators would depend on the context of the situation, as there was no universally agreed-upon priority or hierarchy. Thus, a holistic method is needed to support a practical resilience-based frameworks.

Similarly, the SFDRR embraced holism, recognising that recovery is part of a continuum inseparable from preparedness, response, mitigation, and sustainable development and integrating BBB into its overarching priorities and principles. The WiA guides released to support the implementation of the framework provide flexibility for users to focus on relevant sections but also pose organisational challenges in adhering to a holistic methodology (UNDRR, n.d.).

Sphere also promotes the premise that an effective humanitarian response must address people's needs holistically, and sectors should coordinate and collaborate to achieve this. The guidance notes in each chapter of the Sphere handbook contain cross-references to other chapters to facilitate a more comprehensive and holistic methodology; however, it is still

expected that readers familiarise themselves with all chapters to support this, ensuring progress in one area must be matched by comparable progress in others (Sphere Association, 2018).

This implies intricate relationships and dependencies exist between the indicators throughout each framework, and success depends on understanding and acknowledging these connections. In other words, each component (or parts of a component, 'indicators') cannot be considered in isolation; it must be viewed in relation to the others that comprise the complete framework. As a result, the number of potential relationships to consider within a framework is proportional to the number of indicators squared, resulting in thousands or even tens of thousands of possibilities to be considered.

This exacerbates the challenge of indicator selection. The selection process depends on individuals understanding the interconnectedness, dependencies, and priorities between indicators or components and applying that knowledge to the situation. It requires sensitivity to holistic principles while maintaining relevance to their work by refining and narrowing down the volume of available indicators to a manageable level (Twigg, 2009).

This was identified as a fundamental weakness in implementing the Hyogo Framework for Action (UNDRR, 2015). Furthermore, the consequences of poor indicator selection were underlined in 2020 when the 'Humanitarian Development Report' highlighted that engaging with the wrong indicator leads to a misdiagnosis of a situation and, consequently, the wrong actions (UNDP, 2020). This concern has been echoed in the 2022 Global Assessment Report, suggesting that sub-optimal decision-making after a disaster remains a significant obstacle to the success of the Sendai Framework's goals (UNDRR, 2022).

## 1.5 Trends in Frequency and Severity

Despite more than three decades of global efforts to reduce disaster risk, there has been a consistent rise in the frequency and severity of disasters worldwide (Mannakkara et al., 2018). This concerning trend is attributed to several factors, with climate change playing a significant role. Global warming has increased ocean and atmospheric temperatures, resulting in more intense storms, hurricanes, and other weather-related events. In addition, between 1970 and 2010, the world population increased by 87%, driving people to settle in risk-prone areas due to land scarcity and economic pressures. Urbanisation trends also show a 114% increase in

population within floodplains and a 192% increase along cyclone-prone coastlines. This urban sprawl, often accompanied by inadequate infrastructure and informal settlements, further amplifies disaster risks (Hallegatte et al. 2020).

Environmental and ecological imbalances, such as deforestation and land degradation, can worsen the risk of disasters. When ecosystems are damaged, they lose their ability to reduce the impact of natural hazards, making people more vulnerable. In addition, natural weather patterns like El Niño and La Niña make it even harder to manage disasters (Sorensen et al. 2006). This complexity creates a challenging environment for disaster management.

Figures 1.2 and 1.3 depict the trends in registered disasters caused by natural/socio-natural and anthropogenic hazards spanning over 66 years from 1956 to 2022. The selected timeframe was chosen to analyse the trends 33 years before and after the adoption of UN Resolution 44/236 in 1989, which declared fatalism towards natural disasters unjustifiable. The information presented in these graphs reveals a significant increase in disaster frequency over time, which prompted the UN resolution to urge a proactive approach towards disaster risk reduction and mitigation.

However, due to limitations in EMDAT, the database used for disaster data, potential reporting biases in pre-2000 data should be considered. These biases could affect the accuracy of disaster counts and trends. Despite these limitations, the total number of recorded disasters included in the graphs is 24,751, providing a substantial dataset for analysis (EM-DAT, n.d.).
According to the graph trend lines, disasters are projected to increase further if the current trends continue, with the projection extending up to 2055. This highlights the importance of implementing enhanced disaster prevention, preparedness, and response measures to address the continuous upward trend in disasters. The data underscores the urgency of sustained global efforts in implementing sustainable disaster risk reduction strategies.

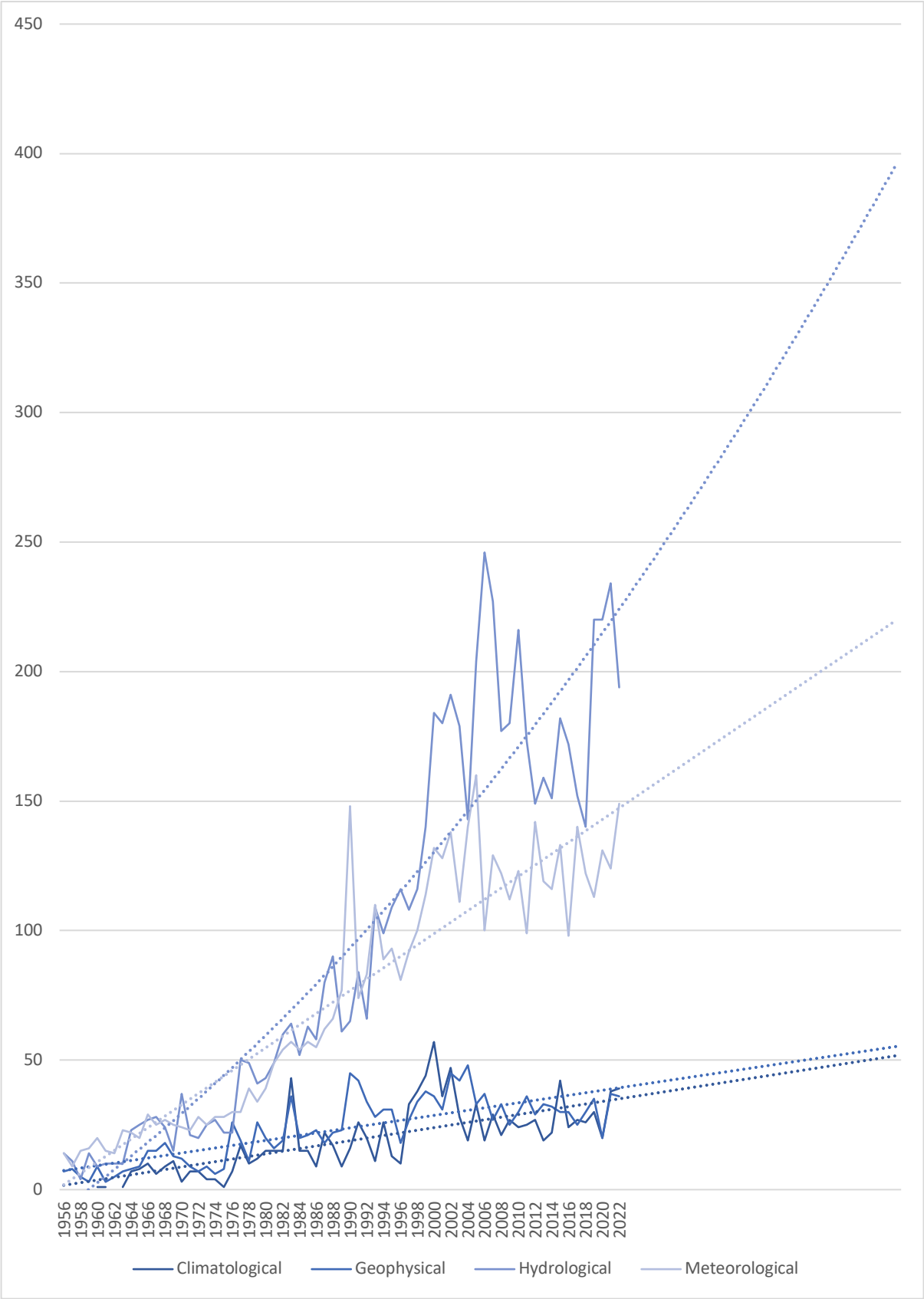


***Figure 0.1*** *Increase of Natural Events Over Time, 1956-2022 (EM-DAT, 2024)*

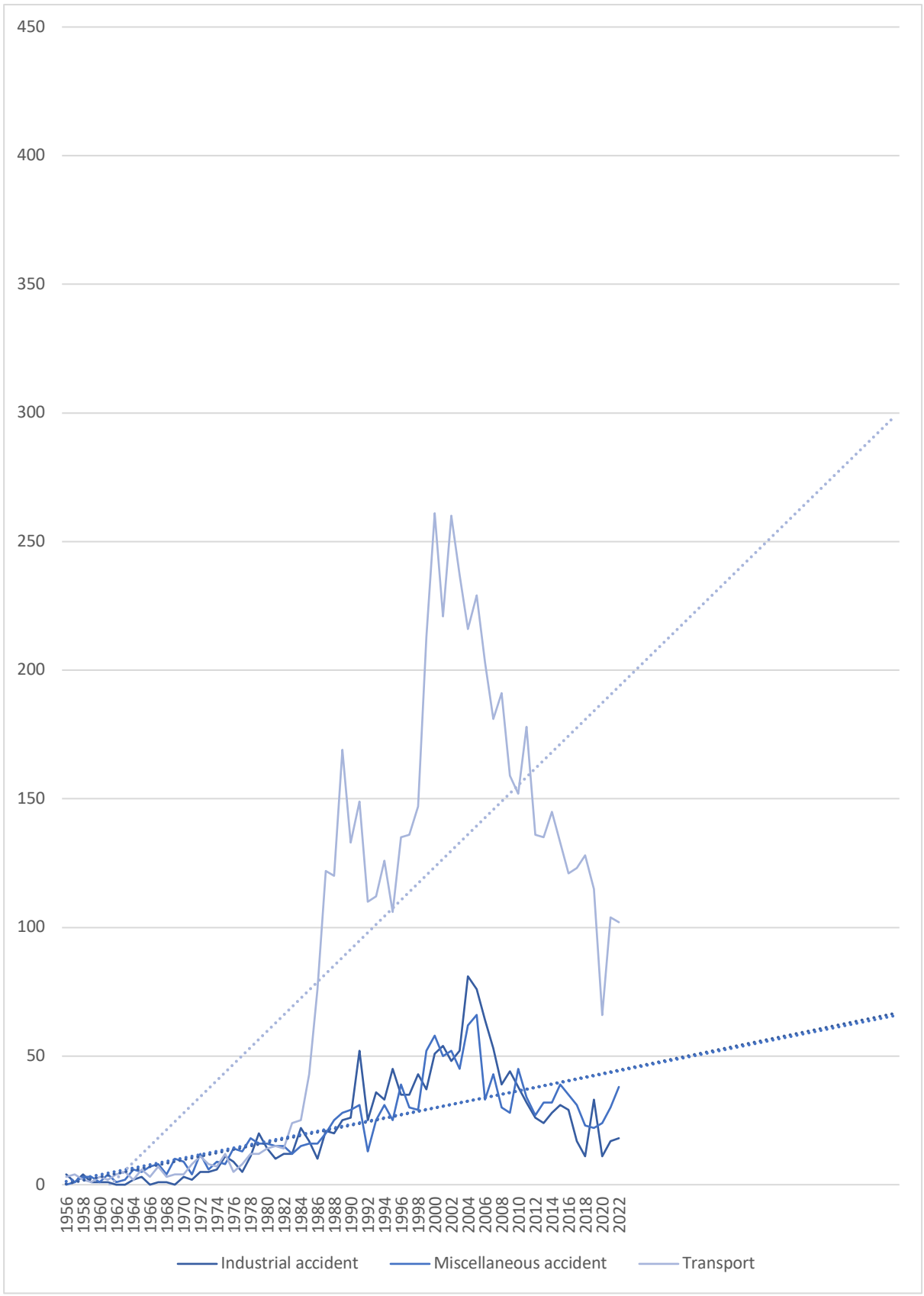


***Figure 0.2*** *Increase of Man-made Events Over Time, 1956-2022 (EM-DAT, 2024)*

The analysis shows a general upward trend regarding anthropogenic-hazard-triggered disasters, with notable fluctuations due to specific events or changes in regulations in the industrial, transportation, and safety sectors. Overall, these increasing trends in natural and man-made disasters underscore the need for ongoing improvements in disaster management strategies and the flexibility to adapt to evolving technological and societal challenges.

The World Disasters 2022 and the Global Assessment Report on Disasters underscore these concerns. The World Disasters Report 2022 identifies climate change as a significant contributor to increased disaster frequency, while urbanisation creates additional risks. The Global Assessment Report on Disaster Risk Reduction 2022 points to the interconnected nature of modern risks, where disasters can trigger cascading effects across various sectors. These reports emphasise the need for a global approach to disaster risk management and the critical importance of addressing these issues with practical and adaptable strategies (UNDRR, 2022; IFRC, 2023).

## 1.6 Rationale of Study

Despite ongoing efforts, significant progress toward sustainable solutions in disaster risk reduction remains elusive. Combined with the rising frequency and severity of disruptive events, this has shortened recovery periods between successive disasters, highlighting the need for robust decision-making during the critical response and recovery periods. Even with frameworks established by the United Nations and adopted by UN member states and leading aid/ humanitarian agencies to support disaster risk reduction, the goals set at the Third World Conference on Disaster Risk Reduction are not on track to be met.

The "Build Back Better" concept has become prominent in disaster recovery discussions. It is praised for its positive outlook but criticised for its unclear implementation. Despite repeated efforts to standardise and unify approaches through additional implementation guides that suggest extensive suites of indicators, ambiguity continues to hinder the concept's practical application. The holistic aspect of "Build Back Better" is often overlooked, suggesting a deeper issue with how disaster risk reduction is operationalised.

To address these issues effectively and realise the potential of "Build Back Better," research must identify the elements missing from its implementation, such as indicator dependency and

their interrelationships. Without thoroughly analysing these gaps, "Build Back Better" risks becoming a hollow slogan rather than a catalyst for sustainable disaster response and reconstruction. This study aims to explore these gaps, providing insights into how the concept can be reinforced to enhance disaster response and recovery for the communities most affected.

## 1.7 Research Questions and Objectives

Based on the rationale of the study, a succinct research question can be formed,

*How can decision-makers tasked to 'Build Back Better' select suitable indicators that guide actions, assess impact, and gauge success to enhance resilience through a holistic approach—a key aspect of the 'Build Back Better' principle?*

This question highlights the study's aim of understanding how the success of interventions by key decision-makers can be improved by focusing on selecting and prioritising appropriate indicators that guide actions and measure success. This can further be broken down into four sub-questions:

1. *How do disaster recovery frameworks integrate multiple dimensions of recovery to enhance resilience and sustainability?*

2. *Can an approach be established to reflect dependencies and interconnectedness between indicators?*

3. *What are the impacts of the contextual issues on indicator selection?*

4. *What can this research produce practically to facilitate increased success in post-disaster recovery?*

To address the first question, this study investigates the strategies and methodologies currently used to select and prioritise indicators in post-disaster recovery. Since it has been established that indicators are critical for guiding recovery efforts and assessing progress, understanding the existing selection process is essential. A core focus will be identifying gaps or limitations in the current selection or process, which might hinder a holistic approach.

The findings will provide a foundation for the second question, which explores how a holistic approach can foster an understanding of interconnectedness and dependencies among various indicators.

The study also seeks to investigate contextual issues' impact on decision-makers to recognise better the realities and challenges in selecting indicators. By examining these impacts, the research aims to offer insights into how recovery frameworks can adapt to diverse conditions, ensuring they are both practical and inclusive.

Lastly, the study's ultimate goal is to produce practical outcomes that can be applied in real-world post-disaster recovery scenarios. This includes developing tangible guidelines and recommendations based on the study's findings to facilitate more successful and sustainable recovery strategies. The study contributes to a deeper understanding of rebuilding communities to meet the needs of those most affected by disasters while promoting resilience and long-term sustainability. Thus, the research objectives may be summarised in four distinct statements.

1. *To identify gaps in current disaster recovery frameworks and propose future research directions to enhance their integration of multiple recovery dimensions.*

2. *To examine how a holistic approach to indicators supports relationships and dependencies among different facets of recovery.*

3. *To analyse the effects of contextual issues on the selection and effectiveness of indicators in post-disaster recovery efforts.*

4. *To develop practical guidelines and recommendations based on the research findings that contribute to more effective and successful post-disaster recovery strategies.*

The relationship between the research questions and objectives is shown in Table 1.2.

| | **Research Questions** | **Research Objectives** |
|---|---|---|
| **1** | How do disaster recovery frameworks integrate multiple dimensions of recovery to enhance resilience and sustainability? | To identify gaps in current disaster recovery frameworks and propose future research directions to enhance their integration of multiple recovery dimensions |
| **2** | Can an approach be established to reflect dependencies and interconnectedness between indicators? | To examine how a holistic approach to indicators supports relationships and dependencies among different facets of recovery |
| **3** | What are the impacts of the contextual issues? | To analyse the effects of contextual issues on the selection and effectiveness of indicators in post-disaster recovery efforts. |
| **4** | What can this research produce in a practical sense to facilitate increased success in post-disaster recovery? | To develop practical guidelines and recommendations based on the research findings that contribute to more effective and successful post-disaster recovery strategies |

***Table 0.1*** *'Research Questions' Corresponding to 'Research Objectives'*

## 1.8 Conclusion

This chapter has established the foundation for investigating how decision-makers can more effectively implement the Build Back Better principle by selecting appropriate indicators that reflect interdependencies, context, and practical priorities. It traced the conceptual evolution of disasters from fatalistic interpretations to human-centred understandings, explored the key stakeholders and frameworks guiding disaster recovery, and highlighted the increasing complexity of hazard exposure in a rapidly changing world. Despite global frameworks advocating for a holistic, integrated approach, indicator selection remains a critical weakness undermining recovery outcomes. The research questions and objectives outlined here frame the remainder of this study, which seeks to develop more practical, interconnected, and context-sensitive approaches to disaster recovery and resilience-building.

# Chapter Two, Methodology

## 2.0 Introduction

This chapter outlines the methodological approach adopted for the study. It explains the rationale behind the chosen methods, details the research design, and identifies the primary data sources. The chapter also considers the benefits and limitations of each method in relation to the research objectives and discusses relevant ethical considerations. The sections that follow provide a comprehensive account of each methodological component, including the procedures undertaken, the justification for their selection, and the sources that informed their use

## 2.1 Research Design

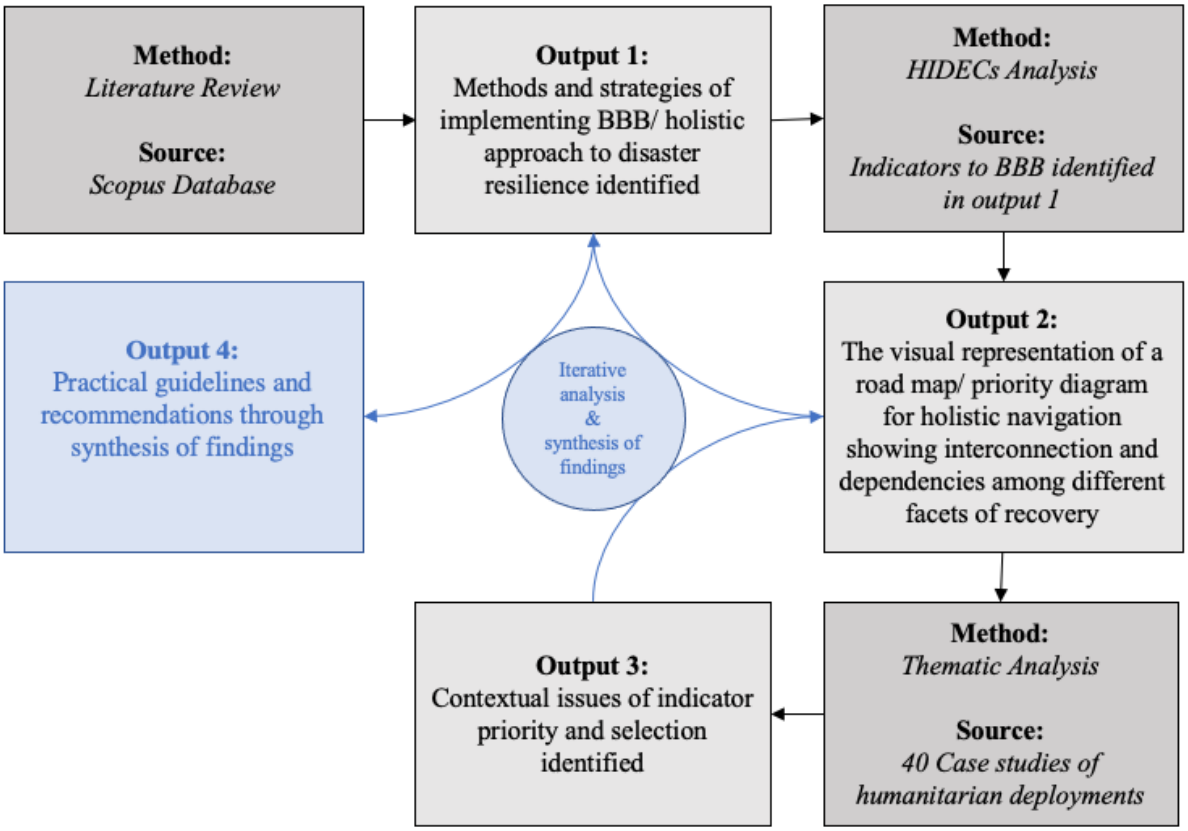


***Figure 2.1*** *Research Design*

Each method was selected to align with a specific objective, ensuring that the research design is both purposeful and coherent. Table 2.1 provides an overview of how the selected methodologies, data sources, and analytical techniques correspond to each objective. The

sections that follow expand on these methods, offering a detailed rationale for their selection and application within the broader research framework. An iterative process informs the direction of the following analysis. This approach acknowledges that insights gained from one analysis can shape the focus or methodology of subsequent analyses. The findings from the thematic analysis of 40 case studies will validate and inform the development of the output from the HIDECs analysis in a feedback-driven process. The revised output will inform recommendations based on the research findings that contribute to more effective and successful post-disaster recovery strategies. The research design is illustrated in Figure 2.1, which highlights this process and intended outputs, closely reflecting the research objectives.

| | **Research Objectives** | **Data Source** | **Methodology** |
|---|---|---|---|
| **1** | To identify gaps in current disaster recovery frameworks and propose future research directions to enhance their integration of multiple recovery dimensions | Scopus database search for relevant articles | Literature Review (qualitative) |
| **2** | To examine how a holistic approach to indicators supports relationships and dependencies among different facets of recovery | Published and publicly accessible frameworks and their predefined indicators | Hierarchical Decomposition System Analysis (qualitative) |
| **3** | To analyse the effects of contextual issues on the selection and effectiveness of indicators in post-disaster recovery efforts | Case studies of 40 humanitarian deployments | Thematic Analysis (qualitative) |
| **4** | To develop practical guidelines and recommendations based on the research findings that contribute to more effective and successful post-disaster recovery strategies | Outputs and insights from previous analysis | Iterative Analysis (qualitative) |

***Table 2.1*** *How Selected Methodology Relates to Set Research Objectives.*

This study is grounded in the complementary research philosophies of interpretivism and pragmatism. Together, these approaches offer a balanced foundation for exploring both the

conceptual and practical dimensions of indicator selection within Build Back Better (BBB) frameworks. Interpretivism enables a deep engagement with subjective experiences, recognising that human understanding and behaviour are shaped by context, values, and lived realities. Pragmatism, by contrast, focuses on the utility of research in practice and its responsiveness to real-world conditions. The integration of these two perspectives supports a methodological design that is both reflexive and action-oriented.

This philosophical foundation shapes and validates the study's multi-method approach, which includes a literature review, a hierarchical analysis using the Hierarchical Decomposition System (HIDECs), and a thematic analysis of deployment case studies. Each method offers distinct insights and, when viewed together, forms a triangulated structure that reinforces the validity and relevance of the findings.

The literature review establishes a conceptual base by synthesising theoretical frameworks and models that define and shape indicator use in disaster recovery. This provides not only background knowledge but also an initial framework for what constitutes success in BBB contexts. From a pragmatic standpoint, the literature review ensures the research is built on established foundations, while from an interpretive lens, it highlights the evolving nature of how recovery is understood and framed across different disciplines.

HIDECs analysis, informed by systems thinking, maps interrelationships between success indicators identified in the literature. This method reveals structural dependencies and hierarchies within existing frameworks, offering a more coherent picture of which indicators may hold more influence or centrality. The use of an algorithm to generate these relationships introduces a formal layer of logic into the study while preserving interpretive judgment in the identification and refinement of themes. This duality reflects the philosophical balance of the research, where inductive insight and structural clarity are both valued.

The thematic analysis of forty humanitarian deployment case studies provides empirical grounding. Drawing on End of Deployment Reports and Terms of Reference, this method captures the lived experience of practitioners working in diverse recovery contexts. The aim is to uncover how success indicators are interpreted, applied, and experienced in practice. This speaks directly to interpretivist priorities, while also aligning with pragmatic aims to develop findings that are grounded, relevant, and responsive to context.

Validation occurs not through any single method but through the way each interacts with the others. The literature review sets the conceptual frame, HIDECs interrogates its structure, and thematic analysis tests it against lived reality. Triangulation across these methods ensures the findings are not only theoretically and empirically supported, but also credible across different forms of evidence. This layered validation strategy reinforces both the philosophical coherence and analytical integrity of the study.

the research design is characterised by an iterative and reflexive logic, supported by complementary methods and validated through triangulation. This design supports a nuanced understanding of indicator selection that remains sensitive to human experience while also being practically applicable in post-disaster recovery settings.

## 2.2 Research Limitations and Assumptions

This study acknowledges several limitations and assumptions that could impact its outcomes. A significant limitation arises from the viewpoints of host governments, which may carry underlying motives influenced by political campaigns or reflect context-specific frameworks tailored to local needs. This variation can lead to differing interpretations of recovery priorities and indicator relevance.

Another key limitation is the perspective of the affected population. Local communities and individuals might have unique needs and priorities that are not fully aligned with the broader governmental or organisational frameworks discussed here. Their viewpoint could reflect a more grassroots understanding of disaster impact and recovery needs, diverging from centralised or formalised approaches. This limitation could affect the study's understanding of which indicators are most relevant or valuable for assessing disaster recovery.

Despite these limitations, this study addresses or offsets these concerns by focusing on case studies from local humanitarian organisations (that have paired with TAO) that are 'boots on the ground' with direct connections to the affected population and national and regional governments. These organisations have a unique perspective on disaster-struck communities' actual conditions and needs. They serve as a bridge between formal frameworks and grassroots experiences, providing valuable insights. While the limitation exists, the study's approach

offers a balanced alternative to interviews or focus groups with national/ regional governments or affected populations, which was not feasible at the time of research.

The study assumes that the host national governments, as UN member states, align with and adhere to the goals and strategies outlined in the Sendai Framework for Disaster Risk Reduction (SFDRR). However, given the potential for political motives or context-specific considerations, there is a risk of misalignment between broader governance ideals and the actual motivations of policymakers.

It is necessary to assume that a holistic approach resonates with key decision-makers. Although a comprehensive approach to disaster risk reduction is advocated throughout field work in disaster management, it is assumed that this advocacy leads to practical motivation among practitioners, influencing their actions and decisions. Understanding these limitations is essential for interpreting the study's findings.

## 2.3 Methodology Overview: Literature Review

Scopus is a significant and trusted research database in various scientific fields. It covers a wide range of journals in all disciplines compared to similar databases. Furthermore, Scopus has 20% more citation accuracy than other databases. For these reasons, it has been selected as the database to search for appropriate material for this study's literature review (Guz & Rushchitsky, 2009; Mongeon & Paul-Hus, 2016; Falagas et al., 2008).

The study uses the following keywords to find relevant articles. “Build Back Better” OR “Building Back Better” AND “Post Disaster” OR “Disaster” AND “Frameworks” OR “Indicators” OR “Disaster management”. This was selected to ensure relevance in the articles.

Build Back Better (BBB) is the central component of this study's investigation; however, the terms Build Back Better and the longer Building Back Better are often used interchangeably. Therefore, both terms ensure that the search for articles is not detrimentally narrowed if the title, abstract, or keywords favour one over the other.

The term has become popular across various fields, leading to its use in research beyond disaster recovery contexts. This broad application reflects the term's inherent appeal and

adaptability, capturing the need for a holistic approach that enhances conditions in many sectors, such as economics, health, and politics. However, this widespread adoption of BBB has also presented challenges. For example, its inclusion within economic discussions often focuses on the economic policies, financial mechanisms, and infrastructure investments required for sustained economic growth. Similarly, BBB in health tends to concentrate on rebuilding healthcare facilities, improving healthcare services accessibility, and addressing public health challenges. While these are facets of a comprehensive, resilient community, their specific and narrow focus is not helpful in this context. Such focuses isolate sectors from each other, undermining BBB's holistic approach. Holistic recovery is grounded on the interconnectivity of many sectors and their ability to support each other in for a resilient community. To address this, the terms “post-disaster” OR “disaster” brings the emphasis back to the relevant field.

| | **Database Search** | |
|---|---|---|
| | ***By Article Title, Abstract, Keywords*** | |
| **1** | ALL<br>(“Build Back Better” OR “Building Back Better”)<br>AND<br>(“Post Disaster” OR “Disaster”)<br>AND<br>(“Framework” OR “Indicators” OR “Disaster Management” | 84 Articles |
| | ***Search Limited By*** | |
| **2** | Language – English, Year of Publication – ‘any’- 2022, Document Type – Journals, Conference Paper, Book, Book Chapter, Publication Stage – Final | 74 Articles |
| | ***Review of Abstracts*** | |
| **3** | Review of abstracts of 74 articles | 58<br>Articles |

***Table 2.2*** *Scopus Search Parameters*

Finally, the terms “Framework” OR “Indicators” OR “Disaster Management” are included. The

term "Framework" is used to pinpoint articles that discuss or propose structured methodologies and theoretical models tailored to disaster recovery. Including "Indicators" in the search criteria focuses on finding studies that engage with indicators to guide or assess the effectiveness of BBB implementations. "Disaster Management" as a search term broadens the scope from the previous two terms to include comprehensive management strategies encompassing planning, mitigation, response, and recovery phases. This term ensures the inclusion of literature that covers the complete cycle of disaster management.

By integrating all these terms collectively, the search strategy aims to collate a comprehensive body of work encompassing the breadth of BBB within disaster recovery contexts. Providing insights into theoretical frameworks and models that guide recovery processes, indicators that monitor and evaluate those processes, and broader disaster management strategies that ensure these frameworks and indicators are effectively implemented.

The initial use of targeted search terms within the Scopus database yielded a substantial pool of 84 articles. This initial figure signifies significant interest and substantial academic output about the subject. However, further filtering was necessary to ensure relevance to this study. The criteria for further refining these results included three key parameters: language, source type, and publication stage. By specifying that only articles in English and their final publication stage be included, the aim was to consolidate the data pool to include only those articles that are most accessible to the international research community and that represent finalised, peer-reviewed knowledge.

Interestingly, this additional filtering stage excluded only 10 articles from the initial set, indicating that most of the literature already met these criteria. Subsequently, the remaining 74 abstracts were reviewed to ensure that each article directly contributes to the research questions and objectives outlined for the study. Exclusion criteria rule out articles based on discussions that are not within the scope of the research. This limited the articles to 58.

This selection process ensures that the final articles address the study's research questions and objectives. Furthermore, the resulting collection of articles provides a solid foundation for exploring existing theoretical frameworks for indicator selection and broader disaster management strategies that consider holistic recovery processes.

## 2.4 Methodology Overview: Hierarchical Decomposition System (HIDECs) Analysis

A number of established methods were reviewed to determine how best to identify and prioritise success indicators within the Build Back Better framework. Each method offered distinct advantages depending on the context and type of analysis required. The Delphi method, for instance, is valued for its ability to build consensus among expert panels through a series of structured, iterative surveys. While powerful for converging perspectives, its reliance on access to a pool of subject matter experts made it less feasible for this study, which did not involve direct expert consultation in the selection or ranking of indicators.

The Analytic Hierarchy Process (AHP), which enables the decomposition of complex decisions into a hierarchy of elements and quantifies their relative importance, was also considered. AHP is particularly effective when both qualitative and quantitative dimensions must be integrated. However, HIDECs was selected over AHP due to the researcher's prior experience with the framework and its established utility in assessing interdependencies between indicators, which aligned more directly with the study's aims.

The Logical Framework Approach was also examined. This method is widely used in project management to link activities, outputs, outcomes, and goals in a structured matrix. It provides clarity in how project components relate to each other and can support monitoring and evaluation. However, its rigid structure and context-specific orientation were not well aligned with the broader and more flexible analysis required to explore success indicators across a conceptual framework like Build Back Better.

Objective Tree Analysis, another method reviewed, helps break down overarching goals into progressively more specific objectives. While this is useful in early-stage planning, applying it in this context would have required close consultation with original authors of the Build Back Better framework or similar stakeholders to refine goals and indicators. Given the need to remain generalisable and interpretive rather than prescriptive, this approach was not pursued.

Outcome Mapping, with its focus on behavioural and relational change, was considered particularly useful for programmes seeking to influence human systems rather than deliver predefined outputs. However, because it requires defining a vision of success first and working backwards from that point, it posed challenges in the context of this study. The research was

not built around a single intervention or context but aimed instead to analyse indicator interconnections across a broad conceptual framework.

Lastly, Multi-Criteria Decision Analysis (MCDA) was considered for its structured approach to evaluating options across multiple, potentially conflicting criteria. This method is especially useful where both qualitative and quantitative measures are needed and where decisions involve trade-offs. However, the level of detailed data required to appropriately weight criteria and generate reliable composite scores was not available for this study, given its conceptual and exploratory focus.

Taken together, these methods each hold value in particular settings. However, HIDECs provided the most suitable approach for this research due to its ability to explore and analyse interconnections and dependencies among indicators in a way that aligned with the study's focus on conceptual clarity and systems thinking within the Build Back Better framework.

Hierarchical Decomposition System (HIDECs) was first developed by Alexander in 1962. Tasked with redesigning a small rural village in India, Alexanders' approach was inspired by the Athens Charter of Congrès Internationaux d'Architecture Moderne, which stated the four functions of a city where work, dwelling, recreation, and transportation and the physical articulation of the built environment should follow this division of functions. Alexander, acknowledging the criticism of the charter's rigid approach, disregard for local context, and focus on functional segregation, expands upon the theory. Formulating that a city is more accurately depicted as a live assembly or aggregate of components and requirements. The best approach to design and implementation is to know the requirements of the various components and then recognise the relationship between them. In doing so, a hierarchy of relationships between the components emerges, which can then guide the approach to design and practical implementation (Alexander C., 2015).

In the original exercise, Alexander compiled a list of requirements based on what the villagers explicitly felt was a need, the criteria called for by national and regional standards, drivers of economy and social purpose, and all other relationships that were already satisfied implicitly in the present village (which indicated they were required in the new village but not felt as needs by anybody) identifying 141 requirements in all. Alexander then drew connections between these requirements, indicating relationships. This is the key part of the process and

requires instinctual action. They are making connections based on whether there is a perception or sense that requirements are connected (Alexander & Manheim, 1968). The first impression and immediate response are what should be recorded. Requirements are connected if whatever is done to satisfy one makes it harder or easier to meet the other. There are no limitations on how many relationships a requirement has, and the relationship goes both ways. The images below (Figure 2.2 and 2.3) illustrate how Alexander graphed this process.

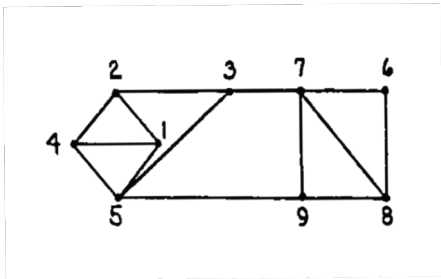


***Figure 2.2*** *A Graph of Variables and their Linkages (Alexander C., 1968)*

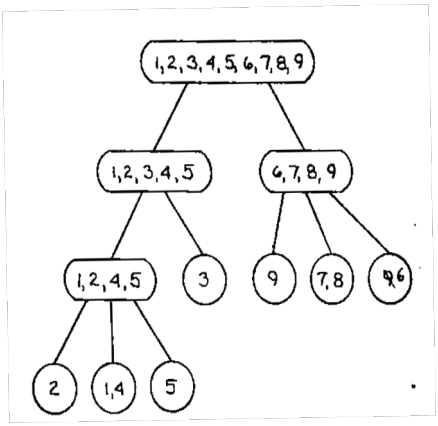


***Figure 2.3*** *Variables and their Linkages as a 'Family Tree' (Alexander C., 1968)*

Once this is completed, an algorithm measures and graphs the connections between the relationships, breaking them into subsets and these into further subsets, forming a family tree-like structure (shown above). Each subset contains a set of very densely connected requirements yet, as far as possible, independent of the requirements in other subsets. The algorithm developed by Alexander is illustrated below (figure 2.4).

$$STR = \frac{RR - \left(\frac{total}{NSQ1}\right) MN}{\sqrt{MN\ (NSQ1 - MN)}}$$

***Figure 2.4*** *HIDECs Algorithm Developed by Alexander (Alexander C., 1968)*

Where 'RR' is equal to the number of links that would be cut if the graph was split, 'Total' is equal to the total number of links in the graph, 'NSQ1' equals the maximum possible number of links for the graph, namely n(n-1)/2 where n+ the number of requirements. 'M' equals the number of requirements in one of the split sets. 'N' is equal to the number of requirements in the other split sets, and 'MN' (M x N) is equal to the prior listed. Finally, INFO is the algorithm measuring the strength of a proposed split within the requirements. This is calculated for each possible split of the graph, with the weakest (lowest value) being taken as the split, resulting in two graphs/ datasets. The decomposition process is repeated until there are no more differences in strength or there is just one variable/ characteristic.

This analysis has two main limitations; the first is that the interruption of connections between the variables depends on the researcher. Second, this HIDECs software analysis method can become overly ridged, with subsets only divisible by two. In contrast, Figure 2.3, showing Alexander's theory, illustrates that subsets may be divisible by three or more. The first limitation is shared with many qualitative methodologies and is answerable to the prescribed research philosophies discussed in section 3.2. The second limitation can also be addressed: if the algorithm determines that it should have more than two divisions from a subset, it will repeat the same subset in full at a lower hierarchical level. It is then up to the researcher to interpret the resulting diagram and correct the generational tiers to reflect subsets accurately (Alexander C., 2015). However, despite this limitation, the results remain hugely beneficial as the analysis articulates a hierarchy without disrupting the requirements or changing aspects that do not need to be changed. This provides a logical rationale on which action and decision could be based.

When conceived in 1963, this analysis was beyond the processing power of the time, but today's technology and the development of HIDECs software means this process is well within reach today. The process remains true to Alexanders' original process and has proven useful in complicated relationships, making sense of 'wicked problems', and producing useable material

out of seemingly chaotic information. The process for this methodology consists of the following steps:

1. The key variables of the issues are identified and coded.
2. Once this is complete, the coded variables are duplicated along a 'Y' axis and a 'X' axis.
3. Connections between the variables are identified and marked.
4. Once completed, the HIDECs software is used to apply the algorithm and measure and graph the connections between the variables into a family tree-like structure.

The analysis of the HIDECs tree-like structure begins at the lowest 'generational tier,' where every subset is labelled for clarity. Variables within these subsets are then evaluated to distinguish a central theme. Subsets of similar themes may be grouped into a cluster. The process is repeated until each generational tier has been assessed and a theme distinguished.

HIDECs was selected for hierarchical clustering analysis due to its availability and the researchers familiarity with its features and operation. This familiarity ensured efficient and reliable execution of the analysis. Although HIDECs is not open-source, it offers a level of transparency that is not available in other software, facilitating a clearer understanding and communication of the methodology and results. Additionally, HIDECs provides specific features that are particularly well-suited to the requirements of the analysis, contributing to both the accuracy and relevance of the outcomes. Considering these factors, HIDECs was deemed the most appropriate tool for the analysis.

This analysis method was applied to relevant and appropriate 'Build Back Better' frameworks identified in the thematic analysis of the literature review. The indicators of success are used in place of 'requirements' or 'variables' as described above. Significantly, indicators can be linked across all components, principles and categories of a framework, and the resulting analysis is a prioritised hierarchy diagram of indicators no longer defined by principles or categories yet preserving the framework's holistic approach, an essential component of the Build Back Better. The interpretation of the resulting diagrams will be compared to answer the question of what if any, indicators from 'Build Back Better' frameworks are more critical to success than others. This produces a tool to illustrate a hierarchical approach of the existing indicators from 'Build Back Better' frameworks.

## 2.5 Methodology Overview: Thematic Analysis

Thematic Analysis is a qualitative research method that involves identifying, analysing, and reporting patterns (themes) within data. It is useful for gaining an in-depth understanding of the experience, opinions and perspectives of practitioners operating in the BBB-driven post-disaster recovery field. It involves several stages: data familiarisation, coding, theme identification, analysis, and interpretation. These stages identify key patterns and themes within the data relevant to the research questions (Braun & Clarke, 2006). Recognising how contextual issues have impacted the effective use of success indicators in practical applications. This method has been selected for its flexibility and adaptability to suit this unique data set.

Relevant Terms of Reference supplement forty End-of-Deployment Reports (EoDR). The chapter begins with a comprehensive introduction, exploring the contents and structure of these reports and distinguishing their inherent significance in establishing factors of success for long-term sustainable solutions. Next, the chapter presents a detailed thematic analysis of the EoDR. This evaluation unveils pivotal insights within the reports and fosters a deeper understanding of recurring patterns and narratives. After the analysis, the findings are presented and discussed in depth.

The reports from a leading aid organisation were given to this study to facilitate the research. The Aid Organisation (TAO) is the foremost international humanitarian response agency tasked with selecting, training, and deploying technical specialists who assist communities in various stages of crisis management, from preparation and planning to recovery post-disaster. Their expertise spans various skills, encompassing disaster risk reduction (DRR), emergency preparedness, recovery, and stabilisation. TAO collaborates with sixteen United Nations (UN) agencies or entities, frontline relief agencies, and local governments. During humanitarian crises, as part of a global network of standby partners, TAO extends additional support to the UN's response initiatives.

The Reports are divided into two key documents. The main one is the End of Deployment Reports (EoDR). EoDR serve as a comprehensive written evaluation in the delegate's own words as they wrap up their assignments. Unlike conventional handover notes that predominantly focus on facts, EoDR encompass personal reflections, in-depth analysis, and

critical evaluations of each deployment. Their overarching aim is duel-faceted: to have a genuine, transparent perspective and offer suggestions and insights to refine future deployment strategies. Structurally, these reports are segmented into distinct sections, including 'Administration and Deployment Support', 'working context', and 'results of deployment'. Each section is further segmented by a series of prompts for the delegates to answer.

Delegates are first prompted to rate their satisfaction with the support from TAO before and during their deployment. The following section, 'working context,' delves into their personal and professional relationships with their host organisation supervisors and other pivotal staff members. Here, delegates describe significant professional or personal challenges they encountered and whether there were substantial alterations to their initial Terms of Reference (ToR). The third section, 'results of deployment', is the most extensive. It provides delegates the platform to highlight the key activities from their deployment and, crucially, the extent of their accomplishments. They also discuss obstacles and opportunities faced and their responses to them.

Furthermore, they pinpoint how their efforts contributed to the resilience and capacity of the host organisation or community, fortified both local and national leadership and how they anticipate their contributions will be sustained, having a lasting impact. They must detail how their work promoted gender equality, disability inclusion, harmonised humanitarian efforts, and increased accountability to the affected population. This section wraps up by soliciting recommendations concerning the future needs of the host organisation, identifying areas where further deployments against the ToR, and quantifying the success of their actions on a scale of one to six, supplemented with a written justification.

The second document is called the Terms of Reference (ToR). This document outlines the delegate's anticipated role, the humanitarian response sector, the expected deployment duration, and the operational context. It also delineates responsibilities, theoretically providing a roadmap of the delegate's mandate. Though ToR exhibits variations depending on the requesting entity, their commonality is in the intent to provide a pathway to measure success.

The framework for analysis is relatively straightforward. First, a preliminary review of each document to understand the structure and content (which is described above). Then,

segmentation. As the EoDR follow a structured format, each is segregated into the respective sections discussed above. After this initial stage, the 40 case studies are analysed and coded, with each section treated as a separate category for analysis. From this emerges themes and patterns. The segmentation allows for an easier cross-document synthesis where themes can be compared across all forty reports to draw broader conclusions. This will also make it easier to identify overarching themes that span multiple sections. Chapter five details the findings from each section, providing a comprehensive overview of the thematic analysis.

A concurrent analysis of the ToR and EoDR allows the evaluation with depth and granularity. Recognising the perspectives of both the host organisation and the delegate is pivotal when discerning markers and measures of success. With its overarching vision, the host organisation outlines the border objectives and strategic goals, while the delegate EoDR provides a ground-level narrative acknowledging real-world factors and challenges. The two perspectives offer a more well-rounded understanding of the patterns and trends of the emerging themes from the thematic analysis. Furthermore, this dual-perspective review sheds light on the alignment and divergence between the host organisations and the delegates as two key decision makers.

The selection of case studies followed a clear and rigorous screening process. Initially, sixty-two End of Deployment Reports were made available through The Aid Organisation. Each report was reviewed to determine its completeness, the presence of sufficient contextual detail, and adherence to a consistent structure. Reports that lacked key information, deviated significantly from the standard format, or provided minimal reflection were excluded. This process resulted in a refined set of forty case studies. These forty reports, supported by their corresponding Terms of Reference, formed the final data set for thematic analysis. This selection ensured that each case provided the depth and consistency required for valid cross-case comparisons. A visual (figure 2.5) complements this explanation, illustrating the screening process from initial access to final selection.

The process of data collection for the thematic analysis began with the acquisition of two interrelated documents: the Terms of Reference and the End of Deployment Reports. These were supplied by The Aid Organisation, already anonymised by a third party to protect confidentiality. A preliminary review was conducted to familiarise with the structure, tone, and focus of the documents. Each report was then segmented into its respective sections to enable categorised analysis. Coding was conducted section by section, which allowed for consistency

in interpretation and later synthesis. The Terms of Reference were coded separately but analysed concurrently to enrich the understanding of alignment or divergence between intended goals and actual experiences. This layered approach facilitated a deeper exploration of recurring patterns and contextual variables across deployments

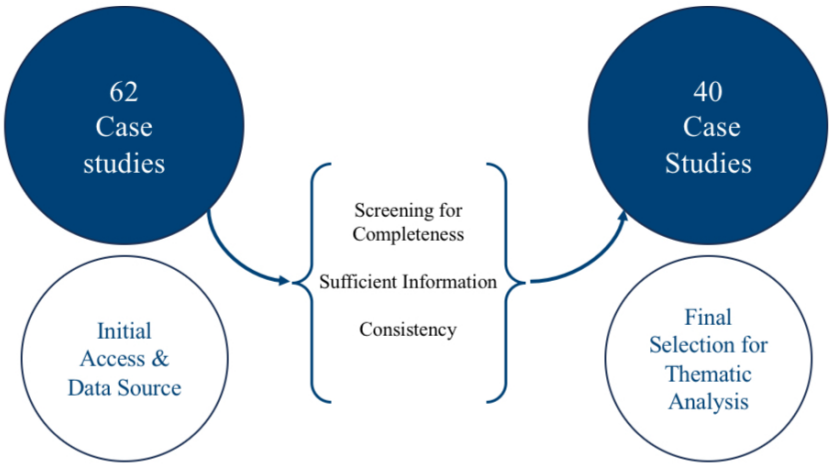


***Figure 2.5*** *Case Studies Selection Process*

## 2.6 Addressing Bias

Recognising the interpretive nature of this study, particular care was taken to address potential bias at each stage of the research process. The interpretivist foundation acknowledges the influence of the researcher's perspective, while the pragmatic stance encourages practical measures to reduce distortion and enhance reliability.

In the literature review, efforts were made to limit selection bias by applying a consistent and transparent search strategy. The use of Scopus and clearly defined search terms ensured that the selected frameworks and indicators were academically robust and relevant to the field of disaster recovery. Inclusion and exclusion criteria were documented and applied systematically.

During the HIDECs analysis, which relies in part on researcher judgment when identifying connections between indicators, bias was mitigated through reflexivity and procedural consistency. The decision to use HIDECs was based not only on the researcher's familiarity with the tool but also on its suitability for revealing interrelationships without stripping away complexity. The algorithmic clustering reduced subjective interference by guiding the segmentation of indicators through structural logic, rather than predetermined categories.

For the thematic analysis, bias was addressed through structured segmentation of the case reports, systematic coding across defined categories, and inductive theme development. By analysing the End of Deployment Reports alongside their Terms of Reference, the study also introduced internal triangulation within each case, reducing the risk of privileging only one perspective. Regular memo-writing and documentation of analytic decisions helped maintain transparency in how patterns and themes were developed.

Overall, the study's iterative and multi-method design not only supports triangulation but also distributes the interpretive burden across different types of evidence. This layered structure, aligned with the study's philosophical grounding, ensures that findings are both reflective and rigorous.

## 2.7 Ethical Considerations

This study adheres to the Code of Responsible Research Conduct (RRC) and the research ethics guidelines established by Massey University. According to the university's ethics criteria, this research was deemed low-risk and did not require approval from a Human Ethics Committee. Instead, a Low-Risk Notification was issued, which was obtained before data collection began. The Low-Risk Notification process is audited periodically to ensure compliance with university guidelines.

This notification was approved based on the data used for thematic analysis of case studies provided by a leading international non-governmental agency. To ensure privacy and confidentiality, the reports were anonymised by a third party before analysis. This step was taken to protect the authors' identities and ensure the study met ethical standards while conducting research.

## 2.8 Conclusion

This chapter has outlined the methodologies used to explore and respond to the research objectives of this study. A literature review was conducted using a carefully considered search strategy to build a strong foundation of existing knowledge around post-disaster recovery frameworks, with a particular focus on Build Back Better. This helped clarify how frameworks are currently used and where gaps remain.

The Hierarchical Decomposition System (HIDECs) was introduced as a way to explore the relationships between indicators drawn from these frameworks. This method helps to make sense of complex systems by revealing the underlying structure of interrelated components. It provides a way to prioritise indicators without stripping away the holistic intent of the frameworks themselves.

Thematic analysis was then used to draw insights from the lived experience of practitioners. By analysing a large number of deployment reports alongside their original terms of reference, this approach offers grounded, real-world perspectives on what success looks like and how it is measured across different recovery contexts.

Together, these methods form an integrated and iterative research design. Each step informs the next, and insights from one method support and refine the findings of another. This structure not only reflects the complexity of post-disaster recovery, but also supports the importance of both theoretical rigour and practical relevance in developing more effective and inclusive strategies.

# Chapter Three, Literature Review

## 3.0 Introduction

This chapter provides a detailed analysis of findings from a literature review of 58 articles from a Scopus search. Initially, the chapter offers an overview of the articles, noting their publication dates and the range of methodologies employed across these studies. It provides a snapshot of the evolution and diversity of research approaches. Subsequently, the discussion shifts to identifying and exploring dominant themes from the articles. These themes are critical for understanding the current state of disaster management research, indicator selection, embracing the holistic principle in recovery, and the strategic directions being pursued.

Further, the chapter delves into the main challenges and issues revealed by the literature. This section highlights the obstacles researchers and practitioners face in implementing disaster management strategies, including technological, logistical, and socio-political factors. It offers a critical examination of how these challenges affect the efficacy of disaster response. A reflective discussion follows. This discussion synthesises and critiques the insights from the reviewed articles. The chapter concludes by outlining directions for future research, suggesting areas that are under explored or particularly promising for developing more effective disaster management strategies. This final section aims to guide the subsequent research efforts, emphasising the need for innovative approaches to address the identified challenges and advance the disaster management field.

## 3.1 Review of Research

As identified in Chapter Three, 58 articles form the foundation of research for this study. The process of their selection has already been established. The 58 articles demonstrate there has been an increased trend in publication over time. Starting with just one article published in 2008, there was a slow upwards trend in publications until 2016. From 2017 onward, there was a notable surge, peaking in 2021 with 11 articles. This pattern suggests a growing academic and practical interest in disaster recovery, likely due to the recognised increase in global disaster events and a heightened focus on resilience and sustainable recovery practices.

In reviewing the methodologies employed across the academic articles, it was found that several were favoured above the rest. The most prevalent is the use of interviews, with 48% of the articles employing either structured or semi-structured interviews. These were conducted with the affected community, regional government organisations, and experts to obtain the data of complex social interactions, personal experiences, community dynamics, and key decision makers' perspectives in post-disaster contexts.

The second equal approach, at 43%, is fieldwork—including observation and participatory observation—and literature reviews. Fieldwork typically involved direct engagement in the environment under study, offering researchers a first-hand look at behaviours, processes, and conditions within disaster-affected communities. Participatory observation, a component of this method, involves active engagement with the community, which may provide insights into the social dynamics at play. Literature reviews, considered essential for synthesising existing published knowledge and identifying gaps in the field, are expected to be a highly used research method. However, nearly half of the articles engaged in this methodology focused on grey literature, conducting a document analysis or review of policies, frameworks, or other non-academic literature and material to disseminate a wide array of information on disaster management through content and comparative analysis.

24% of the articles use case studies, underscoring their importance in delivering detailed, context-specific insights to understand broader patterns or theories in real-world settings. Lastly, surveys and questionnaires, used in 21% of the articles, that provided a way to collect data from a broader audience.

Other methodologies employed included workshops and media analysis, which provided avenues for engagement and examination of public narratives. Less traditional methods also played a significant role; analytic auto-ethnography offered personal insights through self-reflective writing, cartographical analysis highlighted spatial dynamics, econometric and estimation analysis quantified economic impacts, psycho-sociological analysis delved into human behaviours and social structures, and text mining analysis allowed for the extraction of data from large textual datasets.

This observation highlights the prevalence of qualitative methods among researchers in this field, enabling them to delve deeply into the complex dynamics of disaster recovery and resilience. However, less commonly employed novel methodologies provide a fresh perspective, offering unique insights into often-discussed data.

## 3.2 Dominate Themes

Several dominant themes and trends have emerged from the analysis of these articles. One of the most notable is the focus on implementing the holistic principle of 'Build Back Better' (BBB). These articles recognise that a holistic approach aims to ensure that post-disaster recovery not only replaces what was lost but also improves upon it, enhancing resilience to future disasters; however, they identify numerous challenges in this area, including understanding the interconnectedness between various dimensions of disaster recovery. Discussions frequently highlight how decisions made in one area can significantly impact others.

Another prominent theme is the focus on prioritising and emphasising community recovery. This theme stresses the importance of participatory recovery strategies and prioritises recovery processes that ensure efforts are practical, culturally appropriate, and socially inclusive. Additionally, the implications of the Sendai Framework for Disaster Risk Reduction (SFDRR) is a focal point. Several articles discuss its impact, implementation, and challenges as a global blueprint for reducing disaster risk and enhancing resilience. Lastly, models and frameworks for improved implementation, indicator selection and prioritisation emerge as a critical theme. These models and frameworks aim to address the gaps and inefficiencies identified in traditional disaster recovery approaches.

### Build Back Better & Holistic Considerations of Disaster Dimensions

Konayashi et al. (2015), Mishra et al. (2017), Anand et at. (2022), and Jouannic et al. (2020) advocate that an interdisciplinary approach is necessary to understand the recovery process comprehensively and thus leverage the connections between various dimensions to address the causes of vulnerability. Forster et al. (2022) further emphasise this by discussing the multifaceted aspects of human welfare and social resilience and stating that these nuances can only be supported by engaging in a similarly nuanced holistic disaster recovery. Dube et al.'s

(2021) findings suggest that post-disaster recovery efforts that do not consider such an approach can miss opportunities to enhance resilience and sustainability. Correspondingly, much of the literature discusses the interplay between the dimensions or facets of disaster recovery, exploring two primary aspects: the significance of connections among various dimensions and their specific impact or influence between these dimensions, hinting at vital dependencies.

Policy and governance are one of the most examined dimensions with significant consideration for its influence on other facets of recovery. This dimension includes the consideration of multi-level governance, finance mechanisms, insurance mechanisms, government initiatives, government frameworks, and policy frameworks. Other vital dimensions include community recovery, economic recovery, physical assets (encompassing critical infrastructure, housing, urban planning, and land use planning) and dimensions of disaster risk reduction, coordination and collaboration, and sustainable development goals.

The interconnections between the dimensions of policy and governance and community recovery are popular to explore. Fayazi et al. (2019), for instance, discuss the comprehensive view of the complexities involved in disaster recovery, particularly in how diverse community responses and state policies intersect to shape long-term development trajectories post-disaster. Era (2021) underscores the importance of social capital (networks, relationships, norms, and trust that exist within a community or between individuals, which facilitate cooperation and collective action), advocating for a more focused integration of social dynamics in disaster response and recovery policies as they found that a community with social capital significantly facilitated better recovery and rebuilding efforts. The study highlights enhancing this through a more considerate governance. Falk et al. (2019) and Pezzica et al. (2022) Explores these two dimensions in combination with physical assets. Falk et al. highlight the interplay between urban planning and community engagement to establish resilience, advocating for a comprehensive approach that extends beyond physical infrastructure to include social and policy drivers, While Pezzica findings underscore the critical role of strategic planning and proper management practices in enhancing the effectiveness of post-disaster temporary housing efforts.

Jones et al. (2022) considered the application of "Building Back Better" in multi-hazard scenarios, focusing on enhancing disaster recovery to achieve greater resilience. The research identified the need for improved disaster risk financing, strengthened social protection services for vulnerable groups, and better coordination among relevant agencies. It also emphasised the importance of pre-disaster recovery planning and resilience-building at both local and national levels, thus blending dimensions of community recovery, policy and governance, disaster risk reduction, and collaboration and coordination.

Hoffmann (2022) also considers the dimensions of community recovery and policy and governance, focusing on cooperation and coordination, highlighting coordinated efforts among insurance mechanisms, governance frameworks, and community participation, which are required to achieve resilient recovery outcomes. Murphy et al. (2018) further echoes this link, whose recommendations for building back better include psychological support, early livelihood support, community empowerment, cohesion, and government collaboration.

Moatty et al. (2021) adds an economic recovery lens and illustrate the complexities of disaster recovery, where systemic constraints and the well-established nature of pre-disaster vulnerabilities often challenge opportunities for significant improvement and adaptation. The research identified vital variables affecting vulnerabilities in political-administrative, economic-financial, socio-cultural, and land-use planning spheres.

Macaskill and Gurthrie (2018) also discuss the dimension of economic recovery and the challenges of building and sustaining resilience. They highlight that the funding mechanisms significantly influence a community's capacity to "build back better," underlining the critical role of national policy and local financial resources in determining infrastructure reconstruction decisions. Similarly, Takim et al. (2018) also examine the 'Building Back Better' (BBB) approach from an economic perspective. Takim et al. identify business opportunities in disaster recovery, focusing on rebuilding while enhancing resilience and sustainability. The findings stress that strategic incentives from governments are crucial for supporting entrepreneurs, fostering economic revitalisation, and promoting resilience in disaster-prone areas. Their insights underscore the essential role of policy, governance, and economic strategies in disaster recovery.

Other explorations of interconnections between dimensions of disaster include community recovery and physical assets, where Mishra et al.'s (2017) article stresses the inclusion of the affected communities in the recovery process, considering both physical and psychological dimensions as equal components of the recovery. Sameen (2018) further explores this link, introducing the dimension of disaster risk reduction to this lens and incorporating social, cultural, and technical dimensions of architectural design and construction. Melilianda et al. (2019) expand further, incorporating economic recovery and sustainable development. They identified significant recovery efforts in infrastructure, economic revitalisation, mental health, and disaster risk reduction programs as opportunities for sustainable development.

Platt et al. (2019) discusses the link between community recovery and disaster risk reduction. The article's central theme explored the complexity of resilience as a dynamic and evolving concept in disaster risk management, urging for integrated strategies that encompass recovery, proactive risk reduction, and community empowerment.

These articles signal a sustained effort to identify the critical dimensions of a disaster that must be addressed to build resilience and develop sustainable solutions for disaster recovery. Additionally, they highlight that significant research has been undertaken to explore the relationships and dependencies among these dimensions.

### 3.2.2 Prioritising Community-Driven Indicators

There is a strong emphasis on the dimension of community recovery within the literature, with several introducing or showcasing community-led recovery methodologies or advocating for greater prioritisation of community recovery within existing disaster frameworks. For instance,

Lin and Lin (2020) introduce a model of community-led recovery that integrates cultural aspects into the economic livelihoods of relocated tribal communities in Taiwan. This approach fosters community cohesion and resilience and promotes sustainable economic development through tourism, suggesting that cultural preservation and enhancement should be significant indicators in recovery frameworks.

Practical initiatives discussed by Anand et al. (2022) and Gjerde (2016) further support this thinking. Anand et al. detail an initiative that engages local artisans in reconstruction efforts,

supporting livelihood recovery and physical rebuilding. Gjerde highlights the “Share an Idea” campaign, showcasing how community input can significantly influence recovery blueprints. These examples advocate for integrating structured community feedback mechanisms and local skills into recovery frameworks, emphasising that reconstruction should resonate with the community’s vision and needs.

From a broader perspective, Imperiale and Vanclay (2020) critique the failures of top-down approaches, particularly following the 2009 L'Aquila earthquake in Italy. The paper stresses the ineffectiveness of approaches lacking genuine community engagement and calls for a shift towards more community-centred methods. It suggests that indicators of recovery success should measure community engagement and empowerment levels.

Mannakkara et al. (2014) supports this view, advocating for integrated community-driven efforts into broader recovery frameworks. This approach underlines the importance of community involvement in planning and decision-making to enhance recovery outcomes.

Maly and Suppasri (2020) discuss the Sendai Framework after the Great East Japan Earthquake, emphasising community-based approaches for its effective implementation. The article articulates that aligning recovery efforts with community needs and capabilities should be prioritised, promoting indicators that measure community preparedness and involvement in disaster risk reduction.

Similarly, Owusu-Sekyere et al. (2021) and Sasaki et al. (2021) underscore the importance of community engagement in disaster management and risk reduction strategies. They highlight the need for recovery efforts to adapt to specific community needs and cultural contexts, reinforcing the argument that community-focused indicators are essential for effective disaster recovery.

These articles collectively advocate for more community-focused and participatory approaches in disaster management. They urge decision-makers to recognise and implement community-led recovery as a strategy. Furthermore, they collectively signal that community recovery should be a more prioritised principle within existing frameworks than it currently is. This is

expected to facilitate recovery efforts that are effective in the short term and sustainable in the long run.

### 3.2.3 Sendai Framework for Disaster Risk Reduction

Several articles discuss Build Back Better, specifically in the context of the Sendai Framework for Disaster Risk Reduction (SFDRR). The SFDRR was adopted at the Third UN World Conference on Disaster Risk Reduction in 2015, introducing seven global targets, four priorities for action, and 13 guiding principles. Notably, the fourth priority and the 11th guiding principle emphasise "Build Back Better." The fourth priority focuses on "enhancing disaster preparedness for effective response and to 'Build Back Better' in recovery, rehabilitation, and reconstruction." Meanwhile, the 11th guiding principle specifically advocates for "Building Back Better" to prevent the creation of new disaster risks and reduce existing ones.

The UN Defines BBB as; “The use of the recovery, rehabilitation and reconstruction phases after a disaster to increase the resilience of nations and communities through integrating disaster risk reduction measures into the restoration of physical infrastructure and societal systems, and into the revitalisation of livelihoods, economies and the environment” (UNDRR, n.d.). Thus, it cements "Build Back Better" (BBB) as a metonym representing a holistic disaster management approach.

Tamura et al. (2018) discuss the formalisation of the BBB principle within the SFDRR. They assert that the concept of recovery, conceptualised as a three-layered model encompassing urban rebuilding, economic rebuilding, and life recovery, embodies BBB's essence. By highlighting the interconnectedness of these layers, the authors argue that achieving effective recovery necessitates a holistic approach. This perspective emphasises integrating resilience-building measures into all aspects of post-disaster reconstruction efforts, aligning closely with the overarching goals of the SFDRR. Consequently, their analysis underscores how the SFDRR provides a structured framework for implementing BBB principles in disaster recovery initiatives.

Graveline and Germain (2022) offer a different perspective: The SFDRR forced the evolution of ‘resilience’ beyond the simpler concept of ‘improved capacity after a disaster’ to one that

necessitates a complex framework that dictates proactive and comprehensive risk management strategies across multiple sectors.

Chapter One introduced the comprehensive implementation guides associated with the SFDRR, which provide a suite of indicators designed to guide different sectors and stakeholders in management strategies. It also discussed some of the challenges this entails.

Anand et al. (2022) reference SFDRR as a guiding international strategy for enhancing disaster preparedness at all levels but only focuses on two of The UN's essentials for making cities resilient, developed to accelerate the implementation of the SFDRR: Essential 8, "Increase Infrastructure Resilience", and Essential 10 ", Expedite Recovery and Build Back Better". The Ten Essentials map directly against the SFDRR priorities of action and its indicators for monitoring actions on disaster risk reduction. They are considered the critical and independent steps prescribed by The UN to build and maintain resilience (UNDRR, n.d.).

Anand et al. found that while initiatives reviewed in the study aligned with the SFDRR goals, several challenges hindered their full implementation. These challenges included systemic issues in planning and execution, the need for greater community engagement, and the incorporation of modern and suitable building practices. The findings suggest that current policies and planning efforts often fall short of the holistic approach advocated by the SFDRR.

Similarly, Goniewicz and Burkle Jr.'s (2019) article focuses on implementing the SFDRR, highlighting the importance of understanding disaster risks and improving disaster preparedness to enhance response effectiveness. This includes adopting global targets and indicators to reduce disaster risks and boost national preparedness and response capabilities. However, they also identified a significant challenge in integrating at national and local levels, emphasising the challenge of comprehensively understanding how different sectors are integrated.

Sasaki et al. (2021) further discuss the implementation of the Sendai Framework for Disaster Risk Reduction (SFDRR), emphasising its universal priority of disaster risks, enhancing disaster preparedness and 'Building Back Better' during recovery and reconstruction as an essential part of coordinating various stakeholders' priorities. They reference Aceh's

rehabilitation and reconstruction phases following the impacts of the Sumatra–Andaman earthquake in 2004, where stakeholder priority varied widely based on their roles, responsibilities, and available resources, noting that this significantly impacted the efficiency and effectiveness of recovery efforts.

Through their discussions, these articles underscore the importance of integrating BBB principles into disaster management strategies to enhance preparedness, resilience, and effectiveness in responding to and recovering from disasters. They also highlight the ongoing need for coordinated efforts and comprehensive understanding across various sectors to fully realise the global goals of the SFDRR at a local level.

### 3.2.4 Proposed Models and Theories in Indicator Selection and Prioritisation

A range of insights into approaches and methods for enhancing resilience and recovery planning have been identified, encompassing data-led approaches, indicator development, and frameworks. The subsequent discussion explores these insights further.

Quantitative-based disaster management models involve data analytics and empirical evidence to inform decisions. Kobayashi et al. (2015) describe using quantitative metrics to evaluate post-disaster reconstruction efforts. Specifically, a paper discusses how academia can help frame useful dialogues that facilitate reconstruction plans based on this collated data. Lines et al. (2022) discuss a research study that evaluates the progress of shelter and recovery efforts over eight months after a disaster. The study uses statistical analysis to measure different communities' success in providing shelter and rebuilding efforts. The study also examines the impact of various socio-economic and locational factors on recovery rates by detailed surveys of affected households and an analysis of recovery processes over time. The study collected comprehensive data from affected individuals to help improve future disaster response planning and execution, highlighting the importance of a data-driven approach in recognising priority for action.

Similarly, needs-based approaches, such as those described by Ananda et al. (2019), Sameen et al. (2018), and Talib et al. (2018), rely on accurate and reliable data to assess specific requirements and conditions of the affected community. For example, Talib et al. discuss the implementation of the Damage, Loss, and Needs Assessment (DaLNA) methodology to

evaluate the critical needs of communities following disasters. Using this methodology, this paper explicitly addresses community empowerment through targeted reconstruction and rehabilitation efforts affected by severe flooding. Ananda et al. outlines a focused assessment of infrastructural resilience in Padang City using a scorecard method from the United Nations Office for Disaster Risk Reduction (UNISDR). The technique involves engaging local stakeholders and authorities to identify and prioritise infrastructural needs and vulnerabilities to enhance disaster preparedness and recovery efforts. Sameen et al.'s article references an index to assess and prioritise disaster recovery based on socioeconomic indicators.

These demonstrate various strategies that use quantitative evaluations, data-oriented techniques, and needs-based approaches dictated by data to monitor and evaluate the progress of recovery and reconstruction, measure outcomes, identify gaps, and adjust strategies. However, collecting and analysing data pose unique challenges. The chaotic nature of disasters and urgent needs can impede systematic data gathering in the early phases after the impact of a disaster. In these movements, rapidly changing environments make obtaining comprehensive information difficult. Access constraints, limited resources, and disruptions in infrastructure further complicate data collection efforts. Inadequate or inaccurate data can have severe consequences, leading to misdirected response efforts and misallocation of resources. This can worsen vulnerabilities and prolong suffering for affected communities. This was a primary challenge identified in the article by Anand et al. (2022), which discusses the need for better data collection, in-depth assessments, and coordinated response strategies to improve resilience effectively.

Sapeclay et al. (2019) research focuses on the resilience of construction organisations, emphasising the importance of leading and dominant indicators. These indicators are vital for industry leaders and practitioners to effectively develop, evaluate, and execute disaster recovery strategies. By focusing on the construction industry, this framework provides practical tools for organisations to enhance their resilience through strategic planning and implementation.

Fischer et al. (2018), present a mathematical framework for assessing and enhancing urban resilience against threats like natural disasters and terrorism. It integrates classical risk assessment with resilience indicators and a performance-time relationship, which helps

monitor urban system degradation. This framework simulates urban elements to evaluate threats, vulnerabilities, and recovery options, offering a comprehensive risk and resilience assessment. Its limitation lies in its complexity and the need for detailed data and high technical expertise, which may be a barrier to implementation in less developed regions.

Sinha et al.'s (2022) paper proposes a framework to promote 'equitable resilience' and 'relational wellbeing' among rural migrant households in Bihar, India, particularly targeting marginalised communities. The framework addresses traditional resilience model gaps by incorporating context-specific social power structures and individual subjectivities. It includes material, relational, and subjective dimensions to assess and improve migrants' well-being comprehensively. Despite its innovative approach, it faces challenges in data reliability, implementation complexity, and resistance due to deep-rooted social inequalities.

Both Sapeclay et al. and Fischer et al. work employ structured, indicator-based approaches but differ in their focus areas—resilience of construction organisations versus urban resilience. In contrast, the Sinha et al. paper introduces a more holistic and socially nuanced framework that addresses broader social dynamics and individual perceptions, setting it apart from the other two frameworks' more technical and data-driven approaches. While all three frameworks aim to enhance resilience, their applicability and effectiveness are limited by the specificity of the sector, the requirement for specialised knowledge, and the sociocultural context of their implementation.

The reviewed literature presents a diverse array of approaches for enhancing resilience and recovery planning, ranging from data-driven models to needs-based assessments and holistic frameworks. Each approach offers valuable insights and tools for improving disaster management, yet each also comes with inherent challenges, particularly in data collection, implementation, and contextual adaptability. Quantitative models, such as those by Kobayashi et al. and Lines et al., emphasise the importance of empirical data in guiding recovery efforts. Still, they also highlight the difficulties in obtaining accurate data during chaotic post-disaster conditions. Needs-based approaches, like those discussed by Talib et al., Anand et al., and Sameen et al., underscore the necessity of targeted interventions based on reliable assessments of community needs. However, these are often hampered by resource constraints and infrastructural disruptions. Meanwhile, more structured indicator-based frameworks, such as

those proposed by Sapeclay et al. and Fischer et al., offer strategic tools for resilience planning within specific sectors but require specialised knowledge and data, limiting their broader applicability. Finally, Sinha's holistic framework introduces a novel perspective by incorporating social dynamics and individual well-being into resilience planning, though its implementation may face resistance due to entrenched social inequalities. Overall, while these frameworks collectively contribute to a more comprehensive understanding of disaster resilience, their effectiveness hinges on the ability to address the complexities of data collection, contextual relevance, and practical application in diverse environments.

### 3.2.5 Synthesised Frameworks

Two frameworks emerged in the literature that address the issue of inconsistent concepts and language used when discussing the dimensions of disasters. Moreover, these frameworks acknowledge the complex interplay among various dimensions and underscore the necessity for synthesis and streamlining for a more unified approach. They both aim to enhance clarity and understanding of the multifaceted aspects of disasters that must be comprehensively addressed to effectively "Build Back Better."

Shi et al. (2021) introduce a new conceptual framework called New-Build Back Better (N-BBB), which synthesises the "Building Back Better" (BBB) philosophy with a post-disaster needs assessments (PDNA). This framework aims to enhance post-disaster recovery and reconstruction by providing policy-making guidance, ensuring that immediate needs and long-term community resilience are addressed. It was developed in response to the Changning Ms 6.0 earthquake in Sichuan Province, China.

The framework was developed through field investigations, collecting demographic, economic, and infrastructural data from the affected areas. In conjunction with a literature review, this data contributed to developing an index system for the N-BBB framework that includes various indicators across the three dimensions. These indicators quantitatively measure the needs and the effectiveness of the recovery efforts. The three main dimensions or categories the N-BBB addresses are.

- Post-disaster reconstruction needs
- Disaster risk reduction

- Enhancement of community resilience.

The paper elaborates on creating this framework, introducing 35 demand indicators spread across nine sectors or components to support post-disaster recovery and reconstruction. These sectors include the following.

- Basic Living Assistance
- Industrial and Economic Reconstruction
- Urban and Rural Housing
- Social Security
- Urban and Rural Infrastructure
- Policy and Planning
- Empowerment and Participation
- Community Reconstruction
- Sustainable Livelihoods.

Each sector/ component features specific indicators representing the disaster survivors' needs, facilitating urgent and important recovery measures and enabling a more tailored and effective recovery process. The development of these indicators is considered by Shi et al. as crucial for providing a comprehensive view of community needs post-disaster and ensuring all aspects of recovery and reconstruction are considered. The framework aims to restore the affected areas and enhance their resilience against future disasters, embodying the BBB ethos. Overall, the integration of these indicators marks a significant advancement in aligning recovery efforts with disaster-affected communities' specific conditions and needs, thereby making the recovery process more effective and sustainable.

As such, the framework serves as comprehensive policy guidance for local and national authorities, facilitating recovery operations that respond to immediate disaster impacts while supporting long-term resilience. N-BBB also promotes robust community involvement in the recovery process, ensuring alignment with the people's actual needs and integrating local knowledge and practices.

In 2014, researchers Mannakkara and Wilkinson developed a BBB framework in response to the confusion of practitioners choosing which BBB guideline to follow, which increased

exponentially in the years since Clinton's report. Here, the BBB framework is described as a classification of strategies most acted on (or ought to be acted on) based on extensive case study research. Case studies were not limited to location or disaster type, making the application intentionally broad. The framework's initial concepts were developed by analysing seven key guidelines in post-disaster recovery. They were as follows.

- Key Propositions for Building Back Better, UN Secretary-General Special Envoy for Tsunami Recovery
- Principles for settlement and shelter, UNDRO
- Post-Tsunami Recovery and Reconstruction Strategy and Build Back Better Guiding Principles, Sri Lanka
- Rebuilding for a more sustainable future, VBRRA, Australia
- Bam's Reconstruction Charter, BRSSPA, Iran
- Recovery and Reconstruction Framework, VBRRA, Australia
- Recovery Strategy, CERA, New Zealand

Developing the framework for post-disaster recovery involved a detailed analysis of various documents to identify distinct elements critical for effective recovery. As these unique dimensions were recognised, they were systematically catalogued and annotated with frequency markers to denote how often each appeared across the reviewed documents. The recurrence of certain concepts in most documents highlighted their pivotal role in facilitating a successful recovery, underscoring their significance in the recovery process.

These concepts were then organised into broader categories collectively representing fundamental recovery aspects. Each category was further refined by identifying core principles essential for achieving the objectives set within those categories. This organisation and categorisation led to the formulation of the framework.

They are structured around six principles distributed under the three main categories. This framework was guided by an overarching principle of monitoring and evaluation to ensure ongoing assessment and adaptive management throughout the recovery process. This structured approach and the resulting framework are visually summarised in Figure 3.1.

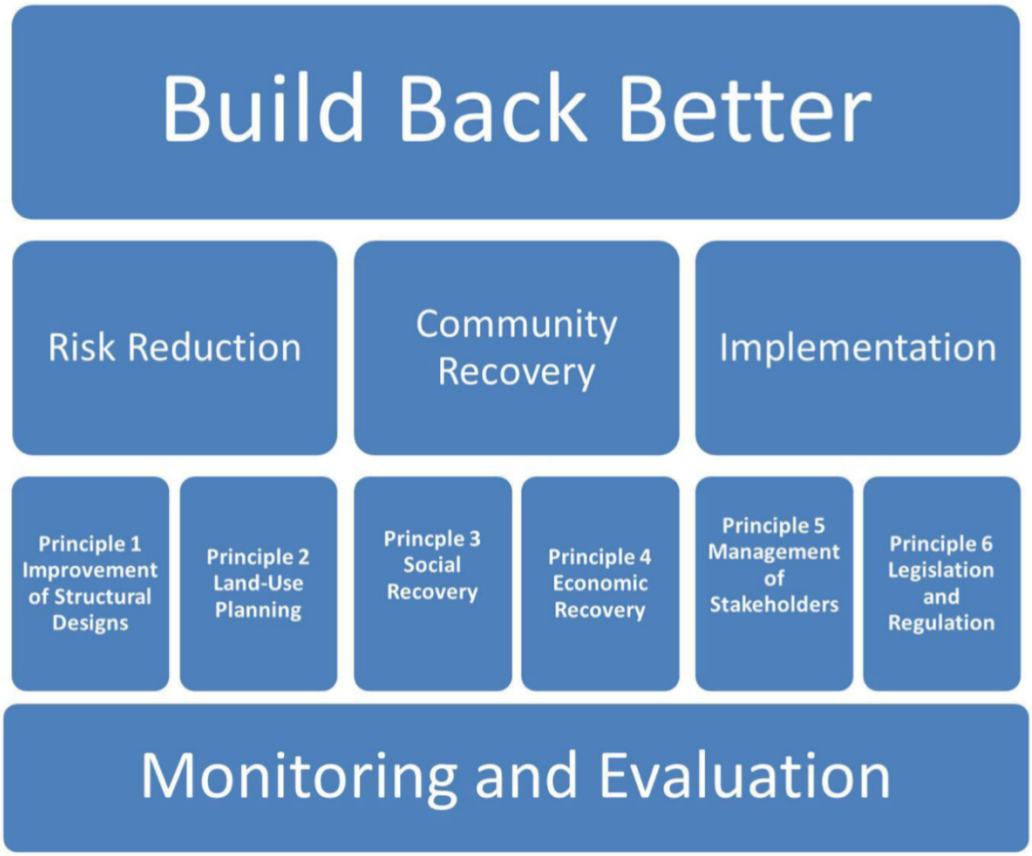


***Figure 3.1*** *Build Back Better Framework (Mannakkara & Wilkinson, 2013)*

In 2014, revisions were made to the earlier 2013 Building Back Better Framework (BBB-F) version. This updated framework incorporated the latest insights from academic research and practical experiences, drawing on various case studies spanning different types of disasters and geographical locations. The goal was to universally enhance the framework's applicability, ensuring its relevance across various disaster scenarios.

Additionally, the revised BBB-F aligns more closely with the updated priorities for disaster risk reduction set forth by the United Nations, specifically reflecting the strategies outlined in the Sendai Framework for Disaster Risk Reduction (SFDRR). A significant change in the 2014 update was the introduction of a new principle focused on 'Early Warning and Disaster Risk Reduction (DRR) Education.' This addition underscores the importance of proactive measures and educational initiatives in mitigating disaster impacts.

Another key adjustment in the 2014 revision was the repositioning of 'Monitoring and Evaluation' from its former role as an overarching guiding principle to being one of the specific principles within the framework. This change emphasises the critical role of continuous assessment and feedback in the disaster recovery process, facilitating ongoing improvements and adaptability. These updates and the restructured principles of the BBB-F are illustrated in Figure 3.2.

***Figure 3.2*** *Modified Build Back Better Framework (Mannakkara & Wilkinson, 2014)*

In 2018, the publication 'Resilient Post Disaster Recovery through Building Back Better' marked a significant enhancement to the modified framework by introducing 87 indicators. These indicators were developed based on extensive case study research, reflecting a deep dive into various disaster recovery scenarios and outcomes. Integrating these indicators into the existing framework was strategic and aimed at providing detailed, actionable guidance to practitioners and policymakers on effectively implementing the Building Back Better (BBB) principles in real-world settings.

The introduction of these indicators also underscores the framework's commitment to staying aligned with the latest academic research and practical insights in disaster recovery. By continually updating and refining its components, the framework maintains its relevance and effectiveness, helping communities not just to rebuild but to emerge stronger and more resilient in the face of future disasters. This ongoing evolution reflects the dynamic nature of disaster recovery and the need for frameworks that can adapt to new challenges and findings.

## 3.3 Challenges and Issues

The literature identifies several key challenges, which can be divided into two categories. The first considers the complexities of operating in disaster contexts, including navigating pre-existing systemic issues, prioritising needs, and the challenges of ongoing or sequential disasters. The second category concerns issues in successfully addressing the principles of BBB, indicating that frequently, dimensions of disaster recovery overwhelm one another.

In the first category, articles identified the challenges of pre-existing systemic issues, recognising that a successful intervention that improves a community's resilience must address these first. These systemic issues that were identified include poor construction practices, inadequate maintenance, and governance and bureaucratic challenges. The presence of any of these led to significant challenges in rebuilding to better standards post-disaster. Furthermore, it was found that when long-term sustainability goals were considered, they often fall short, with immediate needs taking precedence (Der Sarkissian et al., 2021; Fischer et al., 2018; Khalili et al., 2018).

This, in turn, contributes to the concern of unintentionally exacerbating pre-existing issues and contributing to social inequities by neglecting systemic conditions. Most discussed is the impact this has on socio-cultural conditions of affected populations leading to segregated communities (Gautam & Cortés, 2021; Nadiruzzaman & Wrathall, 2015; Sharma et al., 2021; Fayazi et al., 2019).

Additionally, as discussed in Chapter One, the increasing frequency and severity of disastrous events are recognised as a considerable challenge. This situation requires the crafting of recovery strategies that are comprehensive enough to handle multiple simultaneous impacts or the complexities of rapidly changing conditions (Jouannic, et al., 2020; Lines et al., 2022).

Further to this is the challenge of coordinating multiple stakeholders responding to disasters with varying interests and priorities (Gjerde, 2016; Owusu-Sekyere et al., 2021; Platt et al., 2019).

The second category concerns implementing the Build Back Better (BBB) principles effectively, with several papers noting the complexities of balancing the various dimensions. Many articles, for example, focus on integrating community-based approaches and ensuring participatory recovery efforts, identifying the lack of such practices as a major issue in achieving a resilient recovery (Hidayati, 2018; Imperiale & Vanclay, 2020; Maly, 2017). Further to this, several articles highlight notable gaps in policy and criticise existing frameworks for failing to incorporate disaster risk reduction dimensions effectively (Falk et al., 2019; Forster, Shelton et al., 2022; Medel et al., 2020).

### 3.4 Discussion

Over a fifth of the research explicitly discusses the need for two or more dimensions to be simultaneously addressed to facilitate an effective recovery. These articles emphasise that a critical link exists between specific dimensions (or components of a dimension). Highlighting that action in one directly impacts the other, or that action in one without action in the other will exacerbate vulnerabilities rather than contribute to sustainable solutions and building back better. While the specifics of these dimensions are often context-specific with these investigations, repeated studies into the interconnectedness between the same dimensions suggest that they are intrinsically linked, transcending contextual variations.

For example, a significant theme within the literature is prioritising community-centric indicators. This approach advocates for integrating community engagement strategies and models into recovery planning, underlining the importance of incorporating local perspectives and needs in disaster recovery efforts. The persistent research on this specific dimension suggests that other dimensions within the framework might overshadow community recovery efforts.

This highlights two things. First, it advises that decision-makers must select indicators that reflect the multifaceted nature of disaster recovery to guide their actions and activities and measure impact. These indicators should span various dimensions to embrace a holistic

recovery. Second, it suggests prioritising indicators that impact multiple dimensions of disaster recovery. For example, effective policy and governance emerges as foundational for supporting other areas like economic recovery and stakeholder coordination. The literature emphasises that a holistic approach to disaster recovery is most effective when it accounts for the complex interconnections and potential dependency among these dimensions. This means that indicators and priorities for disaster recovery should be chosen with these relationships in mind, leading to a more robust framework for sustainable resilience.

The formalisation of the Build Back Better (BBB) concept within the Sendai Framework for Disaster Risk Reduction (SFDRR) signalled to national governments that a holistic approach is essential for achieving sustainable resilience. While this reinforced what many in the field already understood about resilience, it was also argued that it introduced complexities in disseminating global targets and national policy into effective initiatives due to the size and scope of the framework.

Implementation mechanisms like the 'Ten Essentials for Making Cities Resilient Toolkit' and guides such as the Word into Action (WiA) series provide an overwhelming number of indicators for various key stakeholders within different sectors to assist with this; however, the number of articles exploring the various disaster dimensions and how they intersect is telling. It indicates that comprehending the interconnectedness, dependencies, and prioritisation between dimensions, dimension components, and indicators is critical, yet it is not always well understood or acted on.

Several approaches have been developed to ease this issue and guide decision-makers in selecting and prioritising appropriate indicators. These include data-driven qualitative methodologies that dictate needs-based approaches and qualitative indicator-based approaches that highlight specific benchmarks or signs that reflect what success looks like, guiding actions and activities to reach these milestones.

These are largely context-specific, designed based on a singular event, sector, or with a particular stakeholder in mind. There is diversity in the terminology used across related articles, where dimensions and their components are described with slight variations in labelling. They

highlight the absence of a unified framework regarding the specific dimensions that constitute a successful recovery, accurately reflecting the principles of Building Back Better (BBB).

The literature reveals two frameworks that aim to address these issues: the New-Build Back Better model (N-BBB) and the Modified Build Back Better Framework (BBB-F).

The N-BBB framework introduced by Shi et al. presents a synthesised overview of disaster recovery by integrating comprehensive post-disaster needs assessments with the "Building Back Better" philosophy. This framework was developed using demographic, economic, and infrastructural data specific to the affected areas of the earthquake in Sichuan Province, China, so the resulting index system is tailored to the unique characteristics of that region. While the framework offers valuable insights and tools for disaster recovery, its applicability is limited when considering its implementation in regions with different socio-economic and environmental contexts.

In 2014, researchers Mannakkara and Wilkinson created the BBB-F to synthesise dimensions to provide a structured recovery guide amidst numerous post-disaster guidelines. Revised in 2016, it incorporated broader research and aligned with the United Nations' disaster priorities. By 2018, the framework included 87 specific indicators to aid its implementation, ensuring its relevance and adaptability in disaster recovery. The strengths of this framework include its comprehensive, evidence-based approach, flexibility in adapting to new research and experiences, and being kept intentionally broad to increase its applicability across various contexts.

This discussion of the current body of research provides a comprehensive snapshot of where disaster management is today. It highlights that there are clear and important dimensions of disaster recovery that must be addressed simultaneously to install resilience and build back better effectively. These dimensions have been synthesised and catalogued, most effectively in the BBB-F. However, the implementation of such frameworks continues to pose significant challenges. Methods and strategies such as data-led or indicator-based help guide and design actions and activities. Still, they do not account for the interconnectedness presently discussed in the research or acknowledged by implementation guides of existing frameworks. Furthermore, the component of community recovery is so prolifically researched that it

highlights implementation does not account for the dependency on prioritisation of these dimensions.

Only a few articles explore a priority between disaster dimensions. For instance, Era discusses the need to establish a social policy to drive social capital, thus facilitating cooperation and coordination. Takim recognises that government incentives are a driving force of business recovery, which in turn drives economic revival. Such insights begin to establish a clear pathway or a roadmap to recovery for decision-makers in future disasters.

## 3.5 Future Research Directions

The existing literature on Building Back Better (BBB) in disaster management underscores the critical need for an approach that clarifies the interconnections, dependencies, and prioritisation among the dimensions of disaster recovery. This clarity is essential to guide decision-makers in assessing the broader impact of their actions. A comprehensive approach should encompass all facets of disaster dimensions to ensure a holistic element, preventing the overshadowing of areas such as community recovery by other dimensions.

Such an approach would begin to address the challenges and gaps identified in the literature. For instance, a roadmap that clearly delineates the dependencies between dimensions would pinpoint areas that must be addressed first, including pre-existing conditions, to ensure that initiatives have a meaningful and sustained impact.

Moreover, this approach must be inherently adaptable to manage disaster scenarios' complexities effectively. This flexibility is crucial for handling multiple impacts and rapidly evolving conditions, thus allowing for timely modifications in response to emerging challenges and new information. Thus, this study will explore the development of such an approach that aligns with the evolving needs and complexities highlighted throughout this literature review.

## 3.6 Conclusion

This literature review has identified gaps within disaster recovery frameworks, directly addressing the study's main objective. An analysis of 58 articles has illuminated key areas where the integration of recovery dimensions can be enhanced to bolster resilience and

sustainability in disaster management. The findings indicate a strong need for more holistic approaches encompassing dimensions of disaster recovery such as economic, social, environmental, and infrastructural aspects. Reflecting on these insights, it becomes apparent that improving the comprehensiveness and adaptability of recovery frameworks is essential. Future research focused on bridging these identified gaps holds the potential to transform disaster management practices, making them more effective in addressing global challenges and fostering more resilient and sustainable communities.

# Chapter Four, Hierarchical Decomposition System Analysis

## 4.0 Introduction

Chapter Four examines the hierarchical decomposition system analysis (HIDECs) of the 'Build Back Better Framework' (BBB-F), using the indicators in the publication 'Resilient Post Disaster Recovery through Building Back Better'. The chapter first gives an overview of the framework, detailing the newly introduced components and indicators in the formally mentioned publications and their distribution among the established principles and categories of the BBB-F. It discusses the number of indicators in each, hypothesising how these will dictate and inform the holistic implementation and potential priority. It then shows the HIDECs matrix, which tracks the interconnectedness and dependencies between each indicator. The resulting 'family tree-like' diagram from the HIDECs algorithm illustrates these connections and dependencies as a hierarchy. The subsequent sections are dedicated to providing an in-depth look into the meaning of this diagram. The chapter concludes with a summary of the analysis findings, and a reflective discussion of the findings concludes this chapter.

## 4.1 Preliminary Analysis of Disaster Risk Reduction Frameworks

An initial HIDECs analysis was conducted on several of the prevalent frameworks previously identified: The Sendai Framework for Disaster Risk Reduction (SFDRR), the latest edition of 'The Sphere Humanitarian Charter and Minimum Standards in Disaster Response' (Sphere), and the 2016 Build Back Better framework (BBB-F). Representing frameworks from a development, humanitarian, and research perspective. Initially, the analysis focused on the connections between the components of the frameworks one organisational tier above indicators. The thinking was that these best encapsulated the dimensions of disasters discussed in Chapter Three (see Appendix D for the conference paper on the study). This approach significantly streamlined the analysis matrix, reducing the complexity, for example, from 249 indicators in the Sphere framework, which suggested 62,001 possible relationships, to 53 components, indicating 2,809 potential relationships.

However, because of this reduction, the resulting priority diagrams from this initial analysis did not yield the expected clarity. It became apparent that components were too broad and highly interconnected, which presented challenges. This high level of interconnection among

components led to the resulting hierarchical diagrams appearing linear, with HIDECs diagrams with a similar number of groups as there were components. This diminished the analysis's utility in establishing a meaningful roadmap of a highly complex framework as the breadth and interconnectedness of the components complicated efforts to delineate clear groups and effectively obscured distinctions necessary for a nuanced understanding of the framework's holistic nature. Recognising the limitations of analysing at the component level, a subsequent pilot HIDEC analysis of indicators proved more insightful. Using the indicators further disseminated the components to an effective level for HIDECs to make useful and insightful groups that could then dictate both the links between components and highlight elements of components that ought to be prioritised. This suggests that to get meaningful insights from the HIDEC analysis, the indicators must be considered over the components.

The choice to use the BBB-F over another framework like Sphere or the SFDRR was informed by several critical factors relating to the study's scope and feasibility. The Sphere framework, for example, in its latest edition, includes 53 standards (components) and 249 key actions (indicators). This extensive number of indicators poses a significant challenge for a thorough analysis within the constraints of this study, as it is nearly three times the size of the BBB-F. With its more manageable set of 87 indicators, the BBB-F allows for a more focused and detailed examination of disaster risk reduction strategies. In addition, Sphere has a considerable focus on the immediate needs of the affected population; this means the framework often negates dimensions such as economic recovery and disaster risk reduction—two critical dimensions that were identified in the literature review.

Unlike the SFDRR, which often necessitates referencing additional materials and presents varying clarity levels regarding its process indicators, the BBB-F provides clearly defined indicators that fully encompass all dimensions. The SFDRR's indicators, when specified, are categorised by different levels of governance—regional and national governments, local government, and non-governmental organisations (NGOs)—which adds another layer of complexity to the analysis. For instance, in the pilot study, only 35 components targeted specifically at NGOs were selected from the SFDRR’s guides, representing just a fraction of the vast amount of information available for implementing the Sendai framework. Thus, there is a similar limitation to using Sphere, where the vastness and specific targeting hinder an effective analysis.

However, the SFDRR cannot be entirely disregarded, as it is considered the global blueprint for disaster risk reduction. It emphasises a holistic approach and "Building Back Better" as essential tenants. The BBB-F aligns with updated United Nations priorities and is structured to reflect more recent findings from comprehensive case studies. Its emphasis on practical application in post-disaster scenarios makes it particularly relevant. It effectively cuts through the complexity of the SFDRR indicators while encompassing its core objectives.

Finally, the 2016 revisions of the earlier 2014 BBB-F and the further research to include the 87 indicators integrate the latest research, evidenced by the addition of principles like 'Early Warning and DRR Education' and 'Monitoring and Evaluation'. These updates highlight that the framework remains at the forefront of current research and practice.

Given these considerations, the BBB-F was deemed the most suitable and effective tool for this study. It allows a more structured, transparent, and manageable approach to demonstrate interconnectedness and priorities in disaster dimensions.

## 4.2 Analysis of the Build Back Better Framework

Table 4.1 shows the distribution of the 87 indicators throughout the framework. Each of the three main categories is listed: Disaster Risk Reduction (DRR), Community Recovery (CR), and Effective Implementation (EI). Under each heading are the associated principles: Resilient physical Assets, Multi-hazard-based land use, DRR Education and Awareness, Psychological and Social Recovery, Business Recovery, Institutional Mechanism, Legislation and Regulation, and Monitoring and Evaluation. These are further disseminated into the relevant components. The naming conventions and subsequent indicators are taken from the publication above.

This shows how indicators are distributed throughout the framework. DRR has seven components and 25 indicators, CR has five components and 20 indicators, and EI has eight components and 42 indicators. At face value, it comes across that the number of components and indicators could reflect the inherent complexity and broad scope of each category. For example, EI having the most indicators suggest that implementing strategies effectively across different contexts and scales involves more nuanced and detailed approaches than DDR or CR, reflected in the significant number of indicators in the category.

| Category | Principle | Component | No. Indicators |
|---|---|---|---|
| Disaster Risk Reduction | Resilient Physical Assets* | Building codes | 4 |
| | | Cost and time | 3 |
| | | Quality | 5 |
| | Multi-hazard land-use Planning | Risk-based Zoning | 4 |
| | | Resettlement | 5 |
| | Early warning and DRR education | Early warning | 2 |
| | | DRR education | 2 |
| Community Recovery | Psychological and social recovery | Community support | 6 |
| | | Community involvement | 3 |
| | Economic recovery | Economic recovery strategy | 5 |
| | | Funding, decision-making and training | 2 |
| | | Business support and promotion | 4 |
| Effective Implementation | Institutional mechanisms | Choosing appropriate institutional mechanisms | 8 |
| | | Fostering partnerships | 3 |
| | | Grass-roots level involvement | 4 |
| | | Quality assurance and training | 4 |
| | Legislation and regulation | Compliance | 9 |
| | | Facilitation | 7 |
| | Monitoring and Evaluation | Compliance | 3 |
| | | Improvement | 4 |

*Note: the priority ‘Resilient Physical Assets’ was relabelled as ‘Structural Resilience between the framework and the book publication

***Table 4.1*** *Expanded BBB-F Showing Indicators Distribution*

However, it could also suggest that the components within EI may be more critical to the success of the entire framework and, thus, are higher in priority (although no less equal) to other indicators and their respective components and principles. By this theory, when considering the number of indicators within each component, it may be hypothesised that the priority of the framework can be presented in a way reflected in Table 4.2.

Table 4.2 organises the framework according to the number of indicators associated with each component, revealing a distinct hierarchy and nine priority tiers. The category EI dominates the top three tiers within this structure, highlighting its critical importance. Specifically, 'Compliance' ranks at the top, followed by 'Choosing Appropriate Institutional Mechanisms' and 'Facilitation'. This arrangement underscores these components' pivotal role in the overall framework.

| Priority | Category | Principle | Component | No. Indicators |
|---|---|---|---|---|
| 1 | Effective Implementation | Legislation and regulation | Compliance | 9 |
| 2 | | Institutional mechanisms | Choosing appropriate institutional mechanisms | 8 |
| 3 | | Legislation and regulation | Facilitation | 7 |
| 4 | Community Recovery | Psychological and social recovery | Community Support | 6 |
| 5 | Disaster Risk Reduction | Resilient Physical Assets | Quality | 5 |
| | | Multi-hazard land-use Planning | Resettlement | 5 |
| | Community Recovery | Economic recovery | Economic recovery strategy | 5 |
| 6 | Disaster Risk Reduction | Resilient Physical Assets | Building codes | 4 |
| | | Multi-hazard land-use Planning | Risk-based Zoning | 4 |
| | Community Recovery | Economic recovery | Business support and promotion | 4 |
| | Effective Implementation | Institutional mechanisms | Quality assurance and training | 4 |
| | | | Grass-roots level involvement | 4 |
| | | Monitoring and Evaluation | Improvement | 4 |
| 8 | Disaster Risk Reduction | Resilient Physical Assets | Cost and time | 3 |
| | Community Recovery | Psychological and social recovery | Community involvement | 3 |
| | Effective Implementation | Institutional mechanisms | Fostering partnerships | 3 |
| | | Monitoring and Evaluation | Compliance | 3 |
| 9 | Disaster Risk Reduction | Early warning and DRR education | Early warning | 2 |
| | | | DRR education | 2 |
| | Community Recovery | Economic recovery | Funding, decision-making and training | 2 |

***Table 4.2*** *Hypothesised Priority of the BBB-F*

This implies that EI requires more detailed guidance and attention in BBB interventions; this does not mean they are more critical, but the components reflect areas where specificity and granularity in measurement and action are crucial for success. For instance, the detailed focus on EI suggests an understanding that the best-planned strategies for DRR and CR are only as good as their implementation.

Moreover, the hierarchy also points to a broader spread in priorities 5, 6, 8, and 9, encompassing multiple components from various principles and categories. This tiered approach simplifies the organisation and offers preliminary insights into which components are more nuanced and require more attention due to the more significant number of indicators they encompass.

However, while this method effectively identifies components with potentially greater complexity or importance, it does not address the interconnectedness identified in Chapter Three. The prioritisation based on the number of indicators alone overlooks critical dynamics and interactions that could influence the overall effectiveness of the intervention.

To overcome this, the novel methodology of HIDECs is used to produce a more nuanced understanding of the interconnectedness of the indicators. Appendix A shows a matrix of how each of the 87 indicators is linked. Indicators 1 to 87 are listed across the Y and X axes, and the connection between indicators is shown by an ‘x’. Figure 4.1 shows the family tree-like diagram produced by the hierarchical programming from this matrix. The numbers in this diagram refer to the respective 87 indicators listed in Appendix B.

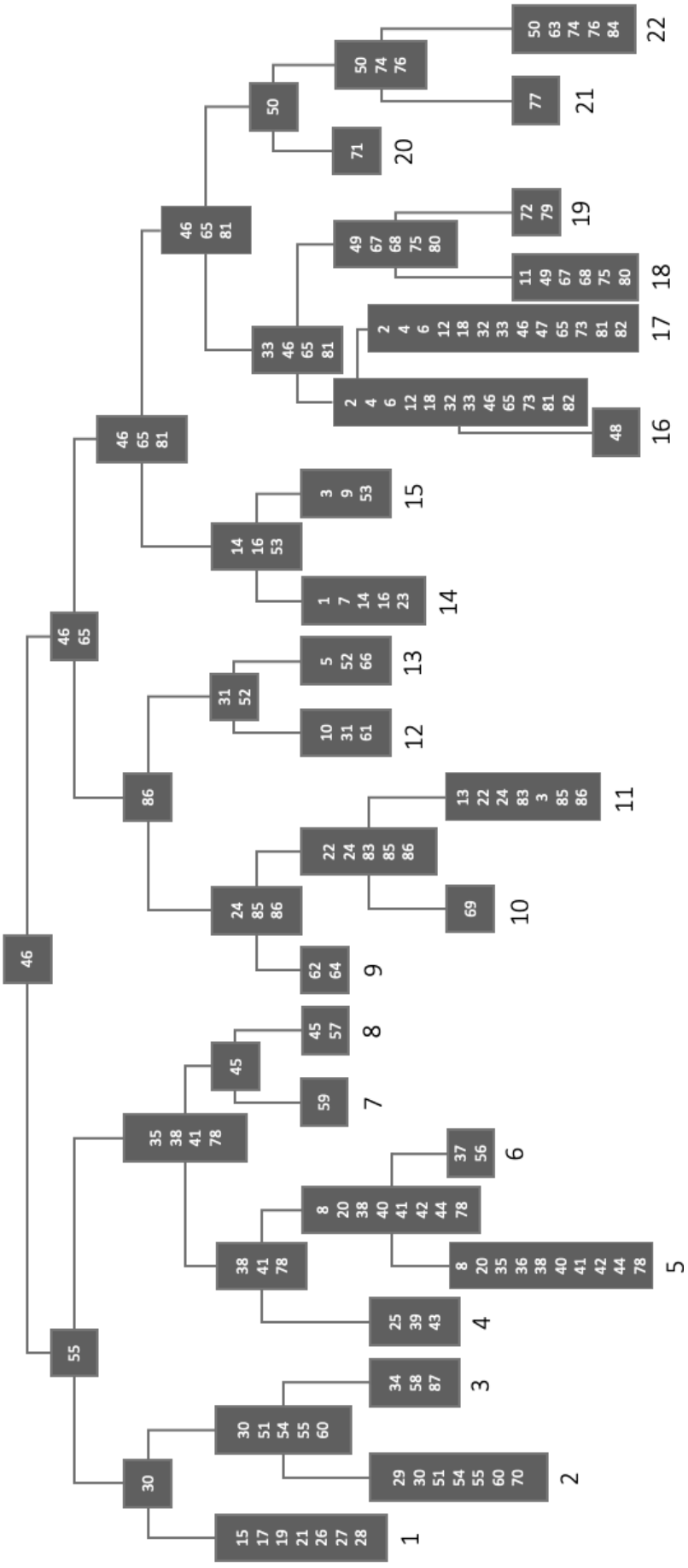


***Figure 4.1*** *HIDECs Diagram of the BBB-F*

## 4.3 Initial Observations

In an initial observation of the data, the matrix used to map the connections between various indicators resulted in a visually striking and informative representation of the framework's intrinsic holistic nature while revealing several key insights.

One of the first observations is the matrix's diagonal symmetry, which arises because connections are bidirectional (i.e., if indicator 1 is connected to indicator 3, then indicator 3 is connected to indicator 1). This symmetry is highlighted through the blue shading.

The connections along the diagonal reveal interactions within the same component, offering insights into how densely connected they are. For instance, in the DRR category under the "Multi-Hazard-Based Land-Use Planning" principle, the "Resettlement" component's indicators are all interconnected, suggesting that these indicators have high interdependence on one another.

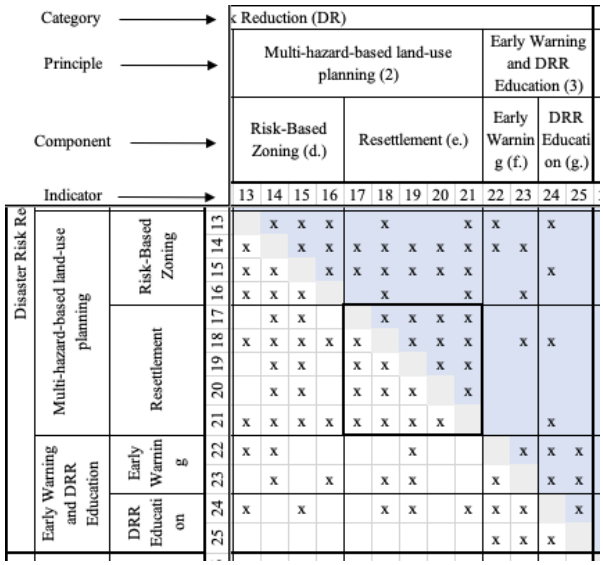


***Figure 4.2*** *An Example of a Highly Interconnected Component in the BBB-F*

This is not surprising as a component is essentially a theme of indicators and, therefore, would be assumed to have a close relationship with each other. However, this level of interconnectedness is not universally observed. In the category of EI, under the principle of "Legislation and Regulation", the indicators within the "Legislation Compliance" component

do not show a similar degree of connection. This could suggest that the indicators that make up this component are highly independent. This could be advantageous in situations where it's important to isolate specific functions as it suggests that they have less influence on other areas of the framework.

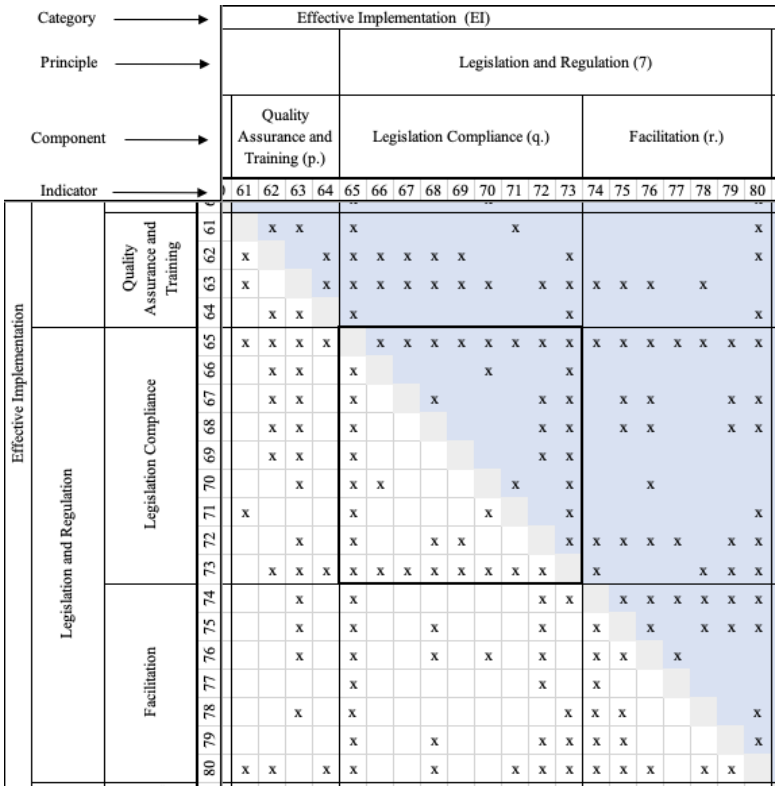


***Figure 4.3*** *An Example of a Less Interconnected Component in the BBB-F*

Moreover, analysing specific 'boxes' or matrix segments can assess how different principles and components interact. For example, the principles of “Psychological and Social Recovery” and “Economic Recovery” from the category CR highly connected with “Resettlement” from DRR and “Multi-Hazard-Based Land-Use Planning”. However, these same principles and the respective components show sparse connections with the “Early Warnings” component from the same DRR category.

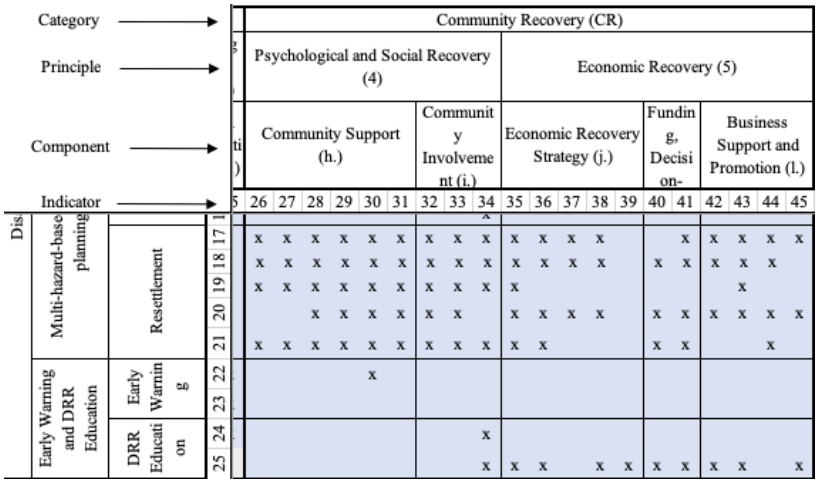


***Figure 4.4*** *An Example of Interconnection Between Various Components in the BBB-F*

An important observation from the matrix analysis highlights the degree of interconnectedness among indicators within the framework. Each indicator has 40 connections on average, meaning, on average, a single indicator directly impacts, influences, or depends on 46% of the framework. This significant level of connectivity reaffirms that a holistic approach is inherent to these strategies.

At the lower end of the spectrum, the least connected indicator has only 20 connections, corresponding to connectivity of 23% with the rest of the framework. This indicates that some components are less integrated and may operate more independently within the system.

Conversely, the most connected indicator stands out with 85 connections, translating to 98% connectivity with the framework. This near-total integration suggests that this indicator (46) plays a crucial and central role in the framework.

Based on these observations, several conclusions can be formulated that, while insightful, may be subject to further verification. Firstly, when there is little connection among indicators, it signals that those indicators (or components) operate more independently within the framework. This can make its implementation more straightforward since the ripple effect through other components is limited. If the indicators are densely connected, it signals that they are significantly more complex, and therefore, managing or implementing requires greater consideration of how a change in one part will affect the whole.

While the matrix provides a useful visual representation of the holistic relationships and connectedness within the framework at a glance, it falls short in clearly illustrating priority among the indicators or effectively grouping indicators that are densely connected, regardless of existing categorisations or organisational barriers such as categories, principles, and components. The HIDECs software addresses these limitations by producing a tree-like family structure (Figure 4.1), where indicators are grouped based on their connections. This approach clarifies the hierarchy and interdependencies among indicators and enhances understanding of their collective impact within the framework.

## 4.4 HIDECs Analysis

Analysis of the HIDECs family tree-like structure begins at the lowest ‘generational tier’ where every group of indicators is labelled for clarity. They have been labelled ‘Group One’ to ‘Group Twenty-two’. The numbers within these groups represent each of the 87 indicators in the framework. Thus, all 87 indicators can be found within the groups on the lowest generational tier, signalling a complete representation of the BBB-F.

The HIDECs software has grouped the indicators by applying Alexanders' mathematical algorithm based on the connection's input to the matrix. The groups show the indicators of connectivity within the network. The specific indicators grouped are highly connected to each other, suggesting a solid relationship. It signals that addressing one will significantly influence another within the same set. At the same time, these groups are significantly disconnected from indicators in other groups, showcasing distinct sections.

This grouping highlight's distinct themes within the overall framework, not to be confused with ‘components’, themes of indicators based on subject relevance. A decision maker considering an indicator within one of these groups must consider the other indicators within its group and the indicators above. In this way, guidance is provided to navigate holistically through the framework, avoid unintended consequences, and recognise components that are dependent or a priority as support.

The next priority in the analysis is considering the groups a generational tier above the lowest groups. Not all 87 indicators are represented; as the tree progresses, only the most linking

indicator between groups is represented. These may be considered as ‘priority indicators’. In the analysis, they are labelled based on the tier within the hierarchy.

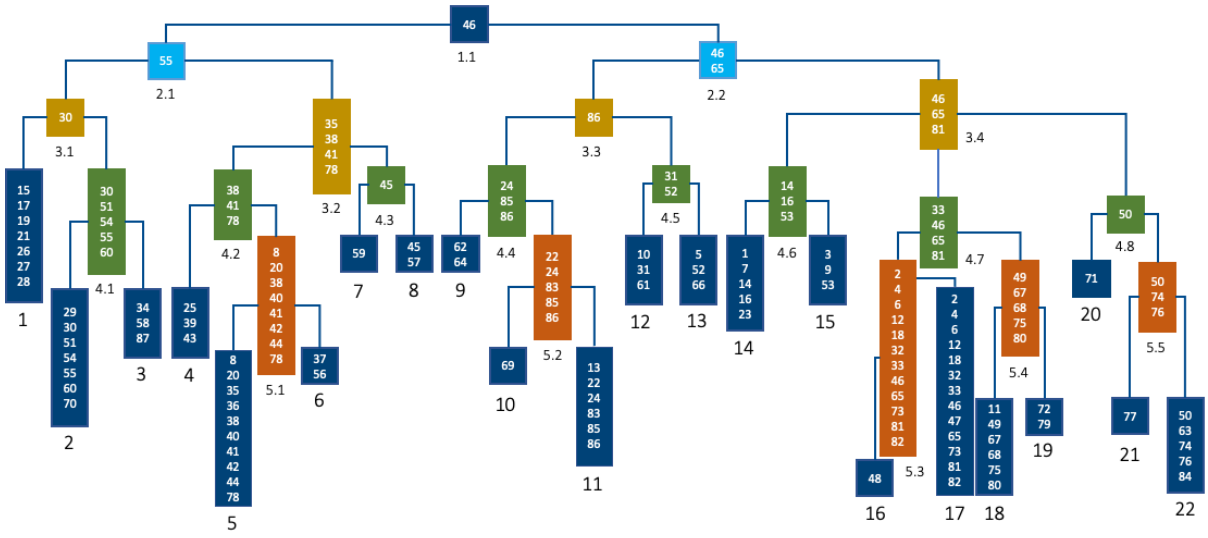


***Figure 4.5*** *HIDECs Diagram Hierarchical Tiers Distinguished*

The figure 4.5 highlights these generational tiers, showing the different groups on each tier and demonstrating how each group is labelled with colour shading for clarity. To continue the family tree analogy, these indicators reflect dominant genes from the lowest generational tier.

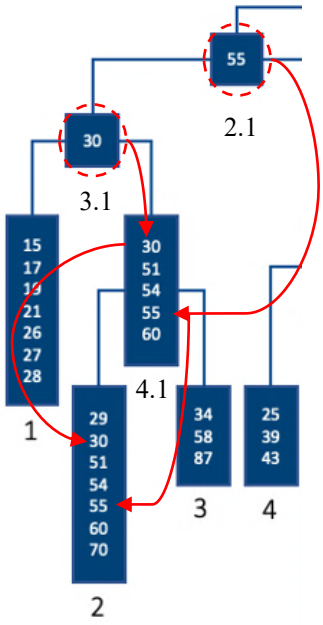


***Figure 4.6*** *Exemplifying Linking Indicators and 'Dominate Genes'*

To illustrate this pattern, Figure 4.6 depicts Groups One, Two, and Three, linked by Groups 3.1 and 4.1, with Group 2.1 positioned above them. Group Two includes indicators 30 and 55 among seven closely interconnected indicators. These seven indicators represent a holistic theme. For example;

| **Group Two Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicator** | |
| **Community Recovery** | | | |
| Psychological and Social Recovery | Community Support | 29 | Organises activities and support groups to bring the community together and build social cohesion. Create a sense of community and togetherness |
| | | 30 | Inform the community regularly on recovery decisions and progress using appropriate channels (e.g., regular public meetings, pamphlets, newsletters, media, text messages, dedicated recovery website, social media) |
| **Effective Implementation** | | | |
| Institutional Mechanism | Choosing Appropriate Institutional Mechanism | 51 | Establish clear roles and responsibilities for all stakeholders |
| | Fostering Partnerships | 54 | Foster effective partnership, collaborations, and effective communication between stakeholders. Create formal partnership if appropriate (e.g., alliances, public-private partnership) |
| | | 55 | Hold regular multi-stakeholder meetings to discuss, plan and implement recovery activities, avoiding duplication and allowing consultation and information exchanges between stakeholders |
| | Grass-roots-level Involvement | 60 | Involve the community as appropriate in planning decision-making and implementation of recovery projects |
| Legislation and Regulation | Compliance | 70 | Mandate community-inclusive and participatory recovery planning and implementation |

***Table 4.3*** *Analysis of the BBB-F, Group 2 Indicators*

Table 4.3 sets out these seven indicators of Group Two in detail. Showcasing the place of organisational structure (Category, Principle, and Component) and the specific indicators that correlate to its identifying number in the group. From this, a holistic theme may be established.

From this, it can be established that the seven indicators form a theme that advocates for legislation and regulation that is community-inclusive and participatory, as two indicators in this set address the "Community Recovery", a subset of the "Psychological and Social Recovery" principle. These indicators (29 and 30) emphasise organising supportive activities and ensuring regular communication. The category EI is represented by two principles,

“Institutional Mechanisms” and “Legislation and Regulation”, with the former encompassing four of the five indicators. The four indicators (51, 54, 55, 60) span across three of the principles components—"Choosing Appropriate Institutional Mechanisms”, “Fostering Partnerships”, and “Grass-roots-level Involvement”—each reflecting a fundamental tenet of engaging key stakeholders and the affected community in the recovery efforts. These components underscore the necessity of defining stakeholder roles, building collaborative relationships, and directly involving the community to ensure that recovery measures are comprehensive and community driven. The final indicator, residing under the “Compliance” component, factors the critical role of legislative frameworks in supporting these ideals. It underscores the importance of mandating community-inclusive and participatory processes (Indicator 70). Advocating for legislative backing that not only sanctions but strengthens the implementation of community-focused recovery strategies.

Group 4.1 consists of five indicators, all appearing in Group Two. Notably, Indicators 29 and 70 are absent, suggesting that they do not play a foundational role in either Group Two or Group Three—the latter also being a derivative of Group 4.1. Group Three contains three unique indicators suggesting that as a group, they function with a degree of independence within the framework. Group 3.1 connects Groups One, Two, and Three under the singular indicator '30'. Interestingly, indicator '30' does not appear in Group 3.1 but acts as the 'dominant gene,' serving as the connecting thread.

Thus, indicator 30 of the CR principle of “Psychological and Social Recovery” and the component of “community Support” states, “Inform the community regularly on recovery decisions and progress using appropriate channels (e.g., regular public meetings, pamphlets, newsletters, media, text messages, dedicated recovery website, social media)”, emerges as a priority indicator with an influence over Groups One, Two and Three.

Above these, in Group 2.1, indicator 55 reappears, illustrating that “dominant genes” may skip a hierarchical tier but remerge as a linking factor in the framework. Once again, this “priority indicator” establishes a critical component to be considered in supporting any initiative involving the indicators of the groups below. It is an indicator of the EI principle “Institutional Mechanisms” component “Fostering Partnerships” and states “Hold regular multi-stakeholder

meetings to discuss, plan and implement recovery activities, avoiding duplication and allowing consultation and information exchanges between stakeholders”

In this example, a decision-maker can effectively utilise the HIDECs analysis of the BBB-F by first selecting the specific indicators from the framework that are intended to guide actions, design initiatives, or measure success. Once these indicators are mapped to one of the 22 groups, the decision-maker will gain insights into additional related indicators that should be considered. This process also helps identify the foundational components by emphasising priority indicators within the framework, guiding more informed decision-making.

Of note is that some sections of the HIDECs family tree have more ‘generations’ than others. Thus, some groups reflect a larger series of priority indicators. For example, Groups Two and Three are 5th generation while Group One is 4th generation. This distinction exemplifies that this methodology can process highly complex networks, distinguishing that some facets of the frameworks require a more comprehensive breakdown than others. Group One is the ‘oldest’ of the lowest tier, only 4th generation from the most connected indicator at the top of the ‘family tree’. The youngest is the 6th generation.

An important aspect to note in the family tree-like structure of HIDECs is the presence of groups with a singular indicator, specifically found in Groups Seven, Ten, Sixteen, Twenty, and Twenty-One. These groups represent indicators that are highly independent within the framework. Initiatives based solely on these indicators will likely have minimal impact on other areas within the framework. This contrasts significantly with the significance of singular indicators in connecting groups. For example, in Figure 4.7, Group Seven features the singular indicator '59'. Above this, in Group 4.3, there is another singular indicator, '45'. However, '45' is a linking factor that connects Groups Seven and Eight, indicating not independence but a necessary interrelationship and representing a relationship between indicator '59' in Group Seven and indicators '57' and '45' in Group Eight. The number of indicators within each group diminishes as they intersect or connect higher up the hierarchy. This reduction in indicators at higher tiers leaves less room for interpretation in the analysis, providing pivotal insights into the most influential dynamics within the framework.

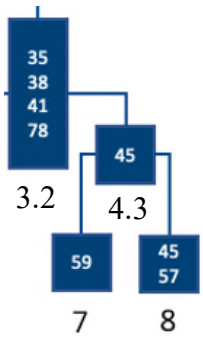


***Figure 4.7*** *Examples of Groups with Single Indicators*

The last thing to consider before moving into a more detailed analysis of the groups and their connections is repeating groups. This is only seen once and is an example of one of HIDEC's limitations discussed in Chapter Two. Figure 4.8 shows this pattern. Two linking groups have the same three indicators: 46, 65, and 81. Figure 4.9 shows that these can be amalgamated to form a singular group with three branches extending from it rather than two.

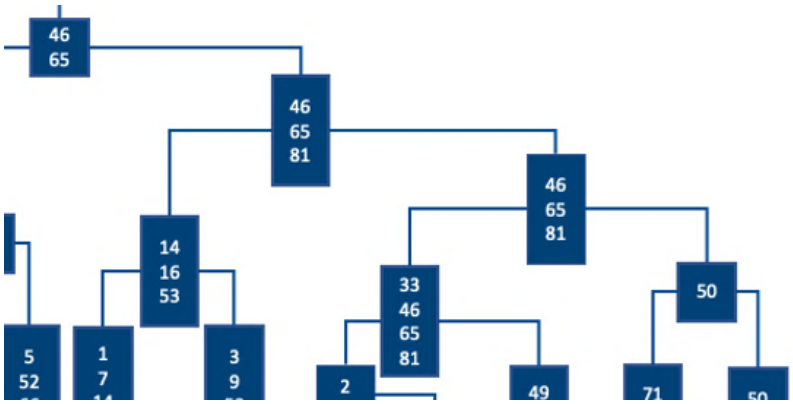


***Figure 4.8*** *Groups of Repeating Indicator*

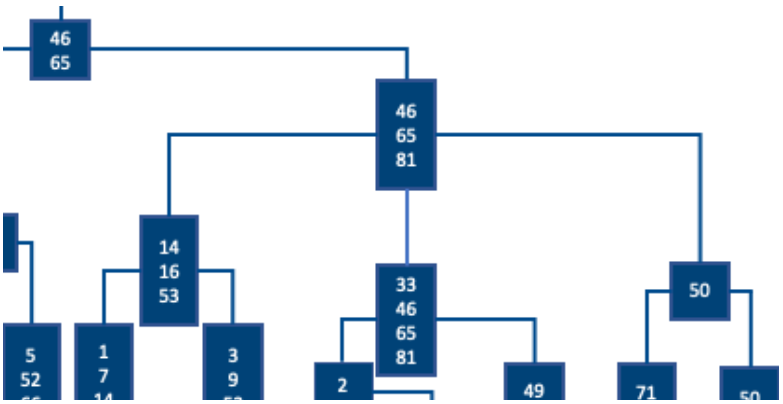


***Figure 4.9*** *Groups of Repeating Indicators Corrected*

The following analysis systematically explores each group within the framework, starting with those on the lowest tier. For ease of analysis, groups on this tier that share a common set of indicators one generational tier above are clustered together, forming nine clusters. Exploring each group involves examining the indicators and noting the principles and components that guide their organisation within the framework. This examination also identifies the holistic themes that emerge from their interconnections.

### 4.4.1 Cluster 1, Groups 1, 2, and 3

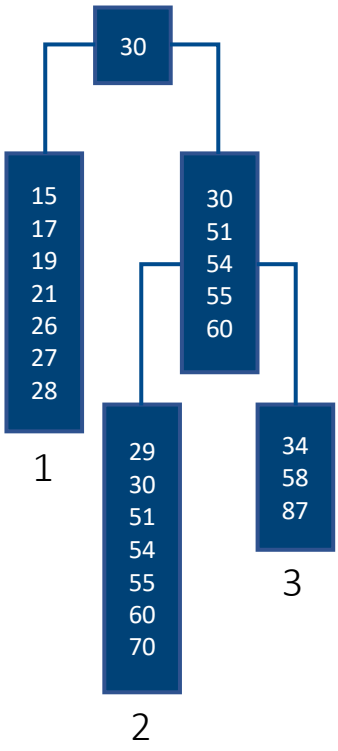


***Figure 4.10*** *HIDECs Analysis of the BBB-F Cluster 1*

**Group One**

Group one has seven indicators. The central theme established through these seven indicators is active engagement with the community in disaster risk reduction and recovery processes. Two main aspects emphasise this theme: being proactive in disaster risk mitigation and having a community-centric recovery approach. The first indicator (indicator 15) clearly emphasises pre-emptive actions to reduce exposure to disasters. This includes strategically relocating assets and communities from high-risk to low-risk areas and creating comprehensive plans that minimise disruption during such transitions (indicators 17 and 19). The second stems from the

indicators under the “Psychological and Social Recovery” principle. It highlights the need to establish advisory services, identify and assist vulnerable groups, and organise support mechanisms. Collectively, these indicators point to a community-inclusive approach where decision-making, planning, and execution of disaster risk reduction and recovery strategies are carried out with the community's active participation to ensure that the solutions are not only technically sound but also socially acceptable and responsive to the needs and circumstances of the community.

| **Group One Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicator** | |
| **Disaster Risk Reduction** | | | |
| Multi-hazard-based land-use planning | Risk-based zoning | 15 | Incentives such as land-swap schemes planned and put in place to facilitate and encourage the relocation of physical assets from high-risk to low-risk areas |
| | Resettlement | 17 | Create a comprehensive resettlement plan to minimise disruption and support the community through the resettlement process |
| | | 19 | Involve the community in choosing new sites |
| | | 21 | Support the community through the provision of counselling and advisory services |
| **Community Recovery** | | | |
| Psychological and Social Recovery | Community support | 26 | Establish community advisory devices to provide information and connect with affected households |
| | | 27 | Identify vulnerable groups in the community and organize specialised assistance to support them |
| | | 28 | Organise psychological support and counselling services for the community |

***Table 4.3*** *HIDECs Analysis of the BBB-F, Group 1 Indicators*

### Group Two

Group Two served as a primary example within this analysis. For the sake of coherence and comprehensive understanding, the discussion of Group Two is reiterated here.

Group two also has seven indicators. however, Group One focused on the links between the categories of DRR and CR, and Group Two linked the CR categories with “Institutional Mechanisms” from EI. As such, the seven indicators that form this group establish a theme that advocates for legislation and regulation that is community-inclusive and participatory. Two indicators in this set address the “Community Recovery”, a subset of the “Psychological and Social Recovery” principle. These indicators (29 and 30) emphasise organising supportive activities and ensuring regular communication. The category EI is represented by two principles, “Institutional Mechanisms” and “Legislation and Regulation”, with the former encompassing four of the five indicators. The four indicators (51, 54, 55, 60) span across three

of the principles components—"Choosing Appropriate Institutional Mechanisms", "Fostering Partnerships", and "Grass-roots-level Involvement"—each reflecting a fundamental tenet of engaging key stakeholders and the affected community in the recovery efforts. These components underscore the necessity of defining stakeholder roles, building collaborative relationships, and directly involving the community to ensure that recovery measures are comprehensive and community driven. The final indicator, residing under the "Compliance" component, factors the critical role of legislative frameworks in supporting these ideals. It underscores the importance of mandating community-inclusive and participatory processes (Indicator 70). Advocating for legislative backing that not only sanctions but strengthens the implementation of community-focused recovery strategies.

| **Group Two Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicator** | |
| **Community Recovery** | | | |
| Psychological and Social Recovery | Community Support | 29 | Organises activities and support groups to bring the community together and build social cohesion. Create a sense of community and togetherness |
| | | 30 | Inform the community regularly on recovery decisions and progress using appropriate channels (e.g., regular public meetings, pamphlets, newsletters, media, text messages, dedicated recovery website, social media) |
| **Effective Implementation** | | | |
| Institutional Mechanism | Choosing Appropriate Institutional Mechanism | 51 | Establish clear roles and responsibilities for all stakeholders |
| | Fostering Partnerships | 54 | Foster effective partnership, collaborations, and effective communication between stakeholders. Create formal partnership if appropriate (e.g., alliances, public-private partnership) |
| | | 55 | Hold regular multi-stakeholder meetings to discuss, plan and implement recovery activities, avoiding duplication and allowing consultation and information exchanges between stakeholders |
| | Grass-roots-level Involvement | 60 | Involve the community as appropriate in planning decision-making and implementation of recovery projects |
| Legislation and Regulation | Compliance | 70 | Mandate community-inclusive and participatory recovery planning and implementation |

***Table 4.4*** *HIDECs Analysis of the BBB-F, Group 2 Indicators*

### Group Three

Group three also links the CR and EI categories. However, this group emphasises transparency and education as pivotal elements. The singular indicator under the priority of "Community Recovery", belonging to the component of "Psychological and Social Recovery", is Indicator 34. It stresses the need for full transparency with affected communities about recovery

decisions. Meanwhile, indicator (58), from the EI category calls for providing transparent information to the community. The final indicator, 87, falls under the "Improvement' component within the "Monitoring and Evaluation" principle. This indicator is about implementing disaster management education campaigns for the public, underscoring the role of knowledge dissemination in empowering communities to respond effectively to future disasters. The central theme among these three indicators is the empowerment of the community through transparency and education.

| **Group Three Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicator** | |
| **Community Recovery** | | | |
| Psychological and Social Recovery | Community Involvement | 34 | Maintain full transparency with affected communities with regard to recovery decisions |
| **Effective Implementation** | | | |
| Institutional Mechanism | Grass-roots-level Involvement | 58 | Provide transparent information to the community |
| Monitoring and Evaluation | Improvement | 87 | Implement disaster management education campaigns for public |

***Table 4.5*** *HIDECs Analysis of the BBB-F, Group 3 Indicators*

The themes of these three groups are all community centric. Though distinct in their specific indicators, Groups One, Two, and Three converge on fostering an informed, educated, well-advised, and supported community.

| **Cluster** | **Group** | **Theme** |
|---|---|---|
| 1 | 1 | Active engagement of the community in disaster risk reduction and recovery processes |
| | 2 | Advocates for legislation and regulation that is community-inclusive and participatory |
| | 3 | Empowerment of the community through transparency and education |

***Table 4.6*** *HIDECs Analysis of the BBB-F, Cluster 1 Themes*

### 4.4.2 Indicators Linking Groups 1, 2, and 3

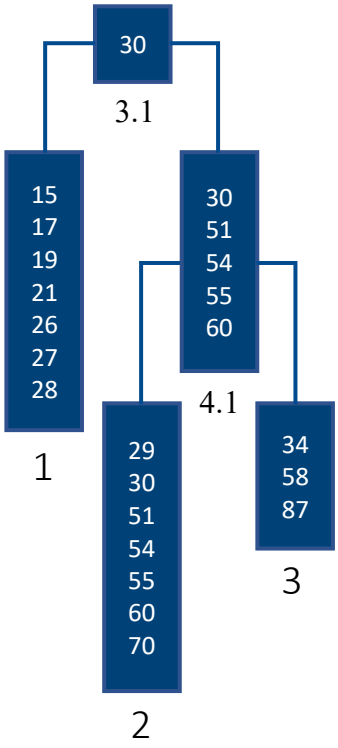


***Figure 4.11*** *HIDECs Analysis of the BBB-F Indicators Sets Hierarchically Above Cluster 1*

Groups Two and Three rely on Group 4.1, a group of five indicators: 30, 51, 54, 55, and 60. Indicator 30 falls under CR, while the other four are in the EI category, covering choosing appropriate institutional mechanisms, fostering partnerships, and grassroots-level involvement. The focus on community support, fostering partnerships, grassroots-level involvement, and choosing appropriate institutional mechanisms to establish clear roles and responsibilities for all stakeholders.

Group 3.1 consists of indicator 30 and is the common link between Group One and Groups Two and Three. "Inform the community regularly on recovery decisions and progress using appropriate channels (e.g., regular public meetings, pamphlets, newsletters, media, text messages, dedicated recovery website, social media)." This indicator belongs to the CR category and focuses on the "Psychological and Social Recovery" principle within the "Community Support" component.

### 4.4.3 Cluster 2, Groups 4, 5, and 6

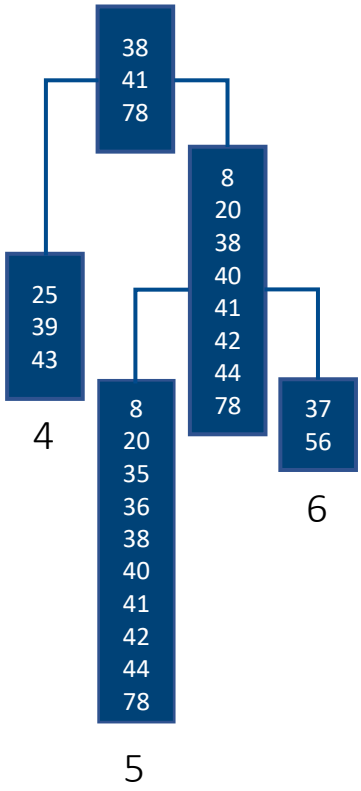


***Figure 4.12*** *HIDECs Analysis of the BBB-F Cluster 2 Comprised of Groups 4, 5, and 6*

**Group Four**

Group Four links the principles of DRR and CR. Similar to the earlier groups in cluster one, but with a distinct focus on economic aspects and education. Under DRR, one indicator is related to "Early Warning and DRR Education" (indicator 25), which emphasises the importance of training and providing resources for continuity plans and forming partnerships to enhance community resilience. Under the CR category, there are two indicators under 'Economic Recovery'. Indicator 39 suggests adopting tools to measure economic progress, a crucial step in gauging the effectiveness of recovery strategies, while Indicator 43 promotes exploring innovative solutions to revitalise the economy post-disaster. The central theme among these indicators is strengthening economic resilience as part of the broader disaster recovery process. It underscores the importance of preparedness through education, strategic economic planning, and the agility to adapt recovery strategies to ensure robust community

revitalisation. The focus here expands beyond immediate disaster response to include sustainable economic strategies that support long-term community recovery and growth.

| **Group Four Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicator** | |
| **Disaster Risk Reduction** | | | |
| Early Warning and DRR Education | DRR Education | 25 | Training and resources provided to organisations on preparing business continuity plans and establishing partnerships with other organisations for improved resilience |
| **Community Recovery** | | | |
| Economic Recovery | Economic recovery strategy | 39 | Adopt a measurement tool to track economic progress |
| | Business Support and Promotion | 43 | Considerations of alternative, innovative options if economic recovery progress is poor (e.g., introducing a big business such as a conference centre, shopping mall, sports stadium) to boost the economy, create new jobs and attract residence and tourists if economic and community recovery progress is poor |

***Table 4.7*** *HIDECs Analysis of the BBB-F, Group 4 Indicators*

**Group Five**

Group Five is the largest group within this cluster—eight indicators from all three categories. The majority are from the principle of "Economic Recovery" from the category CR, specifically "Economic Recovery Strategies" (indicators 35, 36 and 38) and "Funding Decision-Making and Training" (indicators 40 and 41). These indicators focus on economic revival, tailoring economic strategies to local needs, leveraging local councils' insights and empowering locals to revive traditional livelihoods and incorporate new technologies for business rejuvenation while ensuring economic recovery is prioritised alongside physical reconstruction. Two indicators in this set are from the category DRR under the principles of "Structural Resilience" (Indicator 8) and "Multi-hazard-based land-use planning" (Indicator 20). This highlights the importance of relocating to areas with robust infrastructure and employment opportunities to lead to more sustainable communities. Finally, a single indicator under the EI category links the "Legislation and Regulation" principle under the "Facilitation" component (Indicator 78). This indicator speaks to assisting business recovery, implying the need for a legislative environment that supports and facilitates the economic aspects of disaster recovery. The central theme connecting these indicators in Group Five is building a resilient community with an adaptive economic foundation. This is achieved by linking structural resilience measures with an economic recovery strategy responsive to local needs and

conducive to long-term sustainability, supported by effective implementation through advisory services and legislative backing.

| **Group Five Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicator** | |
| **Disaster Risk Reduction** | | | |
| Structural Resilience | Quality | 8 | Redundancies and transitional arrangement in place to relieve pressures on fast and reactive rebuilding (transitional accommodation, alternative travel routes etc.) and implement well-planned rebuild projects |
| Multi-hazard-based land-use planning | Resettlement | 20 | Provide incentives for relocation (good infrastructure, employment opportunities etc.) |
| **Community Recovery** | | | |
| Economic Recovery | Economic recovery strategy | 35 | Develop a tailor-made Economic Recovery Strategy catering to local needs using information collected from locals and local councils |
| | | 36 | Empower and support locals to re-establish traditional livelihoods and to upgrade facilities and technologies for business rejuvenation if appropriate |
| | | 38 | Plan economic restoration activities concurrently with rebuilding (e.g., rebuilding of infrastructure contributing to key economic activities prioritised) |
| | Funding, decision-making and training | 40 | Put in place business advisory services to support and advise businesses |
| | | 41 | Put in place business advisory services to support and advise businesses |
| | Business Support and Promotion | 42 | Support speedy re-establishment of businesses through setting up temporary retail/ workspaces for businesses, fast-tracked permit procedures and incentives provided to skill builders to facilitate rebuilding, and fast-tracked insurance settlements |
| | | 44 | Keep the local community regularly informed on economic recovery plans and progress to encourage residents and boost morale |
| **Effective Implementation** | | | |
| Legislation and Regulation | Facilitation | 78 | Assist business recovery |

***Table 4.8*** *HIDECs Analysis of the BBB-F, Group 5 Indicators*

### Group Six

Group Six comprises two indicators, one from the category of CR concerning the component of "Economic Recovery Strategy" (Indicator 37) and one from the category EI concerning the component of "Fostering Partnerships" (Indicator 56). The central theme connecting these indicators is developing a resilient community through strategic economic empowerment reinforced by institutional transparency. Group Six links closest to Group Five, having linking indicators that reflect the emerging overarching theme of sustainable economic recovery during and after disaster reconstruction, focusing on supporting businesses and ensuring ongoing monitoring to adapt and improve recovery efforts over time.

| Group Six Indicators | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicator** | |
| **Community Recovery** | | | |
| Economic Recovery | Economic Recovery Strategy | 37 | Introduce new livelihood options utilising local resources and opportunities for up-skilling to cater to skills shortages |
| **Effective Implementation** | | | |
| Institutional Mechanism | Fostering Partnerships | 56 | Generate systems for easy and transparent access to information between stakeholders |

***Table 4.9*** *HIDECs Analysis of the BBB-F, Group 6 Indicators*

Groups Four, Five and Six combined promote an overarching theme of Promoted, well-advised and supported industry and businesses by emphasising strategies that intertwine community resilience with economic development. Group Four sets the foundation by linking disaster risk reduction with economic recovery, advocating for education and preparedness that fortify industries against future crises. Group Five expands this narrative with the most indicators, heavily focusing on economic revival through local insights, traditional livelihoods, and structural resilience that align with sustainable business growth. Group Six furthers the agenda by underscoring the importance of strategic economic empowerment and transparent institutional partnerships.

| Cluster | Group | Theme |
|---|---|---|
| 2 | 4 | Sustainable economic strategies that support long-term community recovery and growth |
| | 5 | Community with an adaptive economic foundation |
| | 6 | Strategic economic empowerment reinforced by institutional transparency |

***Table 4.10*** *HIDECs Analysis of the BBB-F, Cluster 2 themes*

### 4.4.4 Indicators Linking Groups 4, 5, and 6

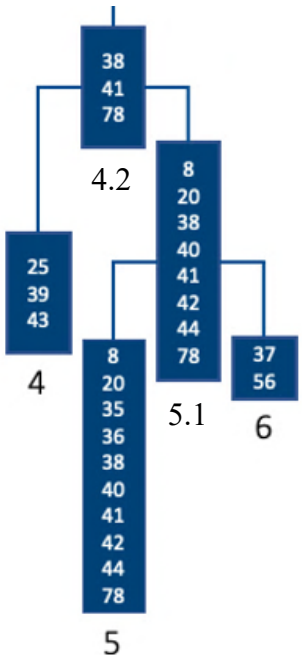


***Figure 4.13*** *Groups 4.2 and 5.1 Linking Groups 4, 5, and 6*

Two groups must be discussed when considering the indicators linking the groups of cluster two. Group Four solely depends on Group 4.2, comprising three indicators (38, 41, and 78). Two of these indicators are from the component of "Economic Recovery" (38,41), while the last (78) considers the "Legislation and Regulation" component as drivers to assist business recovery. Groups Five and Six are linked by Group 5.1, which comprises Group 4.2 and indicators (38, 20, 40, 42, and 44). Three (40, 42, and 44) are "Economic Recovery" indicators, while the other (8 and 20) are DRR indicators. Of note is the inclusion of the component "Resettlement", which broadens the scope of the theme of these dependency indicators from just economic to livelihood.

### 4.4.5 Cluster 3, Groups 7 and 8

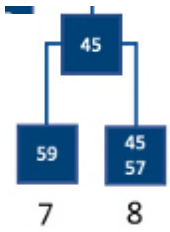


***Figure 4.14*** *Cluster 3, Groups 7 and 8*

**Group Seven**

Group Seven comprises a sole indicator, number 59. The presence of a single indicator within a group typically implies that it represents a less interconnected factor. This does not suggest it is less important in its role, but rather that it is distinct in focus within this grouping. This indicator pertains to empowering local councils to assume leadership in the recovery process. It is within the "Grassroots-level involvement" component of the "Institutional Mechanisms" principle under the broader EI category.

| **Group Seven Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicator** | |
| **Disaster Risk Reduction** | | | |
| Institutional Mechanism | Grass-roots-level Involvement | 59 | Support local councils to take a lead role in recovery |

***Table 4.12*** *HIDECs Analysis of the BBB-F, Group 7 Indicator*

**Group Eight**

Two indicators define Group Eight. Indicator 45 is classified under the CR category, within the "Economic Recovery" principle, and specifically relates to the "Business Support and Promotion" component. Indicator 57, on the other hand, is aligned with the EI category under the "Institutional Mechanism" principle and falls within the "Grass-roots-level Involvement" component. The central theme uniting these indicators is their emphasis on promoting community engagement and economic development as fundamental elements of the recovery process, underlining their critical roles in ensuring an inclusive path to post-disaster revitalisation.

| Group Eight Indicators | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicator** | |
| **Community Recovery** | | | |
| Economic Recovery | Business Support and Promotion | 45 | Advertise and promote local industries and attractions to appeal to tourists |
| **Effective Implementation** | | | |
| Institutional Mechanism | Grass-roots-level Involvement | 57 | Emphasise decentralisation and grass-root involvement in recovery planning and implementation |

***Table 4.11*** *HIDECs Analysis of the BBB-F, Group 8 Indicators*

Represented by a single indicator, Group Seven underlines local councils' significant role in leading recovery, echoing the cluster's theme of supporting key economic players. Lastly, Group Eight reinforces the theme by promoting community involvement in business support.

| | | |
|---|---|---|
| 3 | 7 | Empowering local councils to assume a leadership role in the recovery process |
| | 8 | Emphasis on promoting community engagement and economic development |

***Table 4.12*** *HIDECs Analysis of the BBB-F, Cluster 3 Themes*

### 4.4.6 Indicators Linking Groups 7 and 8

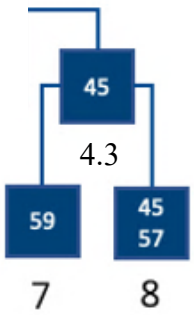


***Figure 4.15*** *Group 4.3 Linking Groups 7 and 8*

A group of a single indicator links groups 7 and 8. Indicator 45, ‘Advertise and promote local industries and attractions to appeal to tourists’, is a CR Indicator from the Principe/ component, Economic Recovery, Business Support and Promotion.

### 4.4.7 Indicators Linking Clusters 2 and 3

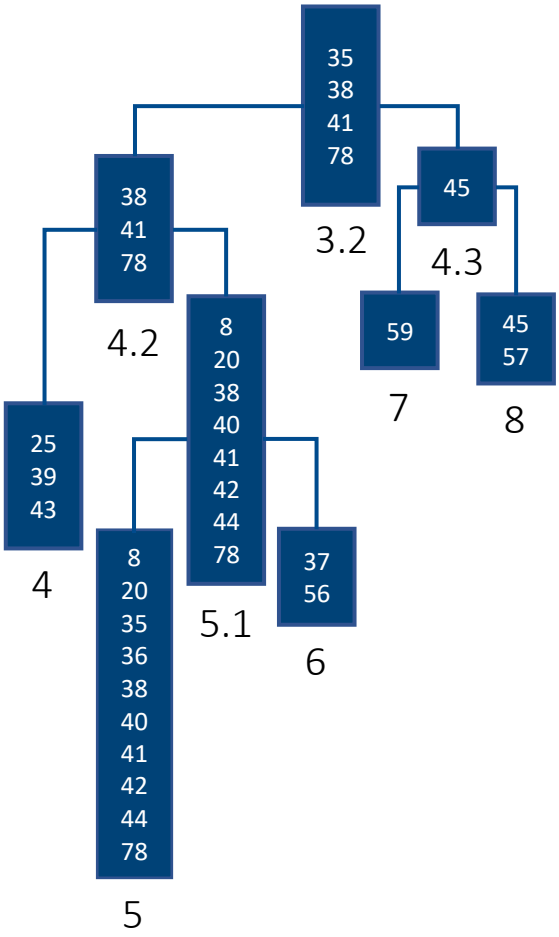


***Figure 4.16*** *HIDECs Analysis of the BBB-F Indicators Sets Hierarchically Above Cluster 2*

Group 3.2 links the clusters of 2 and 3, drawing together Groups 4 through 8. Group 3.2 has four indicators. Three from CR and one from EI. These indicators collectively emphasise a strategic, integrated, and supportive approach to economic recovery following a disaster, crucial for restoring normalcy and promoting sustainable development within affected communities. These indicators are wholly repeated in Group 5 and do not appear in Groups 4, 6, 7, or 8, which are significantly smaller groups of indicators. This suggests that while the smaller groups are more specialised, group 5 plays a central role in ensuring the economic resilience of communities, highlighting its strategic importance within the overall framework.

### 4.4.8 Indicators Linking Clusters 1, 2, and 3

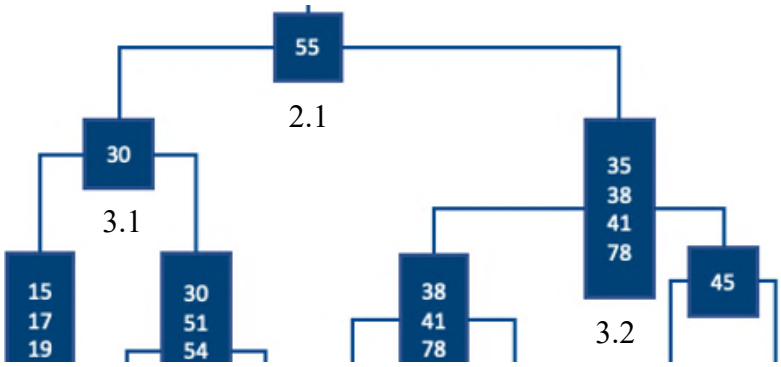


***Figure 4.17*** *Group 2.1 Linking Groups 3.1 and 3.2 Linking Groups 1, 2, and 3*

Only one indicator, indicator 55, links clusters one, two, and three together. This indicator comes from the category EI and concerns "Fostering Partnership", a principle of "Institutional Mechanisms". It states, "Hold regular multi-stakeholder meetings to discuss, plan, and implement recovery activities, avoiding duplication and allowing consultation and information exchanges between stakeholders." Its prevalence as the linking indicator between the two highlights the importance of collaboration and coordination.

### 4.4.9 Cluster 4, Groups 9, 10, and 11

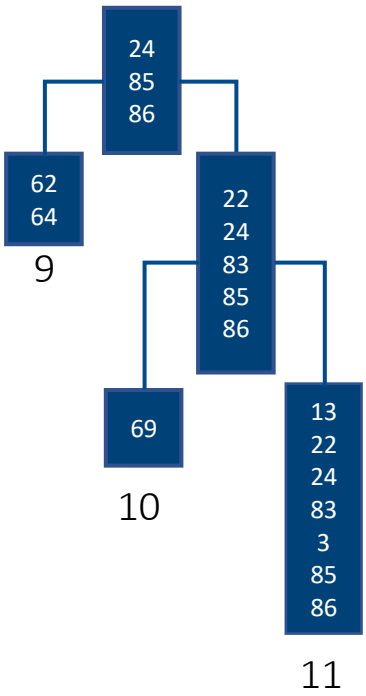


***Figure 4.18*** *HIDECs Analysis of the BBB-F Cluster 4*

**Group Nine**

Group Nine indicators fall under the categories of EI, with a focus on the component of "Institutional Mechanisms" related to "Quality Assurance and Training". The central theme of these indicators is the development of a knowledgeable and prepared community and governance structure capable of handling all phases of disaster management. They advocate for a systematic approach to disaster response, where training and sharing best practices play critical roles in enhancing the overall effectiveness of recovery and future preparedness efforts.

| **Group Nine Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicator** | |
| **Effective Implementation** | | | |
| Institutional Mechanism | Quality assurance and training | 62 | Provide training prior to recovery work as appropriate |
| | | 64 | Put in place mechanisms to transfer lessons learnt to local and a national government and all relevant stakeholders for capacity-building, future resilience work, pre-disaster planning, emergency management and post disaster recovery |

***Table 4.13*** *HIDECs Analysis of the BBB-F, Group 9 Indicators*

**Group Ten**

Group ten's indicators are situated within the categories of EI, specifically under the "Legislation and Regulation" component. The singular indicator in this group, Indicator 69, focuses on enforcing risk management and retrofitting programs as part of ongoing hazard risk management. The central theme here revolves around the necessity of a regulated approach to reducing risk through structural adjustments and consistent risk management practices, emphasising the need for ongoing compliance and enforcement to safeguard against future hazards.

| **Group Ten Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicator** | |
| **Effective Implementation** | | | |
| Legislation and Regulation | Compliance | 69 | Enforce risk management and retrofitting programmed for ongoing hazard risk management |

***Table 4.14*** *HIDECs Analysis of the BBB-F, Group 10 Indicator*

**Group Eleven**

Group Eleven indicators link DRR and EI categories. Under DRR, there are indicators for "Multi-Hazard-Based Land-Use Planning", "Early Warning and Disaster Risk Reduction". In the EI principle, the indicators relate to "Monitoring, Evaluation, and Improvement". The central theme linking these indicators is the enhancement of disaster resilience through

comprehensive risk assessment, community education, and an iterative process for disaster risk management that leverages past experiences for continual improvement. This approach underscores the importance of proactive planning, informed community engagement, and the adaptive evolution of disaster management strategies.

| **Group Eleven Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicator** | |
| **Disaster Risk Reduction** | | | |
| Structural Resilience | Building Codes | 3 | Building codes and regulations that incorporate traditional technologies and are aligned with local knowledge and skills |
| Multi-hazard-based land-use planning | Risk-Based Zoning | 13 | Accurate, up-to-date understanding of all hazards in the area by conducting multi-hazard assessments and creating clear risk zone maps |
| Early Warning and DRR Education | Early Warning | 22 | Advanced science and local knowledge are used to improve the accuracy of hazard predictions |
| | DRR Education | 24 | Communities and stakeholders are educated on prevalent disaster risk, practical disaster risk reduction methods and disaster preparedness |
| **Effective Implementation** | | | |
| Monitoring and Evaluation | Compliance | 83 | Create plans about monitoring and evaluation mechanisms for long-term hazard risk monitoring |
| | Improvement | 85 | Incorporate lessons learnt into revising policies and procedures for future disaster management practices |
| | | 86 | Train stakeholders on disaster management practices from lessons learnt |

***Table 4.15*** *HIDECs Analysis of the BBB-F, Group 11 Indicators*

A singular overarching theme of 'Educated on DRR & promoting lessons learnt' emerges from these. Group Nine emphasises the cultivation of a knowledgeable base through targeted training and best practices dissemination, ensuring that stakeholders are equipped with the skills and insights necessary for effective disaster management. Group Ten advocates for a structured and regulatory-backed approach to continual risk management, focusing on compliance and proactive safety measures in infrastructure and community planning. Lastly, Group Eleven ties these concepts together by highlighting the significance of education in DRR, the need for thorough risk assessments, and the critical role of iterative learning from previous experiences to enhance resilience and response capabilities.

| **Cluster** | **Group** | **Theme** |
|---|---|---|
| 4 | 9 | Proactive planning, informed community engagement, and the adaptive evolution of disaster management strategies |
| | 10 | Regulated Risk Reduction with Structural Adjustments and Compliance |
| | 11 | Proactive planning, informed community engagement, and the adaptive evolution of disaster management strategies |

***Table 4.18*** *HIDECs Analysis of the BBB-F, Cluster 4 Themes*

### 4.4.10 Indicators Linking Groups 9, 10, and 11

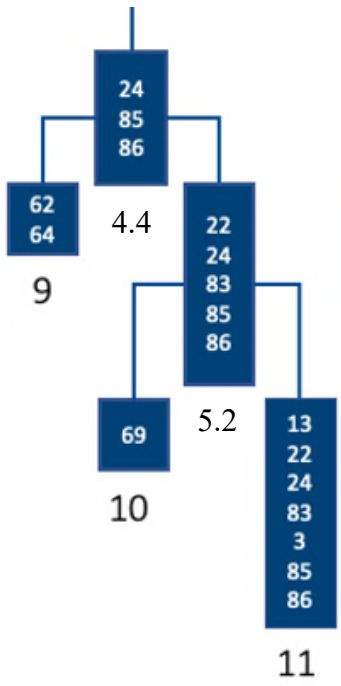


***Figure 4.19*** *HIDECs Analysis of the BBB-F Indicators Sets Hierarchically Above Cluster 4*

Two sets of indicators link these three groups together. First, considering set 5.2, which links Groups 10 and 11. Set H is a substantial set of five indicators from group 11. Thus, it reflects a similar theme of proactive planning, informed community engagement, and the adaptive evolution of disaster management strategies. Of greater interest is set 4.4, which links group 9 to groups 10 and 11. It comprises just three indicators (24, 85, and 86). Again, these indicators stem from group 11.

Indicator 24 is categorised under the DRR Category from the principle of "Early Warning and DRR Education"/ "DRR Education", and states that communities and stakeholders are educated on prevalent disaster risk, practical disaster risk reduction methods and disaster preparedness. Indicators 85 and 86 stem from the category of EI, the principle of "Monitoring and Evaluation", a component of "Improvement". Indicator 85 states: Incorporate lessons learnt into revising policies and procedures for future disaster management practices and indicator 86 states: Train stakeholders on disaster management practices from lessons learnt.

Together, these indicators underscore the necessity of a comprehensive approach to disaster management that is both proactive and reactive. They highlight the necessity of ongoing education and the refinement of practices based on real-world experiences and lessons learned, thereby enhancing the effectiveness and resilience of disaster management efforts. This integrated strategy ensures that communities are prepared and continuously evolving in their capabilities to manage and mitigate the impacts of disasters.

### 4.4.11 Cluster 5, Groups 12 and 13

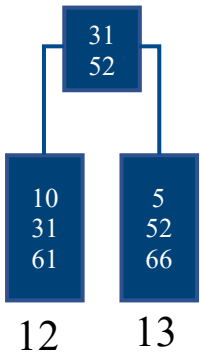


***Figure 4.20*** *HIDECs Analysis of the BBB-F Cluster 5*

**Group Twelve**

Group twelve has three indicators, one from each of the three categories. DRR is addressed through a quality-focused indicator pertaining to the structural resilience component. This indicator (10) advocates establishing incentives or special partnership arrangements to engage skilled and certified builders in reconstruction efforts. The indicator from CR, under the "Psychological and Social Recovery" principle, is focused on community support. The indicator (31) highlights the necessity of reconstructing public facilities and heritage sites that align with the cultural and social demands of the community, exemplified by educational, religious, health, commercial, and recreational establishments. This set's final indicator is from the EI category. Indicator (61) discusses the engagement of qualified and credible stakeholders for recovery operations and is classified by the component of "Quality Assurance and Training" from the "Institutional Mechanism" principle. the central theme of these indicators is the emphasis on the strategic engagement of resources and stakeholders to rebuild and revitalise

communities following a disaster, prioritising both structural integrity and the socio-cultural fabric of the affected areas.

| **Group Twelve Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicators** | |
| **Disaster Risk Reduction** | | | |
| Structural Resilience | Quality | 10 | Incentives or special arrangements (e.g., alliance or public-private partnership) planned and in place to attract skilled certified builders to meet reconstruction demands |
| **Community Recovery** | | | |
| Psychological and Social Recovery | Community Support | 31 | Priorities the rebuilding of public facilities and heritage sites based on community's social and cultural needs (e.g., schools, churches, hospital, supermarket, community halls, recreation centres) |
| **Effective Implementation** | | | |
| Institutional Mechanism | Quality Assurance and Training | 61 | Use qualified, reputable stakeholders for recovery activities |

***Table 4.16*** *HIDECs Analysis of the BBB-F, Group 12 Indicators*

### Group Thirteen

Group Thirteen is a set of three indicators that link DRR with EI. The unifying aspect of these indicators is their collective focus on developing thorough financial and institutional protocols. This initiative involves establishing long-term funding mechanisms designed to offset the additional costs of structural enhancements, as described by indicator 5. Additionally, creating an exclusive disaster recovery fund is proposed to centralise resource management, providing a singular, transparent avenue for accountability and the efficient distribution of funds to satisfy a range of recovery needs, as outlined in indicator 52. Moreover, implementing an authoritative mechanism to supervise post-disaster reconstruction and recovery—whether through an existing organisation or a new authority—is needed to strengthen the governance needed to steer and manage the recovery efforts, as outlined in indicator 66. Together, these strategic measures form a theme of financial foresight with organised oversight, linking financial strategies to institutional frameworks that ensure sustainable funding and clear accountability for disaster recovery and structural improvement efforts.

| Group Thirteen Indicators | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicators** | |
| **Disaster Risk Reduction** | | | |
| Structural Resilience | Cost and Time | 5 | Long-term funding mechanisms in place to fund extra costs incurred for structural improvements |
| **Effective Implementation** | | | |
| Institutional Mechanism | Choosing Appropriate Institutional Mechanism | 52 | Create an exclusive, singular fund for disaster recovery to direct all funds dedicated to recovery into one pool for clear accountability and allocation for different recovery needs |
| Legislation and Regulation | Compliance | 66 | Enforce an institutional mechanism for post-disaster reconstruction and recovery (existing organization or a new recovery authority) |

***Table 4.17*** *HIDECs Analysis of the BBB-F, Group 13 Indicators*

The overarching theme between these two groups is the consideration of the financial mechanisms of community assets addressed. This is reinforced by the linking indicators between the two groups, indicators 31 and 52, that emphasise this theme.

| Cluster | Group | Theme |
|---|---|---|
| 5 | 12 | Prioritising structural and socio-cultural integrity through strategic engagement of resources |
| | 13 | Financial foresight with organised oversight, linking financial strategies to institutional frameworks |

***Table 4.18*** *HIDECs Analysis of the BBB-F, Cluster 5 Themes*

### 4.4.12 Indicators Linking Groups 12 and 13

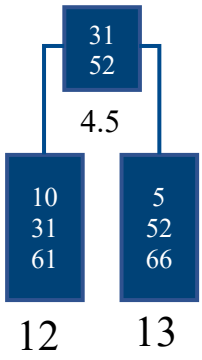


***Figure 4.21*** *Group 4.5 Linking Groups 12 and 13*

Group 4.5 links Groups 12 and 13. It comprises two indicators. Indicator 31, found in Group 12, is a CR indicator of the principle/ component of “Psychological and Social Recovery”/ “Community Support”. This indicator suggests prioritising rebuilding public facilities and heritage sites based on the community's social and cultural needs. Indicator 52, found in group 13, is an EI indicator of the principle/ component “Institutional Mechanisms”/ “Choosing Appropriate Institutional Mechanisms”. It suggests creating an exclusive, singular disaster recovery fund to direct all recovery funds into one pool for clear accountability and allocation for different recovery needs.

Together, these indicators from Group J highlight a holistic approach to disaster recovery that integrates thoughtful reconstruction of community spaces with robust financial management strategies. Addressing the socio-cultural fabric and the operational efficiencies within disaster recovery, these indicators help ensure that recovery efforts are both culturally sensitive and institutionally effective, paving the way for a more resilient post-discovery environment.

### 4.4.13 Indicators Linking Clusters 4 and 5

A single indicator link clusters four and five. Indicator 86 is an EI Indicator that considers the importance of monitoring and evaluation, specifically the component of “Improvement”. It states, “Train stakeholders on disaster management practices from lessons learnt,” recognising the progression and adaptation of disaster management practices over time, reflecting a more dynamic and forward-looking approach to learning from past experiences.

### 4.4.14 Cluster 6, Groups 14 and 15

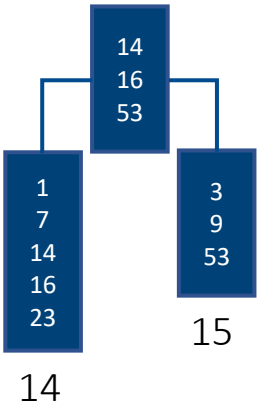


***Figure 4.22*** *HIDECs Analysis of the BBB-F Cluster 6*

**Group Fourteen**

Group fourteen indicators are all categorised under DRR and concerns informed and strategic management of land and resources to mitigate risks and enhance community safety. This includes utilising accurate and current data to understand the full scope of hazards that could impact physical assets which is crucial for developing effective building codes under the principle of structural resilience (indicator 1), Implementing restrictions on costly construction in areas identified as high-risk, addressing the cost and time considerations in structural resilience (indicator 7), Revising land-use plans based on new risk assessments and enforcing them through appropriate legislation, falling under the principle of "Multi-Hazard-Based Land-Use planning" and the component of risk-based zoning (indicator 14), Providing education to stakeholders and the community about disaster risks and the new land-use plans, which is also part of multi-hazard-based land-use planning and emphasises the importance of risk-based zoning (indicator 14), and deploying early warning systems that are tailored to the local community, integrating modern technology with local knowledge and traditional methods, as per the principle of "Early Warning and Disaster Risk Reduction Education". These indicators underscore the importance of proactive, knowledge-based action and regulatory measures to build resilience against disasters through careful planning, community education, and the application of technology in harmony with traditional practices.

| **Group Fourteen Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicators** | |
| **Disaster Risk Reduction** | | | |
| Structural Resilience | Building Codes | 1 | Accurate, up-to-date understanding of all hazards affecting physical assets and resulting disaster risks and vulnerabilities |
| | Cost and Time | 7 | Unaffordable construction on high-risk land restricted |
| Multi-hazard-based land-use planning | Risk-Based Zoning | 14 | Land-use plans revised with appropriate land-uses determined by analysing the new risk zone maps and relevant updated building regulations, enforced using appropriate legislation |
| | | 16 | Education to provide to stakeholders and the community on disaster risk and revised land-use plans prior to rebuilding |
| Early Warning and DRR Education | Early Warning | 23 | Early warning systems appropriate to the local community are employed using a combination of new technology and local knowledge and traditional methods |

***Table 4.19*** *HIDECs Analysis of the BBB-F, Group 14 Indicators*

**Group Fifteen**

Indicators within Group Fifteen emphasise the importance of combining local expertise with effective quality assurance under a well-defined institutional structure. The first two indicators,

numbered 3 and 9, from the DRR category, promote building codes and regulations that both recognise and incorporate traditional practices and local insights, enhancing the structural resilience of communities. The third indicator, which falls under the EI category, highlights the critical role of a detailed and extensive information database in reinforcing institutional mechanisms that dictate suitable disaster response strategies. These indicators collectively point to an approach that values cultural respect and pragmatic methods executed within an institutional framework.

| **Group Fifteen Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicators** | |
| **Disaster Risk Reduction** | | | |
| Structural Resilience | Building Codes | 3 | Building codes and regulations that incorporate traditional technologies and are aligned with local knowledge and skills |
| | Quality | 9 | Practical, uncomplicated, and efficient quality assurance measures in place appropriate for post disaster environments |
| **Effective Implementation** | | | |
| Institutional Mechanism | Choosing Appropriate Institutional Mechanism | 53 | Maintain a thorough information database |

***Table 4.20*** *HIDECs Analysis of the BBB-F, Group 15 Indicators*

The overarching theme is the strategic and informed integration of local knowledge, technology, and institutional governance to enhance disaster resilience and community safety.

| **Cluster** | **Group** | **Theme** |
|---|---|---|
| 6 | 14 | Building resilience with proactive, informed actions and regulations |
| | 15 | values culturally respected, pragmatic methods executed within an institutional framework. |

***Table 4.21*** *HIDECs Analysis of the BBB-F, Cluster 6 Themes*

### 4.4.15 Indicators Above Cluster 6

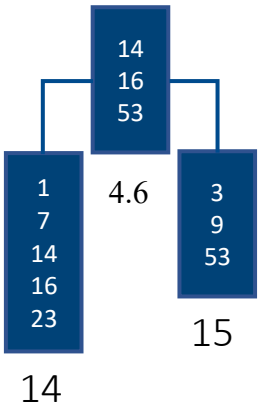


***Figure 4.23*** *Group 4.6 Linking Groups 14 and 15*

Three indicators from Group 4.6 (14, 16, and 53) exemplify the link between DRR and EI. Indicators 14 and 16, originating from Group 14, focus on multi-hazard-based land-use planning, while Indicator 53 from Group 15 highlights the role of EI, particularly through maintaining a comprehensive information database. These indicators collectively underscore a multifaceted approach to disaster management that integrates risk-based land-use planning with robust information management. By emphasising pre-emptive planning, coupled with the institutionalisation of knowledge management, these indicators effectively bolster the resilience and preparedness of communities against diverse hazards. This alignment facilitates informed decision-making and enhances the overall efficacy of disaster risk reduction initiatives.

### 4.4.16 Cluster 7, Groups 16 and 17

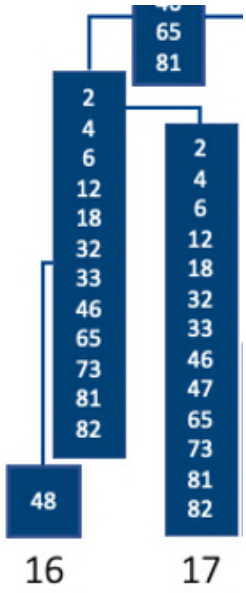


***Figure 4.24*** *HIDECs Analysis of the BBB-F Cluster 7*

#### Group Sixteen

Group Sixteen is an outlier set. It comprises a singular indicator, a "Risk-Based Zoning" component from the DRR category. It concerns the education of stakeholders and the community on disaster risk and land-use plans before rebuilding.

| **Group Sixteen Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicators** | |
| **Disaster Risk Reduction** | | | |
| Multi-hazard-based land-use planning | Risk-Based Zoning | 16 | Education to provide to stakeholders and the community on disaster risk and revised land-use plans prior to rebuilding |

***Table 4.22*** *HIDECs Analysis of the BBB-F, Group 16 Indicator*

#### Group Seventeen

Group Seventeen is a substantially larger set of 13 indicators from all three main categories. The initial five indicators come from the DRR category and emphasise developing structural codes legislated in line with the latest multi-hazard assessments, ensuring these codes recognise and are tailored to local resource constraints (indicator 2). Additionally, this set incorporates an indicator of educational initiatives addressing changes in post-disaster building regulations

(indicator 4), reflecting this set's narrative of a proactive stance toward engaging stakeholders in enhancing structural resilience. Economic aspects of resilience are contemplated through incentives designed to encourage the adoption of structural improvements (indicator 6). These are further complemented by advisory services to provide homeowners with the support necessary for reconstruction (indicator 12). Finally, the component of "Resettlement" links incorporating community needs into land-use planning (indicator 18). The next two indicators are from the CR category, from the "Psychological and social recovery" principle, focusing on "Community Involvement". More specifically, these indicators advocate for a recovery process that empowers grassroots participation (indicator 32) and supports owner-initiated rebuilding efforts (indicator 33), encouraging communities to play an active role in their reconstruction. The last six indicators are from EI and are equally taken from three principles and components. Indicators 46 and 47 are indicators of "Institutional Mechanisms". Specifically, they relate to "Choosing Appropriate Institutional Mechanisms". They are about choosing local authorities who understand what the community needs to manage the recovery process; they aim to strike a balance between the control necessitated in higher-level planning and allowing local communities to make their own decisions. Indicators 65 and 73 relate to compliance with legislation and regulation, emphasising adherence to the principles of BBB through the precise tenets of these principles within this context remain unspecified. Finally, indicators 81 and 82 relate to the compliance of "Monitoring and Evaluation" and link to the long-term monitoring and the formulation of mechanisms to evaluate the accuracy and quality of ongoing recovery efforts. Group Seventeen indicators are linked through a commonality of 'integrating resilience and community engagement in post-disaster recovery'.

| Group Seventeen Indicators | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicators** | |
| **Disaster Risk Reduction** | | | |
| Structural Resilience | Building Codes | 2 | Legislated structural codes based on up-to-date multi-hazard assessments with design and construction specifications aligned with local resource availability and affordability |
| | | 4 | Education provided to stakeholders on post disaster building regulation changes prior to commencing rebuilding work |
| | Cost and Time | 6 | Incentive planned and in place to promote adoption of structural improvements to homes, buildings, and infrastructure |
| | Quality | 12 | Rebuilding advisory service with rebuilding advisors in place to support, educate and assist homeowners needing to rebuild |
| Multi-hazard-based land-use planning | Resettlement | 18 | Consider the needs of the affected community |
| **Community Recovery** | | | |
| Psychological and Social Recovery | Community Involvement | 32 | Empower the community by incorporating grass-roots methods for recovery (e.g., creating/ utilising community groups to get community input for planning, decision-making and various aspects of implementation of rebuild and recovery) |
| | | 33 | Promote owner-building of homes to empower homeowners with support and supervision from skilled builders |
| **Effective Implementation** | | | |
| Institutional Mechanism | Choosing Appropriate Institutional Mechanism | 46 | Choose a local level body (e.g., existing government organization or new recovery authority) most suited to the local context to plan, implement and manage recovery activities, and facilitate coordinating and partnership between stakeholders involved in recovery |
| | | 47 | Choose the level of centralisation or decentralisation most suited to the local context or community, and combine central-level coordination of recovery with decentralised planning and implementation |
| Legislation and Regulation | Compliance | 65 | Put in place legislation and regulations as appropriate to enforce and comply with BBB-Based recovery decisions |
| | | 73 | Impose long-term monitoring of recovery |
| Monitoring and Evaluation | Compliance | 81 | Put in place mechanisms to monitor the quality and compliance of ongoing recovery in line with BBB |
| | | 82 | Measure recovery outputs to track progress by collecting comprehensive data about recovery |

***Table 4.23*** *HIDECs Analysis of the BBB-F, Group seventeen indicators*

| Cluster | Group | Theme |
|---|---|---|
| 7 | 16 | Engaging in rebuilding with revised plans |
| | 17 | Integrating resilience and community engagement in post-disaster recovery |

***Table 4.24*** *HIDECs Analysis of the BBB-F, Cluster 7 Themes*

### 4.4.17 Indicators Above Cluster 7

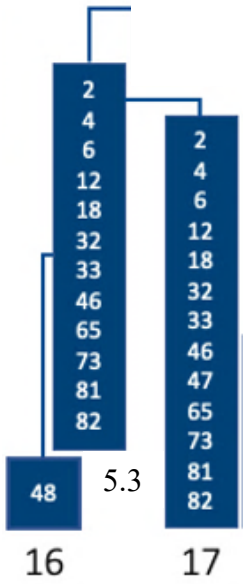


***Figure 4.25*** *Group 5.3 Linking Groups 16 and 17*

Group 5.3 connects Groups 16 and 17 and is relatively straightforward, as it literally combines the indicators from both groups. More significantly, it highlights the isolation of indicator '48' (from Group 16) as an outlier. This signals its relationship to the overall framework yet distinctly separates it from the significant set of indicators represented in Group 17.

### 4.4.18 Cluster 8, Groups 18 and 19

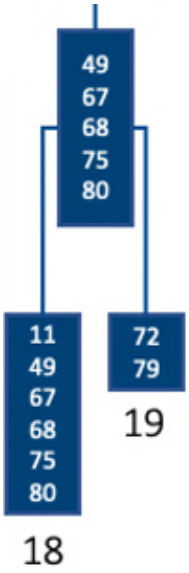


***Figure 4.26*** *HIDECs Analysis of the BBB-F Cluster 8*

**Group Eighteen**

Group Eighteen is comprised of six indicators. The first comes from the DRR category and suggests providing professional supervision for owner-building of homes for quality assurance. The remaining five are all indicators of EI. The first indicator, 49, regards "Choosing Appropriate Institutional Mechanisms", which would allow for an effective exit strategy for short-term recovery authorities to transition smoothly from rebuilding and recovery operations to business as usual. The remaining four indicators are from the principle of "Legislation and Regulation" and are split between the components of "Compliance" and "Facilitation". The commonality between these four components is the enhancement of building and planning regulations, streamlining rebuilding processes, and educating stakeholders on legislative changes. Taken together, the set of indicators in Group Eighteen emphasises the strengthening of regulatory frameworks and processes for post-disaster reconstruction.

| **Group Eighteen Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicators** | |
| **Disaster Risk Reduction** | | | |
| Structural Resilience | Quality | 11 | Provide professional supervision for owner-building of homes for quality assurance |
| **Effective Implementation** | | | |
| Institutional Mechanism | Choosing Appropriate Institutional Mechanism | 49 | Devise an effective exit strategy for short-term recovery authorities to transition smoothly from rebuilding and recovery operations to business as usual |
| Legislation and Regulation | Compliance | 67 | Enforced updated building codes and building regulations |
| | | 68 | Enforce updated planning regulations and land use plans |
| | Facilitation | 75 | Simplify and fast-track permit procedures for rebuilding |
| | | 80 | Provide training and education for stakeholders and the community on new legislative changes |

***Table 4.25*** *HIDECs Analysis of the BBB-F, Group 18 indicators*

**Group Nineteen**

Group Nineteen has two indicators, both from the category of EI and addressing the "Legislation and Regulation" principle. The first, indicator 72, concerns "Compliance" and discusses enforcing standardising post-disaster building contracts for residential buildings. The second, indicator 79, concerns "Facilitation" and considers the flexibility required in the end dates of legislative provisions. A commonality between these indicators is that they enhance post-disaster resilience through legislative compliance and flexibility.

| Group Nineteen Indicators | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicators** | |
| **Effective Implementation** | | | |
| Legislation and Regulation | Compliance | 72 | Enforce Standardised post disaster building contracts for residential rebuilding |
| | Facilitation | 79 | Maintain flexibility in the end dates of legislative provisions |

***Table 4.26*** *HIDECs Analysis of the BBB-F, Group nineteen indicators*

| Cluster | Group | Theme |
|---|---|---|
| 8 | 18 | Strengthening of regulatory frameworks and process for post-disaster reconstruction |
| | 19 | Enhancing post-disaster resilience through legislative compliance and flexibility |

***Table 4.27*** *HIDECs Analysis of the BBB-F, Cluster 8 Themes*

### 4.4.19 Indicators Linking Groups 18 and 19

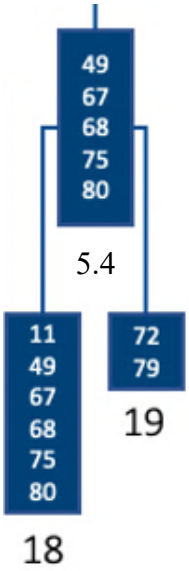


***Figure 4.27*** *Group 5.4 Linking Groups 18 and 19*

Group 5.4 serves as a pivotal link between Groups 18 and 19. It comprises five key indicators that extend the thematic focus established in Group 18. This set of indicators primarily falls under the category of EI, emphasising critical principles fundamental to ensuring successful disaster management strategies.

The indicators within Group 5.4 underscore various principles designed to optimise the framework within which disaster management initiatives operate. These principles include "Choosing Appropriate Institutional Mechanisms", "Compliance", and "Facilitation".

Together, these highlight a multi-dimensional approach to effective implementation in disaster management. This thematic continuity from Group Eighteen strongly emphasises institutional integrity and operational efficiency as key drivers of successful disaster management outcomes, effectively bridging the strategic objectives of Groups Eighteen and Nineteen.

### 4.4.20 Indicators Linking Clusters 7 and 8

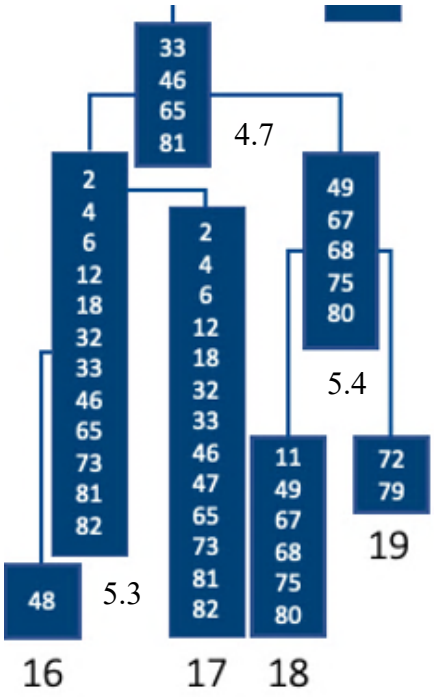


***Figure 4.28*** *Group 4.7 linking clusters 7 and 8*

When considering the linking indicators comprising group 4.7 (33, 46, 65, and 81), the first is a community recovery indicator from the principle/ component, Psychological and Social Recovery/ community involvement. The other three are principles/components from the EI category: "Institutional Mechanism"/ "Choosing Appropriate Institutional Mechanism", "Legislation and Regulation"/ "Compliance", and "Monitoring and Evaluation"/ "Compliance", respectively. The group of clusters reflects empowering reconstruction and adaptive governance. This reflects the group's focus on community empowerment through

owner-building, careful selection of local bodies for recovery management, legislative reinforcement of recovery principles, and monitoring for quality and compliance.

### 4.4.21 Cluster 9, Groups 20, 21, and 22

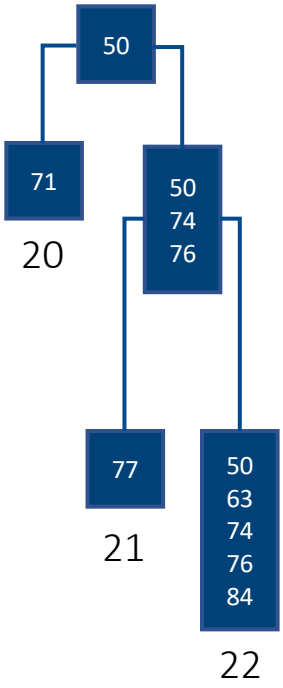


***Figure 4.29*** *Analysis of the BBB-F Cluster 9*

**Group Twenty**

Group Twenty is an outlier group. Its indicator is of the principle/ component "Legislation and Regulation"/ "Compliance" and concerns imposing quality control specifications for stakeholder selections and management.

| **Group Twenty Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicators** | |
| **Effective Implementation** | | | |
| Legislation and Regulation | Compliance | 71 | Impose quality control specifications for stakeholder selections and stakeholder management |

***Table 4.28*** *HIDECs Analysis of the BBB-F, Group 20 Indicator*

**Group Twenty-one**

Group Twenty-one is also an outlier group, but it is of the principle/ component "Legislation and Regulation"/ "Facilitation" and concerns expediting funds' disbursement and focusing on how legislation and regulatory frameworks can streamline the release of financial resources during critical times, such as post-disaster recovery or other emergency scenarios.

| **Group Twenty-one Indicators** | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicators** | |
| **Effective Implementation** | | | |
| Legislation and Regulation | Facilitation | 77 | Expedite disbursement of funds |

***Table 4.29*** *HIDECs Analysis of the BBB-F, Group 21 Indicator*

**Group Twenty-two**

Group Twenty-two has five indicators; the first two (50 and 63) are from the principle 'Institutional Mechanism', the components of 'Choosing Appropriate Intuitional Mechanism' and 'Quality assurance and Training', respectively. They address strengthening the capacity of disaster-impacted organisations, allowing them to take part in the recovery post-disaster, and the requirement of mechanisms for monitoring and evaluating the recovery process. The next two indicators (74 and 76) come from the principle/ component of "Legislation and Regulation"/ "Facilitation" and concern the enabling of 'business-as-usual" and the expediting of releasing state land for temporary housing and resettlement. The final indicator of this group (indicator 84) is from the principle/ component, "Monitoring and Evaluation"/ "Improvement" and concerns identifying problems with current post-disaster recovery practices through monitoring and evaluation mechanisms. Thus, these groups of indicators may be linked together through the commonality of 'streamlining post-disaster recovery and resilience mechanisms.'

| Group Twenty-two Indicators | | | |
|---|---|---|---|
| **Principle** | **Component** | **Indicators** | |
| **Effective Implementation** | | | |
| Institutional Mechanism | Choosing Appropriate Institutional Mechanism | 50 | Strengthen the capacity of disaster-impacted organisations to take part in recovery |
| | Quality Assurance and Training | 63 | Put in place mechanisms for monitoring and evaluation of the recovery process |
| Legislation and Regulation | Facilitation | 74 | Put in place legislation and regulations to facilitate business-as-usual processes to improve efficiency for recovery |
| | | 76 | Expedite the release of state lands for temporary housing and resettlement |
| Monitoring and Evaluation | Improvement | 84 | Identify problems with current post disaster recovery practices through monitoring and evaluation mechanisms |

***Table 4.30*** *HIDECs Analysis of the BBB-F, Group 22 indicators*

Given the cluster's overall focus on EI, with emphasis on legislation and regulation, across the three groups, this cluster is called 'Enhancing Efficiency and Quality in Post-Disaster Recovery.'

| Cluster | Group | Theme |
|---|---|---|
| 9 | 20 | Implementing quality control of stakeholder selection and management |
| | 21 | Expedite disbursement of funds |
| | 22 | streamlining post-disaster recovery and resilience mechanisms |

***Table 4.31*** *HIDECs Analysis of the BBB-F, Cluster 9 Themes*

### 4.4.22 Indicators Linking Groups 20, 21, and 22

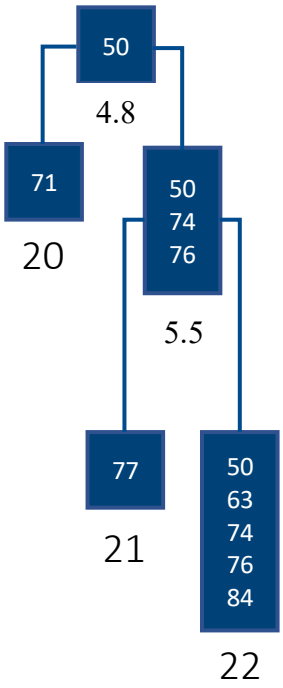


***Figure 4.30*** *Groups 4.8 and 5.5 linking Groups 20, 21, and 22*

Two groups link the Twenty, Twenty-one, and Twenty-two groups together. These are labelled as groups '4.8' and '5.5'. Group 5.5 has three indicators, all from the category of EI. They covey the principles of "Choosing appropriate institutional mechanisms" and "Facilitation". They stem from group 22 exclusively. Group 21 and Group 22 are then linked to Group 20 by Group 4.8, which contains a single indicator (50) of the principle of "Choosing Appropriate Institutional Mechanisms" and states, "Strengthen the capacity of disaster-impacted organisations to take part in recovery". This linkage promotes efficiency and compliance across different facets of disaster management and ensures that the entire framework is geared towards a unified and effective response and recovery effort.

### 4.4.23 Indicators Linking Clusters 6, 7 and 8

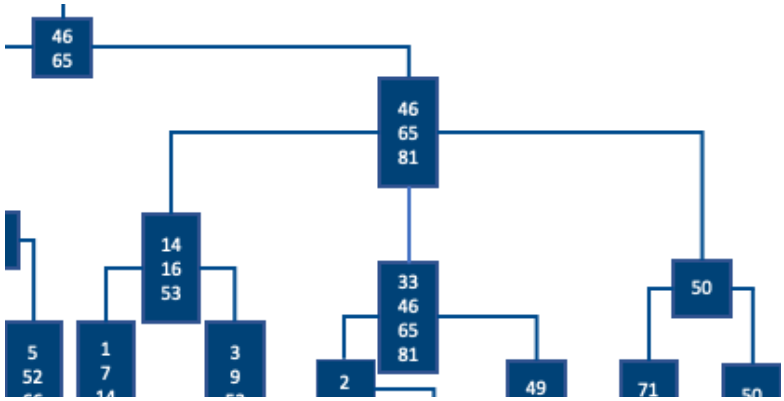


***Figure 4.24*** *Indicators linking clusters 6, 7, and 8*

Cluster six, seven, and eight share a core set of indicators (46, 65, and 81). As previously discussed, one of the limitations of the HIDECs equation is that each set of indicators can only be disseminated into two additional sets. However, there are instances where three or more divisions reflect the links or matrix more appropriately. This is one such example. Thus, the set splits into a set of three: the first three indicators (14, 15, and 53), a set of four indicators (33, 46, 65 and 81), and a final set of a single indicator (50).

The three indicators in question (46, 65, and 81) all stem from the second of these branches. They are all indicators from the category of EI and encompass the components of "Choosing Appropriate Institutional Mechanisms", "Compliance" from a legislation and regulation perspective, and "Compliance" from a monitoring and evaluation perspective.

Together, these indicators ensure that disaster management practices are efficient and adhere to established standards and protocols, enhancing the overall effectiveness and accountability of the disaster response and recovery efforts.

### 4.4.24 Indicators Linking Clusters 4, 5, 6, 7, 8 and 9

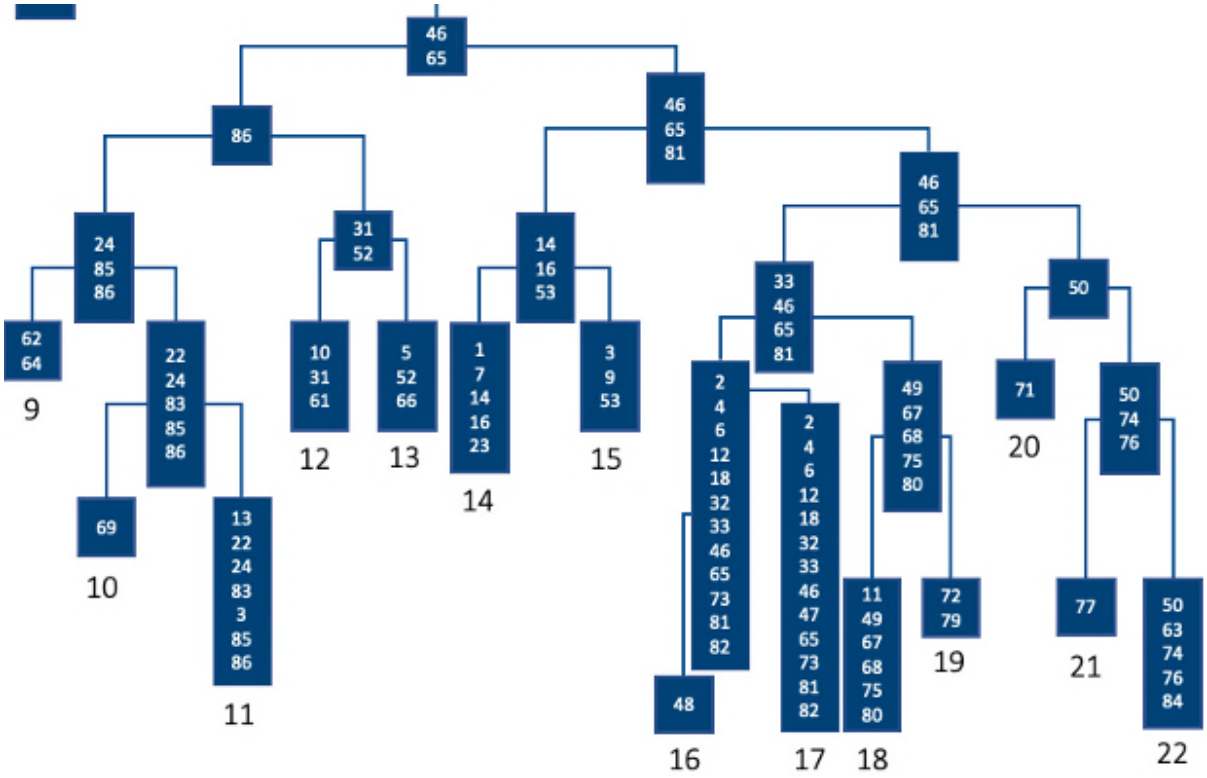


***Figure 4.25*** *Indicators linking Groups four, five, six, seven, eight, and nine*

Moving further, two indicators (46 and 65) links cluster 4, 5, 6, 7, 8, and 9. Indicator 65, 'Put in place legislation and regulations as appropriate to enforce and comply with BBB-Based recovery decisions' is a component of compliance from the legislation and regulation principle under EI. Indicator 46, 'Choose a local level body (e.g. existing government organisation or new recovery authority) most suited to the local context to plan, implement and manage recovery activities, and facilitate coordinating and partnership between stakeholders involved in recovery' is a component of 'choosing appropriate institutional mechanisms' also of EI.

### 4.4.25 Most Interconnected Indicator

Indicator 46 emerges as the most interconnected factor in the framework, linking all the groups together. This illustrates the central role that effective organisational structuring plays in disaster management. By selecting the most suitable local body to oversee recovery activities, Indicator 46 ensures that the processes are well-coordinated, contextually appropriate, and

inclusive of all stakeholders. This enhances the efficiency and effectiveness of the recovery efforts, establishing a strong foundation for collaborative and integrated disaster management.

## 4.5 Discussion

The findings from HIDECs can be used in two distinct ways. First, the grouping of indicators (specifically the lowest groups) gives insights into the interconnection between the eight principles of the framework and the components of these principles. The second is the dominant or priority of specific indicators that offer more direct guidance to decision-makers in prioritising specific actions and activities.

### 4.5.1 Holistic Roadmap

Key findings include identifying 22 distinct groups of indicators on the lowest generational tier of the family tree-like structure. The most significant observations are the make-up and size of these groups, the linking indicators, and their specific placement within the diagram. The above analysis of the HIDECs diagram outlines each group, recognising the indicators' specific principles and components. This section highlights recurring patterns and trends, offering further insights into how a holistic approach to indicators reflects the relationships and dependencies among different facets of recovery.

Five of the 22 groups consist of a single indicator, all within the "Effective Implementation" (EI) category (Groups 7, 10, 16, 20, and 21). This suggests that certain aspects of implementation in the framework are uniquely distinct, possibly requiring specialised attention or approaches that are not as interconnected with other initiatives or indicators. It implies that these specific indicators, while no less critical or even foundational to the success of the broader framework, necessitate being managed or monitored independently to ensure they are not diluted or lost when integrating more interconnected measures.

Beyond groups defined by a single indicator, there are clusters where multiple indicators, all from the same category, align to form distinct groups. This observation initially goes against the very aspect of the holistic principle; however, when examining the principle or component level, there is a distinct difference within the category. This anomaly is particularly notable in the EI category. For example, group 19 consist of two indicators exclusively from the Effective

Implementation category. Both from the principle of “Legislation and Regulation”, Indicator 72 is organised into the component ‘Compliance’ while 79 is from the component ‘Facilitation’.

Such pairings of indicators suggest they are closely linked, perhaps representing actions or policies best designed to be implemented as a unit. This setup indicates that these paired indicators support one another, and for optimal effectiveness, they must be activated together, forming a cohesive implementation strategy.

Group 22 contains five indicators, all within the EI category, illustrating a more intricate arrangement. They encompass all three of its principles. Multiple interconnected indicators in a single group suggest a more complex web of deeply interdependent actions. To be effective, these actions require a comprehensive and well-coordinated strategy, highlighting the need for a multi-faceted approach to implementation that simultaneously addresses various facets of disaster management.

Similarly, Group 14 comprises five Disaster Risk Reduction (DRR) indicators. This grouping suggests a focused and consolidated approach to risk reduction, where multiple coordinated measures are necessary to effectively address and mitigate disaster risks comprehensively.

Contrastingly, the Community Recovery (CR) category exhibits a different pattern; its indicators are never isolated but are always linked with indicators from at least one other category—DRR or EI. This pattern underscores the inherently interconnected nature of community recovery efforts, which rely on the foundational support of risk reduction measures and effective implementation strategies to achieve successful outcomes.

For instance:

- Groups One, Three, and Four connect indicators from DRR with those from CR.
- Groups Two, Six, and Eight connect indicators from EI with CR.
- Groups Five, Twelve, and Seventeen are tripartite, combining indicators from DRR, CR, and EI."

The remaining groups, Eleven, Thirteen, Fifteen, and Eighteen, link the categories of DRR and EI.

| Groups of indicators by HIDECs | Category and Principles of the BBB-F | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | DRR | | | CR | | EI | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | | 4 | | 3 | | | | |
| 2 | | | | 2 | | 4 | 1 | |
| 3 | | | | 1 | | 1 | | 1 |
| 4 | | | 1 | | 2 | | | |
| 5 | 1 | 1 | | | 7 | | 1 | |
| 6 | | | | | 1 | 1 | | |
| 7 | | | | | | 1 | | |
| 8 | | | | | 1 | 1 | | |
| 9 | | | | | | 2 | | |
| 10 | | | | | | | 1 | |
| 11 | | 1 | 2 | | | | | 3 |
| 12 | 1 | | | 1 | | 1 | | |
| 13 | 1 | | | | | 1 | 1 | |
| 14 | 2 | 2 | 1 | | | | | |
| 15 | 2 | | | | | 1 | | |
| 16 | | | | | | 1 | | |
| 17 | 4 | 1 | | 2 | | 2 | 2 | 2 |
| 18 | 1 | | | | | 1 | 4 | |
| 19 | | | | | | | 2 | |
| 20 | | | | | | | 1 | |
| 21 | | | | | | | 1 | |
| 22 | | | | | | 2 | 2 | 1 |

***Figure 4.26*** *Distribution of the BBB-F Principles Across 22 HIDECs Groups*

Figure above (4.32) highlights the distribution of the eight principles across the 22 groups. The categories of Disaster Risk Reduction (DRR), Community Recovery (CR), and Effective Implementation (EI) principles are listed across the top, and the 22 groups are labelled along the left. The values reflect the number of indicators of each principle within the group. The shading reflects the size of this value. It is an effective aid in demonstrating some emerging patterns and trends.

For instance, while there is an uneven distribution of indicators across the principles, the image above (Figure 4.32) demonstrates how spread across the groups they are—emphasising and supporting the holistic principle required. There are a few noticeable discrepancies. Principle 5, "Economic Recovery", for example, is largely clustered with 65% of its indicators within group 5. Second to this, principles 1, "Structural Resilience", 2 "Multi-hazard-based Land-use Planning", 6 "Choosing Appropriate institutional mechanisms", and principle 7, "Legislation and Regulation", have smaller clusters of 4 indicators clustered within groups 17, 1, 2, and 18

respectively. But here, the number of indicators within each principle must be considered. A cluster of four indicators within principle six carries less weight than principle two because while principle six has 19 indicators, principle two only has nine.

A weighted analysis can rectify this. Figure 4.33 shows the same matrix adjusted to reflect the value of the indicators within each principle as equal regardless of how many are in each. This adjustment shows that four indicators in Group One from principle 2 are, in fact, more intricately connected than those of the four indicators in principle 1 in Group Seventeen, for example.

| | | Category and Principles of the BBB-F | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | DRR | | | CR | | EI | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Groups of indicators by HIDECs | 1 | | 0.05556 | | 0.04167 | | 0.00658 | | |
| | 2 | | | | 0.02778 | | 0.02632 | 0.00781 | |
| | 3 | | | | 0.01389 | | 0.00658 | | 0.01786 |
| | 4 | | | 0.03125 | | 0.02778 | | | |
| | 5 | 0.01042 | 0.01389 | | | 0.09723 | | 0.00781 | |
| | 6 | | | | | 0.01389 | 0.00658 | | |
| | 7 | | | | | | 0.00658 | | |
| | 8 | | | | | 0.01389 | 0.00658 | | |
| | 9 | | | | | | 0.01316 | | |
| | 10 | | | | | | | 0.00781 | |
| | 11 | | 0.01389 | 0.06250 | | | | | 0.05358 |
| | 12 | 0.01042 | | | 0.01389 | | 0.00658 | | |
| | 13 | 0.01042 | | | | | 0.00658 | 0.00781 | |
| | 14 | 0.02084 | 0.02778 | 0.03125 | | | | | |
| | 15 | 0.02084 | | | | | 0.00658 | | |
| | 16 | | | | | | 0.00658 | | |
| | 17 | 0.02084 | 0.01389 | | 0.02778 | | 0.01316 | 0.01562 | 0.03572 |
| | 18 | 0.01042 | | | | | 0.00658 | 0.03124 | |
| | 19 | | | | | | | 0.01562 | |
| | 20 | | | | | | | 0.00781 | |
| | 21 | | | | | | | 0.00781 | |
| | 22 | | | | | | 0.01316 | 0.01562 | 0.01786 |

***Figure 4.27*** *Weighted Distribution of the BBB-F Principles Across 22 HIDECs Groups*

Groups containing indicators from multiple principles highlight the necessity for multidisciplinary approaches. Group 5, for instance, integrates Economic Recovery extensively with Structural Resilience, suggesting that economic considerations are pivotal when planning structural enhancements. This integration supports more robust disaster preparedness and ensures recovery efforts contribute to economic stability.

Principle 6, Choosing Appropriate Institutional Mechanisms, appears across a diverse range of groups, indicating its pivotal role in supporting the implementation of strategies across all other principles. This widespread presence underscores the importance of adaptable and responsive institutional arrangements in facilitating diverse recovery and resilience-building efforts.

Moreover, the significant presence of the Legislation and Regulation principle (principle 7) in groups with a high concentration of other principles, particularly Groups 17, 18, and 19, highlights the critical role of legal frameworks in ensuring the enforcement and sustainability of disaster management initiatives. These frameworks provide the legal backing supporting other principles, ensuring a cohesive and enforceable approach to disaster management.

Principles related to CR, such as Psychological and Social Recovery (principle 4) and Economic Recovery (principle 5), frequently intersect with other principles, reflecting the complex and intertwined nature of community recovery efforts. These efforts depend heavily on structural and institutional support to be effective, demonstrating the interconnectedness of all principles within the framework.

The repeated appearance of the Monitoring and Evaluation principle in groups such as 11, 17, and 22 highlights its role in continuously improving and adapting disaster management practices. Effective monitoring and evaluation ensure that initiatives remain relevant and responsive to evolving circumstances, providing a feedback loop crucial for continuously refining disaster management strategies.

The analysis of the BBB-F principles across the 22 groups reveals interdependencies that underpin effective disaster management. By recognising and leveraging these patterns, stakeholders can enhance the effectiveness of disaster management efforts, leading to more resilient communities and better preparedness against future risks. The strategic integration of these principles, supported by appropriate institutional and legal frameworks, is essential for realising the goals of the BBB-F and truly building back better.

### 4.5.2 Priority Indicators

The HIDECs analysis extends beyond its family tree-like structure's lowest 'generational' tier, illuminating the connections through "dominant genes" or repeated indicators that suggest

greater priority or significance. Identifying these linking elements highlights strategic priorities and enhances cross-category consideration. The linking or dominant genes—factors that connect groups at the generational tier above the lowest—are often compound groups composed of several indicators.

**Most Connected indicator**

Figure 4.5 illustrates the alignment of various groups within the generational tiers of our analysis. The most connected factor resides at the top tier, coded in navy colour, is indicator 46. This indicator is central to our framework, specifying the selection of a local-level body responsible for planning, implementing, and managing recovery activities. Positioned within the EI category and under "Choosing Appropriate Institutional Mechanisms," Indicator 46 is a foundational element. It plays a crucial role that transcends all organisational boundaries within the Build Back Better Framework (BBB-F), integrating aspects of CR and DRR elements. This indicator's essential, multifaceted nature is pivotal in linking diverse initiatives and disciplines, vital for disaster-stricken communities' successful recovery and resilience.

For instance, a local body selected to manage recovery operations and act as a coordinator is integral as it ensures that recovery efforts encompass all of a community's needs. Furthermore, they are best suited to tailor any external assistance and their strategies to the local context, which varies widely with geography, cultural factors, and specific disaster impacts. This flexibility enhances the effectiveness of recovery efforts of external decision-makers and ensures they are well-received and supported by the local community.

Furthermore, through collaboration with external parties, including humanitarian organisations, the capacity of these local bodies is improved. This is a critical component of DRR, as improving local capabilities builds resilience. Such strengthened capabilities are essential for sustained recovery and for preparing communities to handle future incidents effectively.

In theory, the chosen local body is also vital in ensuring effective communication and stakeholder engagement. Coordinating all parties involved in recovery efforts—from government agencies to local community groups—to be well-informed, involved, and aligned

with recovery objectives. This supports effective implementation and bolsters community recovery by maintaining an environment of trust and inclusivity.

**Tier Two**

Concerning the two groups are highlighted in light blue. The first group contains a single indicator, and the second consists of two indicators, including the most connected indicator within the framework. Both groups are categorised under Effective Implementation (EI).

Indicator 55 of the first group highlights the crucial factor of fostering partnerships. It emphasises enhancing collaboration between various stakeholders and effectively links community recovery (CR) efforts with broader disaster recovery strategies. This connectivity is vital for coordinated resource allocation and comprehensive disaster response.

The second group features Indicator 65, which focuses on compliance with legislation and regulations tailored to support Build Back Better-based recovery decisions. This indicator is especially significant within the framework's Disaster Risk Reduction (DRR) aspects, as it ensures that recovery efforts adhere to high standards, thus enhancing infrastructural and community resilience against future disasters.

**Tier Three**

Four groups, consisting of tier three, are highlighted in yellow and illustrate a progression in complexity. Two groups have a single indicator; one has three indicators, and another has four. This increase in group size indicates growing complexity within the framework.

Two of these groups originate from Indicator 55 and are composed predominantly of CR indicators, emphasising the focus on recovery efforts at the community level. In contrast, the two groups stemming from Indicator 65 consist solely of EI indicators, which are pivotal for enforcing and implementing recovery strategies.

A notable observation from this grouping is the absence of Disaster Risk Reduction (DRR) indicators. This omission suggests that the primary focus within these particular groups is on immediate recovery and implementation processes rather than long-term risk reduction strategies. This distribution underscores the specialised roles of CR and EI indicators in

addressing specific aspects of disaster recovery while highlighting areas for potential integration of DRR measures to balance the framework.

**Tier Four**

The eight groups highlighted in green begin to distinguish significantly different thematic connections. The first three groups on the left side of the diagram link Community Recovery (CR) indicators to Effective Implementation (EI) indicators with a noticeable absence of Disaster Risk Reduction (DRR) indicators. This signals a focus on integrating recovery operations with effective implementation processes, excluding long-term risk reduction.

The remaining five groups display a mix of thematic overlaps on the right side of the diagram. Two groups combine DRR and EI indicators, integrating immediate response measures with strategies to reduce future risks. Two other groups combine CR and EI indicators, linking community recovery efforts directly with implementation practices. The final group is composed exclusively of EI indicators, continuing to focus solely on implementation aspects of disaster recovery.

**Tier Five**

In the framework, five groups marked in orange demonstrate varied thematic alignments and sizes. One group, located on the left side of the diagram, integrates indicators from all three categories—Community Recovery (CR), Effective Implementation (EI), and Disaster Risk Reduction (DRR). This group predominantly features CR indicators, with 5 of the 8 indicators focusing on "Economic Recovery."

The four groups on the right side of the diagram present a mix of combinations. Two of these groups are triads: one primarily addresses CR, and the other primarily addresses DRR, illustrating their focus on specific recovery and risk reduction needs, respectively. Another group combines CR with EI indicators, linking community recovery efforts with effective implementation strategies. The last two groups are composed solely of EI indicators, indicating a specific focus on the implementation aspects of disaster recovery.

The patterns of these priority diagrams tell a story about how the framework, illustrated by Figure 4.34, visually represents the distribution of indicators and principles throughout the tiers.

| | | | Category and Principles of the BBB-F | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | DRR | | | CR | | EI | | |
| Hierachical tier and group | Teir | Group | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | 1 | 1.1 | | | | | | 1 | | |
| | 2 | 2.1 | | | | | | 1 | | |
| | | 2.2 | | | | | | 1 | 1 | |
| | 3 | 3.1 | | | | 1 | | | | |
| | | 3.2 | | | | | 3 | | 1 | |
| | | 3.3 | | | | | | | | 1 |
| | | 3.4 | | | | | | 1 | 1 | 1 |
| | 4 | 4.1 | | | | 1 | | 4 | | |
| | | 4.2 | | | | | 2 | | 1 | |
| | | 4.3 | | | | | 1 | | | |
| | | 4.4 | | | 1 | | | | | 2 |
| | | 4.5 | | | | 1 | | 1 | | |
| | | 4.6 | | 2 | | | | 1 | | |
| | | 4.7 | | | | 1 | | 1 | 1 | 1 |
| | | 4.8 | | | | | | 1 | | |
| | 5 | 5.1 | 1 | 1 | 5 | | | | 1 | |
| | | 5.2 | | | 2 | | | | | 3 |
| | | 5.3 | 4 | 1 | | 2 | | 1 | 2 | 2 |
| | | 5.4 | | | | | | 1 | 4 | |
| | | 5.5 | | | | | | 1 | 2 | |

***Figure 4.28*** *Distribution of the BBB-F Principles Across HIDECs Tiered Groups*

The most connected factor is distinguished by light blue shading. The groups positioned on the left side of the diagram (Figure 4.34) are shaded in darker blue, whereas the groups on the right side are indicated with white shading.

There is a distinct progression in complexity. Starting from Tier Two and progressing to Tier Five, there is a clear trend of increasing complexity in group compositions. Tier Two introduces basic groupings with a few indicators focusing on partnerships and compliance. In contrast, Tier Three expands with groups varying in size from one to four indicators, suggesting layered complexity. By Tier Five, groups are larger and more diverse in their thematic focus, combining indicators from all three categories.

In Tiers Two and Three, there is a dominant focus on Effective Implementation and Community Recovery, with a notable absence of Disaster Risk Reduction (DRR) indicators. This emphasis indicates a strong initial focus on establishing operational frameworks and community-focused recovery efforts. However, as we progress to Tier Four and Tier Five, there is a noticeable shift, with DRR becoming more integrated, especially in Tier Four where two groups combine DRR and Effective Implementation (EI) indicators. This shift suggests a strategic layering where initial recovery efforts are supported by subsequent integration of risk reduction strategies.

The absence of DRR indicators in the earlier groups (one, two, and three) and their subsequent inclusion in later tiers reflect a strategic staging in framework implementation. Early focus on community recovery and effective implementation sets the groundwork, which is built upon by integrating risk reduction measures as the framework evolves.

Initially, it was hypothesised that organising components by the number of indicators they contain would reveal insights into the priorities within the framework. Although this method provided basic insights, it failed to highlight the most critical components accurately.

Instead, using a matrix method to identify the most connected indicators proved more effective. This matrix helped recognise which indicators are pivotal (due to their numerous connections) and which are more isolated, thus outlining a clearer picture of priority within the framework.

However, while the matrix provided a clearer indication of priority and connections, the HIDECs software brought an additional layer of depth. HIDECs was able to uncover more nuanced connections between the indicators, offering a comprehensive understanding of how they interact within the holistic nature of the framework. This suggests that while simpler methods can offer initial insights, specialised software like HIDECs is essential for a detailed and accurate analysis, particularly in complex frameworks where the interrelationships and prioritisation of indicators are critical to understand.

## 4.6 Conclusion

The existence of groups with single indicators, especially within the "Effective Implementation" category, points to the necessity for specialised attention to certain

implementation aspects. These unique indicators likely represent critical components that require distinct strategies or focused oversight to ensure they are effectively addressed without being overshadowed by more complex or multifaceted initiatives.

The groups within "Effective Implementation" that consist of two or more indicators highlight the need for integrated action where certain policies or measures are designed to complement each other. These pairings or clusters indicate that some strategies are most effective when implemented simultaneously, suggesting a need for careful coordination and integration in policy execution.

The focused grouping of indicators within the "Disaster Risk Reduction" category into a single group implies a comprehensive approach is necessary for risk management. This suggests that risk reduction benefits from a consolidated strategy involving multiple, coordinated actions to effectively mitigate the comprehensive range of potential risks.

The consistent linking of "Community Recovery" indicators with those from other categories emphasises the interconnected nature of recovery efforts. It implies that successful community recovery relies on foundational support from both risk reduction measures and effective implementation strategies. This highlights the need for an integrated approach where community recovery is not seen in isolation but as part of a broader, collaborative effort involving various aspects of disaster management.

The groups that combine indicators from all three categories (Disaster Risk Reduction, Community Recovery, and Effective Implementation) underscore the complexity of disaster management. They illustrate how various strategies must be engaged to address the multifaceted challenges of disasters effectively. This supports the theory and persistent avocation of the holistic principle; no single category can operate in isolation without the support and enhancement provided by others.

Even when some categories show tendencies to cluster within themselves, the inter-category linkages in other groups suggest that a holistic approach, blending different categories, essential for an effective and comprehensive recovery.

Priority indicators represent essential actions or priorities that can significantly impact the framework's success. These indicators are areas where investing resources or efforts can yield substantial benefits across various aspects of disaster management.

By identifying these dominant indicators, decision-makers can prioritise resource allocation to these critical areas, ensuring that the most impactful measures are robustly supported and implemented. Initiatives designed around these dominant indicators should consider their cross-category impacts, starting at the lowest generational tier. This approach creates more cohesive and comprehensive strategies that simultaneously address multiple dimensions of disaster management.

An emerging trend shows that Effective Implementation (EI) indicators are foundational. Principles such as "Legislation and Regulation" and "Choosing Appropriate Institutional Mechanisms" must be prioritised for decision-makers designing initiatives using the framework.

Acknowledging the limitations of the HIDECs approach is crucial. Further exploration is required to establish universally agreed-upon hierarchies and ensure the inclusivity and adaptability of recovery frameworks. Future research should focus on enhancing the robustness and applicability of the HIDECs methodology and addressing emerging complexities in disaster recovery planning and implementation.

These findings suggest that the BBB-F's structure promotes a balanced approach between focused, specialised strategies and broad, integrative measures. It highlights the importance of independence and interdependence within disaster management strategies, advocating for tailored approaches where necessary while ensuring these efforts are comprehensively coordinated across the broader framework.

# Chapter Five, Case Studies

## 5.1 Introduction

This chapter presents a comprehensive thematic analysis of 40 interventions in emergency relief and prolonged crises by a leading aid organisation. The themes contribute to understanding the contextual factors that influence the selection and prioritisation of indicators. The analysis begins with an overview of the interventions, detailing their locations, timeframes, host organisations, and the specific areas where the delegates' skills and focus were requested. The chapter then explores predetermined characteristics of contextual factors that dictate a successful intervention from an academic, development and humanitarian perspective. These "success factors" are introduced to establish a benchmark to base a discussion for evaluating the emerging themes. Subsequent sections delve into the themes, providing concise definitions, drawing on evidence from the case studies, and discussing their interpretation. Cumulatively, the themes highlight key insights, recurring patterns, and narratives. A discussion of findings follows, reflecting on the "success factors" established earlier. The chapter concludes by summarising the significant findings.

## 5.2 Case Studies

The following information outlines the details of 40 case studies provided by a prominent international humanitarian organisation. This organisation, referred to as 'The Aid Organisation' (TAO), is responsible for selecting, training, and deploying technical specialists who assist communities at various crisis management stages. These stages range from preparation and planning to recovery post-disaster. The organisation's expertise covers multiple skills, including disaster risk reduction (DRR), emergency preparedness, recovery, and stabilisation. TAO works with sixteen United Nations (UN) agencies and entities, as well as frontline relief agencies and local governments. TAO extends additional support to the UN's response initiatives during humanitarian crises as part of a global network of standby partners.

Of the 40 reports reviewed, 30 were from UN agencies or entities. These included significant organisations like the United Nations High Commissioner for Refugees (UNHCR), United Nations Relief and Work Agency for Palestine Refugees (UNRWA), United Nations International Children’s Emergency Fund (UNICEF), Food and Agricultural Organisation of

the United Nations (FAO), World Food Programme (WFP), and the International Organisation for Migration (IOM). The remaining ten reports comprised six from National Disaster Management Offices or National Emergency Management Offices (NDMO/NEMO) and four from governmental entities, specifically the Prime Minister's Office or Office of the President (PMO/OTP) and the Public Works Department (PWD).

These reports cover a diverse range of sectors and roles, including shelter, disaster risk reduction/management (DRR/DRM), water, sanitation, and hygiene (WASH), logistics, education, and monitoring, evaluation, accountability, and learning (MEAL). They provide insights into deployments across eighteen countries distributed over four global regions. The deployments covered in the Middle East and North Africa include Jordan, Lebanon, the West Bank, and Iraq, totalling seven reports. Another set of seven reports focuses on Africa, highlighting work in Uganda, Ethiopia, Malawi, and Zambia. In Asia, deployments spanned four countries - Nepal, Bangladesh, Myanmar, and the Philippines, with thirteen reports. Lastly, the Pacific region is represented by thirteen reports from assignments in Samoa, Kiribati, Solomon Islands, Tonga, Vanuatu, and Fiji. Deployments spanned from January 2018 to mid-September 2020, ranging from a month to two and a half years.

Tables 4.1 and 4.2 showcase this variety in the case studies. Table 4.1 shows the regions, countries, length of assignment, and the host organisation requesting assistance. Table 4.2 highlights the delegates' skill area, the skill profile requested by the host organisation, and the job title.

| | Region | Country | Start | End | Months | Host Org |
|---|---|---|---|---|---|---|
| 1 | MENA* | Jordan | 10.04.18 | 10.10.18 | 5.8 | UNHCR |
| 2 | MENA | Lebanon | 03.02.19 | 05.02.20 | 12.1 | UNHCR |
| 3 | Asia | Nepal | 19.02.18 | 30.06.18 | 4.3 | UNHCR |
| 4 | MENA | OPT** | 23.07.18 | 22.01.19 | 6 | UNRWA |
| 5 | Africa | Uganda | 18.04.18 | 30.10.18 | 6.4 | WFP |
| 6 | Asia | Bangladesh | 12.06.19 | 11.12.19 | 6 | UNHCR |
| 7 | Pacific | Samoa | 12.01.19 | 14.07.19 | 6 | NDMO |
| 8 | Pacific | Kiribati | 21.01.20 | 09.09.20 | 7.6 | Office of the President |
| 9 | Pacific | Solomon Is. | 23.04.19 | 19.03.20 | 8.1 | NDMO |
| 10 | Pacific | Tonga | 29.01.19 | 15.10.19 | 8.5 | NEMO |
| 11 | Pacific | Vanuatu | 05.08.19 | 04.08.20 | 12 | NDMO |
| 12 | Pacific | Vanuatu | 26.03.18 | 30.06.19 | 14.8 | NDMO |
| 13 | Africa | Uganda | 06.03.18 | 05.09.18 | 6 | UNHCR |
| 14 | Africa | Ethiopia | 06.06.18 | 05.01.19 | 6.3 | FAO |
| 15 | Pacific | Vanuatu | 14.06.18 | 14.12.18 | 4.8 | NDMO |
| 16 | Africa | Ethiopia | 31.03.19 | 29.11.19 | 8 | UNICEF |
| 17 | Asia | Bangladesh | 24.05.19 | 23.11.18 | 6 | UNHCR |
| 18 | Asia | Bangladesh | 22.05.18 | 22.08.18 | 3 | UNHCR |
| 19 | Africa | Uganda | 18.03.18 | 17.09.18 | 6 | UNHCR |
| 20 | MENA | Jordan | 21.03.18 | 31.10.18 | 7.2 | UNHCR |
| 21 | Pacific | Vanuatu | 17.01.18 | 31.08.20 | 31.5 | Public Works Dept. |
| 22 | Asia | Myanmar | 17.04.18 | 17.10.18 | 6 | WFP |
| 23 | MENA | Lebanon | 19.06.18 | 19.12.18 | 6 | UNRWA |
| 24 | Pacific | Vanuatu | 21.01.19 | 30.05.19 | 4.2 | Vanuatu Gov. |
| 25 | Pacific | Vanuatu | 20.08.19 | 29.05.20 | 9.3 | UNHCR |
| 26 | Asia | Bangladesh | 25.05.18 | 28.02.19 | 9.2 | FAO |
| 27 | Asia | Philippines | 14.06.18 | 19.11.18 | 5.2 | FAO |
| 28 | Pacific | Fiji | 04.02.19 | 04.04.19 | 1.9 | FAO |
| 29 | MENA | Iraq | 14.05.18 | 20.12.19 | 19.2 | UNHCR |
| 30 | Asia | Bangladesh | 10.05.18 | 13.02.19 | 9 | IOM |
| 31 | Asia | Bangladesh | 04.01.20 | 20.03.20 | 2.5 | UNHCR |
| 32 | Asia | Bangladesh | 25.03.18 | 19.09.18 | 5.9 | UNHCR |
| 33 | Asia | Bangladesh | 28.03.18 | 06.10.18 | 6.3 | UNHCR |
| 34 | Asia | Bangladesh | 06.04.18 | 03.05.18 | 3 | UNHCR |
| 35 | Pacific | Samoa | 04.04.18 | 07.07.18 | 1 | NEMO |
| 36 | Pacific | Tonga | 14.01.19 | 16.07.19 | 6 | NEMO |
| 37 | Africa | Malawi | 17.04.19 | 17.10.19 | 6 | UNICEF |
| 38 | Asia | Bangladesh | 01.08.18 | 01.11.18 | 3 | UNHCR |
| 39 | Africa | Zambia | 18.01.18 | 20.04.18 | 3 | UNHCR |
| 40 | MENA | Lebanon | 04.01.18 | 21.01.19 | 12.6 | UNHCR |

*Middle East, North Africa
** Occupied Palestine Territories

***Table* 5.1:** *Forty Case Studies by Region, Country, Length of deployment and Host Organisation*

| | Skill Area | Skill Profile | Job Title |
|---|---|---|---|
| 1 | Education | Education/ EIE* | Associate Education Officer |
| 2 | Response Coordination and Management | Assessment/ Monitoring Evaluation | Associate MEAL Officer |
| 3 | Technical Services | Shelter | Associate Site Planning Officer |
| 4 | Technical Services | Civil / Structural Engineering | Civil Engineer |
| 5 | Technical Services | Civil / Structural Engineering | Civil Engineer |
| 6 | Response Coordination and Management | Humanitarian Affairs | Coordination Officer |
| 7 | Preparedness, Risk Reduction and Resilience | Disaster Risk Management | Disaster Risk Management Specialist |
| 8 | Preparedness, Risk Reduction and Resilience | Disaster Risk Management | Disaster Risk Management Specialist |
| 9 | Preparedness, Risk Reduction and Resilience | Disaster Risk Management | Disaster Risk Management Specialist |
| 10 | Preparedness, Risk Reduction and Resilience | Disaster Risk Management | Disaster Risk Management Specialist |
| 11 | Preparedness, Risk Reduction and Resilience | Disaster Risk Management | Disaster Risk Management Specialist |
| 12 | Preparedness, Risk Reduction and Resilience | Disaster Risk Management | Disaster Risk Management Specialist |
| 13 | Health / Nutrition | Education / EiE | Education Officer |
| 14 | Stabilisation and Recovery | Food Security / Livelihoods | Emergency Program Officer |
| 15 | Response Coordination and Management | Emergency / Field Coordination | Emergency Resettlement Coordinator |
| 16 | Response Coordination and Management | Emergency / Field Coordination | Emergency Specialist (Revolving IDP** Response) |
| 17 | Response Coordination and Management | Administration | Executive assistant |
| 18 | Response Coordination and Management | Humanitarian Affairs | Humanitarian Affairs Officer |
| 19 | Response Coordination and Management | Information Management | Information Management Officer |
| 20 | MEAL and Reporting | Monitoring, Evaluation, Accountability & Learning (MEAL) | Monitoring, Evaluation, and Communications Expert |
| 21 | Response Coordination and Management | Project Management | Project Management Specialist |
| 22 | Technical Services | Civil / Structural Engineering | Project Manager/ Engineer |
| 23 | Education | Education / EiE | Project Reporting Officer, Field Education Program |
| 24 | Response Coordination and Management | Emergency / Field Coordination | Recovery Coordination Adviser |
| 25 | Response Coordination and Management | Emergency / Field Coordination | Recovery Coordination Adviser |
| 26 | Response Coordination and Management | Humanitarian Affairs | Reporting Officer |
| 27 | Preparedness, Risk Reduction and Resilience | Disaster Risk Reduction | Resilience and DRR Expert |
| 28 | Stabilisation and Recovery | Food Security / Livelihoods | Resilience Program Review Expert |
| 29 | WASH | WASH | Sanitation/Wastewater Specialist |
| 30 | Technical Services | Shelter | Shelter and Supply Management Officer |
| 31 | Technical Services | Shelter | Shelter Officer |
| 32 | Technical Services | Shelter | Shelter Officer |

| | | | |
|---|---|---|---|
| 33 | Technical Services | Shelter | Shelter Officer |
| 34 | Technical Services | Shelter | Shelter Officer (Engineer) |
| 35 | Technical Services | Civil / Structural Engineering | Structural Engineer |
| 36 | Technical Services | Civil / Structural Engineering | Structural Engineer |
| 37 | Technical Services | Civil / Structural Engineering | Structural Engineer |
| 38 | WASH | WASH | WASH Officer |
| 39 | WASH | WASH | WASH Officer |
| 40 | WASH | WASH | WASH Specialist |

*Education in emergencies
** Internal Displaced Population

***Table 5.2:*** *Forty Case Studies by Skill Area of Delegate, Skill Profile, and Job Title from TOR*

## 5.3 Established Factors of Success

The analysis of these case studies provides insights into the contextual factors that have influenced the prioritisation of indicators. This is achieved through a thematic analysis of two pivotal documents: the Terms of Reference (ToR) and the End of Deployment Reports (EoDR). These documents illuminate the practical aspects and outcomes of the interventions, highlighting the contextual nuances that shaped their section and the prioritisation of indicators.

However, a thorough understanding of these contextual factors depends on first understanding those that have been previously established. Understanding these is crucial because they provide a benchmark for discussing emerging themes, determining overlap and gaps, and gaining insights into what is happening and why. This section explores these success factors derived from academic, development, and humanitarian perspectives. Each perspective contributes distinct criteria that together define success.

In a 2015 research paper, researchers Puri et al. (2017) examined the methodologies utilised in evaluating the impact of humanitarian assistance, aiming to ascertain how measuring impact can determine the success of an intervention. The paper identifies several key factors crucial for a thorough evaluation of the effects of humanitarian aid, which are:

- Ethical Considerations
- Accessibility of Data
- Evaluation's Cost and Timeliness
- Adequacy of Sample Sizes
- Unforeseen Impacts and Attention to Vulnerable Groups

From a development standpoint, the Organisation for Economic Cooperation and Development's (OECD) review of Development Assistance Committee (DAC) member practices offers an extended view. In their evaluation of development practices from member reports, the OECD identifies the following critical factors for success:

- Clear Purpose and Goals for Results
- Well-Established Results Culture
- Commitment from Partner Organisations at the Country Level
- Well-Defined Results at Both Country and Intervention Levels
- Balance Between Immediate and Long-Term Results
- Practical Frameworks Aligned with Strategic Priorities
- Enhanced Data Availability and Reliability

On the humanitarian front, Ramalingam et al. (2015) provide insights from their study, which delves into the current performance management practices within the humanitarian sector, comparing them to practices in other sectors. The study outlines experiences and potential benefits and provides recommendations for the humanitarian sector. The recommended factors for consideration include:

- Coordination Among Agencies and Stakeholders
- Incorporation of Multi-Dimensional Frameworks from Various Disciplines
- Enhancement of Collective Performance
- Performance Evaluation Based on Monitoring and Measuring Success
- Utilisation and Learning from Available Data
- Long-Term Analysis and Ongoing Monitoring Beyond Immediate Results
- Addressing Systematic Gaps
- Integration and Balancing of Diverse Concepts and Methods

These insights collectively provide a comprehensive perspective on evaluating the impact of humanitarian interventions, drawing from academic, development and humanitarian viewpoints. A number of these factors align or overlap and thus can be clustered into groups concerning factors of success. The following section explores these, developing a synthesised list to support the discussion from the findings of the thematic analysis.

### 5.3.1 Ethical and Rights-based Principles

Puri et al. find that the outcome of action and activities or 'approaches' engaged by practitioners responding to challenges, such as limited resources or an inability to reach the entirety of the affected population, was best measured by the ability to see these as opportunities to come up with innovative solutions. The appropriateness of such solutions rests on being able to 'significantly improve but not worsen outcomes for emergency relief recipients', a premise based on the 'do no harm' principle. The concept of 'not harm' is most commonly associated with the Hippocratic Oath in medical ethics. However, Puri et al. demonstrate its relevance in humanitarian action, comparable to other ethical principles such as 'leave no one behind', which is a fundamental principle of the United Nations Sustainable Development Goals (SDGs), embodying a commitment to inclusive and equitable progress, or the humanitarian principles that include 'humanity', 'neutrality', 'impartiality', and 'independence'. Over 492 international humanitarian organisations adhere to these principles, ensuring consistent practices and ethical frameworks for effective crisis response and assistance to affected populations (OCHA, 2012). The first three of these 'humanitarian principles' were formally embraced and endorsed by the United Nations in resolutions 46/182 (1991) and the later 'independence' in 58/114 (2004), solidifying their role as a unified approach. Ethic-based principles provide an ideological framework directing development cooperation and humanitarian action and informing and guiding the decisions made in the field to ensure the most viable positive outcome.

This factor crosses closely to Ramalingam et al.'s theme of 'integrated and balancing of diverse concepts and methods', which discusses the need for a balanced, comprehensive, and coherent framework for humanitarian performance that could be agreed upon across agencies. It underscores the importance of incorporating ethical considerations and principles into existing broader frameworks agreed across agencies. By integrating these moral considerations, frameworks ensure that humanitarian efforts not only aim for effectiveness and efficiency but also ensure that the impacts of humanitarian performance include a focus on not worsening outcomes for emergency relief recipients.

### 5.3.2 Data-Driven Decision Making

Puri et al. stress the importance of creatively using data in the context of both anticipated disasters and protracted crises. They argue that data availability allows for creating a baseline upon which elevations can be built, enhancing the understanding of impacts. Their discussion points out that "in all cases, the use of data that is used creatively in the context of both unanticipated disasters and for protracted crises to understand and create a baseline on which to build an appropriate evaluation" highlights the versatility required in data collection and analysis, suggesting that traditional longitudinal studies might not always be feasible or necessary in evaluating impactful humanitarian work. The DAC emphasises the critical need for "strengthened data availability and reliability" to conduct practical result analysis. This involves ensuring that data collection is resourceful, not diverting attention from other critical tasks. The OECD's approach, as mentioned, includes "engagement with local expertise, third-party monitoring, open-source databases, and resource pooling to collect data across projects to gather data," showcasing a multifaceted strategy to enhance data reliability and availability without compromising the efficiency of humanitarian interventions. Finally, Ramalingam et al. advocate using data in learning, reflection, and ongoing monitoring. They highlight the importance of "use available data for learning and reflection", underlining the necessity of collecting data and actively engaging with it to improve humanitarian practices.

This approach supports the idea that data should inform not only the initial planning stages but also the entire lifecycle of the humanitarian interventions, facilitating adaptations based on real-time feedback and long-term impact assessment. Together, this suggests that successful humanitarian interventions require a comprehensive approach to data management that spans beyond collection. It calls for integrating data into all aspects of humanitarian work, from strategic planning to on-the-ground implementation, ensuring interventions are responsive, effective, and genuinely beneficial to those in need. In simpler terms, these points all emphasise the importance of using available information in innovative ways to plan interventions better, ensure we can trust the data being used, and keep learning and adjusting actions and activities to help people in the most effective way possible.

### 5.3.3 Long-term Analysis and Ongoing Measures

Ramalingam et al. emphasise the significance of "longitudinal performance and monitoring beyond results-based" analysis for evaluating success, advocating for a combination of performance monitoring with evaluation. They argue that "Performance monitoring determines

whether specific results were achieved – normally quantitative indicators enable comparability across a wider scale and range of activities over time". This approach allows for a comprehensive understanding of the immediate impacts of humanitarian interventions. It facilitates comparisons across different emergencies and contexts over time, highlighting the importance of continuity and adaptability in response strategies. The OECD complement this perspective by stressing "balance between short-term and long-term results", where it is acknowledged that "focusing on long-term requires analysing how results interlink over time and across sectors (holistic)." The review highlights the necessity of comprehensive approaches that help understands these links, requiring "strong monitoring and evaluation capacities including at the field level to address linkages and qualitative changes." This suggestion of a balanced approach resonates deeply with the understanding that humanitarian action should not only address the immediate needs arising from crises but also lay the groundwork for sustainable development.

This involves "analysing how results interlink across sectors," acknowledging that interventions in one area can have profound implications for other aspects of recovery and redevelopment. As such, success is found in forward-looking perspectives, where immediate actions are considered with an awareness of their long-term impacts. This integration of long-term analysis with ongoing measures into the evaluation process underlines a fundamental shift towards a more holistic tactic towards humanitarian intervention, moving beyond focusing on immediate outputs and considering long-term sustainable solutions.

### 5.3.4 Engagement and Buy-in From Stakeholders

The OECD recognises the importance of "Buy-in to the results from donor agency management and partner organisations at the country level", pointing out that this engagement is vital for ensuring the interventions are well-targeted and resonate with the needs and priorities of the affected community. OECD stresses that this buy-in goes beyond coordination and encompasses the pivotal aspect of collaboration and negotiation among all key stakeholders to align goals and strategies of interventions best. Such transparency is essential for encouraging management to make relevant and impactful changes. Ramalingam et al. take this concept further by advocating for "coordination approaches between agencies and stakeholders", which they identify as essential for enhancing the effectiveness of humanitarian efforts. They discuss

how an integrated approach to performance, which intentionally unites different levels, functions, and initiatives within the humanitarian system, can significantly improve how aid is delivered and its impacts. Furthermore, Ramalingam et al. illustrate that a more unified and effective response mechanism would leverage the strengths and resources of various stakeholders and, in doing so, better address humanitarian challenges. This perspective combined emphasises that no single organisation or sector can address complex challenges alone, and effective response requires partnership and collaborative frameworks to yield successful outcomes.

### 5.3.4 Incorporation of Multi-dimensional Frameworks

This underscores the critical need for a functional, holistic approach in the planning and implementation of actions and activities. Ramalingam et al. advocate for the "acknowledgement and engagement with multi-dimensional frameworks that aim to blend concepts with diverse disciplines", highlighting the value of integrating a wide range of perspectives and methodologies to enhance the effectiveness of humanitarian aid. Again, the Sustainable Development Goals (SDGs) are referenced to highlight an example of such a framework. It is emphasising its role in promoting collaboration among different agencies and nations. According to Ramalingam et al., this approach embodies a holistic perspective central to the success of humanitarian efforts.

Similarly, the OECD emphasises the importance of "Manageable results frameworks aligned to priorities", arguing that the effectiveness of humanitarian intervention is significantly enhanced when the frameworks used are both practical and strategically aligned. The OECD suggests that aligning frameworks to strategic priorities enables a focused and effective response, stating that "it is crucial to align results frameworks to strategic priorities and filter the information according to demand". This alignment ensures that interventions are responsive to immediate needs and guided by a more significant strategy. This enables those designing key actions and activities to realign themselves over time as situations develop, continuing to work towards a unified goal of sustainable, long-term impact. These suggest incorporating a holistic approach to humanitarian aid can have a more significant effect.

### 5.3.5 Focus on Vulnerable Populations and Long-term Outcomes

Puri et al. identify the necessity of considering "unintended consequences and vulnerable groups" in evaluating humanitarian aid's impact. They point out that "evaluations of impact should be cognisant of the direct effect on these groups as well as other unintended consequences", emphasising the essential need to focus on women, children, LGBTQ (Lesbian, gay, bisexual, Transgender, Queer) communities, and others who might be disproportionally affected by crises. This focus is not just a matter of ethical concern, which is better covered in the previous section 4.1, 'Ethical and Rights-based principles'. Still, it is argued to be integral to the effectiveness and righteousness of humanitarian interventions, suggesting a profoundly rights-based approach to aid delivery. The OECD complements this viewpoint by advocating for a "clear purpose of the results system", where interventions are designed with immediate objectives and aligned with long-term outcomes that contribute to sustainable development and resilience. The Emphasis here is on understanding and articulating the long-term goals of humanitarian actions, ensuring that these goals address the needs and vulnerabilities of affected populations. The OECD's stance reinforces that for aid to be truly effective, it must be delivered with a clear understanding of its broader objectives and impacts, particularly concerning the most vulnerable. When considering these factors together, it is essential to ensure that aid efforts do not inadvertently exacerbate vulnerabilities or overlook the specific needs of marginalised groups. Thus, the idea of 'success' can be considered when humanitarian effort improves the conditions and resilience of these vulnerable populations over the long term.

### 5.3.6 Operational Efficiency and Strategic Alignment in Evaluation

The three components that make up this factor are 'Evaluation's Cost and Timeliness', 'Well-Defined Results at Both Country and Intervention Levels', and 'Performance Evaluation Based on Monitoring and Measuring Success'. Together, they discuss a dual focus of evaluations. The first considers the evaluations guiding immediate choices during an evolving and rapidly changing environment, and the second informs future strategic decisions. Both address the fostering of an atmosphere of ongoing improvement. Puri et al. highlights the balance between "cost and speed of evaluation", referring to the necessity for speedy, cost-effective evaluations that allow immediate adjustments and decision-making during ongoing and rapidly evolving crises. This suggests that success is more likely when the continual assessment of critical activities occurs to guide the ongoing selection of success indicators, ensuring efficient and

impactful actions. The OECD's emphasis on “clear results set at country and intervention levels” stresses the importance of having specific, measurable goals that guide humanitarian efforts (benchmark indicators such as the SDGs or Sphere standards, for example). This “gives a strategic direction to staff and development partners” in measuring impacts, maintaining focus, and enabling organisations to allocate resources and efforts more effectively. This factor aligns with Puri et al. by giving a baseline or framework on which to base evaluations. Ramalingam et al.’s avocation for “evaluating performance based on monitoring and measurement of success” argues for monitoring and evaluation techniques to understand interventions' immediate and long-term impacts. Encouraging delegates to reflect on the possible wide range of outcomes that their work impacts to impart the importance of adaptability and learning, ensuring humanitarian organisations can refine and improve their strategies over time based on solid evidence, improving upon the frameworks discussed by the OECD. These three factors together reflect the importance of monitoring and evaluating both measurable performance through benchmark indicators and the impact of success indicators, not only on the immediate needs of the crisis but also on contributing to the broader goals of sustainable development and resilience. Thus, success is reflected in a culture of continuous learning where the insights gained from monitoring and evaluation inform future strategies, fostering an environment of ongoing improvement.

### 5.3.7 Continuous Improvement and Systemic Enhancement

The OECD discusses the need for a “mature results culture” within organisations. This idea suggests that for humanitarian work to make a difference, the organisation must prioritise achieving meaningful results. They characterise this culture by six essential elements: strong leadership, appropriate staff incentives, accountability for results, empowerment for corrective adjustments, an environment conducive to discussing performance, and a commitment to learning from results. Like the principle of building back better, these are considered holistic and require all aspects to derive beneficial action and decisions at every level. Conversely, Ramalingam et al.’s focus on ‘Addressing Systematic Gap’. This perspective acknowledges that evaluating humanitarian action often omits critical stakeholder perspectives, including beneficiaries, affected populations, and national governments, leading to a narrow understanding of success and impact.

Furthermore, they emphasise the need for a broader view of how different contexts affect outcomes. They also suggest that “success” relies on organisations (or delegates) operating in these spaces to build capacity, form partnerships, and innovate. These factors depend on a healthy organisational culture that facilitates the delegates to act in a particular way. Defining success is not in achieving predefined outcomes but in the effectiveness of interventions, the inclusivity of the process, and the adaptability of strategies in the face of a changing landscape.

### 5.3.8 Synthesised Factors of Success

Thus, success can be evaluated against these eight factors from an academic (Puri et al.), development (OECD), and humanitarian standpoint (Ramalingam et al.) standpoint.

- Ethical and Rights-based principles
- Data-Driven Decision Making
- Long-term analysis and ongoing measures
- Engagement and buy-in from stakeholders
- Incorporation of Multi-dimensional Frameworks
- Focus on vulnerable populations and long-term outcomes
- Continuous Improvement and Systemic Enhancement

In the thematic analysis of these 40 interventions, it is essential to have a clear and consistent framework to assess their effectiveness. To this end, establishing predefined "factors of success" serves two critical purposes. Firstly, these factors provide a standardised benchmark against which all interventions can be evaluated. This standardisation ensures that assessments are objective and comparable across different contexts and interventions. Secondly, defining these factors beforehand helps focus the analysis on what truly matters for the success of interventions. It shifts the evaluation from project-specific goals to adhere to a broader discussion of what indicators, or components of indicators, need to be prioritised to support more specific interventions. This approach not only evaluates the accountability of the interventions but also guides future strategies by highlighting areas of strength and pinpointing where improvements are needed, thus aiming to address the research objective of analysing the contextual issues and effectiveness of indicators in post-disaster recovery efforts.

### 5.3.9 Linking ToR and EoDR to Factors of Success

The two reports (ToR and EoDR) associated with the 40 case studies have several key intents and purposes that align with these established factors. See Appendix C.1 and C.2 for an example of these documents and how they have been formatted. This suggests that the TAO is aware that several facts are pivotal in facilitating effective indicator selection, structuring the ToR and EoDRs to prompt thought and reflection on these factors.

*Ethical and Rights-based principles:*
The ToR, with its focus on outlining objectives, roles, and responsibilities, ensures clear directives and expectations and sets a foundation for ethical and rights-based approaches.

*Data-Driven Decision Making:*
Both documents strongly support data-driven decision-making. The ToR sets clear objectives and expected outcomes, which can be used as data collection and analysis benchmarks. Meanwhile, the EoDR documents tangible outcomes and evaluates the impact, highlighting how data was utilised to inform decisions and adapt strategies exemplifying or denying a commitment to evidence-based interventions.

*Long-term analysis and ongoing measures:*
The focus on detailing the working context and results of deployment within the EoDR supports long-term analysis by documenting how interventions are expected to influence broader outcomes over time, how host organisation will sustain their work and the strength of host organisations and communities to support this. This is less explicitly addressed in the ToR but is implied through the objectives and expected outcomes, which could be designed with long-term impacts in mind. Furthermore

*Engagement and buy-in from stakeholders:*
The ToR's emphasis on roles, responsibilities, and reporting structures suggests an effort to ensure alignment and buy-in from various stakeholders by clarifying expectations and communication channels. The EoDR complements this by reflecting on the dynamics between the delegate, their supervisor, and other personnel, offering insights into how stakeholder engagement influenced the deployment's outcomes.

*Incorporation of Multi-dimensional Frameworks:*
While the ToR sets the stage for a multidimensional approach by defining objectives and the scope of work, the EoDR provides a more comprehensive view of how these frameworks were applied or adapted in practice. Analysing the delegate's experiences and the outcomes achieved within the EoDR offers a nuanced perspective on integrating various disciplines and methodologies.

*Focus on vulnerable populations and long-term outcomes:*
Both documents indirectly support this factor by emphasising objectives and outcomes, which could include specific references to vulnerable groups. The EoDR's detailed analysis of deployment results and reflections on the challenges faced provide an opportunity to assess how interventions addressed the needs of these groups and contributed to sustainable outcomes.

*Operational Efficiency and Strategic Alignment in Evaluation:*
The structure and content of both ToR and EoDR support this factor by ensuring that deployments are guided by clear objectives and evaluated against tangible outcomes, fostering an environment of continuous learning and improvement. The ToR's focus on roles, reporting, and qualifications ensures that deployments are strategically aligned, while the EoDR's reflective analysis provides a basis for evaluating operational efficiency and impact.

## 5.4 Terms of Reference Thematic Analysis

Nine themes emerged from the Terms of Reference (ToR) thematic analysis, each encapsulating a different aspect of the most commonly stipulated requirements, expectations, and guidelines. This analysis involved systematically coding and categorising the text within the ToRs to identify recurring patterns and determine the most prevalent characteristics and expectations across the documents. These themes are,

- Experience
- Technical Expertise
- Analytical and Problem-Solving Skills
- Flexibility and Adaptability
- Coordination and Collaboration
- Communication Skills

- Leadership and management
- Capacity Building and Training
- Cultural Sensitivity

Note that no ToR was available for 5 of the case studies (4, 7, 14, 15 and 18)

### 5.4.1 Experience

The theme of "Experience" here is the accumulation of knowledge, skills, and competencies gained through practical involvement in complex situations, particularly within humanitarian affairs and disaster management contexts. It highlights the critical importance of practical field experience, emphasising that this experience ensures interventions are grounded in a deep understanding of sectoral challenges, beneficiary needs, and contextual dynamics.

Every ToR requests a level of experience in some way. It is typically listed as qualifications, specific degrees, or several years of work experience in relevant fields. The universal prevalence of the theme underscores its indispensable role. In essence, the interpretation of “experience” underscores that practical experience is a cornerstone of successful project implementation across all disaster management sectors. It enables teams to devise solutions informed by past successes and failures, adapt to emergent challenges, and ensure interventions are contextually relevant and impactful.

### 5.4.2 Technical Expertise

The "Technical Expertise" theme is defined by the specialised knowledge and skills essential for effectively carrying out various projects. ToR’s specify qualifications, specific degrees, and several years of work experience in relevant fields. This expertise enables professionals to implement, manage, and innovate. The necessity of technical expertise is evident in its application to ensure precision and adherence to standards in project execution. It also equips professionals to solve complex challenges and provide strategic advice, ensuring projects comply with regulatory frameworks tailored to meet the environment's specific needs or situations.

### 5.4.3 Analytical and Problem-Solving Skills

Based on the ToR, the "Analytical and Problem-Solving Skills" theme is foundational for navigating complex environments, analysing intricate situations, identifying core problems, and formulating effective solutions. Candidates must possess strong analytical and problem-solving skills to assess complex situations, identify needs, and develop appropriate responses.

### 5.4.4 Flexibility and Adaptability

While clear objectives provide a framework for action, ToR acknowledges the importance of flexibility and adaptability in responding to evolving circumstances and unforeseen challenges. They suggest that delegates remain open to adjusting their approach and strategies to overcome obstacles and stay aligned with their goals.

### 5.4.5 Coordination and Collaboration

The ToRs systematically emphasise the indispensable role of "coordination and collaboration" in successfully executing humanitarian and development projects. It becomes evident that such collaborative efforts are not optional but foundational to achieving desired outcomes in many sectors. This narrative is woven through the Terms of Reference (ToR) provided, each illustrating the critical nature of these joint efforts as central to the operational and strategic execution of tasks.

### 5.4.6 Communication Skills

Integrating insights from these ToR, it is clear that "Communication Skills" are indispensable across all sectors covered. Effective communication enhances project management, stakeholder engagement, and community participation, ensuring that interventions are well-coordinated, needs-based, and sustainable. Through clear, consistent, and culturally sensitive communication, project teams can navigate challenges, foster collaboration, and achieve impactful outcomes, reinforcing communication skills' critical role in humanitarian and development contexts.

### 5.4.7 Leadership and Management

The theme of "Leadership and Management" is extensively reflected across various ToR, underlining its crucial role in ensuring the successful implementation and management of projects within diverse sectors. Leadership and management skills are indispensable for steering projects towards achieving their goals, fostering teamwork, and ensuring that interventions are effectively coordinated, implemented, and scaled to meet the needs of affected populations. Integrating insights from specific ToR, the value of leadership and management in project success can be explored in greater detail.

### 5.4.8 Capacity Building and Training

The ToR highlight the importance of equipping national and local disaster management offices and teams with the necessary tools, knowledge, and skills to better prepare for, respond to, and recover from natural hazards and disasters. It is suggested that this be achieved through several objectives and goals, such as providing technical advice, developing strategies, legislation, and policies, and strengthening coordination and communication mechanisms. The focus on simulation exercises, incident management systems, and capacity building within the host organisation illustrates a proactive approach to disaster preparedness and resilience building.

### 5.4.9 Cultural Sensitivity

This theme highlights the need to understand, and respect affected communities and individuals' diverse cultural backgrounds, practices, and needs. It ensures that interventions effectively meet the physical needs of communities and individuals and are respectful and responsive to their cultural identities and preferences. Culturally sensitive approaches can help projects achieve greater acceptance, impact, and sustainability.

### 5.4.10 ToR Themes Reflection Against Factors of Success

Both the ‘factors of success’ and the themes identified in the ToR share a partial alignment in emphasising skills and expertise, such as technical know-how, analytical and problem-solving abilities, leadership, and management. This shows that both the factors of success and the ToR recognise the importance of these capabilities for effective interventions. However, the ToR

emphasises practical skills and experiences like flexibility, coordination, communication, and cultural sensitivity, suggesting that host organisations prioritise distinguishing the operational capabilities of the delegates in the ToR rather than the specific process they foresee them undertaking to achieve the set objective.

There are some evident gaps between the two. The "factors of success" include broader, more strategic elements such as ethical and rights-based principles, data-driven decision-making, and a focus on vulnerable populations and long-term outcomes. These elements are not explicitly mentioned in the ToR themes, potentially indicating a gap in how strategic and ethical considerations are being requested or emphasised by host organisations. Additionally, the ToR does not explicitly address long-term analysis, ongoing measures, or systemic enhancement, as highlighted in the success factors.

The success factors also incorporate multi-dimensional frameworks that suggest a more integrated approach to handling interventions. This is not directly mirrored in the ToR themes, possibly indicating a need for a more directed holistic approach in intervention planning. This may be better considered by analysing how the ToR aligns with the Build Back Better Framework component.

### 5.4.11 ToR Prioritisation of Build Back Better Components

The themes identified offer insight into the qualities of the delegates sought by the host organisations seeking assistance. They reflect overarching qualities consistent across different contexts, highlighting the importance of a unified approach to recovery and development. However, the analysis overlooks specific considerations of how the holistic principles are integrated within these themes.

To bridge this gap, the primary duties, responsibilities, and expected outputs detailed in each Terms of Reference (ToR) were carefully examined to determine their alignment with the 'Build Back Better Framework' discussed in the previous chapter. This process involved categorising these specific ToR elements under the corresponding components of the framework.

| | Build Back Better Framework | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***Disaster Risk Reduction*** | | | | | | | ***Community Recovery*** | | | | | ***Effective Implementation*** | | | | | | | |
| **Principle** | *Resilient Physical Assets* | | | *Multi-hazard land use planning* | | *Early warning and DRR education* | | *Psychological and social recovery* | | | *Economic Recovery* | | *Institutional Mechanisms* | | | | *Legislation and regulation* | | *Monitoring and evaluation* | |
| **Component** | *Building codes* | *Cost and time* | *Quality* | *Risk Based Zoning* | *Resettlement* | *Early warning* | *DRR warning* | *Community support* | *Community Involvement* | *Economic and recovery strategy* | *Funding decision-making and training* | *Business support and promotion* | *Choosing appropriate institutional mechanisms* | *Fostering Partnerships* | *Grass-roots level involvement* | *Quality assurance and training* | *Compliance* | *Facilitation* | *Compliance* | *Improvement* |
| **1** | x | x | x | | | | | x | x | x | x | | x | x | x | x | | | x | x |
| **2** | x | x | x | | | | | | | | x | | x | x | x | x | x | x | x | x |
| **3** | | x | x | | | | | x | x | x | x | | x | x | x | x | | | x | x |
| **4** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **5** | x | x | x | | x | | x | x | x | | | | x | x | x | x | x | | x | x |
| **6** | | x | x | x | | x | x | x | x | | x | | x | x | x | x | | | x | x |
| **7** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **8** | x | | x | | | | x | | | | | | | | | x | | | x | x |
| **9** | x | x | x | | x | | x | x | x | | | | x | x | x | x | x | | x | x |
| **10** | x | x | x | | | | | | | | x | | x | | | x | x | | x | x |
| **11** | x | x | x | | | | x | x | | x | x | | x | x | | x | | | x | x |
| **12** | | x | x | | | x | x | x | x | x | x | | x | x | | x | | | x | x |
| **13** | x | x | x | x | x | | x | x | x | | x | | x | x | | x | | | x | x |
| **14** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **15** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **16** | x | x | x | x | x | | x | x | x | | x | | x | x | x | x | x | | x | x |
| **17** | x | x | | | x | | | x | x | | | | x | x | | | x | | x | x |
| **18** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **19** | x | x | x | x | x | | x | x | x | | x | | x | x | x | x | x | | x | x |
| **20** | | x | x | | x | | | x | x | | x | | x | x | x | x | | | x | x |
| **21** | | x | x | | | | | x | x | x | x | | x | x | x | x | | | x | x |
| **22** | | | x | x | x | x | x | x | x | | x | | x | x | | x | | | x | x |
| **23** | | x | x | | x | | | x | x | | x | | x | x | x | x | x | | x | x |
| **24** | | x | x | | x | | | x | x | | | | x | x | | x | | | x | x |
| **25** | | x | x | x | | x | x | | x | | x | | x | x | x | x | | | x | x |
| **26** | | x | x | x | | | | | x | | x | | | x | | x | | | x | x |
| **27** | | x | x | | x | x | x | x | x | x | x | x | x | x | x | x | | | x | x |
| **28** | | x | x | | | x | x | x | x | x | x | | x | x | x | x | x | x | x | x |
| **29** | x | x | x | | | | x | x | x | x | x | x | x | x | x | x | x | x | x | x |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **30** | | x | x | x | | | | | | | x | | | x | | x | | | x | x |
| **31** | x | x | x | | | | x | x | x | | x | | x | x | x | x | | | x | x |
| **32** | x | x | x | x | x | | x | x | x | x | | | x | x | x | x | | | x | x |
| **33** | x | x | x | | | | x | x | | | | | x | x | | x | | | x | x |
| **34** | | | | x | | x | x | x | x | | | | x | x | | x | | x | x | x |
| **35** | | | | | | x | x | x | x | | | | x | x | | x | | | x | x |
| **36** | | x | x | | | | | | | x | x | | | x | | x | | | x | x |
| **37** | x | x | x | x | | | x | | | x | x | | x | x | x | x | | | x | x |
| **38** | x | x | x | x | x | | | x | x | x | | | x | x | x | x | | | x | x |
| **39** | x | x | x | x | x | | | x | x | x | | | x | x | x | x | | | x | x |
| **40** | x | x | x | x | | x | x | x | x | x | x | | x | x | x | x | x | x | x | x |

***Table 5.3:*** *Dimensions/ Components of Disaster Recovery Addressed in ToR*

Unlike in the previous chapter, which considered the indicators of the BBB-F, here, the components, one organisational tier above indicators, are being considered. This is because components act as 'themes' of indicators and, thus, serve as a broader, more inclusive framework that can accommodate diverse approaches and practices. This shift from specific, indicators to thematic components allows for greater flexibility and adaptability in applying the Build Back Better Framework principles across varied organisations.

This provides a clearer picture of how the roles, duties, and expected outputs may be categorised according to the Build Back Better Framework (BBB-F) components, thus illustrating both the prioritisation and the embracement of the holistic principle. The observations are as follows.

On average, the ToR embrace 12.5 or 62.5% of the components that encapsulate the BBB-F, with the range being from 8 to 18 of the 20 available components being represented or acknowledged in some form.

Looking at the broadest organisational tier, the majority connect to the three categories defined by the BBB-F. The exception is ToR 8, which sought a delegate to undertake structural assessments and did not have any connection to components under the 'Community Recovery' category and was uncommonly short compared to other ToR, possibly negating aspects that would fall under other components in reality.

The table below (Table 5.4) ranks the components of the BBB-F by their percentage representation across the 35 available ToR. It shows that the principles of monitoring and evaluation and institutional mechanisms from the Effective Implementation category emerge as the most connected components.

| Representation across all ToR | Component | Principle | Category |
|---|---|---|---|
| 100% | *Improvement* | Monitoring and Evaluation | EI |
| 100% | *Compliance* | Monitoring and Evaluation | EI |
| 94% | *Quality assurance and training* | Institutional Mechanisms | EI |
| 94% | *Fostering Partnerships* | Institutional Mechanisms | EI |
| 91% | *Quality* | Resilient Physical Assets | DRR |
| 89% | *Choosing appropriate institutional mechanisms* | Institutional Mechanisms | EI |
| 89% | *Cost and time* | Resilient Physical Assets | DRR |
| 77% | *Community Involvement* | Psychological and social recovery | CR |
| 77% | *Community support* | Psychological and social recovery | CR |
| 69% | *Funding decision-making and training* | *Economic Recovery* | CR |
| 60% | *Grass-roots level involvement* | Institutional Mechanisms | EI |
| 60% | *DRR warning* | Early warning and DRR education | DRR |
| 54% | *Building Codes* | *Community support* | DRR |
| 40% | *Economic and recovery strategy* | Psychological and social recovery | CR |
| 40% | *Resettlement* | Multi-hazard land use planning | DRR |
| 40% | *Risk Based Zoning* | Multi-hazard land use planning | DRR |
| 31% | *Compliance* | Legislation and regulation | EI |
| 26% | Early warning | Early warning and DRR education | DRR |
| 14% | Facilitation | Legislation and regulation | EI |
| 6% | Business support and promotion | Economic Recovery | CR |

***Table 5.4*** *ToR Connection to Components of the BBB-F*

In the Effective Implementation (EI) category, components such as Monitoring and Evaluation stand out with a 100% connection rate, signalling that every analysed ToR emphasised Improvement and Compliance as critical components of this principle. This suggests a commitment to ensuring that initiatives are effectively monitored and meet their intended outcomes. Other components like Quality Assurance, Training, and Fostering Partnerships also received high attention (54-94% connection), signifying the importance of a strong institutional framework. However, some aspects, such as Facilitation in Legislation and Business Support,

are less emphasised (6-31% connection), which might reflect their specificity or contextual dependency.

For Disaster Risk Reduction (DRR), there is a significant focus on the Quality of resilient physical assets and efficient Cost and Time management (89-91% connection), highlighting the priority given to durable infrastructure and resource optimisation. While components like Early Warning Systems and Risk-Based Zoning also feature prominently (40-60% connection), Early Warning Education is less prioritised (26% connection), possibly again due to existing proficiency or a lesser immediate perceived need in this area.

Community Resilience (CR) has a high integration of components critical for Psychological and Social Recovery, with Community Involvement and Support noted in 69-77% of ToRs. This reflects the necessity of active community engagement in recovery processes identified in Chapter Three. Conversely, aspects like Economic and Recovery Strategy and Business Support receive less focus (6-40% connection), suggesting these areas may either be well-established or not viewed as immediate priorities relative to direct community support.

The prevalence of a diverse range of the components in the Effective Implementation, Disaster Risk Reduction, and Community Recovery categories shows a holistic approach adopted in the ToR regardless of context however, some components are prioritised over others.

### 5.4.12 Significant Changes Based on the Initial ToR

This section examines the delegates' reports of any significant changes to the ToR during their deployment due to contextual factors.

A third of reports explicitly state no changes to their ToR. This includes reports by delegates who highlighted no significant deviations while additional areas were addressed. These extra tasks were undertaken without formal amendments; for instance, reports 17 and 18 describe the adoption of added responsibilities or unexpected roles even as the original ToR remained intact. Reports 20, 37, 10, and 12 further support this, emphasising the fluidity of tasks and the adaptability of individuals in their roles. Reports 7, 9, and 16 indicate this issue is often rooted in the ToR. When the ToR is overly broad or generic, a consequence is frequently changing

roles based on arising needs or ground realities, resulting in daily adjustments that impact addressing original issues.

Furthermore, changing circumstances, especially during emergency phases, played a pivotal role in deviations from the ToR. Reports 4, 5, and 35 reflect emergencies of escalating situations, specifically in conflict areas or a global health crisis such as COVID-19, which necessitated immediate adjustment to delegate roles. Managerial challenges are also catalysts for change. Reports 1, 6, 25, 30, and 33 note changes stemming from supervisory changes, miscommunication, resignations, or inter-departmental issues.

There were situations where the ToR was formally amended to accommodate changes. For instance, report 21 notes modifications due to the initial inadequacy of the ToR. Reports 15, 31, 39, and 28 further exemplify instances where the ToR changed, ranging from minor to significant amendments. In one example, the ToR was redrafted to mirror the evolving demands of the job.

While a number of deployments adhered strictly to their original ToR (or did not change beyond 25%, as was the benchmark described as a 'significant change'), a larger portion experienced deviation-driven contextual factor. These discrepancies underline the complexity and fluidity inherent in many roles, with unforeseen circumstances and evolving requirements often dictating adjustments.

Based on this, the subsequent sections look at the EoDR fully to better associate the reoccurring themes that contribute to these contextual factors.

### 5.5 End of Deployment Reports

In the End-of-Deployment Reports, deployees detail the specific indicators (or hint at the components and theme of indicators) used to measure the success of Build Back Better approaches to post-disaster recovery. These indicators often derive from the objectives and outcomes outlined in the deployment's ToR or project plans. The reports offer valuable insights into the key metrics used to guide actions and measure success by providing a clear list of indicators employed in practical applications. For example, indicators may include infrastructure reconstruction, community resilience, economic recovery, environmental

sustainability, and social inclusion metrics. By documenting these indicators, deployees enable stakeholders to understand the criteria by which success is assessed and evaluate the effectiveness of interventions.

### 5.5.1 Working Context

Regarding professional relationships, delegates highlighted two significant factors: the connections within the workplace and the overall work culture/ environment. Unsurprisingly, an intrinsic link between these factors was noted, as individual interactions contribute to the broader organisational culture and vice versa—the culture influences personal connections among colleagues. The reports showed that these positive or negative factors affected the delegate's tenure.

The first factor, *'connections within the workplace'*, is the consideration of professional relationships and connections between people, which is the basis upon which the workplace culture is built. In the reports, positive relationships within teams emulated a strong, functional, and collaborative unit that supported delegates in achieving their key activities and objectives. Report 1, for example, underscored that such effective relationships encouraged collaborations and innovative solutions. Also notable were reports 11 and 16 that mention the delegate's alignment with managerial styles within their host organisation facilitated good dynamics within existing teams. However, many reported significant challenges that hindered delegates' success and were detrimental to achieving key activities and objectives. Reports 15, 17, 24, and 25 voiced concerns about limited interactions with supervisors and feelings of detachment or isolation, especially when roles mandated high degrees of independence, as outlined in reports 5 and 7. Challenges also arose when there were management shifts, noted in reports 22, 23, 34, and 40, and from broader organisational restructuring, as seen in report 7. These changes disrupted relationships, necessitating extra sensitivity and time to rebuild connections. Previous positive rapport did not guarantee that the same positive relationships would automatically be re-established. Finally, report 36 showed that challenges arose when the host organisation perceived a lack of responsiveness or action on the delegate's recommendation. This frustrated the delegates, who felt their insights and proposed solutions were undervalued or ignored. Such challenges resulted in deteriorating or strained relationships, impacting the morale of delegates and diminishing their motivation and engagement with the host organisation.

Regarding *'Work culture/ environment'* refers to the collective values, behaviours, practices, and norms that define an organisation. It encompasses the ethos of the workplace or organisation – how things are done, how people interact, and what the organisation values. Those who recorded positive aspects reported on friendly and inclusive cultures of the delegate contribution. This led to a culture of encouragement and mentoring operating in both directions, fostering strong relationships between the delegates, the host organisation, and the community. The reported challenges include instances of a dysfunctional office environment (Reports 4 and 6). In such cases, the discord existed before the arrival of the delegates and thus was deeply seeded within the organisations.

Consequently, delegates were required to navigate around such issues. Many, as discerned from reports 3, 18, 14, and 23, took on additional roles of mediating or advisory capacities, often bridging communication gaps and advocating for staff needs. The need for proficient cross-cultural communication skills emerged as a critical factor, particularly highlighted in report 10, in which the challenges of overcoming linguistic and cultural barriers were highlighted by the delegates observing the host organisation operating across multiple cultures ineffectively. The inadequate cross-cultural communication led to misunderstandings and reduced cooperation within the team, compromising project outcomes. Reports 14, 15, and 26 noted concerns regarding 'silo mentality' or cliques where teams became territorial, preventing the sharing of information and resources across departments and leading to inefficiencies and a lack of communication within the organisation.

Additionally, reports 22 and 23 identified challenges related to role ambiguity, which led to confusion regarding responsibilities and expectations, decreased job satisfaction from both the perspective of the delegates and host organisation and ultimately diminished their potential impact. Finally, the challenges related to heavy workloads and resource constraints are evident in reports 33 and 40, respectively. Heavy workloads and resource constraints led to burnout, decreased quality of work, and a diminished sense that the delegates could 'succeed', especially when measured against set objectives.

One of the dominant themes that emerge when looking at the delegate's self-described 'major professional or personal constraints or challenges' is the theme of *government and bureaucratic*

*hurdles*. For instance, report 1 demonstrates constraints arising from government restrictions on pivotal services such as water, sanitation, and hygiene (WASH) and shelter activities; likewise, in Report 2, where the delegate stresses their disappointment with the government's lack of collaboration and cooperation. Large organisations reportedly have similar shortfalls and constraints, as discussed by a delegate in Report 21 who notes challenges stemming from bureaucracy intrinsic within the UN system, which hindered achieving set objectives within limited timeframes. Similarly, Report 25 notes the complications resulting from a lack of a unified strategy, possibly resulting from a disjointed approach to response initiatives. Pre-existing issues within a host organisation amplified these bureaucratic constraints. Reports 6 and 7 note issues such as office mismanagement and detrimental micromanagement.

Furthermore, reports 36 and 37 highlight broader systemic inefficiencies like a lack of urgency in addressing emergencies and, in one instance, misallocated funds. Notably, report 36 emphasises the challenge of operating in such atmospheres, in this instance, a host organisation that often disregarded the pressing nature of emergencies, coupled with leadership inefficiencies. Finally, these issues are exacerbated by communication challenges, as detailed in reports 33 and 39. These reports underline the difficulties of communication, particularly when facing a shortage of staff and the critical need for staff to speak a common language to ensure effective communication proficiently.

Such communication barriers emerge as a pronounced concern. A collection of reports (21, 22, 23, 24, and 30) reflect the spectrum of difficulties this causes within teams and in external interactions, highlighting frequent miscommunications, misunderstandings and struggles with ineffective information change. Thus, challenges of communication and interpersonal relations emerge. Management issues are documented in reports 4, 6, 7, and 9, which range from conflicts with supervisors and divergent opinions to managerial shortfalls that cultivate a negative work culture. The repercussions of these challenges emerged as delays after a supervisor's resignation and the presence of work case bullying—the second, issues around trust and relationship building. Reports 21 and 23 explain challenges in forging trust with colleagues, often due to some staff's protective nature over their domains, which impeded open information sharing. Reports 22 and 30 emphasise disruptive team dynamics, including conflicts and a reluctance towards genuine collaboration. Hierarchical barriers within organisations amplify these challenges, as evidenced by Report 22, which mentions covert

behaviours of senior members within the team, and Report 24's insight into delays caused by the host organisation hierarchies. Report 32 encapsulates the complexities of collaboration and trust, pointing to challenges in leadership roles and strained relationships with key stakeholders such as government. Report 10 discusses the challenges encountered in bridging inter-departmental divides. Specifically, it points to difficulties rallying staff from different departments around process improvements. Furthermore, the same report underlines the issues of engagement and stakeholder relations, advocating for cultivating positive relationships and underscoring the importance of mutual respect with local colleagues.

The second most dominant theme is *logistical and operational challenges—f*ormulated by a pattern of concerns such as in report three, which emphasises a scarcity of vital resources, specifically citing a lack of transport and suitable office accommodations. This is echoed in report 5, which articulated the complexities faced by delegates when trying to familiarise themselves with the problematic layout and nuanced environment of a refugee camp within the short timeframe of their deployment. These operational challenges are further underscored by reports 26 and 28, which outline the delegate's concerns, ranging from the quality of healthcare services to legislative delays that adversely affect actions and activities. Report 31 criticises the required extended travel times resulting in diminished productive hours. Report 36 notes limited resources, coordination problems among the humanitarian community, and difficulties in advocating for the rights of internally displaced persons due to political issues and the behaviours of organisers. Adding to these issues, reports 32 and 38 highlight how these work environments are constantly changing, stressing the need to adjust quickly to government decisions. Together, these reports highlight the urgent need for delegates to tackle logistical and operational challenges that significantly affect the ability to achieve efficient and effective results.

Many reports showed a need for reflective introspection to overcome some of these challenges. These patterns and trends can be surmised as a personal adaptation. Report 5 discusses the demands of long workdays set against challenging conditions, which are physical and profoundly psychological, influencing individuals' morale and team cohesion, as noted in Report 9. This report further highlights the consequential impact of a team leader's management style, emphasising its influence on team dynamics. A spectrum of personal challenges delegates encounter are documented through reports 27, 28, and 29, ranging from

trust issues to the emotional toll of losing colleagues or friends. The significance of maintaining personal well-being, maintaining a support network, and ensuring active social engagement during deployment becomes clear. Report 28 offers practical guidance, advocating for involvement in local community groups as a coping mechanism against the challenges of being away from home. Report 40 touches upon feelings of isolation, often stemming from linguistic barriers and exclusion from local dialogues. Complementing this, report 39 underscores the importance of language proficiencies, advocating for comprehensive language training, especially for extended assignments, to ensure smoother integration and effective communication. Collectively, these emphasise the importance of recognising, understanding, and addressing the challenges of personal adaptation and its impacts on delegates in diverse work environments.

This leads to the next theme of *cultural, linguistic, and societal factors*. Navigating diverse cultures presents unique barriers, as emphasised in report ten, which sheds light on hurdles encountered when working in an Arabic-speaking environment, particularly one predominantly female-dominated, necessitating an adjustment period. Further, reports 24 and 29 reflect nuances of navigating cultural norms. They touch upon the "Bangladesh way" (the nation of the deployment in question) of agreeing without certainty and the challenges of positioning oneself as an outsider within a governmental framework. Similarly, report 40 discusses the concept of "Tarawa time", describing a cultural pace at which locals operate as a distinct difference from Western norms to which the delegate is more accustomed. This report also accentuates the linguistic barriers that arise when the predominant language in the workplace diverges from the delegate's native tongue. Finally, report 38 noted the intricacies of forging relationships within foreign governmental bodies and, in doing so, influencing decision-makers to value and consider newly proposed initiatives. These insights emphasise the significance of understanding and adapting to diverse cultural, linguistic, and societal factors, highlighting their crucial role in shaping interaction and the outcomes or success of critical activities.

The reports reflect that many of the challenges discussed stem from the following theme: *issues with role definitions and clarity.* Role clarity, an integral aspect of practical functioning, appears repeatedly compromised. Report 1, for instance, underscores the challenges when shifting the focal point from water supply to solid waste management, indicating a lack of clear role delineation. Report 7 highlights how the absence of strategic decision-making, especially

following a supervisor's departure, can lead to protracted project delays and stalled outcomes. Reports 22 and 25 both give examples of ambiguous communication concerning the responsibilities and tasks of the delegates. Such ambiguity not only led to confusion but also resulted in operational inefficiencies. Report 32 and 38 touches upon the challenges of operating beyond defined parameters and confronting overlapping roles, which strained professional relationships. Finally, report 30 recognised the multifaceted challenges professionals face when thrust unexpectedly into multiple roles without the guidance of supervision or sufficient support.

Dynamics between the supervisors and key staff and the subsequent impact on success highlighted two main factors: the quality of their professional relationships and the work culture/ environment. The positive aspects of professional relationships were identified as strong, functional, and collaborative when managerial styles aligned. Conversely, negative relationships were determined by deterioration, limited integration, role ambiguity, isolation, rejection of expertise and managerial problems. Regarding work culture/ environment, positive attributes included a friendly and inclusive atmosphere that fostered relationship-building, support, and mentoring. However, dysfunctional aspects such as cultural and bureaucratic hurdles, a siloed approach to work, and limited resources were felt to impact progress negatively.

### 5.7.3 Impact of Action

The consideration of the impact on the persons of concern, a term which encapsulates the population the delegate was targeting, was typically answered with specifics regarding actions and activities undertaken. Detailed accounts of efforts to meet specific objectives within the initial ToR or in response to the developing situation. However, for this analysis, it is more beneficial to disregard specifics and take a closer look to consider insight into issues, challenges, definitions of success, optimism, pessimism, and the reason behind this outlook.

For example, the reports define the impact of their work on the persons of concern in one of four ways; 'direct impact through infrastructure and essential service' recognised as tangible outputs, 'capacity building and coordination' where the focus was on enhancing coordination among agencies and stakeholders, training, and strengthening capacities, indirectly impacting beneficiaries through more efficient and effective service delivery, 'awareness, education, and

advocacy' where delegates raised awareness, made educational improvements. Advocacy of humanitarian efforts, affecting populations by changing perceptions and improving access to services, and finally, 'research, planning and policy development' where efforts indirectly influence outcomes for persons of concern through strategic improvements and preparedness.

19 of the 40 reports reflect positivity in their descriptions. Recognising their impacts had a favourable outcome for the persons of concern within their deployment. Four trends characterise them. The first is 'comprehensive and holistic approaches.' There is a clear trend towards adopting comprehensive recovery plans and interventions that address multiple facets of community life, from mental health to livelihood recovery. The second is 'community involvement and empowerment'; many initiatives highlight the importance of involving affected populations in the planning and implementation, ensuring that interventions are tailored to specific needs and contexts. The next is 'Sustainability', which recognises the notable emphasis on sustainability in terms of environmental impact and the long-term viability of projects. This includes the use of sustainable materials, disaster risk reduction, and the development of resilient infrastructure. Here, the final trend emerged in 'strategic coordination and funding'; effective coordination among stakeholders and strategic funding allocation are key trends, indicating a move towards more efficient and impactful humanitarian interventions.

Eight reports, however, had distinctly negative characteristics. They are defined by three categories. The first is 'uncertainty and delay in action'. This is a reoccurring trend where strategies and proposals are either in the planning stages or focused on long-term solutions, leaving immediate needs unmet. Report 7, for example, cites the uncertainty of impactful climate solutions, and Report 21 recognises the harmful imbalance caused when the focus is solely on future strategies rather than immediate action. The second category is 'service provision gaps', where challenges in providing essential resources for delegates are recognised to limit the impact on the persons of concern significantly. Report 20 noted that the "huge gaps" in education services for refugees underscore the challenge of ensuring quality education for all, a key objective for the delegate to achieve. Reports 26 and 33 note a lack of direct assistance to the affected population due to significant gaps in their immediate support systems. The third category is 'poor coordination and efficiency'. Here, issues in communication and coordination are identified as potential hindrances to efficient response to needs on the ground, affecting the effectiveness of interventions.

### 5.7.4 Sustainment of Contribution

In the discussion on sustaining their work, 85% of the delegates frequently referenced a formal handover process to ensure their efforts' longevity. This would include handover notes, detailed briefings, and overlap periods to induct an incoming delegate. When the delegate was not replaced, delegates held training sessions with the host organisation, building capacity. This emphasises that the continuation of any success gain hinges on effective knowledge transfer.

The theme of ‘New Practices and Technology’ is a significant focus within the reports, highlighting efforts to integrate innovative solutions and emerging mythologies to enhance project sustainability. The theme is referenced in 35% or 14 of the 40 reports. These collectively show the range of strategies to improve projects' efficiency, effectiveness, and long-term viability through technological advancement and new operational practices. For instance, report 1 outlines the development of comprehensive training and management strategies for WASH (Water, Sanitation and hygiene) and SWM (Solid Municipal Waste), emphasising a new proactive approach. Similarly, report 7 discusses how the delegate introduced a novel strategy for pre-emptive action against drought impacts, showcasing a move from reactive to anticipatory humanitarian efforts. Report 10 notes the adoption of a new structured framework through operating procedures for procurement and risk management. Report 34 further exemplifies this trend where the delegates worked aligning disaster response with internationally recognised practices through the Sendai Framework, marking a shift towards standardised approaches. Report 9 illustrates the use of drone technology and new construction techniques, highlighting the potential of modern tools to redefine traditional project methodologies. The role of continuous expert support in embedding these new technologies is underscored in report 28. It stresses the importance of sustained consultative roles to support these innovations as they update and develop.

Another recurring theme is the focus on appropriate reporting, which encompasses funding availability and the critical role of having the right staff. This theme occurred in nearly a third of the reports (27.5%). Financial stability is essential for the continuous operation and growth of many projects. Several reports have pointed out that the uncertainty of funding will likely directly impact the feasibility and longevity of projects. For instance, Report Four explicitly ties the future implementation of the programs they established to funding availability, while

Report 12 discusses the struggle to maintain operations due to funding shortages. The importance of skilled, committed personnel is highlighted on the staffing front as a cornerstone for project success. Reports detail the necessity of recruiting capable staff and ensuring their retention and involvement in key activities to ensure their longevity. For example, report 36 touches upon the difficulties of continuing without secured resources for staffing, and Report 20 emphasises the need for specific roles to be fully funded to maintain the quality of work.

While these themes suggest delegates have aimed to ensure their work will be sustained, this view is not often shared by the delegates despite best efforts. 25% discuss specific challenges that threaten the work during their deployment. These challenges include funding shortages and staffing problems discussed in the last theme but extend to organisational changes and external disruptions like COVID-19 that could reprioritise attention away from critical activities. When looking at the tone of the reports, only 12.5% expressed optimism about the sustainability of their efforts. In comparison, 77.5% exhibited a more cautious, concerned, or neutral stance regarding the long-term sustainability of the projects, pointing to significant levels of uncertainty or scepticism. Four reports suggest that the sustainability of the projects is contingent on overcoming specific challenges or securing necessary resources, indicating a recognition of the hurdles that need to be addressed for successful continuation.

Overall, the similarity across the reports demonstrates a common understanding of the importance of proper handover, capacity building and institutionalising new practices for sustainability. However, there is a discernible effort in optimism about the sustainability of these efforts and the acknowledgment of external dependencies, emphasising the complexities of ensuring that improvements last beyond individual deployments.

### 5.7.5 Recommendations

The recommendations by the delegates within these reports cover several themes, which can be grouped into broader categories. The first is ‘program and response focus’, consisting of the themes ‘Focus on Disaster Preparedness and Mitigation’ and ‘Holistic and Sustainable Approaches’. The first of these themes highlights the need for a greater focus on disaster preparedness and mitigation, suggesting long-term deployments and support for logistic hubs.

Reports 7 and 17 discuss ‘coordination and collaboration’ within humanitarian efforts; report 7 points out the challenges of insufficient collaboration between UN agencies and government systems, emphasising the need for better information sharing and a unified approach to enhance the efficiency of humanitarian actions. Similarly, report 17 stressed the importance of supporting government coordination efforts and suggested further deployments to strengthen the partnership and operational collaboration between the government, UNHCR, and other agencies. This highlighted the need for clearer roles and better integration with government strategies to be more effective in humanitarian initiatives. Together, these recommendations display a need for greater coordination and collaboration in the approach to addressing complex humanitarian responses. Ensuring efforts are aligned, resources are used appropriately, and the collective responses are more effective.

The theme of ‘policy development and governance’ emerges from reports 39 and 40, which discuss critical gaps in their disaster management that had adverse effects on achieving key activities and actions, illustrating the need for strengthened governance structures. The Recommendations from the delegate in report 39 suggest that issues in the early stages of recovery planning and coordination were hindered by the lack of specific laws and policies for managing disaster recovery and that had these been in place, ongoing work would have enhanced the existing National Disaster Recovery framework to cover all disaster management stages, including preparation, response, recovery, and the transition between these phases. Report 40 highlighted the considerable gaps in government policy, especially in managing data and logistics for emergency supplies, which was spotlighted by the COVID-19 pandemic. Together, these reports recognise the need for comprehensive policy development and governance to support and strengthen disaster management.

### 5.7.6 Overarching themes

*Building Positive Relationships*

Deployees prioritise building positive and collaborative relationships with various stakeholders, including host organisations, government agencies, NGOs, international non-governmental organisations (INGOs), and local communities. They recognise the significance of trust, mutual respect, and transparency in fostering effective partnerships and achieving shared goals. Deployees create a conducive environment for cooperation and collective action by establishing a solid rapport with stakeholders.

*Understanding Stakeholder Needs and Priorities:*

Deployees demonstrate a commitment to understanding different stakeholders' needs, priorities, and perspectives. They actively engage in dialogue, consultation, and participatory processes to gather insights, solicit feedback, and incorporate diverse viewpoints into decision-making. By listening attentively to stakeholders, deployees ensure that interventions are contextually relevant, responsive, and inclusive, thereby enhancing their impact and sustainability.

*Promoting Ownership and Participation:*

Deployees prioritise promoting ownership and participation among stakeholders by involving them in all stages of the project cycle, from planning and design to implementation and evaluation. They empower stakeholders to take an active role in decision-making, problem-solving, and resource allocation, fostering a sense of ownership, accountability, and commitment to collective success. By fostering a participatory approach, deployees leverage stakeholders' knowledge, expertise, and resources, leading to more impactful and sustainable outcomes.

*Facilitating Collaboration and Coordination:*

Deployees facilitate collaboration and coordination among diverse stakeholders to leverage complementary strengths, minimise duplication of efforts, and maximise collective impact. They serve as catalysts for partnerships, networks, and alliances, bringing together stakeholders with shared interests and objectives to work towards common goals. By fostering synergies and promoting information sharing, deployees enhance interventions' efficiency, effectiveness, and coherence, contributing to greater overall success.

*Adapting to Cultural and Contextual Dynamics:*

Deployees recognise the importance of cultural sensitivity and contextual understanding in stakeholder engagement. They adapt their communication styles, approaches, and strategies to suit different stakeholders' cultural norms, preferences, and sensitivities, fostering greater trust, rapport, and collaboration. By demonstrating cultural humility and openness, deployees navigate complex socio-cultural dynamics and build bridges across diverse stakeholders, ultimately enhancing the relevance and acceptability of interventions.

*Promoting Sustainable Partnerships:*

Deployees prioritise establishing sustainable partnerships that extend beyond the duration of the deployment. They invest in capacity building, knowledge sharing, and institutional strengthening initiatives to empower stakeholders to drive positive change long after the deployment. By fostering a culture of partnership and collaboration, deployees lay the foundation for enduring relationships and collective action, ensuring their interventions' sustained impact and legacy.

## 5.8 Discussion

The analysis of TORs offers significant insights into post-disaster reconstruction efforts. Additionally, while the valuation of indicators may not be explicitly addressed in the TORs, the emphasis on stakeholder coordination and collaboration suggests that the appraisal of indicators is intricately linked to practical application and stakeholder engagement. This resonates with the study's exploration of how contextual factors influence the effective use of indicators in disaster recovery efforts.

Firstly, the TORs underscore the importance of identifying success indicators, mirroring the study's focus on discerning key indicators within Build Back Better frameworks. Emphasis is placed on indicators related to components of improvement and compliance from the principle of monitoring and evaluation, which is part of the Effective Implementation category in the Build Back Better Framework. Then, aspects of disaster risk reduction and community recovery. Moreover, the holistic embracement of various dimensions of disaster recovery emerges as a recurring theme in the ToR, echoing the study's aspiration to understand the prioritisation of specific indicators over others.

Additionally, while the valuation of indicators may not be explicitly addressed in the TORs, the emphasis on stakeholder coordination and collaboration suggests that the appraisal of indicators is intricately linked to practical application and stakeholder engagement. This resonates with the study's exploration of how contextual factors influence the effective use of indicators in disaster recovery efforts.

Furthermore, the TORs shed light on the impact of contextual issues such as geographic location, socio-economic conditions, and cultural considerations, echoing the research question on understanding the influence of contextual factors on indicator selection and utilisation. These contextual nuances underscore the need for tailored approaches in indicator selection to accommodate diverse socio-cultural landscapes.

The TORs also highlight the imperative of addressing shortcomings through capacity building, training, and mentoring, aligning with the study's objective of identifying solutions to enhance the utility of indicators in disaster recovery efforts. This emphasis on continuous improvement underscores the dynamic nature of post-disaster reconstruction endeavours and the necessity of adaptive strategies.

Lastly, while the TORs may not explicitly delve into testing findings or comparing past actions, they underscore the importance of learning from past experiences and adjusting strategies accordingly. This resonates with the study's aim of translating research findings into practical solutions through iterative refinement and real-world application.

In the EoDR, deployees detail the specific indicators used to measure the success of Build Back Better approaches to post-disaster recovery. These indicators often derive from the objectives and outcomes outlined in the deployment’s ToR or project plans. The reports offer valuable insights into the key metrics used to guide actions and measure success by providing a clear list of indicators employed in practical applications. For example, indicators may include infrastructure reconstruction, community resilience, economic recovery, environmental sustainability, and social inclusion metrics. By documenting these indicators, deployees enable stakeholders to understand the criteria by which success is assessed and evaluate the effectiveness of interventions.

Deployees describe the hierarchical approach of existing indicators from Build Back Better frameworks by outlining the structure and relationships between indicators. They demonstrate how overarching goals and objectives are broken down into specific indicators at various levels of analysis, illustrating the interconnectedness and alignment of indicators within the broader framework of post-disaster reconstruction. For instance, overarching goals such as improving disaster resilience may be broken down into hazard mitigation, preparedness, response

capacity, and recovery efforts indicators. By visualising this hierarchical structure, the reports clarify how indicators are linked to broader goals and objectives, facilitating comprehensive monitoring and evaluation processes.

The reports acknowledge which indicators or components are prioritised over others. Deployees discuss the rationale behind selecting and emphasising specific indicators based on contextual factors, stakeholder priorities, and project objectives. These are defined into themes that may be compared back to the BBB-F to understand prioritisation within the framework and, in doing so, highlight components that receive greater attention and resources due to their perceived importance. For instance, indicators related to community participation, local ownership, and sustainability may be prioritised over purely quantitative measures of progress. By shedding light on the factors influencing decision-making and resource allocation, the reports provide insights into how indicators are strategically utilised to maximise impact and effectiveness in post-disaster recovery efforts.

Deployees identify how contextual issues have impacted the effective use of success indicators in practical applications. They discuss challenges such as resource constraints, institutional capacities, socio-cultural dynamics, and environmental factors that influence the implementation and interpretation of indicators. The reports provide insights into the barriers and opportunities these create. Ultimately, it suggests that indicators within the Effective Implementation category are the most vulnerable to being affected by contextual issues. The reports offer recommendations on how shortcomings in indicator use can be addressed and how successful approaches can be further strengthened to Build Back Better. Deployees identify areas for improvement in indicator selection, measurement, monitoring, and evaluation, proposing solutions such as capacity building, stakeholder engagement, knowledge sharing, and adaptive management. They suggest practical strategies for enhancing the effectiveness of indicators, such as developing standardised measurement tools, conducting regular data quality assessments, and integrating feedback mechanisms into monitoring frameworks. By providing actionable recommendations, the reports contribute to advancing post-disaster reconstruction efforts and promoting continuous learning and improvement in indicator-based approaches.

## 5.9 Conclusion

This chapter has provided a comprehensive thematic analysis of 40 interventions in emergency relief and prolonged crises by a leading aid organisation, offering crucial insights into the contextual factors influencing the selection and effectiveness of indicators in post-disaster recovery efforts. It has established a foundational understanding of the diverse contexts in which these recovery efforts were undertaken and highlighted several key themes essential for understanding the effective use of indicators within the Build Back Better frameworks. The hierarchical nature of indicators was underscored, emphasising the need to prioritise specific components or priorities to streamline assessment processes and optimise resource allocation.

Contextual factors and their associated challenges in applying indicators provided valuable insights into prioritising indicators. The conclusions drawn from the analysis of Terms of Reference (TOR) and End-of-Deployment Reports (EoDR) align closely with the goals of this PhD study, which aims to explore the importance of indicator selection in post-disaster frameworks. The reports show how indicators drive Build Back Better post-disaster reconstruction efforts, highlighting the challenges and opportunities in indicator selection.

This chapter has offered a comprehensive understanding of the indicators used by key decision-makers to assess the effectiveness of their efforts and monitor progress in post-disaster recovery and reconstruction. This process holds significant implications for improving post-disaster recovery and reconstruction efforts by enabling more awareness as the decisions regarding indicator selection, thereby better reflecting Build Back Better's key concepts and holistic approach.

# Chapter Six, Conclusions, Implications for Practice & Future Research

## 6.0 Introduction

This thesis set out to answer the research question:

*How can decision-makers tasked to 'Build Back Better' select suitable indicators that guide actions, assess impact, and gauge success to enhance resilience through a holistic approach—a key aspect of the 'Build Back Better' principle?*

This final chapter presents an overview of the key findings and chapter conclusions, discussing the broader significance of the study. It begins with a summary that outlines the findings chapter by chapter, demonstrating how the study successfully addressed the research questions and achieved its objectives. Next, the chapter discusses the overall significance of these conclusions, highlighting their contribution to existing knowledge and the broader academic discourse. It also identifies potential gaps and unexplored areas, suggesting avenues for future research. Then, it outlines how the research can be implemented in real-world contexts and provide meaningful change to decision-makers. This section shows the connection between theoretical insights and practical outcomes. Finally, future research directions are identified and point to new areas for exploration, indicating how the study's results can guide further investigation. This segment suggests additional research questions and methodologies to build on the current findings.

## 6.1 Review of Research Objectives

The first chapter sets out the rationale and significance of the research that has led to the research question, sub-questions, and their corresponding research objectives. Six main points summarise the chapter.

1. Perception has shifted from a fatalistic view of disasters to one in which human agency and decision-making are central to the core components of a disaster. Those core components are ‘hazards’, ‘exposure’, and ‘vulnerability’. The combination of these

components contributes to disaster risk, offset by the factor of ‘resilience’. Thus, working towards reducing disaster risk requires effective decision-making that will implement disaster risk reduction strategies and improve a community's resilience.

2. There are several phases of disaster recovery. The final phase in the Hass et al. model, 'commemorative, betterment, and development reconstruction period,' introduced the idea of 'betterment' into the recovery process in the late 1970s. Contemporary thinking, however, recognises that disaster recovery can involve chaotic transitions between phases before reaching new normalcy. This suggests that decision-making towards 'betterment' or 'resilience' cannot be reserved for consideration at the end of recovery due to the unpredictability and fluidity between phases. Instead, it must be recognised as an end goal within every decision. This requires understanding the dependencies and interconnections between the indicators selected to guide actions and measure impact in each phase.

3. The key stakeholders who largely make these decisions have a complex history that has culminated in developing a unified approach. The first official plan was the Hyogo Framework for Action in 2005. This ratified the use of frameworks and indicators to guide decision-making and measure performance. Within time, it was found that there were significant challenges in selecting appropriate indicators, which resulted in additional frameworks and suites of indicators being developed to address additional phases, sectors, and levels of implementation. Its predecessor and current model, the Sendai Framework, was introduced in 2015 and aimed to address these issues by establishing the Words into Action series, which emphasises a holistic approach.

4. Similarly, other frameworks in disaster management by these key stakeholders, such as Sphere, which considers minimum target indicators from a humanitarian perspective, further highlight consistent issues within frameworks and their accompanying suite of indicators. These issues primarily consist of identifying the appropriate indicators to guide the right action and activity and recognising the dependency and interconnectedness of indicators across the framework to support the holistic approach to resilience. The term “Build Back Better” emphasises this approach, which promotes

using the recovery period to address systemic issues of ‘exposure’ and ‘vulnerability’ to improve resilience.

5. These issues were identified in the United Nations Humanitarian Development Report in 2020 and the United Nations Global Assessment Report in 2022.

6. The importance of addressing this issue is highlighted by identifying the trends in the frequency and severity of disasters, which showed alarming increases in the number of events. The increase in ‘exposure’, ‘vulnerability’, and ‘hazards’ of all types emphasised the recovery period is becoming significantly smaller between events, placing more significant pressure on addressing issues succinctly during the recovery period before the impact of another event.

These findings underscore a critical gap in key decision-makers selection and prioritisation of indicators within disaster recovery frameworks, revealing an area needing enhanced focus and refinement. Thus, the research question, sub-questions and research objectives are formulated. The sub-questions are as follows:

1. *Question: How do disaster recovery frameworks integrate multiple dimensions of recovery to enhance resilience and sustainability?*

   *Objective: To identify gaps in current disaster recovery frameworks and propose future research directions to enhance their integration of multiple dimensions of disaster recovery.*

2. *Question: Can an approach be established to reflect dependencies and interconnectedness between indicators?*

   *Objective: To examine how a holistic approach to indicators supports relationships and dependencies among different facets of recovery.*

3. *Question: What are the impacts of the contextual issues?*

*Objective: To analyse the effects of contextual issues on the selection and effectiveness of indicators in post-disaster recovery efforts.*

4. *Question: What can this research produce practically to facilitate increased success in post-disaster recovery?*

   *Objective: To develop practical guidelines and recommendations based on the research findings that contribute to more effective and successful post-disaster recovery strategies.*

The following section explains how these objectives were achieved and the key findings, highlighting the significance of insights.

## 6.2 Achievement of Objectives and Key Findings

The following sections systematically assesses the key findings from the study to demonstrate the achievement of the research objectives

### 6.2.1 Objective One

'*To identify gaps in current disaster recovery frameworks and propose future research directions to enhance their integration of multiple dimensions of disaster recovery'.*

This research objective was accomplished through a literature review is summarised here through eight key points.

1. A review of existing research showed a prevalence towards qualitative research methodologies, favouring interviews, fieldwork, and case studies. These methods gave researchers a firsthand look at behaviours, processes, and conditions within disaster-affected communities, garnering significant insights into cause and effect. Furthermore, it was observed that articles that employed more novel approaches provided a fresh perspective on new ways forward.

2. Several dominant themes emerged from the existing research. The most prevalent is the holistic principle of 'Build Back Better' (BBB). This theme highlights the need to address multiple dimensions of disaster recovery to support effective and sustainable solutions for resilience. The identified dimensions from the literature examined are as follows:

    - Policy and governance
        - Multi-level governance
        - Finance mechanisms
        - Insurance mechanisms
        - Government initiatives
        - Government frameworks
        - Policy frameworks
    - Community recovery
    - Economic recovery
    - Physical Assets
        - Critical infrastructure
        - Housing
    - Land use planning
        - Urban planning
    - Disaster Risk Reduction
    - Coordination and Collaboration
    - Sustainable Development

    Articles that explore and advocate for the holistic principle of resilience in recovery take two or more of these dimensions and examine their interconnection and dependency on one another.

3. An equally prominent theme was the prioritisation of community-driven indicators. The collective findings underscored the critical importance of prioritising community recovery within existing disaster recovery frameworks. This insight revealed that, although community recovery is considered a fundamental component of the overall recovery process, it is often overlooked or deprioritised by other dominant dimensions,

such as policy and governance and economic recovery, in pursuit of disaster risk reduction.

4. The next theme recognised in the literature was the integration of 'Build Back Better' as a guiding principle within the Sendai Framework for Disaster Risk Reduction (SFDRR), which reinforces the conclusions of the first chapter, specifically summary 4. It emphasises that resilience is achieved by addressing systemic challenges and deficiencies across multiple sectors using a holistic approach. The articles discussing this theme recognise the need for greater coordinated efforts and a comprehensive understanding across all sectors (or dimensions of disaster recovery) to fully realise the goals of the SFDRR at the local level. These issues, as highlighted, were advocated to be addressed in summary 5 of the first chapter. While not a dominant theme, this summary is the nexus of the overarching research problem.

5. The literature review identified several proposed models and theories in indicator selection. The findings from this theme showcased different approaches and their strengths and weaknesses. It highlighted that an appropriate approach to indicator selection must address the complexities of data collection and recognise contextual relevance to have practical application within diverse environments.

6. Finally, two articles in the literature review showed examples of synthesised frameworks responding to criticisms of inconsistent concepts and language used when discussing dimensions of disaster recovery. The first, ‘New Build Back Better’ (N-BBB), is significantly limited by its system being tailored to the characteristics of a specific region for which it was developed. This reflects one of the key limitations that cause challenges (See summary 5). The second synthesised framework discussed was the ‘Build Back Better Framework’ (BBB-F), which sought concepts shared in various key disaster recovery frameworks. Later amendments and additions that reflect the strategies outlined in the Sendai Framework (See summary 4) and include a suite of indicators aimed at keeping the framework intentionally broad and relevant across various disaster scenarios. Notably, the BBB-F reflects the dimensions of disaster recovery identified in the articles discussed in summary 2. This is illustrated below

(table 6.1). The able shows how each dimension of disaster recovery identified in the articles is reflected in the principles of the BBB-F.

| | ***Build Back Better Framework (BBB-F)*** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Disaster Risk Reduction | | | Community Recovery | | Effective Implementation | | |
| ***Identified dimensions of disaster recovery*** | Resilient Physical Assets | Multi-hazard based Land-use | DRR Education and Awareness | Psychological and Social recovery | Business Recovery | Institutional Mechanisms | Legislation and Regulation | Monitoring and evaluation |
| **Policy and governance** | | | | | | | | |
| Multi-level governance | | | | | | x | x | x |
| Finance mechanisms | | | | | x | x | x | |
| Insurance mechanisms | x | | | | | x | | |
| Government initiatives | | | | | | x | x | x |
| Government frameworks | | | | | | x | x | x |
| Policy frameworks | | | | | | x | x | x |
| **Community recovery** | | | | x | x | | | |
| **Economic recovery** | | | | | x | | | |
| **physical assets** | x | | | | | | | |
| Critical infrastructure | x | x | | | | | | |
| Housing | x | x | | | | | | |
| Urban planning | x | x | | | | | | |
| Land use planning | x | x | | | | | | |
| **Disaster Risk Reduction** | x | x | x | | | | | |
| **Coordination and Collaboration** | | | x | x | | x | x | |
| **Sustainable Development** | x | x | x | x | x | x | x | x |

***Table 6.1:*** *Dimensions of Disaster Recovery Identified in the Literature Review Relevance to Components of the BBB-F*

7. The challenges and issues identified throughout the articles were divided into two categories. The first considers the complexities of operating in disaster contexts (again, see summary 5). The second category concerns successfully addressing the principles of Build Back Better, indicating that frequently, dimensions of disaster recovery overwhelm one another.

8. The discussion portion articulates the importance of simultaneously addressing multiple dimensions in disaster recovery to ensure effective outcomes. It emphasises that action in one dimension impacts others, and neglecting this interconnectedness can exacerbate vulnerabilities. The literature highlights the prioritisation of community-centric indicators and the need for holistic frameworks that integrate diverse recovery aspects. However, the many indicators and their complex interconnections often overwhelm decision-makers. Two frameworks, the New-Build Back Better model (N-BBB) and the Modified Build Back Better Framework (BBB-F), are discussed as structured approaches to guide recovery efforts. While the BBB-F is praised for its adaptability and comprehensive nature, challenges remain in its implementation, particularly in accounting for the dependencies between different recovery dimensions. The text underscores the need to prioritise these dimensions to create a sustainable recovery strategy.

The literature review achieved several things. First, it provided the empirical evidence required to support and reflect the knowledge gap identified in Chapter One. Second, the literature review answered the research question of how disaster recovery frameworks integrate multiple dimensions of recovery to enhance resilience and sustainability by incorporating a comprehensive suite of indicators through various guides. Thus, it provided a significant output of identifying the methods and strategies of implementing a 'Build Back Better'/ holistic approach to disaster resilience. However, it also showed the gap and challenges associated with the approach. Mainly the overwhelming number of indicators becomes difficult to navigate if a decision-maker were to truly embrace and consider the holistic principles of resilience embedded in 'Build Back Better'. Thirdly, by identifying the gaps in current disaster recovery frameworks, the literature review appropriately guided the future research direction of this study. In the section 'Future Research Directions', it is addressed that a comprehensive

approach towards indicator selection should encompass all facets of disaster dimensions identified to ensure a holistic element. This would require a roadmap highlighting the interconnectedness and dependencies between various dimensions of recovery. Any approach must remain intentionally broad to avoid being too specific or technical to allow for the greatest application. This third point answered the intended research objective.

### 6.2.2 Objective Two

"*To examine how a holistic approach to indicators supports relationships and dependencies among different facets of recovery".*

This objective was accomplished through a HIDECs analysis documented in Chapter Four. It is summarised in the following twelve points.

1. The Build Back Better Framework (BBB-F), identified in the literature review as a comprehensive approach to addressing all essential dimensions of disaster recovery, was selected as the most suitable tool for analysing interconnectedness and dependencies. The BBB-F is the most effective and appropriate framework for this study because it offers a structured, transparent, and manageable method for illustrating the relationships and priorities among various disaster recovery dimensions.

2. The analysis process is discussed, recognising that the indicators need to be considered the most nuanced and detailed aspect of the framework over the components or principles, which are broader categorisations within the framework.

3. The 87 indicators that accompany the BBB-F are introduced. Specifically, their distribution is across the framework's various components, principles, and three broad categories. This signals that indicators are not evenly distributed across frameworks, which highlights that a traditional holistic approach that considers the sum of parts as equal is unlikely and that it shows how various dimensions that have more indicators attributed to them may overwhelm others.

4. From a purely observational perspective, the number of indicators attributed to the ‘Effective Implementation’ category outnumbers those of ‘Disaster Risk Reduction’ and ‘ Community Recovery’. It is hypothesised that this may reflect the complexity of each category and thus suggest a priority. However, it is identified that such observational organisation overlooks critical dynamics and does not address the interconnectedness between indicators, thus supporting the novel HIDECs analysis.

5. Several insights were garnered from the initial observation of the data. Firstly, the matrix used in the analysis proved effective in showing where indicators were densely interconnected components and principles and those that had more perceived independence due to their isolation.

6. Each indicator was, on average, connected to 40 other indicators or related to 46% of the framework in some way. This showed ineradicably the existence of the holistic principle. The least connected indicator was connected to half of the average amount, with only 20 connections; this indicated that even the most dependent indicator required consideration of its holistic connections. Furthermore, the initial observation showed the most connected factor. This indicator was deemed related to 98% of other indicators within the framework, highlighting it as a critical factor to consider in almost all stakeholders' actions and activities.

7. The HIDECs analysis was disseminated to unveil the priority between the dimensions of disaster recovery. The resulting analysis distinguished groups of indicators separated by generational traits and linked through a family tree-like structure. Each 22 groups of indicators and their placement were considered in the analysis.

8. Five of the 22 groups have a single indicator, all within the "Effective Implementation" (EI) category. This suggests that these specific implementation aspects are uniquely distinct and may require specialised attention or independent management to ensure they are not diluted when integrated with more interconnected measures.

9. Beyond single-indicator groups, there are clusters where multiple indicators from the same category align to form distinct groups. This is particularly notable in the EI

category, where some indicators are closely linked, suggesting they should be implemented together for optimal effectiveness.

10. Unlike the EI and Disaster Risk Reduction (DRR) categories, Community Recovery (CR) indicators are never isolated. They are always linked with indicators from at least one other category—DRR or EI—underscoring the inherently interconnected nature of community recovery efforts, which rely on the foundational support of risk reduction measures and practical implementation strategies to achieve successful outcomes.

11. A weighted heat map shows the distribution of BBB-F principles within the 22 groups. It highlights varying degrees of interdependence among the categories of DRR, CR, and EI, with some areas showing strong connections that require integrated strategies. In contrast, others may be more independent and require distinct approaches.

12. Figure 4.34 shows the distribution of principles throughout the generational tiers of the HIDECs analysis. It signals that indicators from the EI category are foundational and must be prioritised for decision-makers designing initiatives using the framework. Furthermore, The absence of DRR indicators in the earlier tier (one, two, and three) and their subsequent inclusion in later tiers reflect a strategic staging in framework implementation. The early focus should be on community recovery, and effective implementation sets the groundwork; this is then built upon by integrating risk reduction measures as initiatives as recovery efforts evolve.

The chapter effectively addresses the research objective of examining how a holistic approach to indicators supports relationships and dependencies among different facets of recovery. By applying a detailed HIDECs analysis, incorporating observational insights, and utilising weighted heat maps and the analysis of principles across generational tiers, the chapter demonstrates the varying degrees of interdependence among the categories of Disaster Risk Reduction (DRR), Community Recovery (CR), and Effective Implementation (EI). These methods help visualise and prioritise the foundational elements of the recovery process and show how a holistic approach can strategically address the different facets of recovery if indicator selection and prioritisation are duly considered.

The HIDECs analysis responds explicitly to the research question, "Can an approach be established to reflect dependencies and interconnectedness between indicators?" The analysis underscores the importance of recognising independent and interdependent indicators, particularly within the EI category. It reveals that while some indicators are standalone due to their unique and critical nature, many others are deeply interconnected, requiring a collaborative approach for successful implementation. This dual perspective effectively demonstrates the feasibility of conceptualising and implementing a methodological approach that reflects these complex relationships.

The HIDECs methodology, which groups and links indicators, is instrumental in making these relationships both visible and functional for decision-makers. This approach supports the research question by providing a concrete example of how dependencies and interconnectedness can be systematically represented and utilised in disaster management.

Furthermore, the chapter reinforces the overarching research objective by emphasising that a holistic approach fosters a comprehensive strategy where indicators from different categories are integrated. This integration is essential for addressing the multifaceted challenges of disaster management. The chapter supports viewing recovery facets as interconnected, as identified in Chapter Three, rather than isolated, thereby enhancing the effectiveness and sustainability of recovery outcomes.

### 6.2.3 Objective Three

*To analyse the effects of contextual issues on the selection and effectiveness of indicators in post-disaster recovery efforts.*

Chapter Five considered the contextual factors that influence indicator selection and prioritisation through the thematic analysis of forty case studies from a leading aid organisation and provided empirical insights into the real-world applications and challenges of implementing BBB. It is summarised in the following points:

1. The 40 case studies are introduced. It demonstrates ‘The Aid Organisations’ (TAO) extensive and varied involvement in global humanitarian efforts, demonstrating their capacity to collaborate with international agencies and local governments. They showcase TAO's expertise in disaster risk reduction, emergency preparedness, and

post-crisis recovery across multiple sectors and regions. The diversity of the reports also highlights TAO's adaptability and the broad impact of its deployments, which address specific needs in different countries and contexts over a significant period

2. The chapter describes the previously established contextual factors contributing to successful indicator selection and effectiveness in post-disaster recovery efforts. These come from three perspectives: academic, development, and humanitarian. The synthesised factors of success that are established by this study based on these are as follows:

    - Ethical and Rights-based principles
    - Data-Driven Decision Making
    - Long-term analysis and ongoing measures
    - Engagement and buy-in from stakeholders
    - Incorporation of Multi-dimensional Frameworks
    - Focus on vulnerable populations and long-term outcomes
    - Continuous Improvement and Systemic Enhancement

    These provide a benchmark of idealised factors that facilitate the later discussion against expectations set by the host organisations without consideration of the contextual factors.

3. The chapter illustrates how the study used two key documents—the Terms of Reference (ToR) and the End of Deployment Report (EoDR)—provided by TAO. These documents capture and reflect the synthesised factors from the host organisation's perspective (TAO) and the delegates' experiences, as detailed in the EoDR

4. The themes from the ToR are outlined. They are:

    - Experience
    - Technical Expertise
    - Analytical and Problem-Solving Skills
    - Flexibility and Adaptability

- Coordination and Collaboration
- Communication Skills
- Leadership and management
- Capacity Building and Training
- Cultural Sensitivity

5. Each theme is explained and compared against the previously established success factors. Here, it is demonstrated that the themes reflect the host organisations prioritising the operational capabilities of the delegates rather than the specific approaches to take. Thus, these themes do not meaningfully reflect the success factor.

6. Recognising this, the ToR were analysed against the components of the Build Back Better Framework. The framework's components reflect dimensions of disaster recovery that ought to be addressed in the principles and categories of the framework. This better showed how host organisations had prioritised dimensions of disaster recovery. It showed that, on average, the ToR embraced 62.5% of the framework, with the lowest ToR roles, responsibilities and outputs reflecting only 8 of the 20 components and the highest reflecting 18 of the 20 components. Furthermore, it was found that the most prioritised aspects where the components of improvement and compliance are from the principle of monitoring and evaluation, which is of the Effective Implementation category. Then, aspects of disaster risk reduction and community recovery, with one of the community recovery components tracking as low as 6% of any direct or indirect focus.

7. The EoDRs show that only a few of the case studies, upon reflection at the end of their deployment, did not deviate from their original ToR, with a significant change being described as 25% or more. At the same time, the majority recognised that contextual factors forced a change in prioritisation of focus.

8. Next, the EoDRs reports were analysed. These showed several themes that contributed to contextual factors that changed the prioritisation or selection of indicators. They are:

    a) Impacts of work culture/ environment
    b) Government and bureaucratic hurdles

c) Logistical and Operational Challenges
d) Issues with role definitions and clarity
e) Cultural, linguistic, and societal Factors

These highlight elements that exert considerable stress on various components within the framework. For consistency, consider their categorisation within the BBB-F; the first four themes align with components under the category of Effective Implementation. For instance, theme a. and theme b. are reflected to the components of 'Fostering Partnership' and 'Choosing Appropriate Institutional Mechanisms,' which fall under the principle of 'Institutional Mechanisms.' Theme c. aligns with the 'Compliance' component of the 'Monitoring and Evaluation' principle. Lastly, theme e. is connected to the 'Grass-roots Level Involvement' component, also within the 'Institutional Mechanisms' principle.

9. When asked about the overall impact of their actions, 19 of the 40 reported positivity. They characterised these in four ways:

f) Comprehensive and holistic approaches
g) Community involvement and empowerment
h) Sustainability
i) Strategic coordination and funding

Eight of the reports, however, highlighted negative characteristics that caused adverse impacts. These were defined as:

j) Uncertainty and delay in action
k) Service provision gaps
l) Poor coordination and efficiency

Several findings can be drawn from the discovery of these themes. Firstly, it shows that operationally, a holistic approach works. Those in the field promote its use and recognise that it produces a meaningful impact. Secondly, and highly interconnected, themes g., h., and i. reflect the three broad categories of the BBBF. Theme g. represents

‘Community Recover’, them h, ‘Disaster Risk Reduction’, and theme i. ‘Effective Implementation’. However, it is notable that the negative characteristics all can be categorised under ‘Effective Implementation’ This reinforces the findings in summary 8.

10. When considering the sustainability of their actions, several key themes emerged that consider the components that support the sustainment of their work after their deployment has ended.

    m) Formal handover process
    n) New practices and technologies
    o) Appropriate resourcing

11. Finally, several themes emerged when asked for final recommendations for improvement based on their experiences. These show how the delegates themselves saw prioritisation of the framework.

    p) Program and response focus
        i. Focus on disaster preparedness and mitigation
        ii. Holistic and sustainable approaches
    q) Coordination and collaboration
    r) Policy development and governance

12. The chapter then recognises six over-arching themes from the analysis.

- Building Positive Relationships
- Understanding Stakeholder Needs and Priorities
- Promoting Ownership and Participation
- Facilitating Collaboration and Coordination
- Adapting to Cultural and Contextual Dynamics
- Promoting Sustainable Partnerships

Building Positive Relationships and Understanding Stakeholder Needs and Priorities are essential for Community Recovery and Effective Implementation. Deployees create a strong foundation for collective action by fostering trust and collaboration among stakeholders. Understanding the needs and priorities of stakeholders ensures that interventions are relevant and aligned with the community's actual needs, which is vital for sustainable recovery efforts and successful project outcomes.

Promoting Ownership and Participation and Facilitating Collaboration and Coordination directly contribute to Effective Implementation and Community Recovery. When stakeholders are actively involved in the decision-making process, they are more likely to take ownership of the project, leading to better sustainability and effectiveness.

Adapting to Cultural and Contextual Dynamics and Promoting Sustainable Partnerships are integral to Disaster Risk Reduction and Community Recovery. Cultural sensitivity ensures that interventions are appropriate and respected within the local context, crucial for their acceptance and success. By promoting sustainable partnerships, deployees ensure that the benefits of their work extend beyond the deployment period, supporting long-term resilience and reducing future risks.

The chapter ends with a discussion based on these findings. It surmises that the ToR and the EoDR provided critical insights into the factors influencing the selection and prioritisation of indicators in post-disaster recovery efforts to Build Back Better. The findings emphasise the importance of recognising that contextual factors contribute to weakening critical components with the potential to derail or stall the initiative. These challenges primarily impact the Effective Implementation category despite being prioritised by the host organisation. It underscores a need for a holistic approach to sustain and improve the effects of recovery efforts. Thus, the chapter answers the research question of the impacts of contextual factors on the prioritisation of indicators and, in doing so, achieves the research objective of analysing the effects of contextual issues on the selection and effectiveness of indicators in post-disaster recovery efforts.

### 6.2.4 Objective Four

*'To develop practical guidelines and recommendations based on the research findings that contribute to more effective and successful post-disaster recovery strategies'*

This final chapter aims to achieve this objective. It considers the findings from the previous three chapters discussed above and poses two pivotal recommendations based on the research findings. These aim to provide well-founded guidelines to key decision-makers pursuing a holistic approach in indicator selection and prioritisation, navigating various dimensions of disaster recovery to build back better. The first recommendation concerns improving frameworks, and the second discusses the specific traits of indicators.

1. Frameworks that provide an accompanying set of indicators must demonstrate an understanding of their interconnection, dependencies, and priority.

Familiarising with an entire framework and its indicators is a comprehensive and exhausting task. Furthermore, determining the interconnections, dependencies, and priority between indicators requires specialised skills in recognising connections across various sectors—the expectation for end users to be able to. The onus of this should not be on the end-users, who are likely sector-specific. Instead, implementation guides recognising the critical need to address the holistic principles correctly should provide some hierarchical clustering analysis.

In doing so, decision-makers may assess the holistic roadmap and, upon selecting a predefined indicator or, if creating one and assigning it to an appropriate component within the framework, do the following,

a) Recognise where their indicator sits in the broader framework.

This recognition means that when situations change and flexibility is needed to pivot and adapt to emerging circumstances, the user may assess the likely impacts and strategies accordingly to ensure continued progress. This approach allows for dynamic decision-making, enabling the user to effectively respond to unforeseen challenges while maintaining focus on overarching goals

b) Identify supporting indicators

These are the highly interconnected indicators that the hierarchical clustering determines as most likely to be impacted by an intervention or action concerning one of them. This identification broadens the understanding of what will be influenced and impacted, thus negating unintended consequences in a directly affected area that may have otherwise been unconsidered.

c) Highlight critical indicators that may be prioritised.

This will highlight aspects that must first be addressed to facilitate a more suitable and sustainable intervention based on the selected indicator. For instance, an indicator of resilient physical assets that addresses disaster risk reduction may show that institutional mechanisms must first be addressed to combat systemic issues such as poor construction practices or inadequate maintenance.

d) Facilitate collaboration and communication.

By recognising the indicator's placement within the framework's broader scope, identifying supporting indicators, and highlighting critical components, users may more effectively address multiple dimensions of disaster recovery and facilitate collaboration and communication with all relevant stakeholders.

2. Decision makers must recognise components have specific traits and patterns

Categories and their components have reoccurring traits and patterns that affect prioritising and interconnectedness. Recognising these traits and patterns will ensure that when decision-makers design unique indicators in response to a specific context, they can predict how they can be supported, sustained, and avoid unintended impacts.

a) Disaster Risk Reduction Indicators

Disaster Risk Reduction (DRR) indicators tend not to appear in the top tiers of a holistic roadmap, signalling them as less supportive and reflecting their role in supporting long-term resilience rather than addressing immediate priorities. These indicators often rely on the foundational work of Effective Implementation to ensure their success and sustainability. DRR indicators are essential for building community resilience, but they typically work with indicators from other categories, such as Effective Implementation, to achieve their goals. Their impact is realised over time, making them critical for long-term recovery, even though they may not be prioritised in the initial stages of a recovery framework.

b) Community Recovery Indicators

Community Recovery components/ dimensions can never be addressed in isolation and rely on support from Effective Implementation Indicators and Disaster Risk Reduction Indicators. This interconnect signals the multi-faceted approach required to have meaningful results.

Community recovery is frequently an early focus but is later overshadowed by other dimensions of disaster recovery, particularly those in Effective Implementation. It is recommended that decision-makers recognise the appropriate support indicators from each category when planning initiatives, such as community-centric approaches to understand the appropriate institutional mechanisms required (implementation indicators) and the long-term goals in mind (Disaster Risk Reduction Indicators).

c) Effective Implementation Indicators

Indicators that address implementation, which include components/ dimensions such as institutional mechanisms, legislation and regulation, and monitoring and evaluation, are foundational in achieving initiatives; however, they are also the most susceptible to being negatively impacted by contextual factors. It is recommended that these be nurtured and closely observed to facilitate the success and sustainability of initiatives.

Indicators of effective implementation tend to function independently within frameworks without having an immediate impact on other components. It is recommended that indicators

identified as being independent receive targeted attention or standalone management to ensure they aren't overlooked or weakened.

Monitoring and Evaluation are pivotal in ensuring the success and sustainability of any initiative. They provide the necessary feedback loops to assess progress, identify areas for improvement, and make informed decisions that drive effective implementation and continuous enhancement of outcomes. Furthermore, when well established, they facilitate a more successful handover of projects between personnel.

## 6.3 Synthesis of Key Findings

Existing disaster recovery frameworks, while rich in content, struggle to operationalise the holistic intent of 'Build Back Better'. The literature review identified extensive overlap in the dimensions of recovery—ranging from policy to infrastructure to community—but revealed limited guidance on how these components interrelate or should be prioritised. The overabundance of indicators often overwhelms decision-makers and leads to inconsistent applications.

The development of the HIDECs methodology represents a key advancement. Through analysis of the Build Back Better Framework (BBB-F), HIDECs made visible the structural relationships between indicators. It revealed that some indicators—especially those related to Effective Implementation—serve as prerequisites for others. Others, such as those for Disaster Risk Reduction, tend to depend on prior actions and are more relevant in later stages of recovery. This undermines the assumption that all indicators can or should be applied simultaneously.

Case study analysis confirmed that contextual realities often disrupt indicator prioritisation. While Terms of Reference (ToR) documents from host organisations nominally reflected a commitment to a broad range of framework components, End of Deployment Reports (EoDRs) showed that delegates frequently had to adjust their priorities in response to cultural, bureaucratic, or operational constraints. These contextual stressors most often impacted Effective Implementation components, which emerged as both foundational and vulnerable.

The combined analysis affirms that a holistic recovery strategy must be sequenced, adaptive, and contextually grounded. Community Recovery indicators, while central to BBB principles, are rarely actionable without support from other domains. The findings underscore that true holism is not about doing everything at once, but about aligning interdependent elements in the right order, with institutional mechanisms providing the base upon which long-term resilience can be built.

## 6.4 Findings Limitations

One of the major limitations of this research lies in its reliance on a single predefined framework—the Build Back Better Framework (BBB-F)—as the basis for the HIDECs analysis. While the BBB-F is broad and widely referenced, it is not universally adopted, and its structure may not reflect the priorities or terminologies used in other sector-specific or regionally adapted frameworks. As a result, the generalisability of the findings across all disaster recovery contexts is constrained. Additionally, the clustering and interdependency analysis, while robust, is interpretive and dependent on the structure of the indicators as currently defined. Changes to indicator definitions or framework structure could shift the relational dynamics identified through HIDECs.

In terms of applicability, the findings offer strong practical value, particularly for practitioners involved in strategic planning and programme design. However, boundaries exist in terms of technical capacity. The HIDECs methodology requires a degree of analytical skill, familiarity with systems thinking, and a structured data environment, which may not be available in lower-resourced or high-pressure post-disaster contexts. Furthermore, the framework assumes a degree of stability and governance coordination that may not exist in politically fragile or rapidly evolving disaster scenarios. In such cases, rigid prioritisation based on interdependency mapping may prove difficult to operationalise.

Despite these constraints, the research provides a clear, evidence-based starting point for improving indicator selection and sequencing in structured environments, such as multilateral agencies, national recovery bodies, and larger NGOs. It is most applicable in the planning and early recovery phases, where there is still scope to shape programme architecture before reactive decision-making dominates.

## 6.5 Original Contribution

This research makes a substantive contribution to the academic discourse on post-disaster recovery by critically refining the concept of holistic recovery, introducing a novel methodological tool, and addressing the enduring disconnect between theoretical frameworks and their practical application, particularly in relation to the Build Back Better (BBB) principle.

### 6.5.1 Enhancing the Build Back Better Principle

Despite the widespread adoption of BBB within global policy frameworks such as the Sendai Framework for Disaster Risk Reduction (SFDRR), the principle remains conceptually expansive and procedurally ambiguous. This study advances the operationalisation of BBB through the development and application of the HIDECs methodology. In contrast to prevailing approaches that treat recovery indicators as either isolated metrics or components of a checklist, HIDECs organises indicators hierarchically. This structure reveals the dependencies among indicators, highlighting which actions must be prioritised to enable subsequent progress. In doing so, the study challenges the assumption that addressing multiple recovery dimensions concurrently equates to a 'holistic' approach. Instead, it proposes a model grounded in sequenced, interdependent action, informed by the realities of implementation.

### 6.5.2 Reframing Holistic Recovery

Conventional interpretations of holistic recovery tend to emphasise the concurrent engagement of various sectors. However, this study contends that such an approach is not only impractical but also misaligned with the empirical dynamics of post-disaster contexts. Through the application of HIDECs, the analysis reveals that certain domains—particularly Effective Implementation—are foundational to the success of recovery efforts. Without functional institutional mechanisms, coherent legislation, reliable monitoring systems, and meaningful stakeholder engagement, progress in areas such as Community Recovery and Disaster Risk Reduction is likely to falter. This reconceptualisation reframes holism not as simultaneous action across all fronts, but as a strategic and phased process, responsive to the interdependencies inherent in complex recovery systems.

### 6.5.3 Refining the Concept of Resilience

The study further advances the discourse on resilience by shifting the focus from its traditional framing as a static outcome to one that views resilience as a function of decision-making logic. Contrary to the view that resilience improves through the accumulation of addressed indicators, this research demonstrates that resilience is better understood in terms of the sequencing and contextual feasibility of selected actions. Analysis of real-world deployments highlights that poorly timed or unsupported interventions—particularly those inattentive to cultural, institutional, or political contexts—can actively undermine resilience. In response, this thesis offers a systems-oriented and dynamic interpretation of resilience that is not only conceptually robust but also operationally viable.

### 6.5.4 Bridging Framework Theory and Operational Practice

While theoretical frameworks such as BBB-F and the SFDRR provide valuable conceptual scaffolding, they frequently fall short in offering practical guidance for implementation. This study addresses that shortcoming by translating abstract indicator frameworks into a functional decision-making tool. The HIDECs methodology enables practitioners to determine not only what actions to undertake but also when and how to execute them, based on a clear understanding of indicator interdependencies. In doing so, it elevates the process of indicator selection from one based on normative assumptions or professional intuition to one informed by structured evidence and system logic.

### 6.5.5 Advancing Disaster Recovery Implementation

By integrating the HIDECs methodology with the BBB-F framework, this research contributes to the emerging domain of disaster recovery implementation. It introduces a methodological approach that is scalable, replicable, and transparent, capable of adaptation across diverse frameworks and recovery contexts. This methodological innovation promotes a shift toward more rigorous, data-informed, and strategically responsive models of recovery planning, in which issues of prioritisation and sequencing are treated as critical to success, rather than secondary to scope.

In conclusion, this thesis strengthens existing theoretical foundations by challenging static conceptions of holism and resilience, while also offering practical, field-tested tools to improve the implementation of post-disaster recovery strategies. It underscores the necessity of moving beyond abstract principles to embrace methodologies that reflect the complexities and constraints of real-world recovery processes.

## 6.6 Significance of Research Outputs

The significance of this research lies in its capacity to reshape how post-disaster recovery is conceptualised, operationalised, and implemented. By introducing a structured approach to sequencing recovery actions, it provides more than a theoretical refinement. It offers a practical intervention into one of the most persistent challenges in disaster recovery: how to move from abstract frameworks to effective decision-making in uncertain, resource-constrained environments.

This work addresses a critical gap in existing policy and practice, where recovery often falters not due to a lack of intent, but because of misaligned priorities, institutional fragmentation, and unclear implementation pathways. The HIDECs methodology directly engages this issue by offering a decision-support tool that clarifies dependencies between actions, enabling governments, NGOs, and local agencies to allocate time, funding, and capacity more effectively. This has tangible implications for improving recovery outcomes on the ground, particularly in low-resource or high-complexity contexts where missteps can compound vulnerability.

Furthermore, the research repositions resilience and holism as dynamic governance problems, rather than static checklists or aspirational goals. In doing so, it challenges entrenched assumptions that have often led to ineffective or performative planning. This reframing holds potential not only for disaster recovery practitioners, but also for donors, evaluators, and policymakers seeking to align funding mechanisms with more realistic and strategic recovery trajectories.

More broadly, the study advances the maturation of disaster recovery implementation science as a field in its own right. It sets a precedent for evidence-based, methodologically rigorous

tools that can be adapted across recovery phases, sectors, and scales. As such, its significance lies not just in improving individual recovery efforts, but in contributing to a systemic shift toward more intelligent, anticipatory, and accountable approaches to rebuilding after crisis.

## 6.7 Implementation Recommendations

This section proposes two core recommendations for those responsible for designing or applying post-disaster recovery frameworks. These recommendations are intended to support practitioners, policymakers, and framework developers in navigating the complexity inherent in disaster recovery, particularly in environments where resources, time, and institutional capacity are constrained. At the heart of both recommendations lies the need to move beyond aspirational checklists and toward tools that are truly operational and responsive to context.

### 6.7.1 Embed Interconnection, Dependency, and Priority into Framework Design

The first recommendation concerns the structure of recovery frameworks and the imperative to represent interconnection, dependency, and priority explicitly. Frameworks such as the Build Back Better Framework (BBB-F) often present a comprehensive set of indicators that outline what matters in recovery. However, what they frequently lack is guidance on how these elements relate to one another, what actions are dependent on others, and in what sequence decisions should be made. In practice, this omission places an unrealistic burden on recovery actors, who are expected to intuitively determine not only what is important but also how to act on it—despite working in time-poor and high-pressure environments.

To address this issue, recovery frameworks must evolve to include implementation logic. Indicators should not simply be listed but should be situated within a broader roadmap that clarifies their role, sequence, and interdependence. One effective approach is to use visual tools and clustering methodologies, such as the HIDECs model developed in this study, which can help decision-makers identify foundational indicators, highlight key dependencies, and anticipate cascading effects across systems. Such methods make it possible to prioritise early-stage interventions that lay the groundwork for later efforts, thereby enhancing clarity, reducing inefficiency, and mitigating the risk of unintended trade-offs.

### 6.7.2 Classify Indicators by Functional Role, Not Just Theme

The second recommendation speaks to the need for a more nuanced understanding of how different types of indicators function within the broader recovery process. Not all indicators are equal in terms of their timing, dependency, or operational implications. The analysis in this study consistently found that indicators fall into one of three functional categories: Effective Implementation (EI), Community Recovery (CR), and Disaster Risk Reduction (DRR), each with its own characteristics and requirements.

Indicators within the Effective Implementation category typically serve as the foundation for the rest of the recovery process. They are often actionable early and are less reliant on the successful completion of other indicators. However, they are also particularly vulnerable to disruption from institutional inertia, role ambiguity, or bureaucratic fragmentation, and as such, they require focused investment and early attention. In contrast, Community Recovery indicators are intrinsically interdependent. While they often attract rhetorical prioritisation, they cannot be meaningfully implemented without first securing adequate support from both EI and DRR domains. Their success depends on aligning with institutional capacity and long-term resilience planning. DRR indicators, meanwhile, are best understood as strategic and long-term. They are rarely suitable for immediate recovery phases and should be activated only once foundational systems are in place.

The practical implication of this categorisation is that indicators must be classified not only by thematic area but also by function. Understanding which indicators are enabling, which are dependent, and which serve a supporting role allows for more coherent planning and sequencing. It avoids the common mistake of prematurely focusing on ambitious outcomes while neglecting the basic building blocks required to support them.

Taken together, these recommendations offer a grounded and actionable pathway for transforming disaster recovery frameworks into tools that are not only comprehensive but usable. They challenge the notion that complexity must be simplified away, proposing instead that it be engaged with directly—through structure, sequencing, and a better understanding of functional roles. This shift promises to bring greater clarity, coordination, and accountability

to the design and implementation of recovery strategies, ultimately leading to more resilient and inclusive outcomes.

## 6.8 Directions for Future Research

This study used the predefined indicators from the Build Back Better Framework (BBB-F). Future research should concentrate on comparative studies of other established disaster recovery frameworks and their predefined indicators using the HIDECs methodology.

As noted in Chapter One, many disaster management frameworks are sector-specific, designed for stakeholders, or address specific disaster recovery phases. Additionally, many frameworks include significantly more indicators than the BBB-F, making their analysis more labour-intensive and beyond the scope of this study. Thus, future research should focus on how the indicators from these frameworks may be analysed similarly. If this could be achieved, it would further advance the discussion of indicator selection by uncovering similarities and differences between the resulting conclusions. Such findings undoubtedly would contribute to developing best practices, identifying areas for integration or refinement, and advancing a unified approach to disaster recovery priorities.

Chapter Five presented a cross-sectional analysis of 40 case studies, recognising the contextual challenges in selecting indicators. Exploring longitudinal studies that track the outcomes of 'build back better' initiative implementations over extended periods would be useful. These studies should assess the immediate aftermath, identifying the indicators or components of indicators selected and prioritised and tracking the changes and impacts brought about by those BBB strategies over several years. Insights gained could guide continuous improvements in disaster recovery planning and execution, highlighting the importance of indicator selection and prioritisation.

The case studies examine recovery initiatives from the perspective of NGO delegates deployed to work in post-disaster scenarios using End of Deployment Reports (EoDR). Their work is in response to the Terms of Reference (ToR), which gives some insights into the perspective of local organisations; however, what is missing is the perspective of those directly impacted. Future studies would benefit from building on the work discussed here to incorporate this perspective, ensuring that the affected communities' experiences, needs, and priorities are fully

represented. Including the perspectives of those directly impacted would provide a more comprehensive understanding of the recovery process, potentially leading to more effective and inclusive recovery strategies that better address the real challenges faced by disaster-affected populations.

## 6.9 Final Thoughts

The enhancement of the Build Back Better Framework's (BBB-F) conceptual clarity, operationalisation, and practical relevance, through multiple analytical lens, lays a foundation for improving disaster recovery practice globally. Grounded in both theory and empirical evidence, the research deepens understanding of recovery dynamics while offering actionable guidance for practitioners and a direction for future academic work. It critically examines the strengths and limitations of the BBB-F, aiming to foster recovery processes that are more resilient, inclusive, and sustainable.

By tackling a persistent challenge in disaster recovery, how to systematically identify and prioritise indicators within comprehensive recovery frameworks, this study offers a valuable contribution to both academic and policy communities. For practitioners and policymakers, it provides a clearer understanding of the interdependencies, sequencing, and relative significance of recovery indicators, supporting more strategic and adaptive decision-making in time-constrained, resource-scarce post-disaster contexts.

Ultimately, this research may be used as a resource for disaster management professionals, policymakers, and academics, advocating for a 'better' holistic and evidence-based approach to building back better after disasters.

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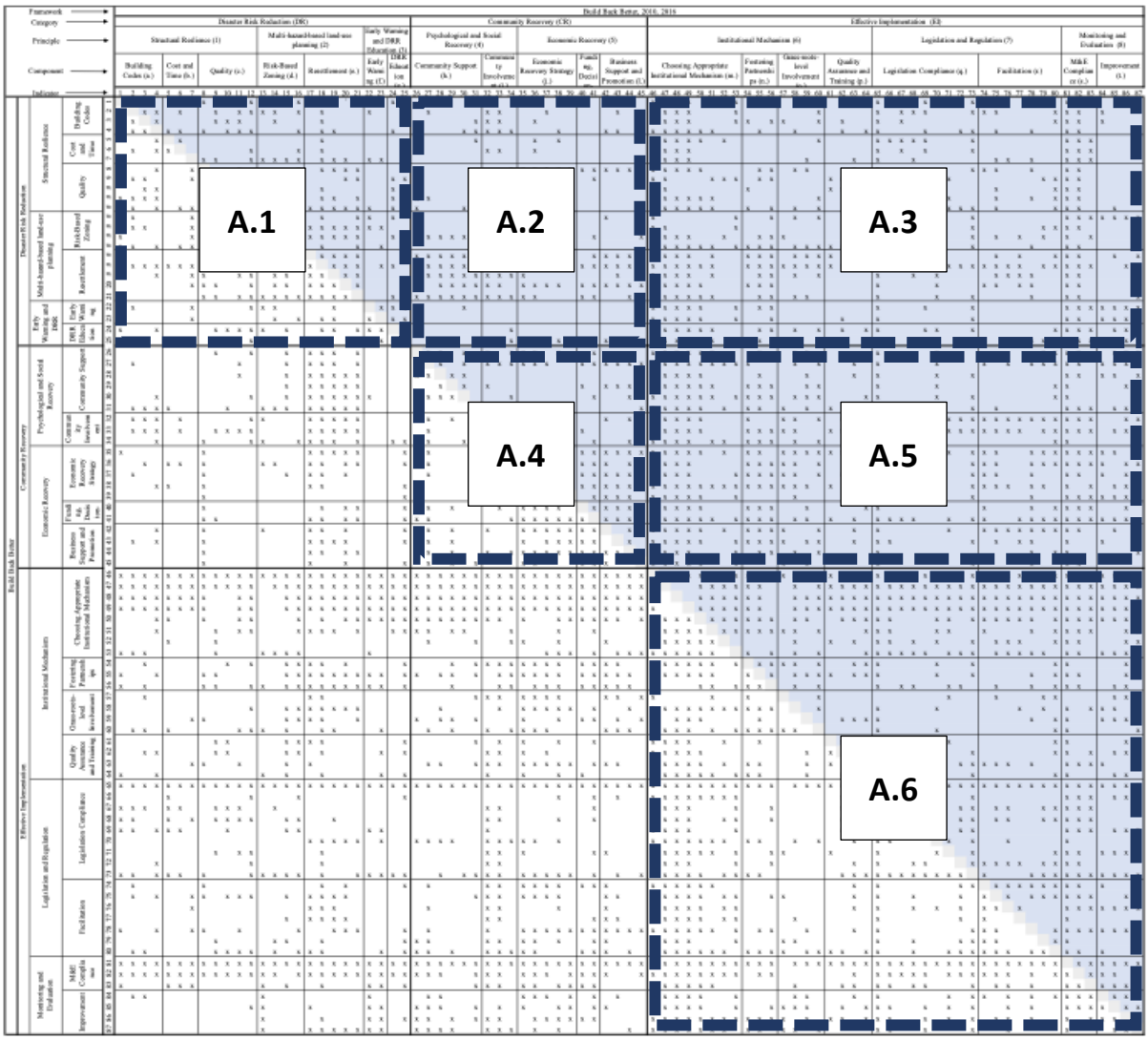
# Appendices

## Appendix A
## Build Back Better Framework Matrix

### A.0 Overview of Build Back Better Framework Matrix.

The image below provides an overview of the matrix generated through the HIDECs analysis discussed in Chapter Four. This matrix organises the 87 Build Back Better Framework (BBB-F) indicators according to their components, principles, and overarching categories. The chapter highlights the matrix's diagonal symmetry, which reflects the bidirectional connections between indicators, illustrated by the blue shading. While this image offers a simplified overview, more detailed images focusing on unique connections are included (A.1 to A.6)



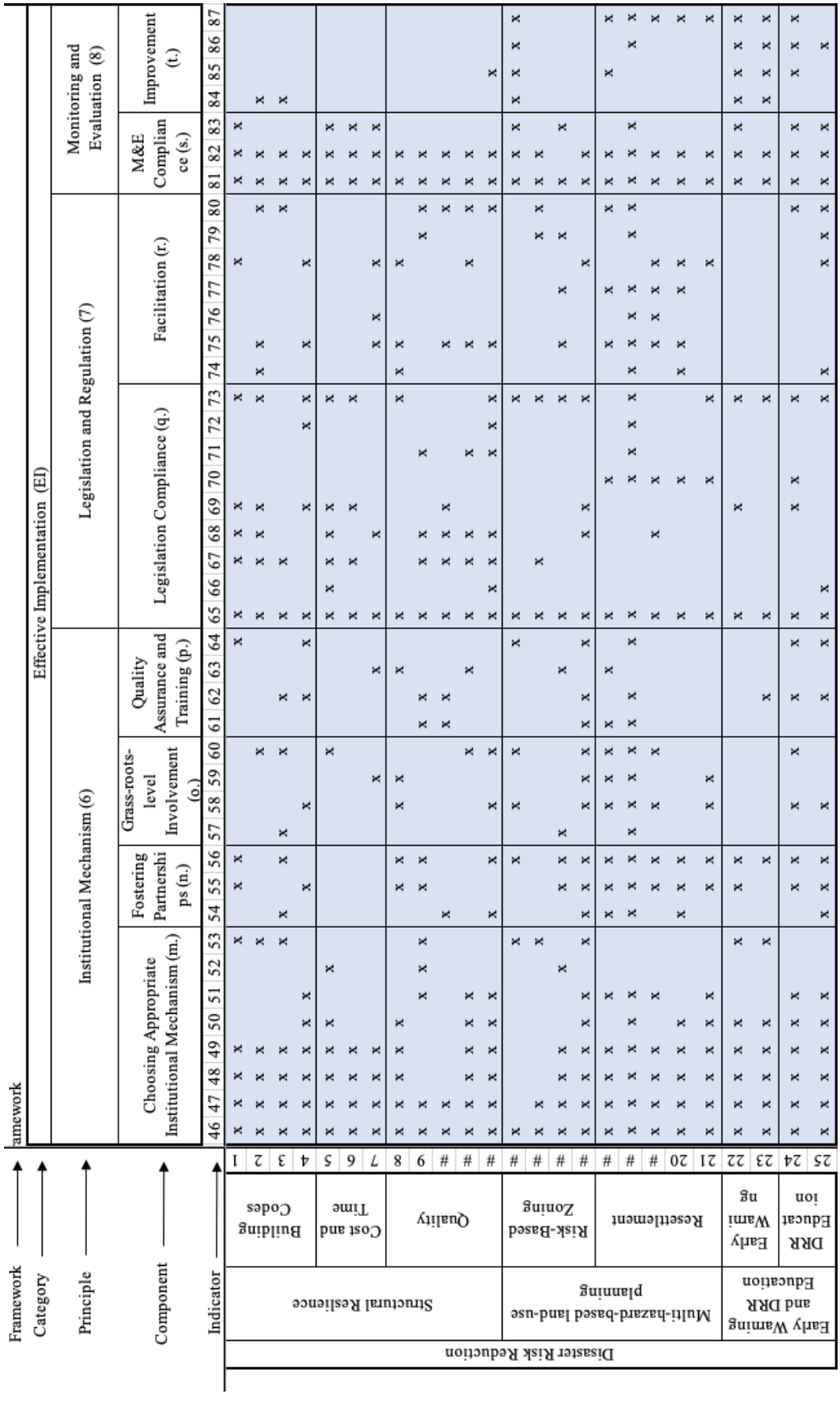
## A.1 BBB-F Matrix ‘Disaster Risk Reduction’ to ‘Disaster Risk Reduction’

| Framework → | | | | Disaster Risk Reduction (DR) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category → | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Principle → | | | | Structural Reslience (1) | | | | | | | | | | | | Multi-hazard-based land-use planning (2) | | | | | | | | | Early Warning and DRR Education (3) | | | |
| Component → | | | | Building Codes (a.) | | | | Cost and Time (b.) | | | Quality (c.) | | | | | Risk-Based Zoning (d.) | | | | Resettlement (e.) | | | | | Early Warning (f.) | | DRR Education (g.) | |
| Indicator → | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| Disaster Risk Reduction | Structural Reslience | Building Codes | 1 | | x | | | | | x | x | | | x | x | x | x | x | x | | x | | | | x | x | x | x |
| | | | 2 | x | | x | x | | x | | | x | | x | x | x | x | | x | | x | | | | x | | | |
| | | | 3 | | x | | x | | | | | x | x | x | | | x | | | | x | | | | | | | |
| | | | 4 | | x | x | | x | x | | x | | x | x | x | | | | x | | x | x | | | | | x | |
| | | Cost and Time | 5 | | | | x | | x | | | | | | | | | | | | x | | | | | | | |
| | | | 6 | | x | | x | x | | | | | | | x | | | | x | | x | | | | | | | |
| | | | 7 | x | | | | | | | x | x | | | x | x | x | x | x | | x | x | x | | x | x | | |
| | | Quality | 8 | x | | | x | | | x | | | | x | | | | | x | | x | x | x | x | | | | |
| | | | 9 | | x | x | | | | x | | | | x | x | | | | x | | | | x | x | | | x | x |
| | | | # | | | x | x | | | | | | | x | | | | | | | x | | | | | | x | |
| | | | # | x | x | x | x | | | | x | x | x | | x | | | | | | x | x | | x | | | x | |
| | | | # | x | x | | x | | x | x | | x | | | x | x | x | x | x | x | x | x | x | x | x | | x | x |
| | Multi-hazard-based land-use planning | Risk-Based Zoning | # | x | x | | | | | x | | | | | x | | x | x | x | x | x | | | x | x | | x | |
| | | | # | x | x | x | | | | x | | | | | x | x | | x | x | x | x | x | x | x | x | | | | |
| | | | # | x | | | | | | x | | | | | x | x | x | | x | x | x | x | x | x | | | x | |
| | | | # | x | x | | x | | x | x | x | x | | | x | x | x | x | | | x | | | | | x | | |
| | | Resettlement | # | | | | | | | | | | | | x | | x | x | | | x | | | x | | | | |
| | | | # | x | x | x | x | x | x | x | x | | x | x | x | x | x | x | x | x | | | x | x | x | | x | x | |
| | | | # | | | | x | | | x | x | | | x | x | | x | x | | x | x | | x | x | | | | |
| | | | 20 | | | | | | | x | x | x | | | x | | x | x | | x | x | x | | x | | | | |
| | | | 21 | | | | | | | | x | x | | x | x | x | x | x | x | x | x | x | x | | | | x | |
| | Early Warning and DRR Education | Early Warning | 22 | x | x | | | | | x | | | | | x | x | x | | | | | x | | | | x | x | x |
| | | | 23 | x | | | | | | x | | | | | | | x | | x | | x | x | | | x | | x | x |
| | | DRR Education | 24 | x | | | x | | | | | x | x | x | x | x | | x | | | x | x | | | x | x | | x |
| | | | 25 | x | | | | | | | | x | | | x | | | | | | | | | | x | x | x | |

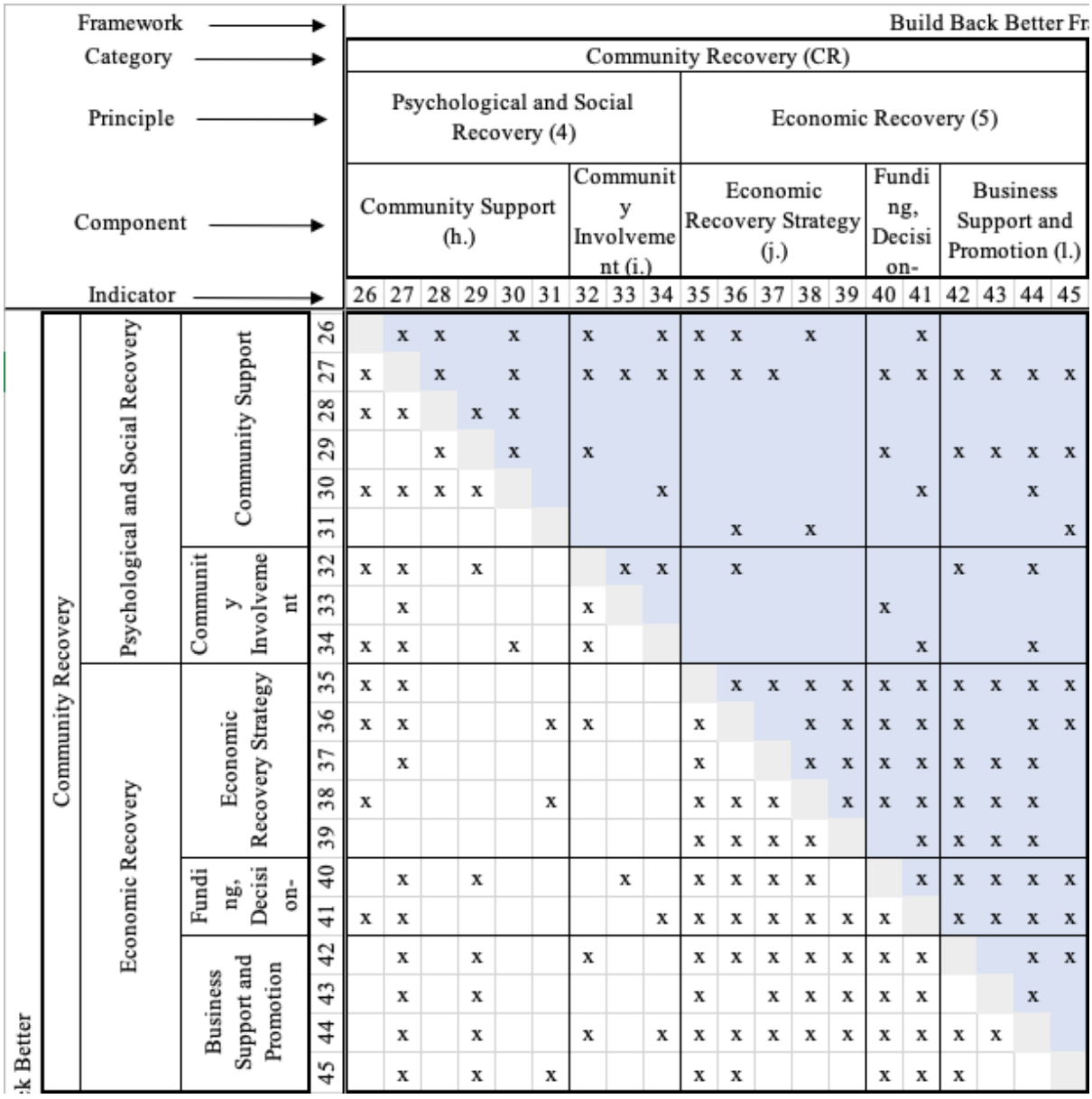
## A.2 BBB-F Matrix 'Disaster Risk Reduction' to 'Community Recovery'

| Framework → | | | | Build Back Better Fr | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category → | | | | Community Recovery (CR) | | | | | | | | | | | | | | | | | | | | |
| Principle → | | | | Psychological and Social Recovery (4) | | | | | | | | | Economic Recovery (5) | | | | | | | | | | | |
| Component → | | | | Community Support (h.) | | | | | | Community Involvement (i.) | | | Economic Recovery Strategy (j.) | | | | | Funding, Decision- | | Business Support and Promotion (l.) | | | |
| Indicator → | | | | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 |
| Disaster Risk Reduction | Structural Reslience | Building Codes | 1 | | | | | | | | | | x | | | | | | | | | | |
| | | | 2 | | x | | | | | x | x | | | | x | | | | | | x | | |
| | | | 3 | | | | | | x | x | x | | | x | | | | | | | | | |
| | | | 4 | | | | | x | x | x | x | x | | | | x | | | | x | x | | |
| | | Cost and Time | 5 | | | | | | x | | | | | x | | x | | | | | | | |
| | | | 6 | | | | | | | x | x | | | x | | | | | | | | | |
| | | | 7 | | | | | | | | | | | | | | | | | | | | |
| | | Quality | 8 | | | | | | | | | x | x | x | x | x | x | x | x | x | x | x | x |
| | | | 9 | x | | | | | | | x | | | | | | | | x | | | | |
| | | | # | | | | | | x | | x | | | | | | | | | | | | |
| | | | # | x | x | | | | | | x | | | | | | | | | | | | |
| | | | # | x | | | | x | | x | x | x | | | | | | | | | | | |
| | Multi-hazard-based land-use planning | Risk-Based Zoning | # | | | | | | x | x | | x | | x | | | | | | x | | | |
| | | | # | | | | | | x | | | | | x | | | | | | | | | |
| | | | # | x | x | x | x | x | x | | | | | | x | | | | x | | | | x |
| | | | # | | | | | | | | | x | | | | | | | | | | | |
| | | Resettlement | # | x | x | x | x | x | x | x | x | x | x | x | x | x | | | x | x | x | x | x |
| | | | # | x | x | x | x | x | x | x | x | x | x | x | x | x | | x | x | x | x | x | |
| | | | # | x | x | x | x | x | x | x | x | x | x | | | | | | | | x | | |
| | | | 20 | | | x | x | x | x | x | x | | x | x | x | x | | x | x | x | x | x | x |
| | | | 21 | x | x | x | x | x | x | x | x | x | x | x | | | | x | x | | | x | |
| | Early Warning and DRR Education | Early Warning | 22 | | | | | x | | | | | | | | | | | | | | | |
| | | | 23 | | | | | | | | | | | | | | | | | | | | |
| | | DRR Education | 24 | | | | | | | | | x | | | | | | | | | | | |
| | | | 25 | | | | | | | | | x | x | x | | x | x | x | x | x | x | | x |

## A.3 BBB-F Matrix ‘Disaster Risk Reduction’ to ‘Effective Implementation’



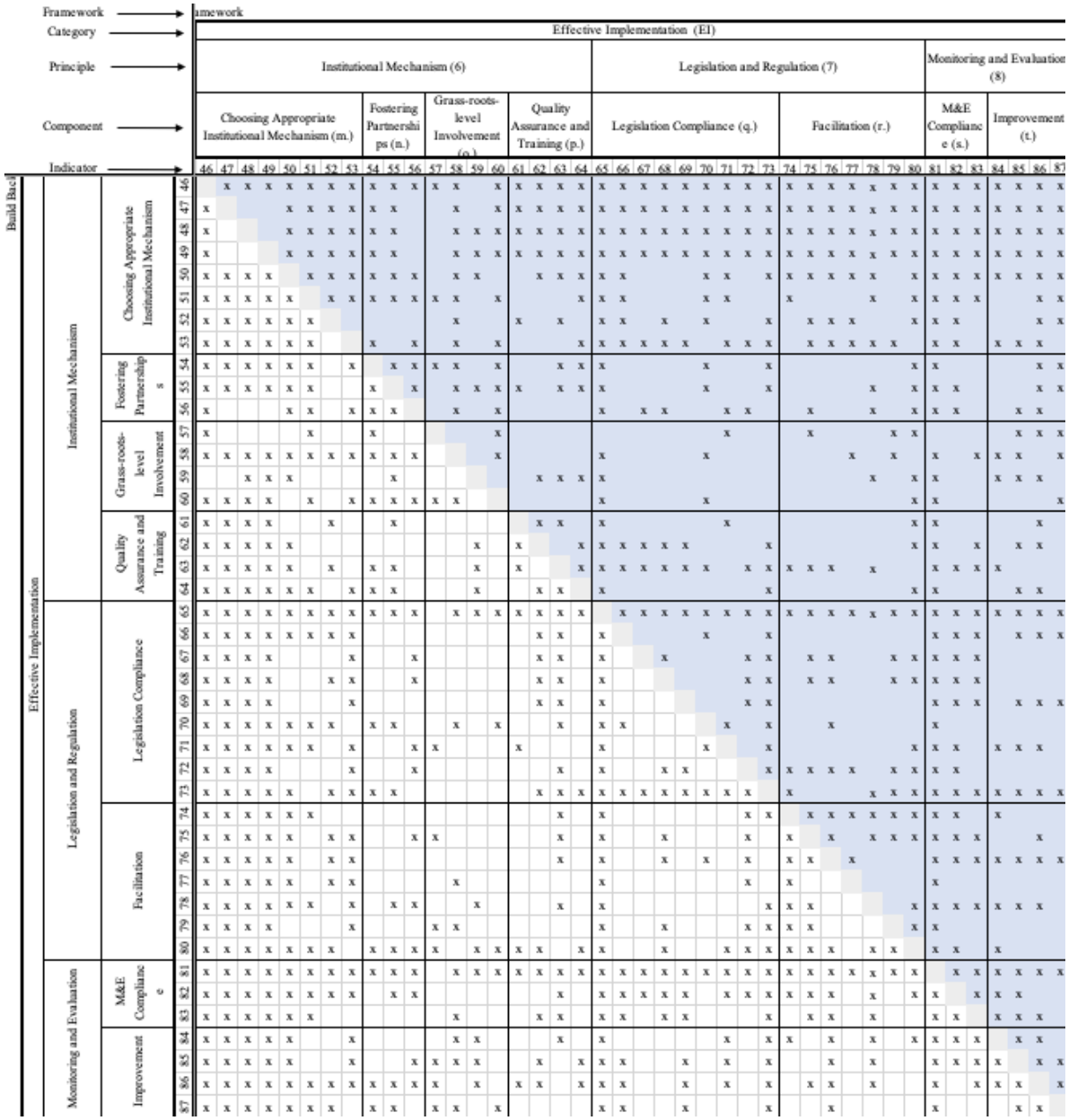
## A.4 BBB-F Matrix 'Community Recovery' to 'Community Recovery'



| Framework → | Build Back Better Fr | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category → | Community Recovery (CR) | | | | | | | | | | | | | | | | | | | |
| Principle → | Psychological and Social Recovery (4) | | | | | | | | | Economic Recovery (5) | | | | | | | | | | |
| Component → | Community Support (h.) | | | | | | Community Involvement (i.) | | | Economic Recovery Strategy (j.) | | | | | Funding, Decision- | | Business Support and Promotion (l.) | | | |
| Indicator → | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 |
| Community Recovery / Psychological and Social Recovery / Community Support | 26 | | x | x | | x | | x | | x | x | | x | | | x | | | | |
| | 27 | x | | x | | x | | x | x | x | x | x | | | x | x | x | x | x | x |
| | 28 | x | x | | x | x | | | | | | | | | | | | | | |
| | 29 | | | x | | x | | x | | | | | | | x | | x | x | x | x |
| | 30 | x | x | x | x | | | | x | | | | | | | x | | | x | |
| | 31 | | | | | | | | | | x | | x | | | | | | | x |
| Community Recovery / Psychological and Social Recovery / Community Involvement | 32 | x | x | | x | | | x | x | | x | | | | | | x | | x | |
| | 33 | | x | | | | x | | | | | | | | x | | | | | |
| | 34 | x | x | | | x | x | | | | | | | | | x | | | x | |
| Community Recovery / Economic Recovery / Economic Recovery Strategy | 35 | x | x | | | | | | | | x | x | x | x | x | x | x | x | x | x |
| | 36 | x | x | | | | x | x | | | x | | | x | x | x | x | | x | x |
| | 37 | | x | | | | | | | | x | | | x | x | x | x | x | x | |
| | 38 | x | | | | | x | | | | x | x | x | | x | x | x | x | x | |
| | 39 | | | | | | | | | | x | x | x | x | | x | x | x | x | |
| Community Recovery / Economic Recovery / Funding, Decision- | 40 | | x | | x | | | x | | x | x | x | x | | | x | x | x | x | x |
| | 41 | x | x | | | | | | x | x | x | x | x | x | x | | x | x | x | x |
| Community Recovery / Economic Recovery / Business Support and Promotion | 42 | | x | | x | | x | | | x | x | x | x | x | x | x | | | x | x |
| | 43 | | x | | x | | | | | x | | x | x | x | x | x | | | x | |
| | 44 | | x | | x | | x | | x | x | x | x | x | x | x | x | x | x | | |
| | 45 | | x | | x | | x | | | x | x | | | | x | x | x | | | |

## A.5 BBB-F Matrix ‘Community Recovery’ to ‘Effective Implementation’

## A.6 BBB-F Matrix 'Effective Implementation to 'Effective Implementation'



## Appendix B, Build Back Better Framework Indicators

The following 87 indicators come directly from the 2018 publication 'Resilient Post Disaster Recovery through Building Back Better' by Mannakkara, Wilkinson, and Potangaroa. Each number corresponds to the number within the matrix in appendix A.

| Disaster Risk Reduction | | | |
|---|---|---|---|
| Structural Resilience | Building Codes | **1** | Accurate, up-to-date understanding of all hazards affecting physical assets and resulting disaster risks and vulnerabilities |
| | | **2** | Legislated structural codes based on up-to-date multi-hazard assessments with design and construction specifications aligned with local resource availability and affordability |
| | | **3** | Building codes and regulations that incorporate traditional technologies and are aligned with local knowledge and skills |
| | | **4** | Education provided to stakeholders on post disaster building regulation changes prior to commencing rebuilding work |
| | Cost and Time | **5** | Long-term funding mechanisms in place to fund extra costs incurred for structural improvements |
| | | **6** | Incentive planned and in place to promote adoption of structural improvements to homes, buildings and infrastructure |
| | | **7** | Unaffordable construction on high-risk land restricted |
| | Quality | **8** | Redundancies and transitional arrangement in place to relieve pressures on fast and reactive rebuilding (transitional accommodation, alternative travel routes etc.) and implement well-planned rebuild projects |
| | | **9** | Practical, uncomplicated and efficient quality assurance measures in place appropriate for post disaster environments |
| | | **10** | Incentives or special arrangements (e.g. alliance or public-private partnership) planned and in place to attract skilled certified builders to meet reconstruction demands |
| | | **11** | Provide professional supervision for owner-building of homes for quality assurance |
| | | **12** | Rebuilding advisory service with rebuilding advisors in place to support, educate and assist home-owners needing to rebuild |
| Multi-hazard-based land-use planning | Risk-Based Zoning | **13** | Accurate, up-to-date understanding of all hazards in the area by conducting multi-hazard assessments and creating clear risk zone maps |
| | | **14** | Land-use plans revised with appropriate land-uses determined by analyzing the new risk zone maps and relevant updated building regulations, enforced using appropriate legislation |
| | | **15** | Incentives such as land-swap schemes planned and put in place to facilitate and encourage the relocation of physical assets from high-risk to low-risk areas |
| | | **16** | Education to provide to stakeholders and the community on disaster risk and revised land-use plans prior to rebuilding |
| | Resettlement | **17** | Create a comprehensive resettlement plan to minimize disruption and support the community through the resettlement process |

| | | | |
|---|---|---|---|
| | | **18** | Consider the needs of the affected community |
| | | **19** | Involve the community in choosing new sites |
| | | **20** | Provide incentives for relocation (good infrastructure, employment opportunities etc.) |
| | | **21** | Support the community Through the provision of counselling and advisory services |
| Early Warning and DRR Education | Early Warning | **22** | Advanced science and local knowledge are used to improve the accuracy of hazard predictions |
| | | **23** | Early warning systems appropriate to the local community are employed using a combination of new technology and local knowledge and traditional methods |
| | DRR Education | **24** | Communities and stakeholders are educated on prevalent disaster risk, practical disaster risk reduction methods and disaster preparedness |
| | | **25** | Training and resources provided to organizations on preparing business continuity plans and establishing partnerships with other organizations for improved resilience |

| **Community Recovery** | | | |
|---|---|---|---|
| Psychological and Social Recovery | Community Support | **26** | Establish community advisory devices to provide information and connect with affected households |
| | | **27** | Identify vulnerable groups in the community and organize specialized assistance to support them |
| | | **28** | Organise psychological support and counselling services for the community |
| | | **29** | Organises activities and support groups to bring the community together and build social cohesion. Create a sense of community and togetherness |
| | | **30** | Inform the community regularly on recovery decisions and progress using appropriate channels (e.g. regular public meetings, pamphlets, newsletters, media, text messages, dedicated recovery website, social media) |
| | | **31** | Priorities the rebuilding of public facilities and heritage sites based on community's social and cultural needs (e.g. schools, churches, hospital, supermarket, community halls, recreation centers) |
| | Community Involvement | **32** | Empower the community by incorporating grass-roots methods for recovery (e.g. creating/ utilizing community groups to get community input for planning, decision-making and various aspects of implementation of rebuild and recovery) |
| | | **33** | Promote owner-building of homes to empower home-owners with support and supervision from skilled builders |
| | | **34** | Maintain full transparency with affected communities with regard to recovery decisions |
| Economic Recovery | Economic Recovery Strategy | **35** | Develop a tailor-made Economic Recovery Strategy catering to local needs using information collected from locals and local councils |
| | | **36** | Empower and support locals to re-establish traditional livelihoods and to upgrade facilities and technologies for business rejuvenation if appropriate |

| | | | |
|---|---|---|---|
| | | **37** | Introduce new livelihood options utilizing local resources and opportunities for up-skilling to cater to skills shortages |
| | | **38** | Plan economic restoration activities concurrently with rebuilding (e.g. rebuilding of infrastructure contributing to key economic activities prioritized) |
| | | **39** | Adopt a measurement tool to track economic progress |
| | Funding, Decision-making and Training | **40** | Provide government support to assist business recovery (e.g. provision of special governments grants and flexible low-interest loans) |
| | | **41** | Put in place business advisory services to support and advise businesses |
| | Business Support and Promotion | **42** | Support speedy re-establishment of businesses through setting up temporary retail/ work spaces for businesses through setting up temporary retail/ work spaces for businesses, fast-tracked permit procedures and incentives provided to skill builders to facilitate rebuilding, and fast-tracked insurance settlements |
| | | **43** | Considerations of alternative, innovative options if economic recovery progress is poor (e.g. introducing a big business such as a conference centre, shopping mall, sports stadium) to boost the economy, create new jobs and attract residence and tourists if economic and community recovery progress is poor |
| | | **44** | Keep the local community regularly informed on economic recovery plans and progress to encourage residents and boost morale |
| | | **45** | Advertise and promote local industries and attractions to appeal to tourists |

| | | | |
|---|---|---|---|
| **Effective Implementation** | | | |
| Choosing Appropriate Institutional Mechanism | Choosing Appropriate Institutional Mechanism | **46** | Choose a local level body (e.g. existing government organization or new recovery authority) most suited to the local context to plan, implement and manage recovery activities, and facilitate coordinating and partnership between stakeholders involved in recovery |
| | | **47** | Choose the level of centralization or decentralization most suited to the local context or community, and combine central-level coordination of recovery with decentralized planning and implementation |
| | | **48** | If a new recovery authority is established, ensure that it includes representatives local government members and local community leaders |
| | | **49** | Devise an effective exit strategy for short-term recovery authorities to transition smoothly from rebuilding and recovery operations to business as usual |
| | | **50** | Strengthen the capacity of disaster-impacted organizations to take part in recovery |
| | | **51** | Establish clear roles and responsibilities for all stakeholders |
| | | **52** | Create an exclusive, singular fund for disaster recovery to direct all funds dedicated to recovery into one pool for clear accountability and allocation for different recovery needs |
| | | **53** | Maintain a thorough information database |

| | | | |
|---|---|---|---|
| | Fostering Partnerships | **54** | Foster effective partnership, collaborations and effective communication between stakeholders. Create formal partnership if appropriate (e.g. alliances, public-private partnership) |
| | | **55** | Hold regular multi-stakeholder meetings to discuss, plan and implement recovery activities, avoiding duplication and allowing consultation and information exchanges between stakeholders |
| | | **56** | Generate systems for easy and transparent access to information between stakeholders |
| | Grass-roots-level Involvement | **57** | Emphasize decentralization and grass-root involvement in recovery planning and implementation |
| | | **58** | Provide transparent information to the community |
| | | **59** | Support local councils to take a lead role in recovery |
| | | **60** | Involve the community as appropriate in planning decision-,making and implementation of recovery projects |
| | Quality Assurance and Training | **61** | Use qualified, reputable stakeholders for recovery activities |
| | | **62** | Provide training prior to recovery work as appropriate |
| | | **63** | Put in place mechanisms for monitoring and evaluation of recovery process |
| | | **64** | Put in place mechanisms to transfer lessons learnt to local and a national government and all relevant stakeholders for capacity-building, future resilience work, pre-disaster planning, emergency management and post disaster recovery |
| Legislation and Regulation | Compliance | **65** | Put in place legislation and regulations as appropriate to enforce and comply with BBB-Based recovery decisions |
| | | **66** | Enforce an institutional mechanism for post-disaster reconstruction and recovery (existing organization or a new recovery authority) |
| | | **67** | Enforced updated building codes and building regulations |
| | | **68** | Enforce updated planning regulations and land use plans |
| | | **69** | Enforce risk management and retrofitting programmed for ongoing hazard risk management |
| | | **70** | Mandate community-inclusive and participatory recovery planning and implementation |
| | | **71** | Impose quality control specifications for stakeholder selections and stakeholder management |
| | | **72** | Enforce Standardized post disaster building contracts for residential rebuilding |
| | | **73** | Impose long-term monitoring of recovery |
| | Facilitation | **74** | Put in place legislation and regulations to facilitate business-as-usual processes to improve efficiency for recovery |
| | | **75** | Simplify and fast-track permit procedures for rebuilding |
| | | **76** | Expedite the release of state lands for temporary housing and resettlement |
| | | **77** | Expedite disbursement of funds |
| | | **78** | Assist business recovery |
| | | **79** | Maintain flexibility in the end dates of legislative provisions |
| | | **80** | Provide training and education for stakeholders and the community on new legislative changes |

| | | | |
|---|---|---|---|
| Monitoring and Evaluation | Compliance | **81** | Put in place mechanisms to monitor the quality and compliance of ongoing recovery in line with BBB |
| | | **82** | Measure recovery outputs to track progress by collecting comprehensive data about recovery |
| | | **83** | Create plans about monitoring and evaluation mechanisms for long-term hazard risk monitoring |
| | Improvement | **84** | Identify problems with current post disaster recovery practices through monitoring and evaluation mechanisms |
| | | **85** | Incorporate lessons learnt into revising policies and procedures for future disaster management practices |
| | | **86** | Train stakeholders on disaster management practices from lessons learnt |
| | | **87** | Implement disaster management education campaigns for public |

## Appendix C, Example of case study documentation

The following is an example of the documentation used for the 40 case studies that form the data collected for Chapter Five. The first (C.1) shows a Terms of Reference (ToR) document. The second (C.2) shows an End of Deployment Report (EoDR). The EoDR has redacted to where appropriate to remove identifiable information in line with the code of ethics being followed and are shown here for reference and transparency in research.

## C.1 Example of Terms of Reference

UNHCR
United Nations High Commissioner for Refugees
Haut Commissariat des Nations Unies pour les réfugiés

### Terms of Reference – Education Officer –Yumbe

#### MISSION LOCATION

UNHCR Filed Office Yumbe, Yumbe District, Uganda

#### DURATION

6 months minimum

#### OPERATIONAL CONTEXT

From July 2016 through January 2017, more than 512,000 South Sudanese refugees arrived in Uganda at an average of 2,400 refugees per day. The influx reached 3,000 a day for several months making Uganda the third ranked refugee-hosting country in the world with close to a million refugees. The majority of refugees are arriving from Yei, Morobo, Lainya, Kajo Keji and the surrounding areas of Central Equatoria. The influx is expected to continue as sporadic military attacks continue to trigger cross border movements. Since July 2016, four settlements have been opened in West Nile region to accommodate the South Sudanese refugee influx. The number of South Sudanese refugees arriving in Uganda remains high as fighting in the Equatoria region continues.

The Government of Uganda adopted the innovative approach of integrating refugee management and protection into its Second National Development Plan (NDP II) through the Settlement Transformative Agenda (STA), in accordance with the 2030 Agenda on Sustainable Development Goals (SDGs). The Settlement Transformative Agenda, aims to sustainably assist refugees and host communities by promoting socioeconomic development in refugee-hosting areas, supported by the United Nations through the Refugee and Host Population Empowerment (ReHoPe) initiative, which was developed in collaboration with the World Bank. The approach is in conformity with the Comprehensive Refugee Response Framework (CRRF) called for by the New York Declaration on Refugees and Migrants adopted by the UN General Assembly in September 2016.

#### AIM OF THE MISSION

Supporting the operation address the education challenges faced by the Country as a result of this South Sudanese influx into Uganda. The position will further support in the actualization of CRRF within Uganda (one of the CRRF pilot countries).

#### MISSION OBJECTIVES

Ensure that:

- UNHCR's country Education Strategy (under review) is in line with the Government Education Sector and Strategic Plan (ESSP), the UNHCR Global Education Strategy (under review), the SDG 4 –Education 2030 agenda and the CRRF.
- UNHCR offices and staff involved in the South Sudan refugee response are provided with appropriate technical advice and training regarding education needs assessment, gap analysis, programme design, programme implementation, data management, results and impact monitoring and evaluation.
- UNHCR staff develop the capacity to effectively participate in or lead coordination of refugee's education responses at the local level in conjunction with the respective District Education Offices.
- UNHCR Partners and staff develop and deliver quality education in both formal and non-formal education programs and ensure incorporation of peace education, Child Protection (psychosocial support) and gender equity in education programming.
- Good practices in the implementation of the Refugee Response Plan are documented and advocacy on key challenges on education for refugee's i.e. full inclusion of refugees into the National education system, undertaken.

#### RESPONSIBILITIES

The education deployee will report to the Protection Officer in the field location that she/he will be based.

Under the direct supervision of Protection Officer and overall guidance of the Head of Office, the Education Officer will:

- Provide technical guidance, and monitor strategic planning and implementation of education for the South Sudanese refugees as per UNHCR's country Education Strategy Education Framework for the South Sudanese

refugees in line with the Government Education Sector and Strategic Plan (ESSP), the UNHCR Global Education Strategy (under review), the SDG 4 –Education 2030 agenda and the CRRF.

- Support regular monitoring of the education activities as per the Uganda MoE standards and indicators and UNHCR Education standards and indicators.
- Identify training and capacity building needs, and arrange trainings on education issues as appropriate.
- Support quality delivery of all education programmes - formal and non-formal in line with the stipulated quality assurance standards of the Uganda MoE and UNHCR standards and indicators.
- Support quality education programming on peace education, Child Protection (psychosocial support for children and teachers) and gender equity in education, among others.
- Foster and support integration of education and other sectors including Child Protection, Livelihood, Health and Nutrition at the Operation level.
- Support and strengthen collaboration and networking between UNHCR, Partners and the District Education Offices and UNICEF and other UN agencies.
- Support and strengthen joint coordination of education stakeholders with District Education Offices and OPM, on regular and systematic meetings.
- Ensure good education practices for refugees are identified, documented and widely disseminated.
- Provide, coordinate and oversee drafting of reports and in-puts required by UNHCR and donors as per need.
- Provide guidance to UNHCR national staff education focal persons

**Note:** In the absence of the Associate Education Officer (based in Kampala), follow up on refugee education activities across the country and provide technical support and guidance, including report writing etc.

## PROFILE

**Experience**

- University degree in Education or related field and over 8 years of experience in progressively responsible functions in education.
- Demonstrate experience working with Ministries of Education and coordination mechanisms.
- Field experience in education programme implementation and coordination.
- Knowledge of UNHCR's role and responsibilities in refugee response.
- Familiarity with INEE MS and implementation.
- Knowledge of UNHCR refugee protection principles and framework
- Training and coaching skills / facilitation of learning.

**Essential requirements**

- Excellent computer skills and knowledge of MS applications.
- Excellent knowledge of English (written/oral)
- Excellent drafting and writing skills.

**Personal Characteristics**

- Excellent project management, communication, inter-personal, negotiation and organizational skills.

**DESIRABLE QUALIFICATIONS:**

- Experience working in education in refugee or displacement settings.
- Experience with education research, teaching or education administration.
- Experience in the area of child protection.

## C.2 Example of End of Deployment Report

**[redacted] - Final Report**

**TIMING:** The Final Report is to be submitted to your Programme Officer at least 48 hours prior to your post-deployment review.

**PURPOSE:** The Final Report should cover the following:

- the outcomes of your deployment and your specific achievements against the **Deployment Terms of Reference** and the [redacted] **program objectives**, including likely impact on your host organisation and the affected population;
- the professional and personal **challenges** you faced;
- the **administration** of your deployment and **your satisfaction with the support** you received.

**DEPLOYMENT DETAILS**

| | |
|---|---|
| **Name of Deployee:** | [redacted] |
| **Role Title and Host Organisation:** | Education Office UNHCR |
| **Duty Station (City, Country):** | Yumbe, Uganda |
| **Deployment Start Date:** | 6th March 2018 |
| **Deployment Last Desk Day:** | 30th August 2018 |
| **Deployment End Date:** | 5th September 2018 |

**TASKING DETAILS**

| **Specific focus** | **Primary** | **Secondary (if relevant)** |
|---|---|---|
| **Region** | Yumbe, West Nile | |
| **Country** | Uganda | |
| **Sector / task** | Education/Protection | |
| **Cross-cutting issue tasking (if relevant)** | Disabled/Girls Education | |
| [redacted] **EPO (1, 2, 3, 4)** | | |
| **Supporting IO (up to 2 each)** | | |

**SUPERVISOR TO COMPLETE PER**

Your Performance Evaluation Report should be filled out in-country prior to your departure, and discussed in person with your HO Supervisor.

| | |
|---|---|
| **Name of HO Supervisor to complete PER** | [redacted] |
| **HO Supervisor's Contact Phone** | [redacted] |
| **HO Supervisor's Contact Email** | [redacted] |

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## PART A - ADMINISTRATION AND DEPLOYMENT SUPPORT

Please rate your level of satisfaction with the various aspects of your deployment according to the following scale, and provide comments to support your rating.

| 1<br>Very dissatisfied | 2<br>Somewhat dissatisfied | 3<br>Satisfied | 4<br>Very satisfied | 5<br>Completely satisfied |
|---|---|---|---|---|

| ASPECT OF DEPLOYMENT | RATING | COMMENT |
|---|---|---|
| [redacted] **support** during pre-deployment and briefing. | 3 | A bit rushed. |
| [redacted] **support** during your deployment. | 2 | Improved after [redacted] took over. Before that I had difficulty having my email queries returned in a reasonable time period. [redacted] however were good with support with a security situation early on in my deployment. Also terms of my deployment, specifically my R and R entitlements (as per UNHCR conditions) were not relayed to me beforehand and [redacted] seemed not to be aware of these. Also payslips not usually forwarded to me so I have no idea of the accounting of my payments. Monies were just placed in my bank account with no explanation. |
| **Host Organisation support** on arrival and during in-country orientation phase. | 5 | Generally good, I received necessary briefings in Kampala and had time to acclimatise. |
| **Host Organisation support** during your deployment. | 5 | At Yumbe, UNHCR was welcoming, supportive and helpful throughout my deployment. |

## PART B - WORKING CONTEXT

**1.** Please describe your **relationship with your supervisor and other key staff**, and general communications in the office. Was the relationship functional, strong or were there complications in forging a working relationship? Was the office a friendly, welcoming and communicative workplace, or were there internal challenges between staff/programs/operational divisions?
*When describing, please write in active first person voice.*

I believe my working relationship with my supervisor was very strong and over the course of my six month contract we built up a mutually respectful and productive professional relationship. [redacted] is an experienced UNHCR protection officer, who has worked in many UNHCR settings, in difficult postings in Africa. As the senior protection officer at Yumbe her leadership was excellent and I learned a lot from her. She helped me to understand how education was closely linked to the protection response to the refugee crisis in Bidi Bidi settlement.

Along with other international staff [redacted] and I lived in a small accommodation compound. This meant that all of us (about 10 in total) shared the challenges of living in this isolated part of Uganda. This experience forged a strong bond between us all, which spilled over into our work environment. [redacted] also was in an adjacent office and we always collaborated and checked issues and problems as they came up. She was always available to support me, particularly at the beginning of my posting, when I was unfamiliar with many aspects of the setting.

Two other officers worked with me in the education section at Yumbe. They had a brief of working half in protection and half in education, so their duties were spread. We worked extremely well together and forged a team which was highly effective in dealing with the education challenges and difficulties. We quickly built up a team feeling and trusted each other's judgement

The local office environment was generally excellent. As far as I could tell from the standpoint of a non-Ugandan, the office was an extremely harmonious place to work. The Head of Office fostered a

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productive and positive working environment. Personal and professional milestones were celebrated and opportunities for office-organised social events supported and publicised. Most staff were out in the settlement most days and this meant a busy work day atmosphere. From a personal perspective, being older than almost all other staff at the Yumbe office seemed to make it little easier for me, and as well, some deference was paid because of my technical expertise and international status.

I worked hard at professional relationships and I made sure I interacted positively with both national and international staff, all of whom were unfailingly courteous and respectful. I found the workforce at UNHCR Yumbe competent and communicative. I had no trouble engaging staff in aspects of my work when they were needed; replying to emails and following up on shared challenges. This maybe because of the isolated nature of the posting and the feeling that the staff were 'all in this together'.

**2.** Please describe the **major professional or personal constraints or challenges** you faced. What were the principal problems you encountered in your day to day work? How did you attempt to resolve these? Were these methods effective, or partially effective? Why or why not?

**Major professional constraints**

The organisation of the administration of education of the settlement was through designated Implementing Partners. The capacity of the three education partners varied and at times there was a glaring lack of management and experience on the part of some of the partners' workforce, which caused difficulties. In response to this, partners were evaluated and given feedback on their work and responsibilities.

With over 100,000 children and young people enrolled in 73 different education sites the gaps were enormous. There were huge needs in provision of classrooms, latrines, WASH, teachers, textbooks, and desks. My job was to essentially monitor education but the provisioning requirements for effective education services were great and, at times, it seemed little progress was made. I made sure that all my paperwork and follow up was up-to-date so that other stakeholders could take action without any holdup. I made sure up-to-date data was immediately available so donors and other agencies could see gaps and respond.

The UNHCR bureaucracy was often slow moving, unresponsive and difficult to negotiate. Rivalries between offices in the West Nile region were a factor in this, and Kampala office seemed not to be well-organised. Once requests for supplies was approved at the Yumbe level it often took up month to be ratified through the Arua office. I followed up on these challenges by continuing to communicate with the relevant officers. Communication with the Kampala office improved when there was some staffing stability there.

**Major personal constraints**

The main personal constraint was to do with the remoteness of the posting. Yumbe is a 12 hour drive from Kampala. It is a tiny, dusty village with few amenities, a small market and limited facilities. The district is among one of the most undeveloped parts of Uganda with low levels of education achievement, only subsistence farming and little or no industry. The local markets have a very small range of produce and the small supermarkets had limited offerings. Although all staff were friendly and supportive, nevertheless I essentially found it to be a socially isolating experience.

I was the only European in the, up to, 120-strong Yumbe UNHCR workforce and the isolation was at times telling. I often travelled to Arua to overnight on weekends, so as break from the isolation. My other strategy was to use social media as a way of connecting with loved ones.

**3. Was there a significant change to your TOR, either upon arrival or during your deployment?** 'Significant' would mean a change to approximately 25% or more of your deployment objectives. **If yes,** please describe the changes and how you clarified/agreed on an amended TOR with both your HO Supervisor and [redacted].

No, my work closely followed the TOR (below) but the dot points in italics and bold took more of my time.

- ***Provide technical guidance, and monitor strategic planning and implementation of education for the South Sudanese refugees as per UNHCR's country Education Strategy Education Framework for the South Sudanese refugees in line with the Government Education Sector and Strategic Plan (ESSP), the UNHCR Global Education Strategy (under review), the SDG 4 –Education 2030 agenda and the CRRF.***
- ***Support regular monitoring of the education activities as per the Uganda MoE standards and indicators and UNHCR Education standards and indicators.***
- Identify training and capacity building needs, and arrange trainings on education issues as appropriate.
- ***Support quality delivery of all education programmes - formal and non-formal in line with the stipulated quality assurance standards of the Uganda MoE and UNHCR standards and indicators.***
- Support quality education programming on peace education, Child Protection (psychosocial support for children and teachers) and gender equity in education, among others.
- Foster and support integration of education and other sectors including Child Protection, Livelihood, Health and Nutrition at the Operation level.
- ***Support and strengthen collaboration and networking between UNHCR, Partners and the District Education Offices and UNICEF and other UN agencies.***
- ***Support and strengthen joint coordination of education stakeholders with District Education Offices and OPM, on regular and systematic meetings.***
- ***Ensure good education practices for refugees are identified, documented and widely disseminated.***
- ***Provide, coordinate and oversee drafting of reports and in-puts required by UNHCR and donors as per need.***
- ***Provide guidance to UNHCR national staff education focal persons***

## PART C – RESULTS OF DEPLOYMENT

**1.** What were the key activities and outputs of your deployment and to what degree where you able to **achieve** them (expressed as percentages)? Which [redacted] Intermediate Outcomes did they contribute to? How would you prioritise your 2-3 most significant achievements? What **opportunities and constraints** did you encounter and how did you respond to them? Describe any significant changes to your ToR.

My work with UNHCR at Yumbe is linked to the [redacted] Intermediate Outcomes under Crisis Preparedness and Response and the Intermediate Outcome 2.2 Response to Conflict. Being the education officer I was central to helping improve educational outcomes for students studying in the Bidi Bidi settlement schools. I prioritised my work with reference to the my TOR and by reference to the contractual obligations of the Implementing Partners.

My most significant achievements

- *Provided technical guidance, and monitor strategic planning and implementation of education for the South Sudanese refugees as per UNHCR's country Education Strategy Education Framework for the South Sudanese refugees in line with the Government Education Sector and Strategic Plan (ESSP), the UNHCR Global Education Strategy (under review), the SDG 4 –Education 2030 agenda and the CRRF.*
- *Supported regular monitoring of the education activities as per the Uganda MoE standards and indicators and UNHCR Education standards and indicators.*
- *Supported quality delivery of all education programmes - formal and non-formal in line with the stipulated quality assurance standards of the Uganda MoE and UNHCR standards and indicators.*

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Constraints:
As per comments above, but includes:

- Lack of capacity from some of the personnel from other stakeholder organisations
- Lack of resources ie teachers, classrooms, etc
- Distance from Kampala and regional office Arua.

**2.** How has your deployment **strengthened the capacity of your host organisation or host community?** E.g. staff mentoring and training, improved skills and knowledge for host organisation, partner or government staff, system and processes, increased planning, improvements to practices, increased local resilience to crisis, improved coordination capacity.

I know that the education sector in Bidi Bidi has been strengthened because of my efforts. The two other members of the local UNHCR education team have improved their skills in monitoring and data collection and reporting, and their knowledge of education issues. I have improved administrative procedures and communication between local actors in the sector.

**3.** How has your deployment contributed to **strengthening national and local leadership** in humanitarian action? (E.g. by reinforcing national and local decision-making making, increasing diversity of local actors, etc.)

At the local level the pivotal decision-making group is the monthly education sector meeting comprising of all implementing and operating partners, UNICEF, Office of the Prime Minister and the district council offices, as well as representatives of other interested stakeholders such as the Aga Khan Foundation. As the convenor I improved organisation and strategic focus of the group through better communication and liaison with the participants. I worked particularly worked hard at developing strong relations with all stakeholders.

I had little real interaction with UNHCR Education Kampala for most of the time I was in Yumbe. Personnel changed and there was only sporadic communication with the Education Officer based in UNHCR Kampala. However, at times I was able to support the central office with respect to hosting of scoping missions, official visits like the visit of the Minister of Education and other officials, UNHCR communication teams, research projects, and the official launch of the updated Ugandan Government Official Education Response Plan to the Refugee situation. Towards the end of my posting Kampala education personnel stabilised and good communication and information sharing markedly improved.

**4.** How will the host organisation ensure that your contribution is **sustained**? (E.g. institutionalisation of new practices, handover, promotion of existing staff, replacement)

Staff have been upskilled in administration processes and practice, handovers of outstanding issues were effective but there is still a need for a fully funded education officer position.

**5**. What has been the effect of your deployment **on the ground/to persons of concern**? How has this deployment provided relief or assistance to affected populations, if relevant?

It has been hard to quantify, but I believe that the provision of education services has now become normalised in Bidi Bidi. While some schools still struggle with (very) temporary and weather-worn facilities other schools have permanent classrooms and better amenities. The sectors of Early Childhood, Primary, Secondary and Accelerated Education Programmes are staffed, albeit inadequately, and have functioning timetables. Community consultation structures (School Management Groups, Parent Teacher Associations) are on-going and in many places operating well. Huge gaps remain of

course and I cannot say that the positive developments are only the result of my efforts. However, I have worked hard with other stakeholders and the results are because of all-of-team effort.

Towards the end of my contract period all implementing partners were evaluated and I believe my recommendations about partner performance will result in an improvement in the services and support given to the education sector in Bidi Bidi.

**6.** How has your deployment contributed to or **strengthened the following:**

1. Gender equality;
2. Disability inclusion;
3. Harmonisation of humanitarian action;
4. Accountability to the affected population.

1. The deficit in girls' enrolment in education was always a topic of discussion and dialogue with the local protection officers and other stakeholders. I continued to support the initiatives of positive discrimination in employment of women in senior positions in schools and the encouragement of pedagogy which improved outcomes for girls education.
2. There were several programmes in place when I arrived that supported the needs of disabled students. I continued to support and strengthen these programmes.
3. Harmonisation of humanitarian action was improved through better coordination and communication processes. There are many stakeholders in Bidi Bidi education sector. Among the initiatives were:
    a. Compilation and distribution spreadsheet of all individuals working in education including contact details, job title, organisation etc (over 80 contacts in the sector - distributed to all concerned)
    b. Updated email distribution lists
    c. Compilation of spreadsheet of stakeholder projects throughout education sector
    d. Compilation of WASH needs of education sites (started but not completed)
    e. Compilation of schools' renovation needs
    f. Improvement of administration of education sector meetings through improved meeting procedure, minute taking, reporting and follow-up action points
    g. Stronger forging of relations between the education stakeholders (includes education Implementing and operating partners, the local district office, the local district education office, the Office of the Prime Minister, UNICEF)
    h. Mapping of education sites (73 sites - not all mapped but process started)

**7. Recommendations.** What do you see as the needs in your host organisation and sector going forward? Are there capacity gaps that could benefit from [redacted] deployment, and if so in what skillsets? Would you recommend [redacted] send more deployees to this host organisation - why or why not?

The needs for monitoring and reporting are enormous, as is a continuing focused leadership for the education sector. The refugee response in Uganda will continue for the foreseeable future and an [redacted]-funded education officer would continue to be of great benefit.

| **8.** Please **rate the overall success of your deployment** against your agreed Terms of Reference. | | | | | |
|---|---|---|---|---|---|
| Unsatisfactory | | | Satisfactory | | |
| 1 (very poor) | 2 (poor) | 3 (less than adequate) | 4 (adequate) | 5 (good) | 6 (very good) |
| Rating: 5 (good)<br>Justification:<br>I am happy with the outputs I achieved but some projects ( ie shoe distribution project and introduction of the Reading to Learn project) were started but not finished in the 6 month contract. However, I am hopeful that these will be finalised by national staff in the next few months. | | | | | |

| **9. Are you interested to write a brief case study on the impact of your deployment?**<br>[redacted] can provide a template to guide you. An ideal impact case study would be approximately two pages in length and can include key achievements, challenges and lessons learned. If you agree, your Programme Officer will share the template with you during your Post Deployment Review. |
|---|
| Yes |

| **10.** [redacted] welcomes any **other comments** about the deployment. |
|---|
| |

## PART D - [redacted] PROGRAM OBJECTIVES

- This section seeks to collect information regarding **the extent to which your individual deployment has contributed to the overall objectives of the** [redacted] **program.**
- Please detail how your deployment has contributed to **primary and secondary End of Program Outcomes**. The bullet points, reflecting Intermediate Outcomes, should act as a guide for each.
- We acknowledge that there will be overlap across some areas. If not applicable, simply mark N/A.

| **EPO1. STABILITY, RESILIENCE AND RISK REDUCTION**<br>To what extent has your deployment contributed to improving your host organisation or host nation's ability to:<br>▪ adopt, lead and implement more effective approaches to resilience and DRR, in line with relevant frameworks (IO 1.1)<br>▪ address fragility, support stability, build societal resilience (IO 1.2)<br>▪ identify, analyse and plan in relation to conflict and fragility risk (IO 1.3) |
|---|
| ▪ adopt, lead and implement more effective approaches to resilience and DRR, in line with relevant frameworks (IO 1.1) – ***I worked with Implementing partners to encourage schools and school communities to take action to improve schools using local resources.***<br>▪ address fragility, support stability, build societal resilience (IO 1.2) – ***I encouraged the capacity building and involvement of School Management Groups and Parent Teacher Associations in appropriate decision-making.***<br>▪ identify, analyse and plan in relation to conflict and fragility risk (IO 1.3) N/A |

**EPO2. CRISIS PREPAREDNESS AND RESPONSE**

To what extent has your deployment contributed to improving your host organisation or host nation's ability to:

- respond to natural disasters (IO 2.1)
- respond to conflict and insecurity (IO 2.2)
- prepare to respond to a humanitarian crisis (IO 2.3)

- respond to natural disasters (IO 2.1) N/A
- respond to conflict and insecurity (IO 2.2) N/A
- prepare to respond to a humanitarian crisis (IO 2.3) N/A

**EPO3. STABILISATION, RECOVERY AND RECONSTRUCTION**

To what extent has your deployment contributed to improving your host organisation or host nation's ability to:

- accelerate the transition from humanitarian response to recovery, reconstruction and longer-term stability (IO 3.1)
- stabilise, recover and reconstruct following a natural disaster (IO 3.2).
- stabilise, recover and reconstruct following conflict (IO 3.3)

- accelerate the transition from humanitarian response to recovery, reconstruction and longer-term stability (IO 3.1) ***The UNHCR work at Bidi Bidi is definitely at a development stage, not an emergency stage. Administrative systems were strengthened, infrastructure gaps identified and capacity building for among stakeholders, teachers and school communities supported.***
- stabilise, recover and reconstruct following a natural disaster (IO 3.2). N/A
- stabilise, recover and reconstruct following conflict (IO 3.3) ***My deployment helped the building of more classrooms, latrines and playgrounds. Teacher recruitment and development was on-going, as was the improvement of curriculum offerings in schools.***

**EPO4. QUALITY OF HUMANITARIAN ACTION**

To what extent has your deployment contributed to improving:

- [redacted] engagement with regional and global humanitarian actors (IO 4.1) N/A
- the harmonisation of [redacted] humanitarian efforts and adherence to agreed humanitarian standards, including mainstreaming the protection of vulnerable groups (IO 4.2) ***This was my number one priority while working with UNHCR at Yumbe. Communication, administrative processes and data were improved and shared. Meetings and briefings, and regular and frequent monitoring visits were made to the field. A collective decision-making process was developed with all education stakeholders. Local and national government were involved and supportive.***
- the visibility and recognition of [redacted] humanitarian contribution (IO 4.3***) I often wore the [redacted] shirt and I made it well-known that my position was funded by [redacted]***

**Thank you for taking the time to complete this Final Report.**
**Please return this report to your [redacted] Programme Officer prior to your post-deployment review.**

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## Appendix D, Conference Paper: Hierarchical importance in ‘Build Back Better’: an analysis of four key frameworks.

The following conference paper was produced and presented for the 2023 i-rec conference in Sendai, Japan. It discusses the pilot study that concluded the need to use indicators in the HIDECs analysis over components (themes of indicators).

**i-Rec** Conference 2023: **Tensions Between Tradition and Innovation in Disaster Risk Reduction, Climate Action, and Reconstruction**

# Hierarchical importance in 'Build Back Better': an analysis of four key frameworks.

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## Abstract

The 'Sendai Framework' in 2015 promoted 'Build Back Better' in post-disaster recovery, rehabilitation, and reconstruction. The latest in a series of internationally recognised frameworks established to guide the actions and activities of those working in disasters risk reduction. These frameworks have compiled a suite of success indicators which are categorised and subcategorised then themed under respective principles in an effort of increased clarity. However, 'Build Back Better' frameworks rely on a holistic approach and consider all categories as interconnected and reliant on one another for success. To accomplish this requires understanding the relationship between indictors across these organisational divisions. As indictors can number in the hundreds, there are thousands of possible relationships and connections between them for practitioners in the field to consider. This is a fundamental weakness in the frameworks. The 2020 'Humanitarian Development Report' noted that engagement with the wrong indicator will lead to the wrong diagnosis of a situation and therefore the wrong action undertaken. This concern was echoed in the 2022 Global Assessment Report that suggest one of the major roadblocks to success of the Sendai Frameworks goals is suboptimal decision making after a disaster. In 2022 a research paper conducted a hierarchical decomposition analysis (HIDECs) on the success indictors of the 2018 'Build Back Better' framework. It showed that such an approach can unveil the nuanced interactions, dependencies and relationship between each indicator and produces a priority diagram to improve clarity in indicator selection while preserving the holistic foundation of the approach. This paper examines the results of a similar analysis on four globally used 'Build Back Better' frameworks. The finding present priority diagrams which reason that components may hold as much relevance as success indicators and concludes by highlighting the potential of implementing HIDECs.

**Keywords:** Build Back Better, Frameworks, Hierarchical Decomposition, Post-Disaster Reconstruction

## Introduction

The word disaster comes from the early Italian word disastro, 'dis' and 'astro' being a conjunction and evolution of the Latin 'astrum sinistrum'. In English this translates to 'ill-starred' or 'unlucky star' (Harper, 2021). The celestial etymological roots imply a strong correlation to fate, or inevitability and depict the earliest perceptions of a disaster and its impacts; certain to occur, destined to repeat and entirely unavoidable. This literal interpretation however does not recognise the fundamental role human decisions have in contributing to a community's exposure and vulnerability, the factors of the societal hamartia, or fatal flaw, that allow disasters to occur (Guha-Sapir, et al., 2004). Cassius, in Shakespeare's tragedy 'Julius Caesar', said *'The fault, dear Brutus, is not in our stars, but in ourselves …'* Invoking a sense that the burden of blame lies not with fate but in our own choices (Shakespeare, 2001). Despite this line being written in 1599 it wouldn't be until 1989 that the United Nations (UN) would bluntly state in resolution 44/236 that *"fatalism about natural disasters is no longer justified"* declaring the 1990's the 'International Decade for Natural Disaster Reduction' (United Nations, 1989). At the decades mid-term review, the UN Secretary General, in co-operation with appropriate organizations of the UN system, relevant scientific, technical, academic, and other non-governmental organizations (NGOs) were tasked to develop an appropriate framework from which that objective might may be achieved (United Nations, 1987).

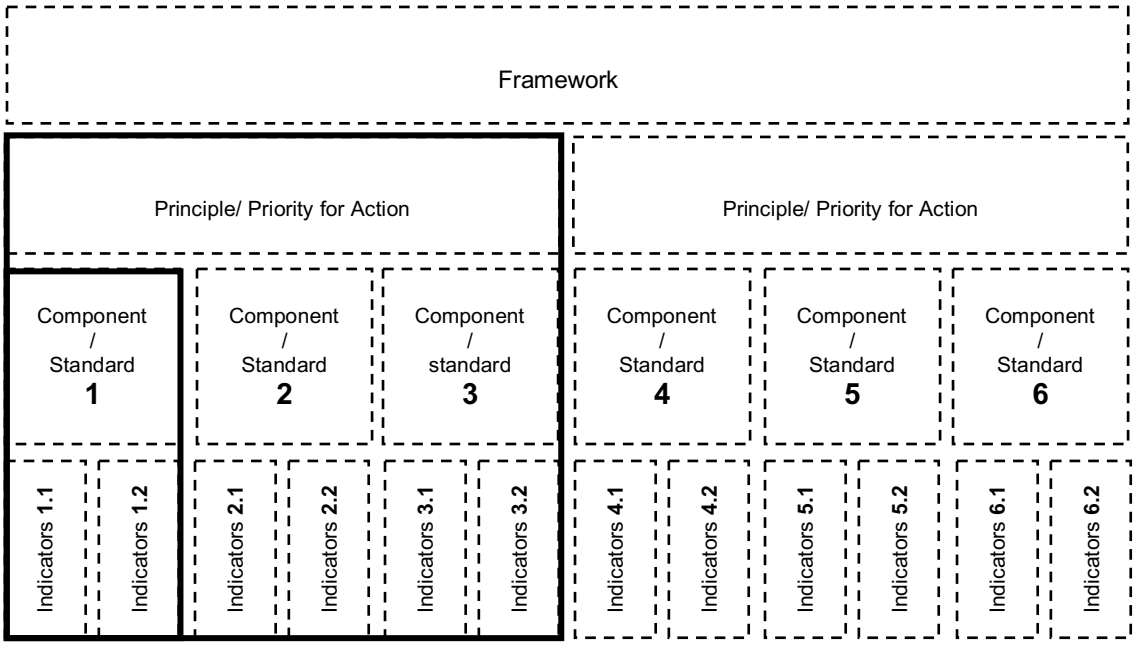


**Fig. 1.** Typical structure of a framework, by author.

Frameworks follow a set organizational structure (see fig 1). First the 'Principles' or 'Priority for Action' are the listed. These are the overarching objectives that a framework is aiming to address. Below these are the 'components' or 'standards' which break down the principles into a series of themes that when addressed contribute to achieving the principle. For example, in the 'build back better framework' (Mannakkara & Wilkinson, 2014) the principle of 'Disaster Risk Reduction' (DRR) has three components 'Resilient physical assets', 'multi-hazard-based land-use' and 'DRR Education & Awareness' (see fig. 2). All three support the principle they are under. To a successful implement these components there is an accompanying suite of indicators. Indictors fill two primary roles, the first is to simplify a complex situation, providing a synthesised view of past situations

which can guide decision making. Secondly, indicators are used to measure the progress and success of an intervention. As such, knowing the right indicators is imperative for individuals and agencies working in the uncharted, rapidly changing environments of disasters (Dwyer & Horney, 2014). Larger frameworks may have addition tiers to provide further organisational structure where necessary.

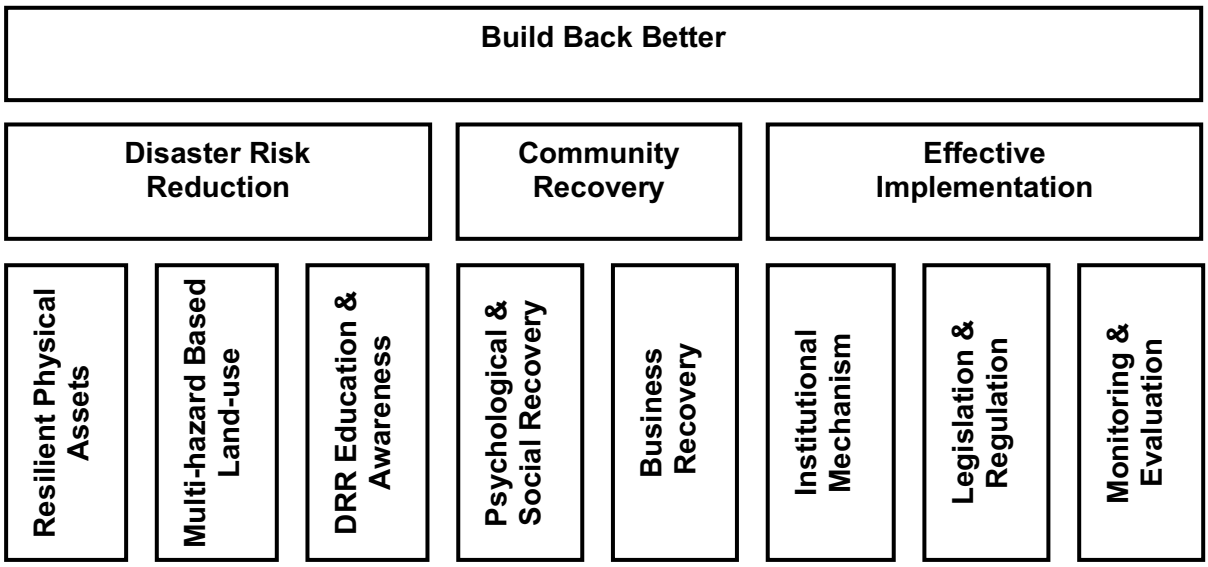


**Fig. 2.** The Modified Build Back Better Framework (Mannakkara & Wilkinson, 2014) edited for formatting by author.

The Hyogo Framework for Action (HFA) was the resulting framework proposed by the UN. It was formally adopted by all UN member states at the Second World Conference on Disaster Risk Reduction in 2005. The HFA is considered as the world's first unified plan to explain, describe, and detail the work required from all different sectors and actors to reduce disaster losses (UNDRR, 2007). Later the same year the first ever 'Humanitarian Overview Report' found that responses to disaster situations lacked clearly defined approaches and there was an urgent need to develop and implement benchmarks and indicators to measure and guide performance (Adinolfi, et al., 2005). In 2007 the UN released its first in a series of guidelines, 'Indicators of Progress; Guidance on Measuring the Reduction of Disaster Risk and the Implementation of the Hyogo Framework for Action'. Aimed to provide comprehensive action-oriented guidance to implementing risk reduction strategies when designing emergency preparedness, response, and recovery programmes. This document identified 22 core indicators across the HFA's five priorities for action in addition to 109 possible additional indicators across 33 components (UNISDR, 2008).

In 2007 'characteristics of a disaster resilient community, a guidance note' was commission by six NGOs. Developed through a desk study with supporting input from leading experts, its aim was to provide further additional support for the successful implementation of the HFA at a local level. The guidance notes reflected upon what a utopian disaster resilient community looked like and thereby identifies the necessary components required for it to be achieved. Each component has a set of its own unique characteristics that reflect a resilient community in addition to an accompanying set of

characteristics of an enabling environment which allow that community to reach and maintain such attributes. While characteristics are not explicitly named as indicators they are noted to function as outcome or process indicators do (Twigg, 2007). The second edition, published in 2009, included several amendments based on feedback from practitioners and case study reflections and proposed 28 components containing a total of 167 unique characteristics (Twigg, 2009).

Significantly, the 'Guidance Notes' stress the importance of the interconnectedness of the characteristic, recognising that while compartmentalising into components and themes is needed from an organisational perspective, it imposes an additional barrier that negates important connections and overlaps that exists between them, impeding on the holistic nature of resilience. Holism was an emerging paradigm shift in disaster management that began in the early 2000s (Geis, 2000) (Monday, 2002). Gaining momentum under the alluring alliterative phrase 'Build Back Better' (BBB) which succinctly defined the utilisation of the reconstruction process to improve a community's physical, social, environmental, and economic conditions to create a more resilient community, requiring the consideration of betterment across all components for a sustainable recovery (Mannakkara & Wilkinson, 2014) (Khasalama, 2009) (Clinton, 2006). The Guidance Notes unofficially embrace the BBB approach in implementing the HFA stating; *"Characteristics … could appear under more than one Thematic Area or Component of Resilience. There is a danger – as there is with any framework – that one will over-separate the different elements and overlook the linkages between them. These connections across the different themes and components must be kept in mind."* (Twigg, 2007).

Highlighting a fundamental weakness of frameworks, the selection process of appropriate indicators depends on the individual knowing the connectiveness, dependencies or priorities between the indicators or components, and then apply that knowledge to the situation in which they find themselves. Being sensitive to the holistic principles while remaining relevant to their work by refining and narrowing the volume of available indicators to a manageable level (Twigg, 2009). This was ultimately one of fundamental weakness reflected upon at the end of the HFAs implementation (UNDRR, 2015).

The Sendai framework superseded the HFA in 2015 at the Third UN World Conference on Disaster Risk Reduction. The 15-year initiative made several significant changes from its predecessor. Firstly, recovery came to be officially viewed as holistic, as part of a continuum and inseparable from preparedness, response, mitigation, and sustainable development. Evident in BBB being included as one of the 13 guiding principles of the framework in addition to being a core factor of the fourth priority for action *"Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation, and reconstruction"* (UNDRR, 2015). Secondly, seeking to reduce challenges for decision makers in using the available information the 'Words into Action' (WiA) series was established. The WiA guidelines provide practical, specific advice on implementing a people-centred approach to disaster risk reduction in line with the Sendai Framework. There are currently fourteen guides in the series, published between 2017 and 2022. Each relevant to one or more targets and priorities within the framework (UNDRR, n.d.). Of the fourteen, ten address the fourth priority of action, with three of those being exclusively dedicated to that priority alone. They are as follows;

- Build Back Better in recovery, rehabilitation, and reconstruction (UNISDR, 2017)
- Enhancing Disaster Preparedness for effective response (UNDRR, 2020)
- Implementation guide for land use and urban planning (UNDRR, 2020/1)

While the guides are intended to allow freedom in reading various sections according to the interests and needs of the users, they do impose an additional organisational component which hinders the holistic principles previously discussed. The guides are not intended to be exhaustive and frequently reference additional material. Some present clear process indicators while others do not, adding an additional level of complexity in understanding explicitly what Sendia's indictors are. Furthermore where clear indicators are listed they have been separated by institution; Regional and National government, Local government and non-governmental organisations (NGOs) For the purposes of this analysis, A selection of 35 components from the above guides have been selected, representing a wide selection of process indictors targeted specifically to NGOs operating in this space. This is only a fraction of the overwhelming information on implementing the Sendai framework.

Humanitarians working in disaster situations will also be aware of the Sphere project. Sphere was created in 1997 with an aim to improve the effectiveness of assistance and accountability of all agencies responding in a disaster situation. Revised editions have been released in 2000, 2004, 2011 and 2018 respectively (Sphere, 2018). Each revision was updated based on consultation with experts, NGOs, governments, and United Nations agencies. The latest edition of Sphere's 'Humanitarian Charter and Minimum Standards in Disaster Response' presents four technical chapters, each disseminated into components which are further divided into standards. Each standard has key indicators which are quantitative minimum target indictors, key actions which suggest practical steps to attain the minimum standard and are comparable to outcome or process indicators, and guidance notes which contain cross-references to other standard within the handbook. These are particularly important as Sphere promotes the premise that an effective humanitarian response must address people's needs holistically, and sectors should coordinate and collaborate with each other to do so. The cross-references help make these links however, it is still expected readers familiarise themselves with all chapters to support a more comprehensive holistic methodology. There are 53 standards, and 249 key actions total within latest edition of the framework (Sphere Association, 2018).

The HFA, and Sendai frameworks represent past and present global approaches to disaster, and disaster risk, reduction. Agreed to by all UN member states, UN organisations and partner societies. The former framework indirectly, and the latter framework directly, embracing a holistic approach in their implementation to achieve their objectives. Twigg's 'Characteristics of a Disaster Resilient Community' and the 'Sphere project' represent past and present large-scale humanitarian developed frameworks aimed at accomplishing similar objectives in disaster situations. They also both embody BBB approaches. All four of these frameworks recognise the importance of selecting the correct success indicators and acknowledge the significant challenge of this task. Therefore, they are useful in contributing to the development of a method or tool to improve upon indicator selection for practitioners engaging in such frameworks.

In 2020, following the publication of the 'Humanitarian Development Report' it was noted that engagement with the wrong indicator will lead to the wrong diagnosis of a situation and therefore the wrong action undertaken (UNDP, 2020). This concern has recently been echoed in the 2022 Global Assessment Report that suggest one of the major roadblocks to success of the Sendai Frameworks goals is suboptimal decision making after a disaster (UNDRR, 2022). In 2022 a research paper conducted a hierarchical decomposition analysis on the success indicators of the 2018 'Build Back Better' framework. It showed that such an approach can unveil the nuanced interactions, dependencies and relationship between each indicator and produces a diagrammatic rationale to improve clarity in indicator selection while preserving the holistic foundation of the approach (Hubbard & Potangaroa, 2022). This analysis is used here, using the HFA's 33 components, Twigg's 28 components, Sendia's incomplete 35 components (from three guidelines) and Spheres 53 standards respectively.

**Research methods**

Hierarchical decomposition system, or HIDECs, is a method first developed by architectural philosopher Christopher Alexander in 1962. At the time, Alexander was tasked with redesigning a small village in rural India and recognised that success in this endeavour relied on understanding the relationship and requirements of the various components that made up the village. Inspired by the Athens Charter of CIAM, first published in 1929, which stated that the four functions of a city where work, dwelling, recreation and transportation and therefore physical articulation should follow this division of functions. Alexander expanded upon the theory stating that a city is a live assembly or aggregate of components and the nuanced relationships between them. Highlighting examples such as the separation of dwelling and recreation which is not always so clear. In many instances people choose to use private spaces to relax and other instances where people choose to recreate in public, commercial and tourist spaces which, in turn have additional requirements as places of work for others. Illustrating that it is essential to know the requirements of the various components then recognise the relationship between them to best guide the approach to design and implementation. The physical aspects of these spaces; housing, buildings, green space, roads and so on, being the 'components', how people used them or what they expected from the various physical components being the 'requirements'.

In the original exercise, Alexander compiled a list of requirements based on what the villagers explicitly felt was a need, the criteria called for by national and regional standards, drivers of economy and social purpose, and all other relationships that were already satisfied implicitly in the present village (which indicated they were required in the new village but not felt as needs by anybody) identifying 141 requirements in all. Alexander then drew connections between these requirements indicating relationships. This is the key part of the process and requires instinctual action. Making connection based whether there is a perception or sense that requirements are in some way connected. The first impression and immediate response is what should be recorded. Requirements are connected if whatever is done to satisfy one makes it harder or easier to meet the other. There are no limitations on how many relationships a requirement has and the relationship goes both ways. Once this is completed, an algorithm is used to measure and graph the connections between the relationships, breaking them into subsets, and these themselves into further subset forming a family tree like structure. Each subset contains a set of requirements very densely connected yet as far a

possible independent of the requirements in other subsets. The algorithm developed by Alexander is illustrated below;

$$STR = \frac{RR - \left(\frac{total}{NSQ1}\right) MN}{\sqrt{\mathrm{MN(NSQ1 - MN)}}} \qquad INFO = (STR)(|STR|)$$

Where 'RR' is equal to the number of links that would be cut if graph was split, 'Total' is equal to the total number of links in the graph, 'NSQ1' equals the maximum possible number of links for the graph, namely n(n-1)/2 where n+ the number of requirements. 'M' equals the number of requirements in one of the split sets. 'N' is equal to the number of requirements in the other split sets, 'MN' (M x N) is equal as prior listed. Finally, INFO is the algorithm measuring the strength of a proposed split within the requirements. This is calculated for each possible split of the graph with the weakest (lowest value) being taken as the split resulting in two subsequent datasets. The decomposition process is repeated until there are no more differences of strength or there is just one variable/ characteristic as the most connected node.

The analysis articulates a hierarchy without disruption to the requirements or changing aspects that do not need to be changed. Producing a logical rational on which action and decision could be based. When first conceived 1963 this analysis was beyond the processing power of the time, but today's technology is able to process hundreds of requirements and thousands of relationships in an instant. The process remains true to Alexanders original process and has proven usefulness with complicated relationships, making sense of wicked problems by producing useable material out of seemingly chaotic information. The method of analysis of the BBB frameworks selected for this study consists of the following steps:

1. The key variables identified and coded.
2. Once this is felt to be complete, the coded variables are duplicated to form a matrix.
3. Connections between the variables are identified and marked.
4. Once completed, the HIDECs software is used to apply the algorithm, measuring, and graphing the connections between the variables into a family tree like structure.
5. The structure is interpreted and rationalised into a diagram showing hierarchical. The most connected factor at the top, and their relationship to the others below.

The interpretation of the HIDECs structures begins at the lowest 'generational tier' where every subset is labelled for clarity. Variables within these subsets are then evaluated to distinguish a central theme. Subsets of similar themes may be grouped into a cluster. The process is repeated until each generational tier has been evaluated and a theme distinguished. This analysis breaks down any preconceived organisation imposed upon variables. There are two main limitations with this analysis, the first being that the interruption of connections between the variables is dependent on the researcher. The second is that this analysis method can become overly ridged with subsets only being divisible by two. The first limitation is one shared with many qualitative methodologies and is alleviated when prescribing to the research philosophy of interpretivism. Interpretivism which places a strong emphasis on personal meanings and interpretations that people give to their experiences, actions, behaviours, and nuanced

relationships. This approach is particularly appropriate for investigating human decisions in post-disaster recovery and reconstruction as it recognises the complex and multifaceted nature of people's experiences and actions. Interpretivism also emphasises the researcher's role in interpreting and comprehending these subjective relationships, highlighting the importance of reflexivity and critical self-awareness in the research process. Regarding the second limitation, if the algorithm should determine that a subset ought to have more than two divisions it will repeat the subset with the same variables in full a hierarchical level lower as demonstrated in It is then up to the researcher to interpret the resulting diagram and correct the generational tiers to reflect subsets accurately.

Components of a framework are used in place of ‘requirements’ or ‘variables’ as described above. A hierarchical decomposition analysis could be applied to each indicator within the frameworks which was done in a 2022 research paper. It applied a similar analysis to the 87 indicators (accounting for a full possible 7,569 relationships) of the ‘Build Back Better’ framework seen in fig. 2 (Hubbard & Potangaroa, 2022). However, this paper looks at multiple larger frameworks. Therefore, by looking organisational tier above indicators the matrix used for analysis is significantly smaller. For example, the ‘Sphere Project’ goes from analysing 249 indicators (a possibility of 62,0001 possible relationships) to analysing 53 components (a possibility of 2,809 possible relationships). This significantly reduces the labour required of the analysis. Furthermore, it may show analysing the components is sufficient to create an appropriate priority diagram going forward.

**Research results**

*Hyogo Framework for Action*

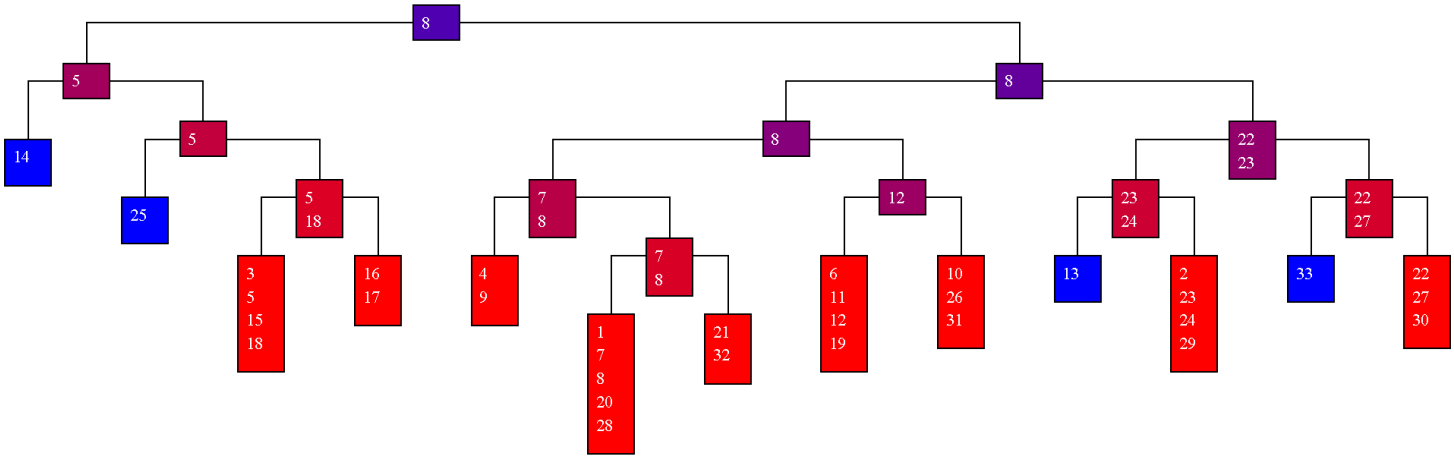


**Fig. 3.** Hyogo Framework for Action HIDECs Diagram

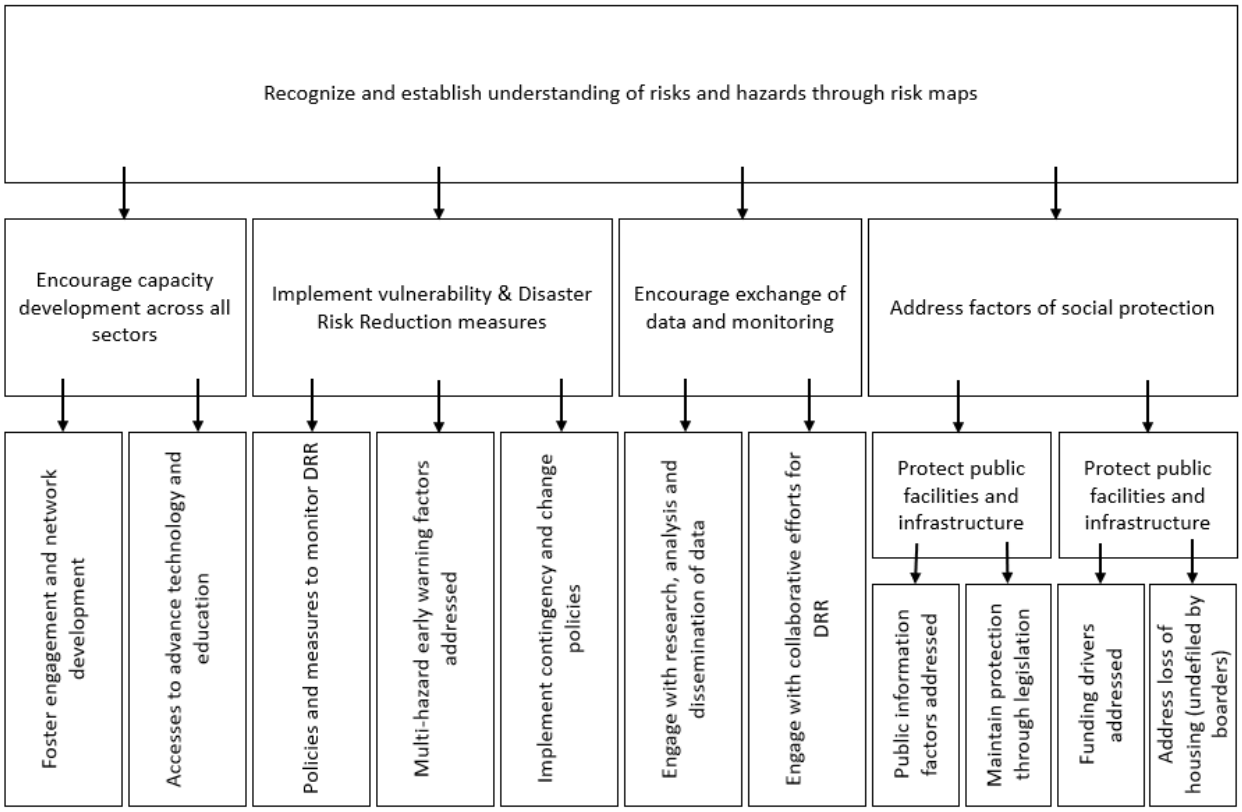


**Fig.4** Priority diagram of the Hyogo Framework for Action based on HIDECs Analysis

*Characteristics of a disaster resilient community*

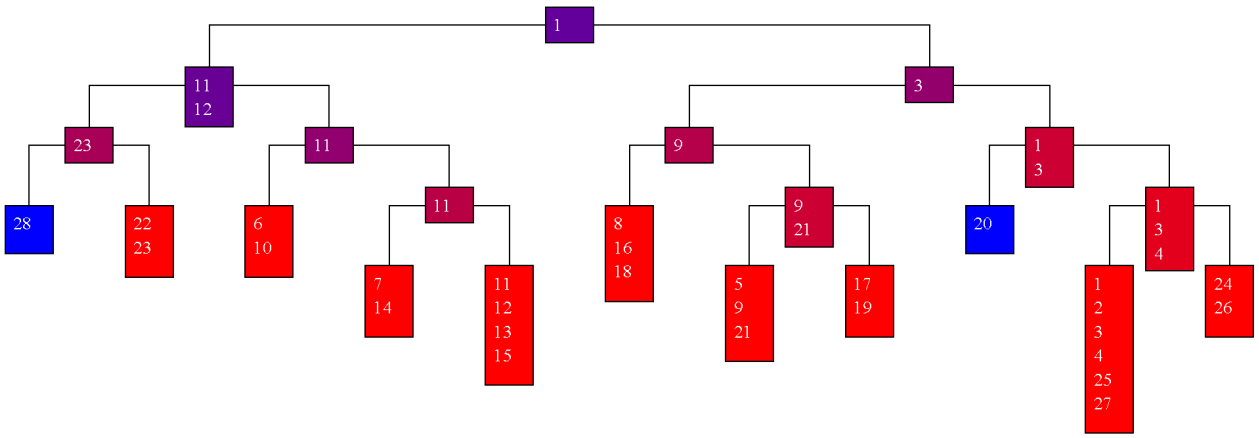


**Fig. 5.** Characteristics of a disaster resilient community HIDECs Diagram

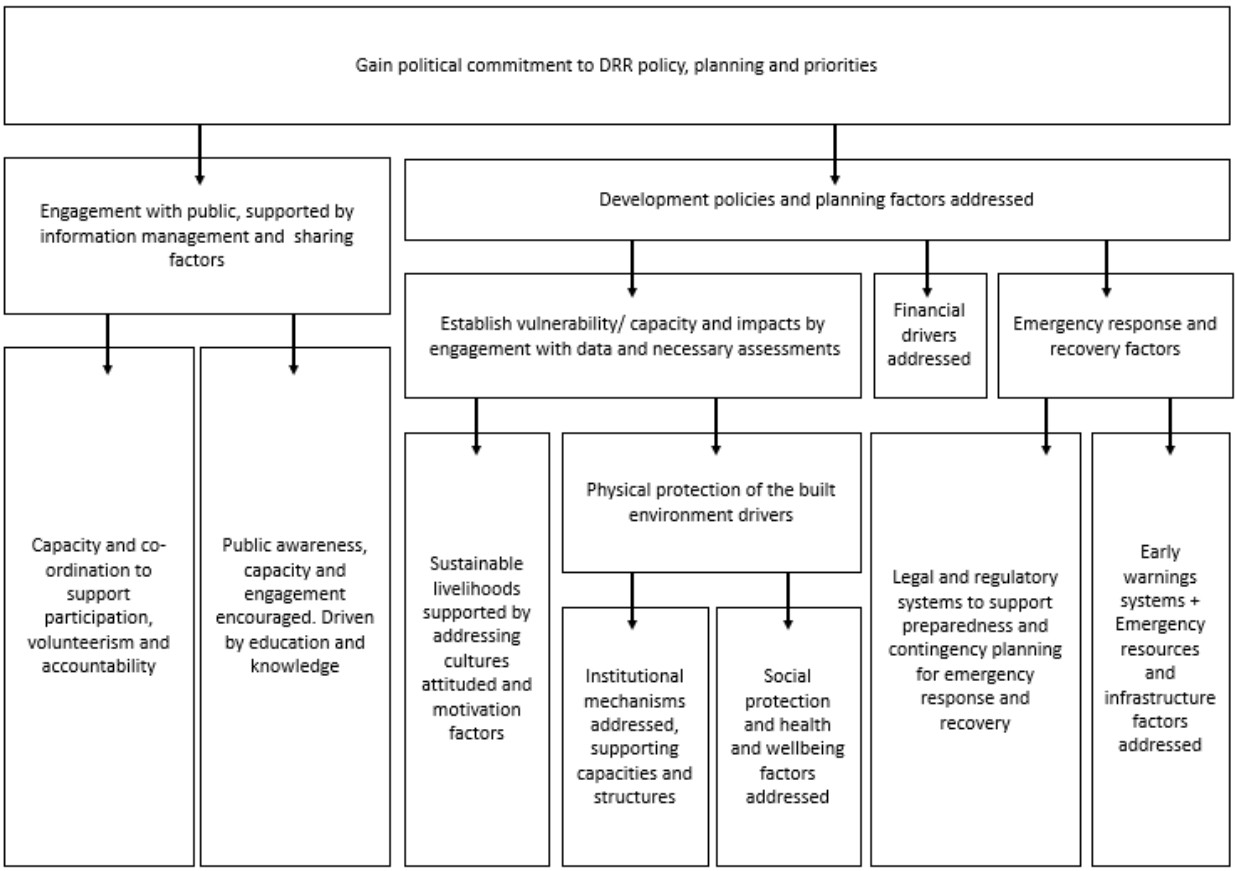


**Fig. 6.** Priority diagram of the 'characteristics of a disaster resilient community' based on HIDECs Analysis

*Sendai Framework*

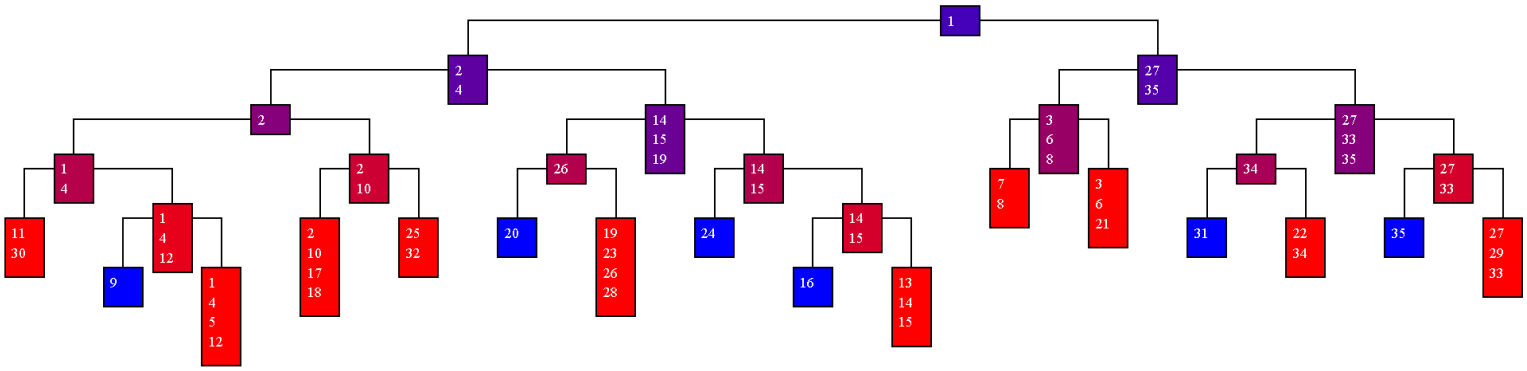


**Fig. 7.** The Sendai Frameworks HIDECs Diagram

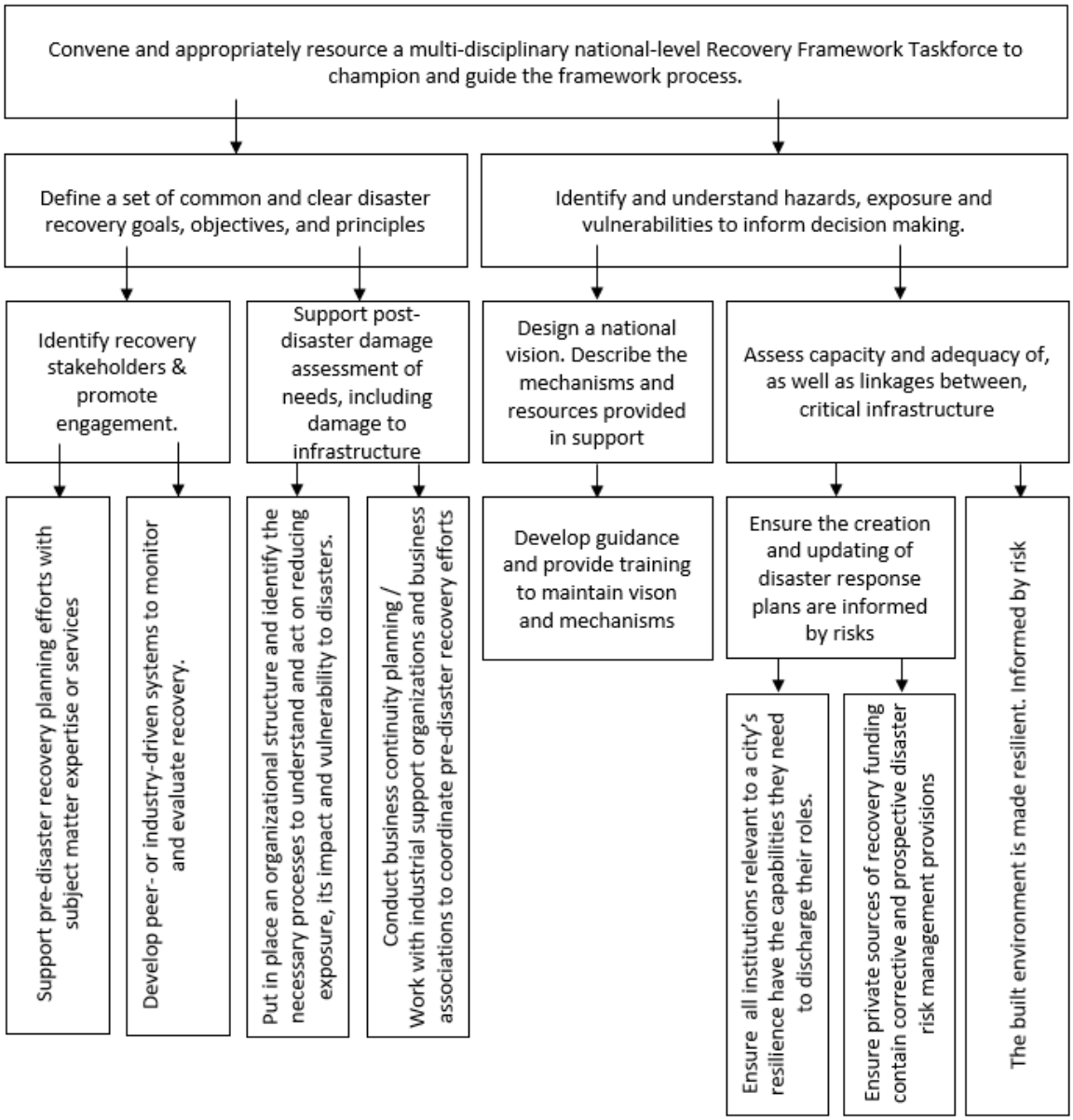


**Fig. 8.** Priority diagram of the Sendai Framework based on HIDECs Analysis

*The Sphere Project Fourth Edition*

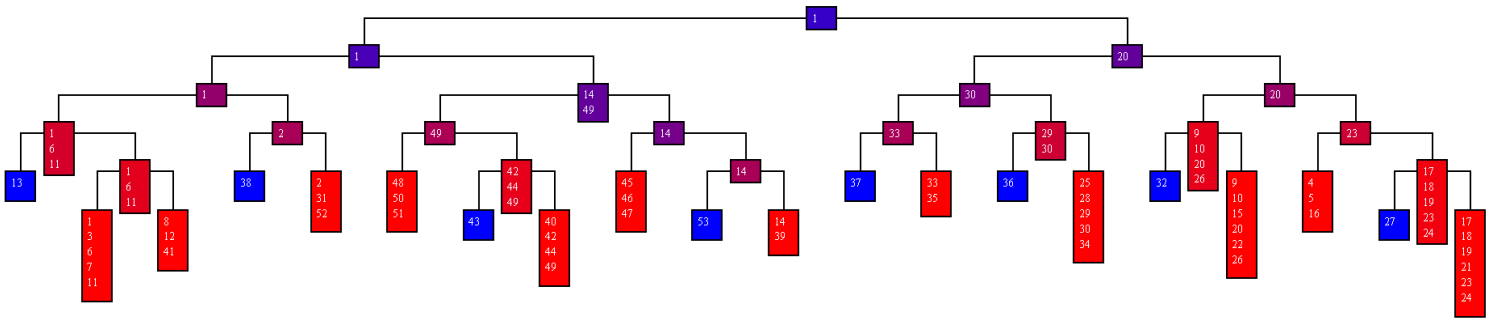

**Fig. 9.** The Sphere Project HIDECs Diagram

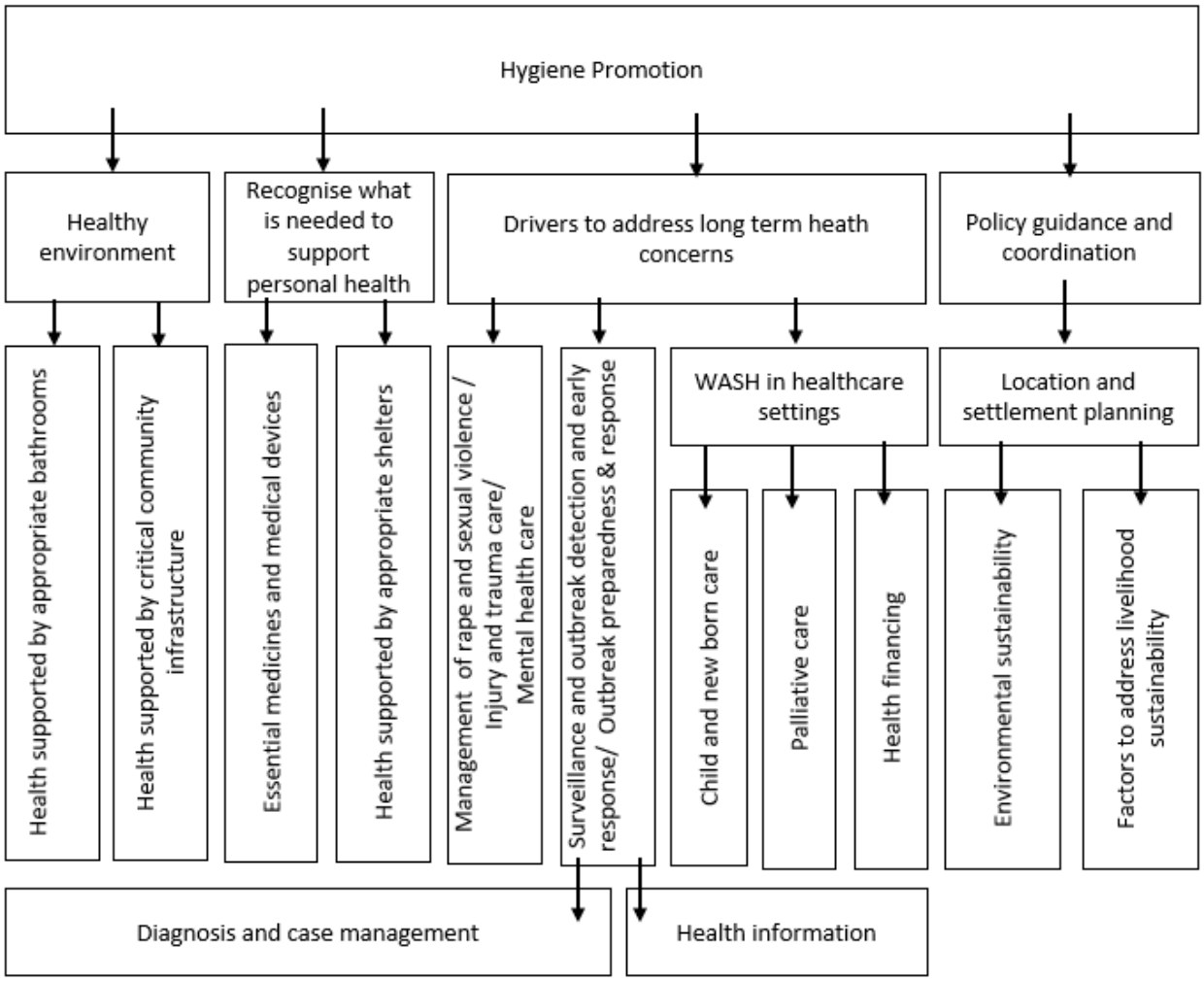


**Fig. 10.** Priority diagram of the Sphere Project based on HIDECs Analysis

## Discussion and conclusions

Using the components, which sit one organisational tier above indicators does show benefits from a hierarchical decomposition analysis to improve the understanding of the relationships that exists between indicators. However, the resulting priority diagrams are significantly less detail and thus, less nuances are revealed than if the indicators themselves were analysed. Many of the priority diagrams are quite linear and have nearly as many attributes as the number of components considered. This indicates that in some instances the components are too broad to establish a truly useful hierarchy. Likely this is because components are thematic organisers in their own right. Nevertheless, there is still sufficient evidence of cross-cutting themes being acknowledges which encourages the holistic approach and engagement across the entire breadth of a framework.

Comparative to one another, there is a significant difference in the priorities being set despite the frameworks having a shared objective. While this could reflect recent framework having more developed components and indicators to work from affecting the outcome, it could also suggest that a ‘unified consensus’ is just not achievable. Thus, working towards developing one priority diagram to suit implementing ‘build back better’ as a concept is fruitless. For example, each of the above diagrams have a significantly

different top priority, the wording is very specific to the framework being analysed and there are vey few consistently in the number and levels of priorities being put forward. It appears that it would be more beneficial for each framework, as it is produced, to have such an analysis conducted. Highlighting where the priorities, dependencies, and relationships between components (or indicators) exist. Furthermore, if within each of the priority boxes of the diagram produced there is specific reference to the indicators that ought to be considered, this could prove to be invaluable in the indicator selection process. Taking a significant amount of assumption and guess work away. The analysis of the Sendai framework in particular reveal that multiple guidelines and resources can be combined to guide users through the large amount of information available to them. The next steps in developing this tool would be to identify how are the indicators being valued by practitioners engaging with 'Build Back Better' frameworks, recognising what are the drivers to prioritise one indicator (or component) over another in practical application. This could be explored through case study research. This could help refine the wording used in the priority diagrams to increase its suitability.

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**Author's Biography**

Francis Hubbard is a final year PhD student at Massey University in Auckland, New Zealand. His study looks at 'Build Back Better' Frameworks in post disaster reconstruction and recovery with a focus on the hierarchical importance of success indicators for improve implementation and application. Francis accomplished his master's degree in architecture with Merit from Victoria University of Wellington (VUW) where he researched alternative earthquake construction techniques based on vernacular designs in Sumatra, Indonesia. It was during field research in Aceh for this study that he first became involved in post-disaster reconstruction and recovery research. Assisting in the assessment of donated housing after the 2004 Indian Ocean earthquake and tsunami and the changes made by occupants over the ten-year period. In 2019 Francis undertook further work in this field, working with the New Zealand Ministry of Foreign Affairs and Trade, New Zealand Red Cross (NZRC) and the Myanmar Red Crescent Society in developing a client briefing document for the design and development of Red Cross warehouse and training facilities using the emerging HIDEC methodology to develop design principles across language and cultural barriers. Upon his return to New Zealand Francis completed his training to become an International Delegate for the NZRC to be deployed in the event of disasters which require shelter specialist assistance. In 2020 Francis left a full-time role at a top tier architecture firm to pursue his PhD researching the 'Build Back Better' approach in post disaster reconstruction. Recipient of several scholarships and accolades including an award for service to the Malaysian High Commission, and a doctoral grant from the Māori Vice Chancellor of VUW. Francis has recently published several papers in his field and has several more set for publication later this year.

Professor Regan Potangaroa's background is as a structural engineer with 25 years' experience in design and construction in NZ, Australia, Singapore, Malaysia, Brunei and the USA. He is well known internationally in the humanitarian aid community having completed over 200 humanitarian deployments in 22 countries since 1996: most recently with UNHCR as part of their shelter team in Bangladesh with the Rohingya Emergency Response; and currently with the IFRC working on capacity training for the incorporation of Housing Land and Property (HLP) issues into existing shelter and settlement programs for the Asia-Pacific region This humanitarian focus is the core of

## Appendix E, Conference paper: Tensions Between Tradition and Innovation in Disaster Risk Reduction, Climate Action, and Reconstruction

The following conference paper was produced for the 2023 i-rec conference in Sendai, Japan. It discusses HIDECs as an emerging methodology and is included here for further explanation of its process, limitations, and impact as an emerging methodology.

**i-Rec** Conference 2023: **Tensions Between Tradition and Innovation in Disaster Risk Reduction, Climate Action, and Reconstruction**

# An Evolving Methodology: The HIDECS Process

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## Abstract

The Hierarchical Decomposition HIDECS process was formulated by Christopher Alexander in 1962 and is a way of breaking down inter-connected variables/characteristics into a family tree structure. As such it is a unique method for breaking down “wicked problems’’ holistically which is the norm for the response, recovery and reconstruction phases following a disaster. We have computerised the process and have been using it to analyse and break down the structure within the work we are doing. This paper reports on a selected case study to highlight its usefulness with complicated relationships using this set theory approach. But at the same time how it manages to ‘’make sense’’ of such situations. And it is this sense making (through interrogation by the researcher) that produces useable material out of seemingly chaotic situations. In 1962 computers struggled with this decomposition approach however, with the computer power currently available this analysis takes seconds to produce outputs of a “family tree” structure. The case study was for logistics and warehouse designs in 5 locations for the Myanmar Red Cross Society MRCS, assisted by the NZ Red Cross NZRC and funded by the Ministry for Foreign Affairs and Trade MFAT. Three had existing warehouses, one a small warehouse and the 5th was bare land. Previous warehouse aid to Indonesia and the Philippines through MFAT (previously NZAid) resulted in the new warehouses being ‘repurposed’ after they were built and handed over to the respective country Red Cross Society. MFAT wanted to address this by ensuring that the design and construction of the 5 warehouses in Myanmar were designed appropriately. And a core part of this was done using HIDECS. The analysis of that HIDEC map, plus space design and warehouse workflow for the site resulted in the design of the 5 different warehouses at Yangon, Sittwe, Myitkyina, Mandalay, and Lashio. Each was a unique problem to be resolved.

Keywords: design, warehousing, engagement, logistics, HIDECS

## Introduction

The New Zealand Ministry of Foreign Affairs and Trade (MFAT) Pacific and Development Group approved a multi-country concept note for the Association of Southeast Asian Nations (ASEAN) Regional Warehousing Initiative (MFAT n.d.).The program was for the design, documentation and development of Red Cross warehousing operated by the Indonesian and Philippine Red Cross Societies. However, there have been problems with this aid program. Once the warehouses were completed and handed over, they were repurposed by the benefacting societies. Make-shift spaces and sup-par renovation were made to better serve those using the facility in way not discussed in the design phase, generally related to training capabilities, offices, and workflow. Thus, these new spaces where immediately not fit for purpose. MFAT wanted to ensure that these issues were addressed for warehousing aid supplied to the Myanmar Red Cross Society (MRCS). MFAT therefore contacted the New Zealand Red Cross (NZRC) to find a way to pre-empt a similar outcome (MFAT 2016).

The importance of the MRCS, as auxiliary to the Myanmar Government, and its logistical role have been underlined in recent disasters of different scales (IFRC 2011). The last decade had shown the need to strengthen both regional and national logistics capacity and the capability for faster and more efficient disaster response. It is the basic task of humanitarian assistance that logistics comprises acquiring and delivering both the requested and appropriate supplies and services, at the places and times they are needed, while ensuring best value for money. This includes items that are vital for survival, such as food, water, temporary shelter, and medicine amongst others. The successful implementation of such assistance is dependent on the improvement of logistics and management of supply delivery so that the number of beneficiaries that can be reached in disaster situations is increased. The MRCS have warehouses for this purpose across the region, but many such warehouses required refurbishment, improved logistics and staff training facilities to achieve the functionality required.

Therefore, a project between MFAT, NZRC and MRCS was conceived to enable “sustainable recovery from emergencies for vulnerable disaster-affected communities through more efficient provision of relief supplies in Myanmar” which aimed to construct/refurbish MRCS warehouse facilities for the storage of relief supplies, meet relevant building codes and operational requirements including forecast warehouse storage requirements; improving internal logistics systems and equipment to better manage and disburse relief supplies; and improve upon warehouse management training and capacity building for MRCS staff. In essence, developing a ‘Client Briefing Document’ lead by the warehouse end users to lead the design and development phases for improved outcomes. To do this required the following,

- Surveying 51 people from the 5 MRCS Local Offices
- Doing 13 Linkage Analyses using hierarchical decomposition analysis (HIDECs)
- Holding 6 Meetings with MRCS, International Federation of the Red Cross (IFRC), International Committee of the Red Cross (ICRC) and BECA (the consultants building the warehousing)
- Holding 5 Focus Groups
- Checking 5 warehouses in 5 different locations in Myanmar

- Complete the necessary structural, logistics workflow, and site analysis including 4 Scala Soil Tests.

This paper looks specifically at the HIDECs component used and its significance.

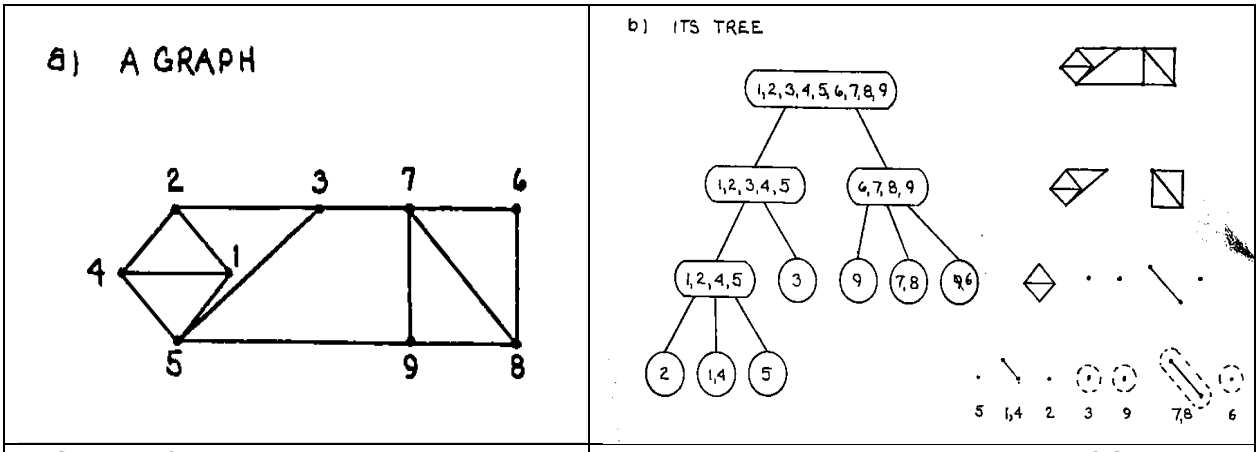
**Research Methods**

HIDECS is an algorithm for breaking down intermeshed problems into a family tree like structure with the most “connected” component at the top and the least one at the bottom. As such, it articulates a hierarchy without disruption to the requirements or variables used in the analysis nor does it require changing aspects that do not need to be changed. Producing a logical rational on which action and decision could be based. The HIDECS process follows the steps below:

1) The key variables/characteristics of the issue are listed on one side of a page.
2) Once this is felt to be complete, that list is duplicated on the other side of the page.
3) Links/lines are then drawn between the variables/characteristics from the list on the left to the list on the right. Note that links from the right to the left will be picked up by the process. This is the key part of the process and requires not over thinking or even thinking about whether there are links in a rational sense, but rather whether there is a ‘’perception’’ or ‘’sense’’ that they are in some way connected. Hence, one’s first impression and immediate response is what should be recorded. This is harder than it seems.
4) Once completed a ‘’Graph’’ is drawn of the links (the lines joining) and the nodes (the characteristics) and the HIDECS process then starts by finding where that graph can/should be split into two separate data sets. If the links are seen as some “statistical correlation between the variables” then the best split should be where there is minimal correlation.
5) That correlation is measured by the algorithm developed by Alexander (illustrated below)

$$STR = \frac{RR - \left(\frac{total}{NSQ1}\right)MN}{\sqrt{\mathrm{MN(NSQ1 - MN)}}} \qquad INFO = (STR)(|STR|)$$

Where ‘RR’ is equal to the number of links that would be cut if graph was split, ‘Total’ is equal to the total number of links in the graph, ‘NSQ1’ equals the maximum possible number of links for the graph, namely n(n-1)/2 where n+ the number of requirements. ‘M’ equals the number of requirements in one of the split sets. ‘N’ is equal to the number of requirements in the other split sets, ‘MN’ (M x N) is equal as prior listed. Finally, INFO is the algorithm measuring the strength of a proposed split within the requirements. This is calculated for each possible split of the graph with the weakest (lowest value) being taken as the split resulting in two subsequent datasets. The decomposition process is repeated until there are no more differences of strength or there is just one variable/ characteristic as the most connected node.




| A Graph of variables and their linkages | Resultant Tree produced by HIDECS |
|---|---|

**Fig. 1.** A Pictorial of the Decomposition Process and the Hierarchical Reconstitution (Alexander 1968).

Figure one shows the linkages as a graph and the resulting tree produced by HIDECs with subsets of the variables in generational tiers of a family tree like structure. The interpretation of the HIDECS structures begins at the lowest 'generational tier' where every subset is labelled for clarity. Variables within these subsets are then evaluated to distinguish a central theme. Subsets of similar themes may be grouped into a cluster. The process is repeated until each generational tier has been evaluated and a theme distinguished.

One main limitation which Alexander referred to in his 1965 critique "A city is not a tree" (Alexander 2015). The essay highlights that while urban planners tend to design cities as tree diagrams (with each node only having a relationship with a parent node), successful and often unplanned cities have a semi-lattice structure (where each node has relationships with many nodes). Further to this, HIDECs can become overly ridged with subsets only divisible by two. If the algorithm should determine that a subset ought to have more than two divisions it will repeat the subset with the same variables in full a hierarchical level lower as demonstrated in It is then up to the researcher to interpret the resulting diagram and correct the generational tiers to reflect subsets accurately. However, even with these limitation in mind, the results remain hugely useful. HIDECS is an emerging methodology that has become a ''secret weapon'' since the computerisation capabilities have exceled it usability, despite being first formulated back in 1962.

**Research Question**

The research question that emerges for this project in Myanmar can be articulated as, What is the effectiveness of using the HIDECS process for designing warehouses in Myanmar and addressing the issue of repurposing, as funded by MFAT?

And in particular:

1. How did HIDECS facilitate a comprehensive analysis of warehouse design variables and their interconnections?
2. What insights and usable material are generated through the sense-making process of HIDECS, particularly in chaotic and complex situations?

3. What were the outcomes and impacts of using HIDECS in terms of improved warehouse design, construction, and subsequent usability by the Myanmar Red Cross Society?
4. How did HIDECS contribute to avoiding the need for repurposing and ensuring that the warehouses in Myanmar were appropriately designed from the beginning?
5. What are the lessons learned from the application of HIDECS in this context, and how can they inform future disaster response and reconstruction projects?

**Research Results**

The approach followed the steps above and in practical terms meant the following in all the 5 different locations as follows:

**Fig. 2.** The 15 Key Factors for a Successful Warehouse Workshop.

First, the group of local warehouse volunteers and MRCS staff were asked to identifiy the 15 key factors for a successful warehouse in their location. The Groups from each

location consisted of senior managers and chairpeople through to volunteers. They were led by Ms Ei Ei Htwe, MRCS's National Logistics Coordinator. More importantly, the focus groups were conducted in Burmese with a subsequent translation of the determined 15 factors. The discussions were always robust and invariably passionate (despite the language barrier) as the need for extension and upgrading had apparently been a topic of constant discussion over the years. In two locations (Myitkyina and Mandalay) plans had already drawn up for such developments.

The Group were then broken up into 3 or 4 teams (usually a maximum of 4 people) and they were asked to draw where they perceived were linkages between the 15 factors determined. Linkages were explained to be factors impacting on another. Once the factors were linked a simple 'mapping' output or spiders web diagram was produced as seen in figure 3. This spiders web was the input for the HIDECs analysis with an example of the HIDECs output seen in figure 4 for the warehouse in Yangon.

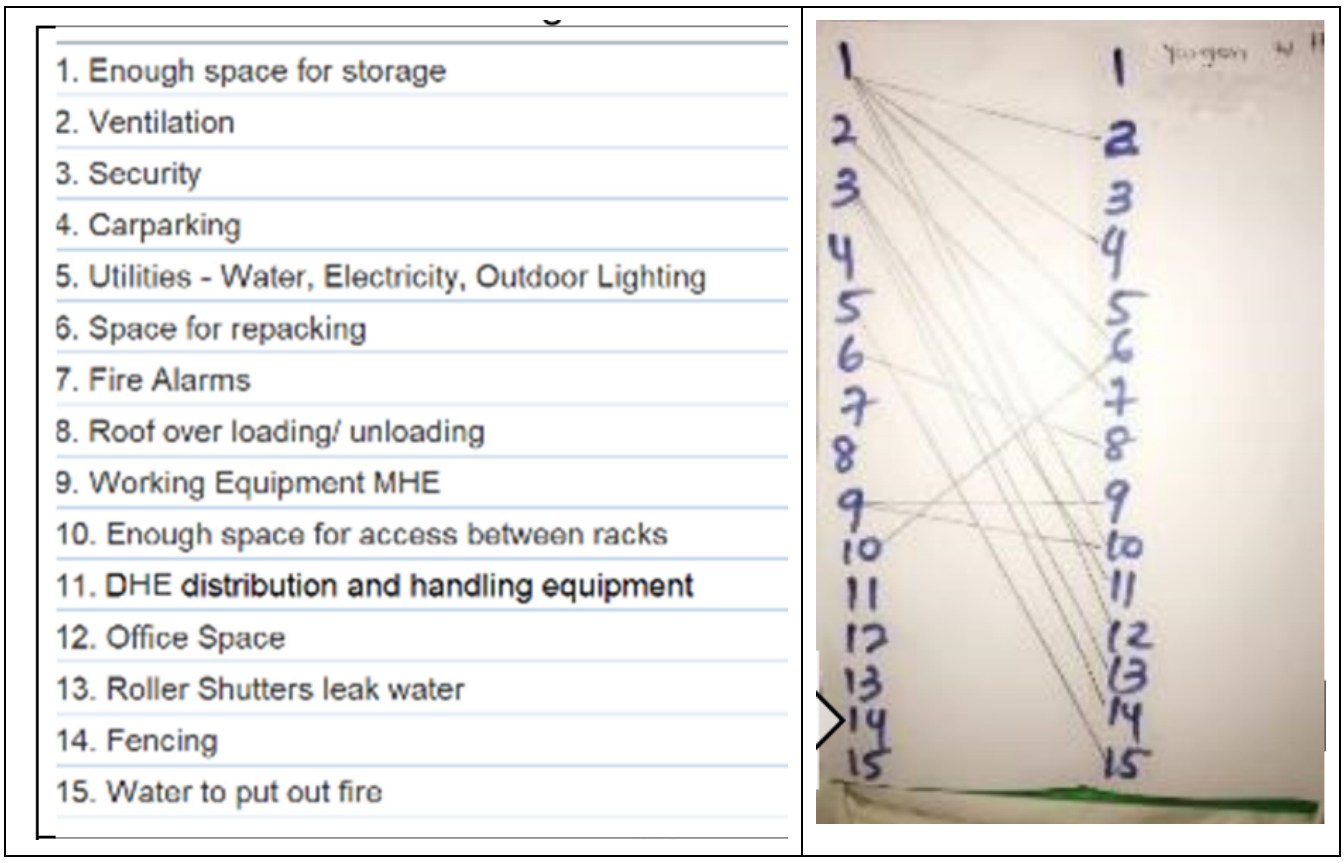



**Fig. 3.** The Factors Determined by the Full Group on the Left, and the Subsequent Spiders Web Mapping from each Breakout Group on the Right (Yangon Warehouse)

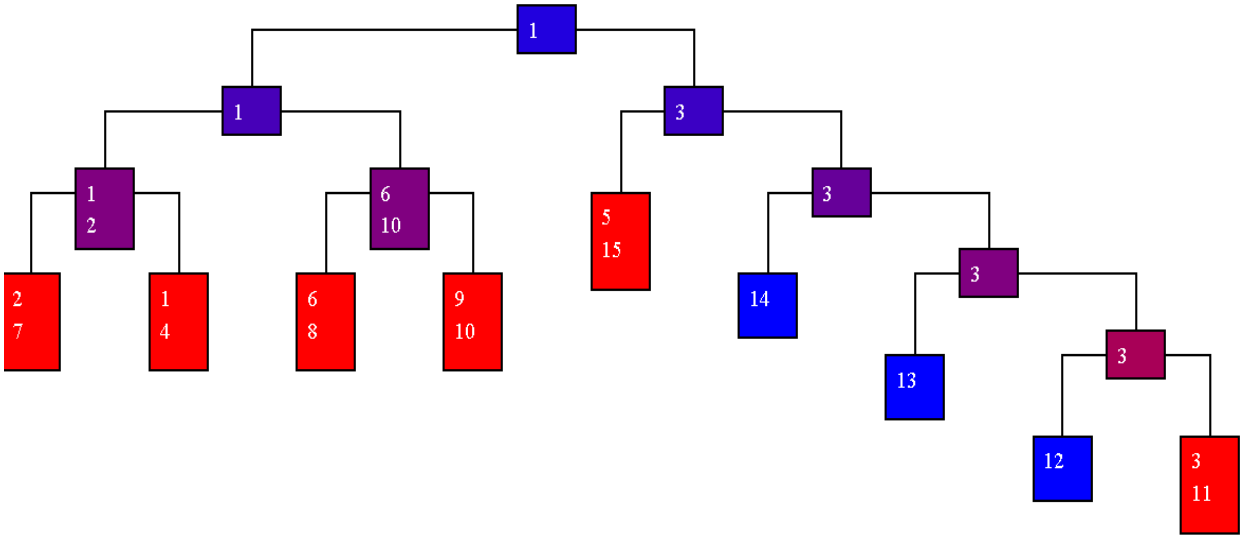



**Fig. 4.** The HIDEC's Output of the 1 to 15 key aspects of a warehouse in Myanmar (Yangon) shown in figure 3 above

The listing of factors served to identified the key issues as seen by the stakeholders. It clustered thematic areas of the design for the warehouse that may have not otherwise been considered. It cannot be stated enough that this analysis was entirely based on the perceptions of the stakeholders and warehouse users. One of initial observation made during the listing of factor is that item 1 (enough storage space) is the key concern for stakeholders despite the existing warehouse more than enough. However space had not been appropriately used. For example, shipping containers of old files by the guard house at the front gate and wasted (negative spaces) around the building (refer to figure 5 below). An initial observation prior to the HIDECs been analysed.

| | | |
|---|---|---|
| | | |
| Storage of office files | Unused (negative space) alongside the warehouse. | The Current Mechanical loading and Unloading equipment |

**Fig. 5.** HIDECS Design Aspects of the Yangon Warehouse

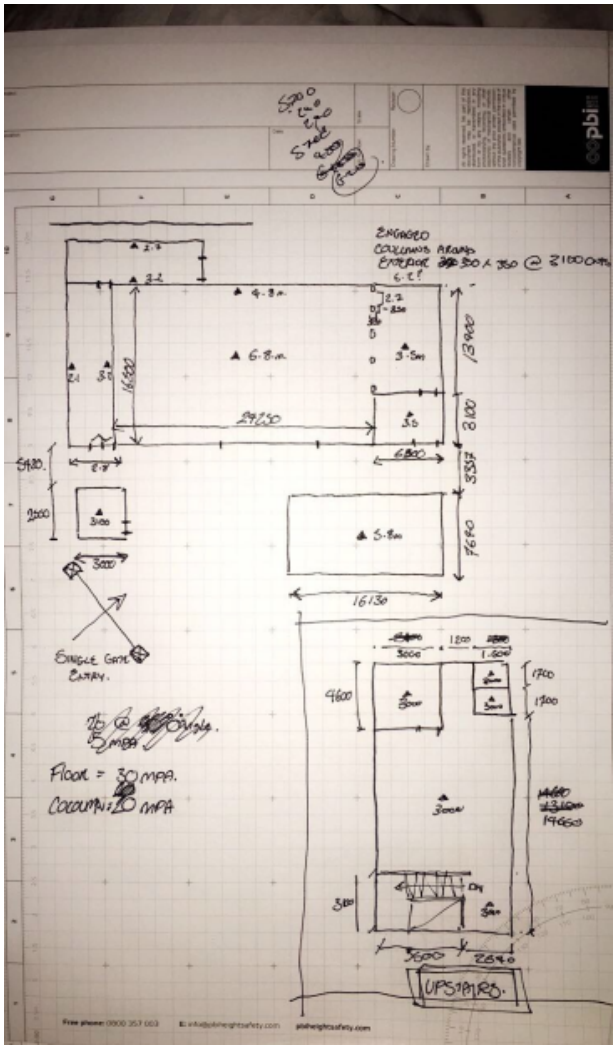



**Fig. 6.** Warehouse Sketch Plan not to scale

Figure four show how HIDECS analysis spits the need for additional storage (item 1), and security (item 3) into the two main themes indicating that they are equivalent issues to be addressed. On the spatial side ventilation (item 2) and work and access space (items 6 and 10) become significant. And below that carparking and fire alarms (items 7 and 4) become significant. On the other side of the spatial issues are a protective roof and mechanical loading unload equipment (items 8 and 9). Moreover, these findings for the spatial considerations are also reflected in the logistics check lists for the warehouse in Yangon shown in table 1 below. The core issues that need to be considered are now in clustered or thematic areas; first the split between space and security; then the cluster/theme around ventilation and repacking areas and finally access. On the security side the need for utilities and then a cascade of clusters/themes covering fencing, roller shutters and finally office space and handling equipment. As a designer, this provides a hierarchy which design needs to work towards.

| Location | Identified Local Priorities | Other Loc. | HIDEC Clusters | Other Loc. |
|---|---|---|---|---|
| Yangon | Enough Space for Storage | ** | Utilities | *** |
| | Security | **** | Security, fences and doors. | *** |
| | Space for Re-packing | ** | Ventilation | |
| | Enough Space for access between the racks | | Operational Space | * |
| | Utilities | **** | | |
| | Water to put out fire | **** | | |

**Table 1**. Feedback from a Warehouse check list for Yangon

Thus, the proposed work that emerged for the Yangon warehouse consisted of moving the 5 office file storage containers and an existing large Rubb Hall[1] temporary tent and erecting a protective roof (shown in their original placement in figure 6). This would be built up to the street and side boundaries and would link into the existing warehouse so that the current office access would be internal. The roof of this new warehouse would be cantilevered out to protect the unloading/repacking area and columns have been reset back to allow easier truck access. A new office for receiving would be established just inside the new warehouse area. The current single-storey lean-to chlorine storage would be removed, and a purpose-built chemicals area established at the rear of the warehouse addition. Finally, the roof and security post would be altered to allow easier security checking (such as sliding windows) and easier truck access by not having the roof protruding into the driveway area.

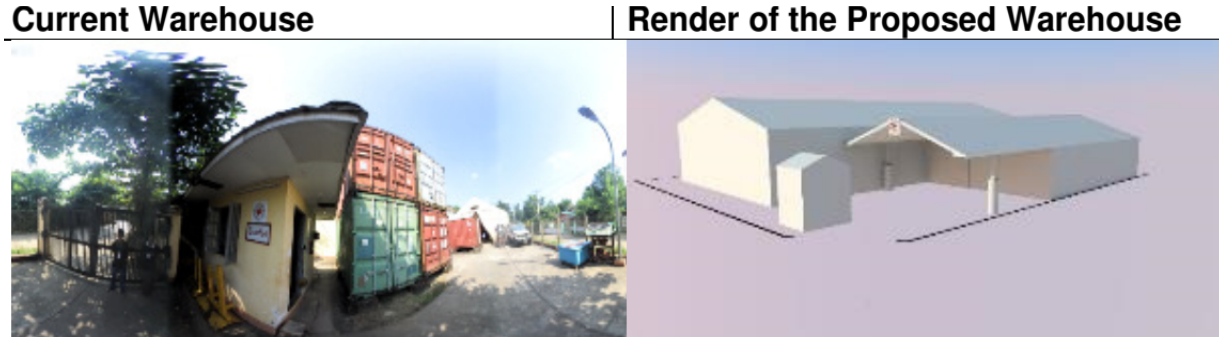



**Fig. 7.** The proposed Yangon Warehouse.

The proposed layout and design were then rendered so that the scale and size of what was being proposed could be communicated back to staff and for feedback from the MRCS (refer to figure 7 above). A similar process was done for all 5 locations. These renders were then converted in structure and contract drawings by BECA Consultants based in Myanmar.

[1]A Rubb Hall is a commercial name for particularly large, relocatable tent-like structure often used in situations of emergency.

**Discussion and conclusions**

The humanitarian sector makes use of several (standard) tools in the area where HIDECS was used to aid in decision-making, planning, and problem-solving. Some of these tools include:

1. Needs Assessment Tools: Various needs assessment tools are employed to gather information about the needs and priorities of affected populations. They include surveys, interviews, focus group discussions, key informant interviews, participatory assessment methods, rapid assessments, and secondary data review. These tools help humanitarian organisations understand the specific challenges and requirements of the population they are serving, enabling them to design and implement targeted interventions. But none are as fast, efficient and in the local language (OCHA n.d.).

2. Stakeholder Analysis: Stakeholder analysis is a tool used to identify and understand the different individuals, groups, and organisations that have an interest or influence in a particular humanitarian situation. By mapping out stakeholders and their roles, perspectives, and interests, humanitarians can engage with relevant actors, build partnerships, and ensure effective coordination and collaboration. In this case the issue of repurposing which was identified in similar aid situations in both the Philippines and Indonesia. The HIDECS approach targets stakeholders directly (the users and the operators in this case) and works with their sense-making of the situation which is another untapped area when dealing with unintended consequences of aid (Newby 2010) (FOA n.d.) (Agenda for Humanity 2015) (Wittek 2015).

3. Decision Matrix: A decision matrix is a tool that helps in systematically evaluating and comparing different options or solutions against predefined criteria. Humanitarians can use decision matrices to assess various response strategies, prioritise actions, or select appropriate interventions based on specific criteria such as feasibility, impact, cost-effectiveness, and sustainability. HIDECS creates a decision tree or hierarchy, but importantly based solely on the users of the warehouses and interpreted by a designer. This identifies perhaps we are starting to appreciate the HIDECS process (the seemingly simple process) above (Rahman, Majchrzak and Sein 2022).

4. Risk Assessment and Management Tools: Risk assessment and management tools assist humanitarians in identifying and mitigating potential risks and hazards. These tools help in analysing vulnerabilities, mapping hazards, assessing the likelihood and impact of risks, and developing strategies to reduce or manage risks effectively. Examples of risk assessment tools include hazard mapping, vulnerability and capacity assessments (VCA), and scenario planning. In the Yangon warehouse above we identified the fire hazard, the lack of utility services, the working space, and the access spaces. All are risks in addition to being factors that prevent productivity within this warehouse (OCHA n.d.).

In addition, HIDECS is important for several more reasons:

1. Holistic problem-solving: HIDECS allows for the comprehensive analysis of complex problems by breaking them down into inter-connected variables and organizing them in a hierarchical family tree structure. This holistic approach ensures that all relevant aspects and relationships are considered, leading to more effective problem-solving.
2. Sense-making in chaotic situations: HIDECS helps make sense of seemingly chaotic situations by providing a structured framework for understanding the interdependencies and relationships between variables. Through interrogation and analysis, the process uncovers valuable insights and generates usable material from complex and confusing scenarios.
3. Analytical tool: HIDECS serves as a powerful analytical tool for researchers and practitioners working in various fields, particularly in disaster response, recovery, and reconstruction. By applying the HIDECS process, they can systematically analyse and understand the intricate connections and characteristics of the problem at hand, leading to more informed decision-making and effective solutions.
4. Computerization and efficiency: With advancements in computer power, the HIDECS process can now be computerised, significantly reducing the time and effort required for analysis. What previously took a considerable amount of time can now be accomplished in seconds, making HIDECS more accessible and practical for real-time decision-making and problem-solving.
5. Application in diverse contexts: HIDECS has proven its usefulness in various domains, including disaster management, urban planning, architecture, and construction. Its versatility allows it to be applied to a wide range of complex problems and systems, facilitating a deeper understanding of their structures and dynamics.

HIDECs accomplished this across language barriers (almost all stakeholders spoke exclusively in Burmese and those conducting the analysis where limited to English), using stakeholders, addressing a recurring unintended issue, to produce a tailored response in 5 locations, using a comprehensive approach that was fast and efficient. Certainly it is the case that when compared to the other standard tools available to humanitarians HIDECs is emerging as a secret weapon.

The warehousing re-purposing project in Myanmar presents a significant opportunity for addressing the multifaceted needs of affected populations in a humanitarian context. By utilising a structured conceptual approach such as HIDECS, stakeholders can effectively navigate complex problems and understand the interconnections between key factors. This approach allows for the integration of quantitative and qualitative data, ensuring a holistic and inclusive understanding of the situation. Additionally, the visual representation provided by HIDECs helps overcome language barriers and facilitates collaboration among stakeholders with diverse linguistic backgrounds. Moving forward, incorporating other established needs assessment tools such as surveys, interviews, and participatory methods will further enhance the understanding of specific needs, preferences, and capacities of the affected communities. By leveraging these tools and approaches, humanitarian organisations can develop targeted and evidence-based interventions to address the challenges faced by the affected populations and work towards sustainable solutions that prioritise their well-being and resilience. But more

than that, this approach is now being developed as part of system that monitors and responds to stakeholders within the New Zealand construction sector on the capability and capacity aspects of that system (Sutrisna, Wilkinson and Cameron 2020).

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## Author’s Biography

*Professor Regan Potangaroa’s* background is as a structural engineer with 25 years’ experience in design and construction in NZ, Australia, Singapore, Malaysia, Brunei and the USA. He is well known internationally in the humanitarian aid community having completed over 200 humanitarian deployments in 22 countries since 1996: most recently with UNHCR as part of their shelter team in Bangladesh with the Rohingya Emergency Response; and currently with the IFRC working on capacity training for the incorporation of Housing Land and Property (HLP) issues into existing shelter and settlement programs for the Asia-Pacific region This humanitarian focus is the core of my research which extends into other areas. Regan is currently developing an Active shooter VR with RedR Australia (together with Massey University); a disaster simulator program for training and research (this is available on GITHUB); drone technology for mapping (‘Drone today Map Tomorrow’), multispectral work for measuring the health of the ground vegetation and also thermal for locating underground water; VR for housing research (used recently for Virtual Retail and Maori Marae); CFD for natural ventilation, and more recently the use of lasers for story telling/communication. Furthermore, Regan has recently co-authored a book on Build Back Better with Sandeeka Mannakkara from Auckland University and Prof Suzanne Wilkinson from Massey University: and a book chapter on transformational Shelter for the Institute of Engineers ICE UK. Regan is currently working on three other book chapters and has published 57 peer-reviewed technical reports.

*Francis Hubbard* is a final year PhD student at Massey University in Auckland, New Zealand. His study looks at ‘Build Back Better’ Frameworks in post disaster reconstruction and recovery with a focus on the hierarchical importance of success indicators for improve implementation and application. Francis accomplished his master’s degree in architecture with Merit from Victoria University of Wellington (VUW) where he researched alternative earthquake construction techniques based on vernacular designs in Sumatra, Indonesia. It was during field research in Aceh for this study that he first became involved in post-disaster reconstruction and recovery research. Assisting in the assessment of donated housing after the 2004 Indian Ocean earthquake and tsunami and the changes made by occupants over the ten-year period. In 2019 Francis undertook further work in this field, working with the New Zealand Ministry of Foreign Affairs and Trade, New Zealand Red Cross (NZRC) and the Myanmar Red Crescent Society in developing a client briefing document for the design and development of Red Cross warehouse and training facilities using the emerging HIDEC methodology to develop design principles across language and cultural barriers. Upon his return to New Zealand Francis completed his training to become an International Delegate for the NZRC to be deployed in the event of disasters which require shelter specialist assistance. In 2020 Francis left a full-time role at a top tier

## Appendix F, Conference Paper: Recognising the impacts of prioritising certain success indicators over others in ‘Build Back Better’ post-disaster reconstruction Frameworks.

The following conference paper was produced and presented for the 2023 i-rec in Sendai, Japan. It is an early finding of the HIDECs analysis that concludes the prioritisation of ‘Effective implantation’ indicators from the Build Back Better Framework over other categories.

**i-Rec** Conference 2023: **Tensions Between Tradition and Innovation in Disaster Risk Reduction, Climate Action, and Reconstruction**

# Recognising the impacts of prioritising certain success indicators over others in 'Build Back Better' post-disaster reconstruction Frameworks.

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## Abstract

The '2015-2030 Sendai Framework', adopted at the 'Third United Nation World Conference on Disaster Risk Reduction', will this year pass its midpoint. The frameworks aim was to improve the adverse effects of disasters by reducing the scale of people and infrastructure affected, proposing four priorities for action. However, the 'Global Assessment Report on Disaster Risk Reduction - 2022' has highlighted that despite providing pathways and solutions, the frameworks goals are not on track to being achieved by 2030. The 'Global Assessment Report' identifies one of the reasons for failing as intended is that decision making after a disaster is suboptimal and therefore, human decisions about risk reduction during this phase must be addressed to accelerate effective action. This is a direct reflection of the Sendai Frameworks fourth priority for action in which the focus is on 'Building Back Better' in recovery, rehabilitation, and reconstruction. This paper examines the decisions that cause success indictors in 'Build Back Better' frameworks to be prioritised over others. This is achieved by analysing the post-disaster recovery of three case studies. Each case study has been selected as they present unique disaster events, declared as state of emergency and requested international assistance. Furthermore, each country; Vanuatu, Bangladesh, and the Philippines, ranked in 'The World at Risks' top 15 most vulnerable nation to natural disaster in the year the events occurred respectively. Each event directly impacted many people and infrastructure and required a unique solution. This paper finds that regardless of the Sendai Framework, when faced with a complex multifaceted holistic approach, the priority of indictors selected is weighted towards succeeding in principles of effective implementation and disaster risk reduction over community recovery. This results in those most vulnerable and affected by the disaster from gaining attaining 'betterment' from the actions and activities undertaken.

**Keywords:** Build Back Better, Frameworks, Indicators, Post-Disaster Reconstruction,

## Introduction

The Sendai Framework was established to enhance the worlds capacity to manage disaster risk and reduce the negative consequences of natural disasters. However, the 'Global Assessment Report on Disaster Risk Reduction - 2022' has highlighted that the framework's goals are not on track to being achieved by 2030 (UNDRR 2022). The report identifies suboptimal decision-making after disasters as one of the reasons for the framework's failure. The Sendai Framework's fourth priority for action focuses on 'Building Back Better' in recovery, rehabilitation, and reconstruction which demands a holistic approach of set core concepts. This paper examines the decisions that cause certain concepts, and their indicators, in 'Build Back Better' frameworks to be prioritized over others. The paper analyses the post-disaster recovery of three case studies, including Vanuatu, Bangladesh, and the Philippines. Despite the Sendai Framework promotion of a holistic approach to recovery, the priority of indictors selected was weighted towards succeeding in principles of effective implementation and disaster risk reduction over community recovery. The paper finds that without effectively considering 'Community Engagement' indicators, a holistic approach has not been achieved, and major issues ensue.

## Background

Build Back Better (BBB) is a term used to describe the holistic principles of resilience. The term first emerged in the early 2000's and was specifically geared to address the reconstruction, recovery, and rehabilitation phase after a disaster. Coined to succinctly explain the importance of addressing all facets of a community, using the disruption of a disaster as an opportunity to rectify factors that are the source of their exposure and vulnerability, the core elements that contribute to disaster risk. One of the earliest frameworks that addressed this was published in the journal article *'Building Back Better, creating a sustainable Community after disaster'* by Jacquelyn L. Monday. Monday's framework considered six core components with a possible 28 indicators to guide the actions and activities that would successfully implement the principles of BBB (Monday 2002).

The terms popularisation, mainly through the UNs publication of *'lessons learned from tsunami recovery, key propositions for building back better'* in 2006, cause many organisations working in the space of disaster response to adopt the holistic approach (Clinton 2006). UN Member States had only recently agreed in 2005 to the adoption of the Hyogo Framework for Action (HFA) which is considered as the world's first unified plan to explain, describe, and detail the work required from all different sectors and actors to reduce disaster losses by emphasising a resilience-based approach (UNDRR n.d.). Thus, with the rise of BBB many sequential documents that served to instruct on implementing the HFA reflect upon its importance in principle if not explicitly by name. Many of these documents presented additional indicators of success, categorised by themes, arranged under related components. Done to improve the clarity in disseminating the information but conversely creating organisational barriers that negated the relationships and dependencies that are essential to know when considering holism as a priority.

Because of the rapid rise in popularity, there were significant gaps in understanding even the core concepts related to BBB. In answer to this, S. Mannakkara synthesized leading BBB frameworks in a PhD study for Auckland university in 2014. The result was

the articulation of the core principles that contribute to an effective BBB response, producing a more unified and practical BBB framework. The shared core concepts from the seven guidelines analysed where grouped into three broad categories: ‘Disaster Risk Reduction’, ‘Community Recovery’ and ‘Effective Implementation’. An updated version of this framework in 2016 accompanied these categories (or principles) with eight components as seen in figure 1.

**Fig. 01.** The BBB Framework (Mannakkara and Wilkinson, 2016)

Only a year prior in 2015, the HFA was superseded by the Sendai Framework which officially recognised BBB. Specifically naming it as one of the 13 guiding principles and being referenced in the fourth and final priority for action *“Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation, and reconstruction”.* In addition to embracing BBB, Sendai recognised the difficultly in implementing the holistic approach and attempted to rectify this by launching the *‘Words into Action”* (WiA) series. The WiA guidelines provide practical, specific advice on implementing the Sendai Framework. There are currently fourteen guides in the series, published between 2017 and 2022. Each relevant to one or more targets and priorities within the framework. While it is recognised that the implementation of the Sendai Framework varies significantly across different countries and contexts there were several common strategies employed.

- National Strategies and Policies: Many countries developed or revised their national strategies and policies for disaster risk reduction to align with the Sendai Framework. These strategies outlined the country-specific goals, priorities, and actions to be taken in reducing disaster risks and enhancing resilience.
- Institutional Arrangements: Countries established or strengthened institutional arrangements to facilitate the implementation of the Sendai Framework. This involved assigning responsibilities to relevant government agencies, creating

coordinating bodies, and fostering collaboration among various stakeholders, including government, civil society organizations, academia, and the private sector.

- Risk Assessment and Monitoring: The Sendai Framework emphasized the importance of risk assessment as the basis for informed decision-making. Countries conducted risk assessments at different levels, from national to local, to identify hazards, vulnerabilities, and exposure to risks. Monitoring systems were also established to track progress, evaluate effectiveness, and inform adaptive management.
- Disaster Risk Reduction Measures: The Sendai Framework promoted a holistic approach to disaster risk reduction that encompassed prevention, mitigation, preparedness, response, and recovery. Countries implemented various measures such as infrastructure development, land-use planning, early warning systems, capacity building, and community-based initiatives to reduce disaster risks and enhance resilience.
- Stakeholder Engagement and Participation: The active involvement of various stakeholders was encouraged in the implementation of the Sendai Framework. Countries engaged communities, civil society organizations, academia, private sector entities, and other stakeholders in decision-making processes, ensuring their participation, empowerment, and ownership of disaster risk reduction efforts.
- Knowledge Sharing and Collaboration: The Sendai Framework emphasized the importance of knowledge exchange, technology transfer, and international cooperation. Countries shared experiences, best practices, and lessons learned through regional and international platforms, fostering collaboration and mutual support in disaster risk reduction initiatives.
- Financing and Resource Mobilization: Implementation of the Sendai Framework required adequate financial resources. Countries sought to mobilize domestic and international funding, including through public-private partnerships, to support disaster risk reduction activities, infrastructure development, capacity building, and recovery efforts.

Highlighting the commonality shared between all member states in addressing post disaster responses. However, the ‘Global Assessment Report on Disaster Risk Reduction - 2022’ has highlighted that despite providing pathways and solutions, the Sendai frameworks goals are not on track to being achieved by 2030. The ‘Global Assessment Report’ identifies one of the reasons for failing as intended is that decision making after a disaster is suboptimal and therefore, human decisions about risk reduction during this phase must be addressed to accelerate effective action. This issue can only begin to be addressed by recognising the contextual issues that impacted on the effective use of BBB in practical situations, understanding which indicators of success are prioritised over others and why.

**Methodology**

These questions will be answered by using case study analysis. Three case studies have been selected. Case study research provides an in-depth analysis of select scenarios providing real-world insight to the study. This methodology has been chosen for various reasons, including the ability to examine complex situations, explore new facets of an issue previously unexplored, and provide a rich understanding of the factors that influence the prioritising of success indictors in post-disaster situations. Case study research also allows for the exploration of multiple sources of data, including

documents, interviews, observations, among any other source of information readily available. This can provide a comprehensive view. Multiple case studies will enable for findings to be triangulated and test for reliability and validity. Triangulation will also increase rigor of research, give greater diversity of across different context, and provide a more comprehensive understanding of the factors under investigation. As important as recognising the methodology most appropriate for this question is in recognising the criteria for case selection. The selection criteria is based on the research scope. The criteria for case study selection for this research are as follows,

- Disasters are,
  - All unique to each other
  - All are 'Natural Disasters' as defined by EM-DAT (EM-DAT n.d.)
- Each country declared state of emergency.
- Each requested international assistance.
- Each disaster occurred after 2008 and before 2020 to give amount of time for;
  - An appropriate response, outcomes, and impacts to occur,
  - Sufficient information to be published for a significant case study investigation,
  - The response to be considered as a 'build back better' approach.
- Each impact caused a large displace populations needing permanent shelter solutions.
- All member states in the UN (so governments have agreed to disaster risk reduction and by extension to embrace a Build Back Better ethos in the recovery frameworks)
- All have unique land, property, and housing laws and to each other requiring unique solutions.

Based on the above criteria, the following case studies where selected,

1. Typhoon Haiyan (Yolanda), Philippines, 2013/2014
2. Ambae Volcanic Eruption, Vanuatu, 2017
3. Flooding of the Padma River, Bangladesh, 2018

Studying two disaster situations that occurred under the Sendai Framework and one that happened before its implementation provides valuable insights into the evolution and impact of disaster risk reduction efforts. Comparing the approaches and outcomes between the pre-Sendai disaster and the post-Sendai disasters allows for an assessment of the effectiveness and improvements brought about by the framework. It will also shed light on any gaps or challenges that existed prior to the framework's establishment. The analysis considers the following perspectives;

1. Context and impact of the disasters, emphasizing the significance and complexity of the challenges faced in each case.
2. The implementation of the Sendai Framework. This is via the actions taken.
3. Prioritisation of Indicators, again through the actions taken rather than exact indicators used.
4. The outcomes and the extent of "betterment" for the affected communities.
5. Lessons Learned

6. Recommendations

By focusing on these aspects within each case study, the paper can effectively highlight importance of addressing the issue of suboptimal decision-making to accelerate effective action towards achieving the Sendai Framework's goals. Using the three core principles of the 2016 BBB framework in figure one to best understand what parts of BBB are being addressed, or prioritised, over others.

**Findings**

*Philippines*

The first case study is the Philippines Government instigation of a No-Build-Zone (NBZ) in 2014 after Super Typhoon Haiyan in November 2013. The Department of Environment and Natural Resources (DENR) declared a “40-metre no-build zone” along the coastlines of Eastern Samar and Leyte, two of the worst-hit areas. The declaration was based on protocols outlined in Article 51 of the Philippine Water Code, a presidential decree (Official Gazette 1977). However, there were problems.

The final report of the Typhoon Haiyan (Yolanda) Shelter Response produced in May 2016 concluded that “land issues indirectly underpinned almost every challenge related to the recovery of affected populations. Lack of access to safe sites led not only to affected households remaining in NBZ but also to lack of implementation of build-back-safer due to lack of permission to build stronger structures and lack of incentive to build secure structures with durable materials that would later have to be taken apart or were in any case not felt to be intended for long-term use. Lack of safe land near livelihoods and community facilities meant that some relocated communities were travelling long distances for all services and livelihoods. Shelter agencies tried several strategies to mitigate challenges faced due to land issues. Rental assistance had been given to households with damaged houses in NBZ; legal assistance was provided to households to facilitate longer-term tenancy with landowners; some tried coordinating with governmental agencies to procure land; and relocation sites were searched for near livelihoods and services.” (Santos 2014).

The first problem was that the 40-metre zone did not mean that people were safe. The impacted zone in Tacloban where a 4-7 metre storm surge was experienced extended up to 500 metres in the northern and downtown part of the city (Mikami , et al. 2018) . This extends to up to 2 kilometres in the low-lying, swampy areas south of downtown Tacloban. The major impact of the storm surge was in the first 200 metres of the coast and highlighted the destructive power of storm waves plus storm surge. It should be noted that Haiyan occurred at a time of low tide otherwise these distances could have been extended by a further 20% (Kinghorn 2018).

The second problem was that this zone was where there were many informal settlements. People that did not have any title and because of issues of poverty, access to work/employment and for fishing, ‘chose’ to live in these zones. In 2012, it was reported that 2.2 million Filipinos, or 5.4 percent of total urban population, lived in informal settlements. Many of these settlements are in climate-impacted zones. Moreover, the Philippines coastline is around 17,462 kilometres long with 60% of Filipinos living in this coastal area and where municipalities are located. It is a ‘contested’ zone. And that contested nature was especially evident in the city of Tacloban (Thomas 2015).

Key messages from the Shelter Cluster (co lead by the IFRC) on the 16 December 2013 were as follows (Shelter Cluster Philippines 2013):

- Typhoon Haiyan has destroyed 580,000 houses and damaged an additional 550,000 houses. That means that more than 1.1 million houses have been severely damaged or destroyed. It will take survivors a long time to recover and both aid organizations and donors need to commit to supporting them for many years. The amount of initiative and effort that the survivors are investing in getting back on their feet is truly inspiring. Data collected by the Shelter Cluster shows that the vast majority of all families have already started rebuilding and repairing their homes, however most of them require help. To assist them, the Shelter Cluster focuses on supporting the survivors with things like tools, building and roofing materials as well as technical assistance so that they can build back safer. While emergency shelter materials such as tarpaulins are still needed, support for self-recovery is fast becoming the priority.
- Shelter Cluster Partners are also planning to augment local government capacity by providing temporary staff and through technical and policy trainings around community resilience and disaster risk reduction.
- Among the biggest challenges for the shelter response are a lack of good quality roofing materials such as corrugated iron sheets (CGI) and hurricane straps. To meet the needs, Shelter Cluster Partners urgently need 4 million CGI sheets and 700,000 hurricane straps, as well as the logistical support to deliver them. While it is possible to buy CGI in the Philippines, most of it is too thin and would likely fly off in the next storm; Cluster Partners have agreed that all CGI sheets should have a thickness of 0.46 mm, but a lot of the locally available CGI measures only 0.33 mm.
- The Cluster is also looking at how traditional building materials such as nipa and bamboo can best be used to build roofs and is working on technical guidance on this.
- Under the Strategic Response Plan, the shelter sector is asking for 178 million US-Dollars in financial and material support. So far, only 27 million US-Dollars have been pledged. Unless donor support increases dramatically over the next weeks, shelter agencies will not be able to assist the typhoon survivors adequately. This would lead to negative long-term effects, such as increased poverty and vulnerability.
- So far, shelter agencies have provided 750,000 people (more than 150,000 households) with basic shelter assistance such as tents and tarpaulins and close to 200,000 people (~ 40,000 households) with tools, building materials etc. that enable the survivors to repair their own homes.

The NBZ policy was then implemented and that immediately shifted this focus of the Shelter Cluster; followed by an additional classification of the NBZ for “safe zones”, “unsafe zones” and “no dwelling zones” in March 2014 (Davidson 2016). This was to be established based on comprehensive geo hazard mapping of the areas.

This played out differently in the affected coastal communities. Those that wanted to clear the area stopped any assistance being given to those affected communities. While at the same time ignoring the requirements of Article 51 to provide alternative living options. However, where living options were provided, they were too far from the sea

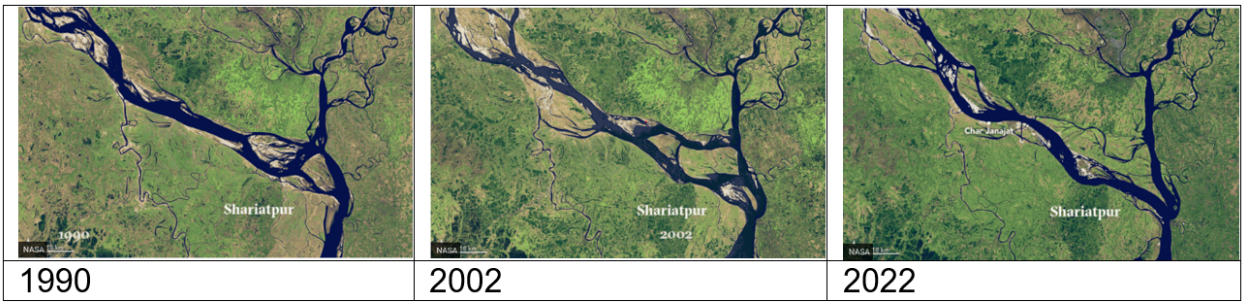
and hence security of boats and fishing was problematic, and they were below Sphere International Standards and hence could not be supported by responding shelter agencies.

In the city of Tacloban, the minutes of the meeting between the Tacloban Shelter hub and the Tacloban City on June 3, 2014 (7 months after Haiyan) stated that no temporary shelter assistance should be provided in the NBZ and that this overrode previous consent for humanitarian agencies to deliver temporary shelter assistance in these areas (Sanderson, Kayden and Leis 2016). Moreover, shelter agencies pointed that where there was an alternative shelter, that there was no access to basic services (WASH, electricity, education, health etc.); and no access to sustainable livelihoods and associated risks of people returning to area of origin in the NBZ.

*Bangladesh*

The second case study is flooding of the Padma River which is part of the biggest river system in Bangladesh. In September 2018 it was subjected to riverbank erosion due to heavy rain falls but also to the opening of flood gates in India. A 5-kilometre stretch of riverbank in Naria and Zajira was washed away affecting 8,710 families or approximately 43,550 people. The flooding damage included 3 school buildings, 3 hospital/clinics, 4 markets and 1.5 kilometres of main roads. People were permanently displaced from their land having lost housing land and property (IFRC 2019).

Bangladesh is annually affected by flooding and in recent years has suffered significant flooding in 2018, 2020 and 2021. The large water catchment area and the flat plains and delta area combined with a large case load creates a vulnerable population exposed to flooding risk. The timing of this flooding can be predicted and pre warning and evacuations or preparation made for the increased water/river levels. However, the river moves as shown below.




| 1990 | 2002 | 2022 |
|---|---|---|

**Fig. 1.** Movement of the Padma River 1990 to 2022 (Alam 2019)

**Fig. 3.** The loss of land (TechTV BD 2018)

**Fig. 4.** The loss of housing and property (TechTV BD 2018)

A joint needs rapid assessment was actioned by the BDRCS. It identified shelter, food, WASH (and Health), and livelihoods as the priority needs. However, gender and diversity issues were considered such as women head of households, pregnant or lactating women, households with persons with disability, older people, those suffering from illnesses, children-headed households, families with children and families that had not received any assistance. However, the basis for that work namely a sex, age, disability disaggregated data (SADDD) study was not effectively followed through on.

The use of cash grants was considered, but the challenge was how to distribute limited support in comparison to the huge number of affected people and who from that large geographically spread population should receive assistance based on need? And hence the above survey. The first challenge was to establish the relevant standards and protocols. This included an understanding of the needs of those affected by displacement. While the second challenge was to establish a database of affected people and their situation. This required coordination between BDRCS and government agencies. This link proved essential for later discussions and decisions around any sensitive land issues. When land is lost, much more is lost together with the physical land such as livelihood, community, and the security it provides.

However, there were reported challenges with those affected being widely scattered, a lack of phone access, language barriers and disagreements over who should be on the beneficiary lists.  Later it was determined that the state was not liable to compensate for loss of land or the consequential displacement. In addition, the loss of livelihood and any supportive immediate social fabric meant that there was little else to kick start the recovery of affected families. It also meant a long-time frame for any durable solutions to emerge. While there are some options if the land reappears in the next 30 years and relocations for new land that the river produces elsewhere, these are often poor-quality agricultural land that are still prone to ongoing flooding. Thus, long term resolutions need to be through local and national authorities and the transparent applications of government policy.

Consequently, engagement with the affected communities was slow at best and hampered by the loss of land. Assessments were also difficult because affected communities were no longer there to be assessed. And while cash grants would have been useful, again the identification of the affected communities was not easy, or practical. A coordination structure with local and territorial authorities was useful and mapping of the potentially affected flood areas prior to flooding might be able to identify those affected, it would be a difficult task to maintain such a list of tenants (Caspellan-Arce, et al. 2019).

*Vanuatu*

Volcanic activity erupted on Ambae in September 2017, resulting in significant damage to the islands fragile infrastructure. Ash deposits covered 40-50% of the surface area, houses and trees collapsed, roads were covered in ash, and food and water sources were contaminated. Health issues such as skin ailments, diarrhoea, and respiratory problems were reported. A State of Emergency was declared, and mandatory evacuation was ordered. The population of Ambae was estimated to be around 11,100. Displaced individuals were relocated to various islands, primarily Santo and Maewo. Some people returned to Ambae, while others remained in their new locations. Communication and infrastructure on Ambae were gradually restored and a recovery plan was developed, focusing on the needs of displaced populations and host communities. The plan aimed to address immediate relief, long-term reconstruction, and support services. The situation remained dynamic, with ongoing movements and uncertainties about future resettlement (Rovins, Stewart and Brown 2020).

| Area Council | Total population | Percent | 0-14 | 15-29 | 30-49 | 50+ | Percent | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | M | F |
| *Area Co* | | | | | | | | |
| W. Ambae | 3,735 | 34 | 1,534 | 782 | 740 | 659 | 51.1 | 48.9 |
| N. Ambae | 3,564 | 33 | 1,530 | 757 | 749 | 515 | 50.1 | 49.9 |
| E.Ambae | 2,116 | 20 | 755 | 507 | 492 | 362 | 53.4 | 46.6 |
| S.Ambae | 1,443 | 13 | 688 | 308 | 287 | 160 | 51.4 | 48.6 |
| ***Tot Ambae*** | ***10,858*** | ***100*** | ***4,507*** | ***2,354*** | ***2,268*** | ***1,696*** | ***51.2*** | ***48.8*** |

**Fig. 5**. A Breakdown of the Numbers of People on Ambae to be Evacuated.

It should be noted that most Ni-Vanuatu on Ambae (94.3%) lived in single family, detached dwellings; with 76.7% households owning their home while 19.5% lived rent free and a mere 3.7% paid rent. On 11 May 2018, the Council of Ministers designated Maewo as the location for the construction of ‘’Second Homes’’ for displaced households from Ambae. And by the 26 July 2018 ordered the compulsory evacuation of Ambae, to be completed by August 2018.

However, 1,725 households (7,499 individuals) relocated from Ambae to Santo. This was over two-thirds of the displaced population from Ambae and was a significant increase in the population of Santo. Similarly, on Maewo, the influx of 797 households (2,714 individuals), or just under one quarter of the people displaced from Ambae doubled the island’s population, placing considerable stress on food, schools, community resources and social services. This additional load on Maewo plus the Second Homes designation meant that Maewo was given priority. Assessments of housing options in Santo is shown below in fig 3. And the 16% of displaced people that purchased house and/or land is an indicator of those that planned to stay.

| Location of displaced from Ambae in Santo | Per cent |
|---|---|
| Staying with host families or communities | 65 |
| Staying in own house or on own land | 16 |
| Staying in evacuation centres | 9 |
| Staying in tents | 4 |
| Other | 6 |
| Total | **100** |

**Fig. 6.** Housing Options for those that Relocated to Santo

However, by mid-February 2019 people had started returning to Ambae, predominantly from Maewo despite its priority status and the Second Home approach of the government. The returning numbers are shown in figure 4 below and can be compared to those evacuated in figure 2. The anomaly of an increase in households recorded but with a decline in individual numbers reflected splitting of families. This was unexpected and meant that agencies had to hold planned assistance.

| Area | Individuals |
|---|---|
| East Ambae | 1,243 |
| North Ambae | 1,465 |
| South Ambae | 668 |
| West Ambae | 802 |
| **Total** | **4,178** |

**Fig. 7.** Returnees to Ambae

This movement back to Ambae did cause delays for the construction of new schools or health facilities – as government agencies simultaneously looked at similar requirements on Santo and elsewhere, where people had chosen to relocate. Finally, the government did lift the State of Emergency on Ambae in November 2018 and started to put in place plans to rebuilt infrastructure on Ambae. The Vanuatu Red Cross Society (VRCS) was involved in the emergency response, the ongoing recovery and displacement; first to evacuation centres on Ambae and then to neighbouring islands. This included conducting assessments of affected families to understand their needs such as those reported above. It also coordinated with the government and other agencies through inter-agency meetings lead by the NDMO and cluster meetings for Shelter, WASH, Health, Education and Gender & Protection clusters.

The uncertainty of displacement movement and changes to the government planning from evacuation to relocation prevented VRCS from deploying. Instead, they mobilised staff in the disaster management, health, logistics, and Planning Monitoring Evaluation, and Reporting (PMER) and finance departments to coordinate the various elements of the response. Volunteer teams in both Sanma and Penama underwent refresher trainings and briefings in shelter, WASH and gender and protection prior to deployment. The Vanuatu government had developed a plan to support the voluntary evacuation of people to Maewo. The budget allocated for the entire Recovery Plan is VUV 4,411,989,000 (approximately USD 40.1 million), reflecting the scale and scope of the recovery efforts. While some sectors have prioritised actions and budgeting, final

decisions on resource allocation and time frames depended on funding availability and discussions between the government and development partners.

But this plan was delayed, during which time the volcanic activity increased again. The government then took the decision to decree a compulsory evacuation of Ambae to the island of Maewo island and coordinated through the humanitarian cluster system to begin planning and preparing the relocation sites. Prior to the off-island evacuation, VRCS worked to ascertain the needs of people living in evacuation centres on Ambae, many of which were overcrowded. Scenario planning identified that the needs of the population would be largely similar, regardless of the location. VRCS maintained flexibility in its response to ensure that the activities undertaken could be adapted to the changing situation. The distribution of relief items and delivery of community awareness activities was delayed as VRCS waited for government plans on population movement to be confirmed. The budget was also increased as it became clear that VRCS would need to respond in multiple locations, thereby increasing logistics costs.

Ongoing assessment conducted in partnership with the NDMO attempted to ascertain the exact numbers of people who had relocated to each location, this proved to be a difficult task as ongoing movement made data collection challenging. As it became clear that most evacuees had chosen to relocate to Santo Island, VRCS adapted its response to include assistance to these populations in addition to those on Maewo Island. The health cluster continued to highlight psycho-social support as a priority need stating that post-traumatic symptoms remained prominent in the communities due to the uncertainty of information and the trauma from the previous evacuation re-surfacing. Heavy ash falls posed health and safety risks for VRCS staff and volunteers deployed to the island. Health risks include respiratory illness, contaminated water, and lack of food. Safety risks include low visibility, structures collapsing and trees falling. The ash falls also blocked road which made access to the worst affected communities difficult. The distribution team was able to overcome these challenges to access by utilising banana boats to reach some of the more remote communities. Some personal protective equipment (PPE) was provided to volunteers, but the distribution teams were caught off guard when the volcano increased its activity suddenly whilst the team was on the island. The team in the East were particularly affected by this and ensuring sufficient PPE for all volunteers is a key lesson learned from this operation (IFRC 2011).

**Discussions and Conclusions**

These case studies have shown that there are clear signs that the indicators of ‘Effective Implementation’ and ‘Disaster Risk Reduction’ were prioritised over ‘Community Engagement’. The key factors that indicate this in the Philippines after Typhoon Haiyan are,

- Limited access to safe sites and lack of alternative options for affected households.
- Insufficient permission and incentives for building safer structures.
- Relocation of communities far from essential services and livelihoods.
- Restrictions on temporary shelter assistance in the NBZ.

These issues suggest there was a focus on policy enforcement and technical measures rather than actively involving and addressing the needs of the affected communities. In

the case of the flooding of the Padma River in Bangladesh the key factors that illustrate this prioritisation are,

- Joint needs assessment focused on priority needs but lacked community participation.
- Challenges in identifying beneficiaries and difficulties in engaging with affected communities.
- Slow engagement and limited assessments due to the displacement of communities.
- Lack of compensation for land loss, prioritising legal and policy considerations.
- Limited options for durable solutions, relying on existing policies rather than community-driven approaches.

Overall, there was a greater emphasis on addressing logistical, administrative, and policy aspects than actively involving and addressing the specific needs and concerns of the affected communities. The last case study (Vanuatu) has the biggest disconnect. The focus of the response was primarily on emergency measures, assessing needs, and coordinating with government and other agencies. While community engagement was not considered. This is evidenced by the selection of choosing Santo over Maewo for resettlement which caused many to return to Ambae despite the declared state of emergency. It was evident in the splitting of families that also occurred as part of the return that this decision added to issues within the community. All these issues were missed by the government programs and point to a clear break down of community engagement and a prioritisation of 'Disaster Risk Reduction' and 'Effective Implementation' indicators.

Overall, these case studies suggest that prioritisation of select indicators existed before the Sendai Framework and continued well after it had been implemented. Community Engagement is a core component of 'Build Back Better' that must be considered equally alongside 'Disaster Risk Reduction' and 'Effective Implementation'. Doing so provides necessary local knowledge and perspectives, community ownership and empowerment and contextual understanding. Furthermore, engaged communities provides supporting agencies with deeper understanding of their unique dynamics and creates ongoing trust and cooperation that results in more sustainable and resilient outcomes. Thus, without an effectively considering 'Community Engagement' indicators, a holistic approach has not been achieved and major issues ensue.

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**Author's Biography**

Francis Hubbard is a final year PhD student at Massey University in Auckland, New Zealand. His study looks at 'Build Back Better' Frameworks in post disaster reconstruction and recovery with a focus on the hierarchical importance of success indicators for improve implementation and application. Francis accomplished his master's degree in architecture with Merit from Victoria University of Wellington (VUW) where he researched alternative earthquake construction techniques based on vernacular designs in Sumatra, Indonesia. It was during field research in Aceh for this study that he first became involved in post-disaster reconstruction and recovery research. Assisting in the assessment of donated housing after the 2004 Indian Ocean earthquake and tsunami and the changes made by occupants over the ten-year period. In 2019 Francis undertook further work in this field, working with the New Zealand Ministry of Foreign Affairs and Trade, New Zealand Red Cross (NZRC) and the Myanmar Red Crescent Society in developing a client briefing document for the design and development of Red Cross warehouse and training facilities using the emerging HIDEC methodology to develop design principles across language and cultural barriers. Upon his return to New Zealand Francis completed his training to become an International Delegate for the NZRC to be deployed in the event of disasters which require shelter specialist assistance. In 2020 Francis left a full-time role at a top tier architecture firm to pursue his PhD researching the 'Build Back Better' approach in post disaster reconstruction. Recipient of several scholarships and accolades including an award for service to the Malaysian High Commission, and a doctoral grant from the Māori Vice Chancellor of VUW. Francis has recently published several papers in his field and has several more set for publication later this year.

Professor Regan Potangaroa's background is as a structural engineer with 25 years' experience in design and construction in NZ, Australia, Singapore, Malaysia, Brunei and the USA. He is well known internationally in the humanitarian aid community having completed over 200 humanitarian deployments in 22 countries since 1996: most recently with UNHCR as part of their shelter team in Bangladesh with the Rohingya Emergency Response; and currently with the IFRC working on capacity training for the incorporation of Housing Land and Property (HLP) issues into existing shelter and settlement programs for the Asia-Pacific region This humanitarian focus is the core of my research which extends into other areas. Regan is currently developing an Active shooter VR with RedR Australia (together with Massey University); a disaster simulator

## Appendix G, Conference Paper: Identifying the validity of success indicators in the 'Build Back Better' approach

The following conference paper was produced and presented at the 2022 Aubea Conference in Sydney, Australia. It examines the effectiveness of indicators and suggests an early holistic road map to selecting appropriate indicators, which is later further developed in this thesis.

# Identifying the validity of success indicators in the 'Build Back Better' approach

**Abstract:**
'Build Back Better' (BBB) is an ethics-based approach in humanitarian-led post disaster recovery. Adopted by leading International Governmental (IGOs) and Non-Governmental Organisations (INGOs) in response to the United Nations recommendations to disaster risk reduction strategies. Yet, the 'Global Humanitarian Overview'(GHO) published in 2022 called attention to the ever-increasing number of internally displaced people following disasters. This suggests that despite delegates of IGOs and INGOs consistently reporting on success, outcomes of their deployments are not resulting in long term sustainable solutions. It has been well established that in knowing the indicators of success (or the components of a successful indicator), the probability of relief efforts continuing to be effective after humanitarian assistance ends increases expediently. Therefore, based in the findings in the GHO established BBB indicators are either

A) Not sufficient in a BBB approach which suggests the need for new indicators to be uncovered
B) Current indicators (or the components) are sufficient but are not being used to guide activities to achieving outputs in a BBB approach

This paper explores these statements by first clarifying and introducing BBB, its principles and intended application. Importantly it highlights the impacts of a poorly executed approach by exploring implications of the No-Build-Zone policies in the Philippines following typhoon Haiyan in 2013. This research then analysis the most recently identified indicators of success form the most prevalent BBB framework formed by researchers Mannakkara and Wilkinson to identify what went wrong and why through hierarchical structural programming. The findings form a new way to prioritise the indicators and suggest a better method to interpret and action BBB for long term sustainable solutions.

**Keywords**:
Build Back Better, Humanitarian, Indicators, Post-Disaster, Theory vs Practise

## 1 Introduction

Previous research has equally promoted and criticised the term BBB. Praising its ability to quickly convey the appropriate optimistic tone while at the same time, chastising its often poorly defined concepts and its inability to easily transfer into practical application. A fact that continues to be proven through various case studies. Yet, because of its popularity, and being endorsed by the United Nations BBB will persist through both the colloquial and formal terminology of disaster reconstruction for many years to come. Thus, there is a pressing need to continue researching BBB and its long-term sustainability. BBB is used by many organizations in their respective grey literature, including policy, reports, guides, and plans for recovery. In addition, a great deal of research has been done on the theory of its application and indictors. Yet, rather than clarifying, this has led to a confusion on how to BBB ought to be acted on. To untangle and simplify BBB for this paper, its evolution is best explored chronologically providing necessary context for the case study and subsequent analysis of the Mannakkara and Wilkinson framework indicators.

## 2 Literature Review

### *2.1 2002: Beginning with Monday.*

The article that first poised 'building back better' by Jacquelyn Monday talks of an evolutionary shift in the approach used for mitigating impacts of future natural hazards. This would be accomplished by using a framework that links the reduction of vulnerabilities (using existing DRR strategies) to environmental sustainability and social resiliency (Monday, 2002). Monday writes of this framework as a;

*"…holistic recovery that takes advantage of the opportunity disaster brings …[and] …rebuild in a better way, instead of succumbing to the natural desire to put things back the way they were as soon as possible."*

The framework is based on six sustainability focused principles and a follows a 10-step process for 'Local Holistic Recovery'. Which considered all aspects of improvement to a community rather than a singular focus outlook. Proffering that the wide and varied systems of a community; social, economic, environmental, physical, and so on, are in harmonious balance and therefore must all have equal consideration for a successful, sustainable recovery.

Despite the level of acknowledgment this article receives as being the first documented use of 'building back better' in an academic publication, it is rarely noted that Monday was writing for localized disasters in North America, a wealthy region which has many exiting well-resourced post-disaster systems of recovery (Neeraj, 2022; Mannakkara, Wilkinson, & Francis, 2014). In fact, it is Monday's suggestion that the BBB framework be the next evolutionary step in already well instituted disaster programs at the community, county and state levels, relying on existing systems being well resourced to be able to enforce the BBB approach (Noy, Ferrarini, & Park, 2019). Furthermore, writing for localised disasters such as regional earthquakes and flooding prompted Monday to state that this evolutionary holistic approach must be one that is context specific, apricating that every community has a unique balance of its various systems that causes different social, economic, and environmental needs and concern to be addressed (Mannakkara, Wilkinson, & Francis, 2014). From this BBB can be defined as, achieving the betterment of a local community in all aspects by seizing opportunities for improvement made possible by the impacts of a disaster. Achieved by using a defined framework based on six sustainability focused principles in a ten-step process supported by existing systems (Monday, 2002). This definition of BBB did not persist for long although the alluring alterative phrase became popular among post disaster partitioners key elements such as the principles and process of implementation where overlooked.

## *2.2 2006: Clinton's influence.*

Given the terms colloquial popularity among organisations and practitioners assisting in the response of the 2004 Indian Ocean Earthquake. It is not surprising the term BBB was unofficially legitimised with the publication of 'Lessons Learned from Tsunami Recovery, Key Propositions for Building Back Better' (Kennedy et al., 2008; Maly, 2017; Mannakkara et al., 2018; Fernandez & Ahmed, 2019; Vahanvati & Rafliana, 2019; Neeraj et al., 2021). The report was authored by Special Envoy of the United Nations Secretary General, William (Bill) Clinton. The report is an initial observation and recommendation on the international response to the disaster (Clinton, 2006). Researched in 2005 and published in 2006, Clinton set out ten key propositions to BBB. This report is widely attribute to the rise in influence and popularity of the term. (Khasalamwa, 2019; Neeraj, 2022; et al.) Yet remarkably, the use of the words only appears in the body of the report twice, both time in 'Proposition Two'. Here Clinton writes of disasters as an opportunity to shift inequitable development patterns that occur in poorer nations. Patterns that inherently cause those living in extreme poverty to be the most vulnerable to disasters (Sorensen, Vedeld, & Haug, 2006; Brown, et al., 2008; Ahmed, 2017). This report officially linked BBB to overseas development assistance (ODA), writing;

*"… financial resources, international focus, and openness to political and policy reform that often characterize a post-crisis period should allow us to build back better and break out of inequitable development patterns in a sustained way."* (Clinton, 2006)

Although not referenced, the specific language of using a disaster as an opportunity suggest some level of inspiration from Mondays 2002 paper (or other papers influenced by it). The propositions consideration of social, economic, governance and other aspects of recovery hint at a holistic approach, although the exact term is not mentioned. Reasonable comparisons to Mondays BBB stop there. No framework is proposed, no process for action suggested. This is because while Monday writes to improve existing systems in a wealthy and stable region, Clinton's report seeks to establish guidance for an unprecedented circumstance in areas with recognized weaker governance and with less resources at their disposal. Thus, the tone and aim of the report is quite different as it purposes is to support a better and faster transition from internationally supported relief to recovery, helping communities towards a path to development (Clinton, 2006; Maly, 2017). Nonetheless, the report is often considered as genesis of BBB concepts hence its popularity in acidemia and influence in international aid development literature (Neeraj, 2022; Fernandez & Ahmed, 2019; Mannakkara et al., 2018; Khasalamwa, 2019; Vahanvati, 2019)

## *2.3 2007: Hyogo Framework for Action & Twiggs Guidance Note.*

At the time Clintons propositions where being researched, similar concepts were being endorsed by the United Nation through the development of the Hyogo Framework for Action (HFA). 168 Governments adopted this ten-year strategy, embracing the first global blueprint for DRR which provided a detailed work plan for governments, IGOs and INGOs various sectors and actors to refer too. The HFA five priorities were

1. Ensuring that disaster risk reduction (DRR) is a national and local priority with a strong institutional basis for implementation
2. Identify, assess and monitor disaster risks and enhance early warning
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels
4. Reduce the underlying risk factors
5. Strengthen disaster preparedness for effective response at all levels

(UNDRR, 2007; UNISDR, 2011).

In 2007, John Twigg authored 'Characteristics of a Disaster Resilient Community, A Guidance Note' which was commissioned by six agencies[1] who were in support of the promotion of the HFA but had realised in two years of practise that there was no way to monitor success at the community level (Twigg, 2007). The guidance notes aimed to solve this issue by simplifying the HFA into thematic categories that needed to be addressed. The thematic categories are; 'Governance', 'Knowledge and Education', 'Risk Management and Vulnerability Reduction', 'Risk Assessment' and 'Disaster Preparedness and Response'. These categories where further broken down into output and outcome-based indictors called 'Characteristics'. Across the five categories, 136 unique indicators (or 'Characteristics') were identified. Significantly Twigg noted that not all of these were of equal importance but without a universally agreed priority or hierarchy the implementation of these indicators would be at the discretion of the delegates to used based on the context of the situation. This work highlighted the relevance of Monday's theory (and supported Clinton propositions) that DRR and 'better' requires a co-ordinated and comprehensive approach in which progress in one area needs to be match by comparable progress in others. In other words, a holistic method is required and supported by a framework (Twigg, 2007; Zhou, et al., 2014).

## *2.4 2014: Initial BBB framework.*

As the popularity of BBB grew, more organisations incorporated various elements of these themes and indicators into their guidelines (Kennedy, et al., 2008). However, it seems that many continued to define BBB by its narrowest characterisation, seeing the term as physically restoring infrastructure with very loose concepts of what 'better' and betterment meant for the beneficiaries in other aspects. This often manifested in a singular focus outlook which not only neglected social and economic recovery but highlighted a poor understanding of the importance of community involvement (Schilderman, 2010; Mannakkara et al., 2018). In 2014, Researcher, Sandeeka Mannakkara developed a BBB framework in response to the confusion of practitioners choosing which BBB guideline to follow (Mannakkara, 2014). The framework identified categories and principles most acted on (or ought to be acted on) an analysis of seven key standards. They were;

1. 'Key Propositions for Building Back Better' (Clinton, 2006)
2. Principles for settlement and shelter, UNDRO (UNDRO, 1982)
3. Post-Tsunami Recovery and Reconstruction Strategy and Build Back Better Guiding Principles, Sri Lanka (GoSl, 2005)
4. Rebuilding for a more sustainable future, VBRRA, Australia (VBBRA, 2009; VBBRA, 2011)
5. Bam's Reconstruction Charter, BRSSPA, Iran (Omidvar et al., 2010)
6. Recovery and Reconstruction Framework, VBRRA, Australia (VBBRA 2009; VBBRA, 2011)
7. Recovery Strategy, CERA, New Zealand (CERA, 2013)

As each unique concept of post disaster recovery was identified it was listed and then marked for the times it occurred across the set of documents. If a concept was repeated across all or most of the documents, it suggested that concept contributed greatly to achieving a successful recovery to BBB. Key

[1] ActionAid, Christian Aid, Plan UK, Practical Action and Tearfund together with the British Red Cross/ IFRC

concepts were grouped into broad categories with core principles noted below. The resulting BBB framework was figure 1.

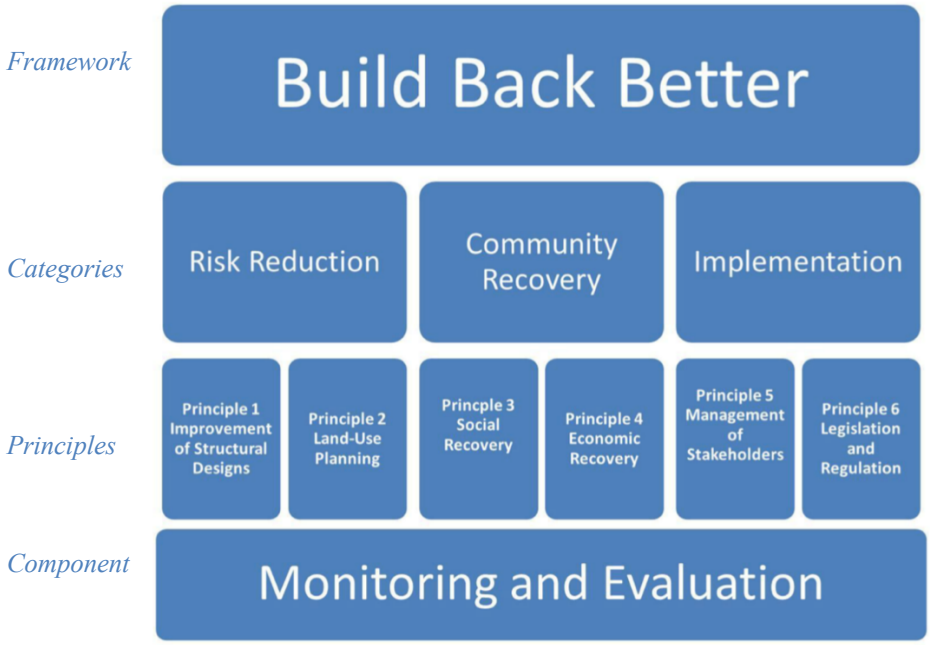


**Figure 1:** BBB Framework (Mannakkara, 2014), edited for clarity by author.

The Framework, its Categories (Risk Reduction, Community Recovery and Implementation) and six principles are designed as a starting point to develop strategies of recovery with an overarching component of 'Monitoring and Evaluation' as the foundation of the principles. The inclusions of relevant indicators for this model are not addressed until 2018 with a revised framework which was first published in 2016 (Mannakkara, et al., 2018)

## *2.5 Case study: The 'No-Build-Zone', Philippines, 2014.*

It was in this context, with established BBB frameworks, principles and indictors identified that ought to have guided and supported key decisions of the recovery following Super Typhoon Haiyan in the Philippines. Unfortunately what occurred was a quagmire, most significantly with the implementation of no-build-zones (NBZ). Used extensively in Banda Aceh and Samoa following the Indian Ocean Earthquake in 2004, the Philippines government applied a similar approach in 2014. The 'Department of Environment and Natural Resources' (DENR) enforced a NBZ of up to forty metres along the coastlines of eastern Samar and Leyte, two of the worst hit areas. The declaration was based on protocols outlined in Article 51 of the 'Philippine Water Code', as a presidential decree (Offical Gazette, 1976). The intention was to apply DRR measures and move those located in these areas to reduce the impacts of future disasters. However, there were numerous problems with this strategy. Firstly, the impact of the storm was felt on average, 200 metres inland which highlights the destructive power of storm waves combined with storm surges and, as Haiyan occurred at a time of low tide, that distance could have extended by a further twenty percent. Therefore, the standardised 40-metre zone would not secure people's safety. In the city of Tacloban, where a four to seven metre surge was experienced, damage extended up to 500 metres inland at the northern and downtown parts of the city and this increased to upwards of two kilometres in low-lying, swampy areas south of the downtown. Thus, what was being touted as a DRR measure achieved very little (Kinghorn, 2018; Santos, 2014; Mikami, et al., 2016).

The second problem was that these zones were the location of many informal settlements, a common issue for the Philippines. Two years earlier in 2012, it was reported that 2.2 million Filipinos, or 5.4 percent of the total urban population, lived in informal settlements existing on the edge of many coastal municipalities where over sixty percent of the population reside. These settlements typically occupied contested zones, particularly the zone from the high tide to the low tide mark which belongs to neither state nor private ownership which led to those in systemic poverty to 'chose' to occupy these spaces

(see figure 2, foreshore). In addition to the opportunity the lack of land titles and ownership afforded, these areas gave those living good access to the sea which was an invaluable resource of work and employment (DENR-USAID & EcoGov, 2004; USAID, 2017).

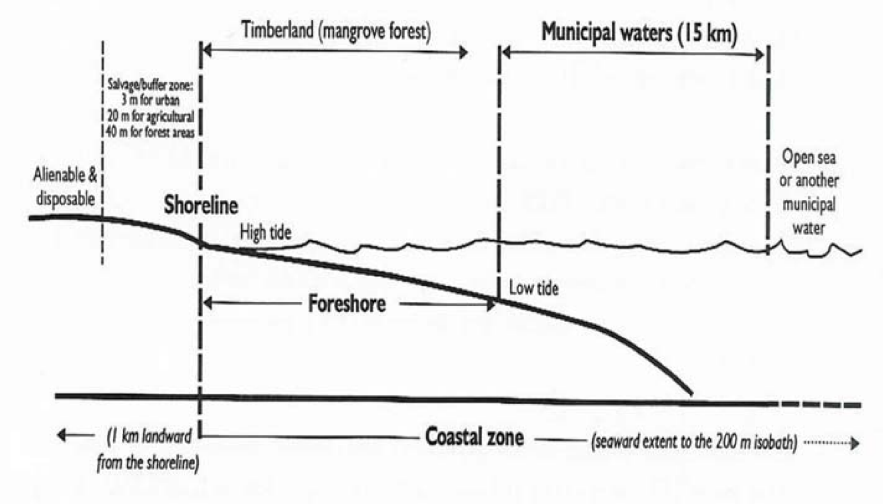


**Figure 2.** A diagrammatic representation of the foreshore area and other features in the coastal zone (Land Management Bureau)

The third problem was that the NBZ was applied selectively, a consequence that was reportedly dependent on which political party the area had voted for in the last election. Areas that were known supporters of the current government faced less impacts from enforced relocations in comparison to others causing controversy, confusion and greatly impacting the quality of response form many aid agencies that had arrived in country to help (Atienza, et al., 2016; Basilio, 2014; Santos, 2014).

These problems and the contested nature of these zones where most evident than in the city of Tacloban. Evident in the minutes of the meeting between the 'Tacloban Shelter Hub' and the 'Tacloban City' on June 3rd, 2014 (Seven months after Haiyan) which read as follows: (Board, 2018)

1. The City of Tacloban communicated their decision that no temporary shelter assistance should be provided in high-risk areas (NBZ). This overrode earlier consent for humanitarian agencies to assist.
2. And that any assistance had to be only in temporary relocation sites in Tacloban North. These were out of town, away from the sea and distant to the NBZ where affected families were originally.
3. Shelter Cluster partners countered with the need to address gaps in temporary relocation areas, such as accessibility, size of housing units, safety and security issues, access to basic services (WASH, electricity, education, health etc.); and access to sustainable livelihoods.

There had not been any discussion with aid agencies nor engagement with affect communities and moreover, the desire of the city mayor was to redevelop the area for tourism and hotel construction. Thus, aid agencies were blocked from assisting the most vulnerable, the most impacted, who had their lives in the NBZ. It raises the question if Twigg's indicators of the UNs priorities for DRR, were sufficient and, if they were why are the not being used to guide activities to achieving outputs in a BBB approach?

# 3 Research Methodology

Researchers Mannakkara and Wilkinson released an updated version of the BBB framework in 2016 (figure 3). Note that this version includes two additional principles, 'Early Warning and DRR Education' and 'Monitoring and Evaluation' which was an overarching component in the previous version of the framework but is now considered a principle unto itself, categorised under 'Effective Implementation'

**Figure 3:** BBB Framework (Mannakkara & Wilkinson 2016), edited for clarity by author.

This updated version reflects more recent finding from research, primarily case studies which included all disaster types and locations to make the framework intentional broad. The updated version also reflect updated United Nation priorities for action, specifically the Sendai Framework which superseded the HFA in 2015 (Malay, 2017; Mannakkara et al., 2018; Vahanvati, 2019; Neeraj, et al., 2021; Cheek & Chmutina, 2021) A publication on the practical applications of the framework in 2018 included a suite of 87 indictors. Indictors were grouped by common components within each principle and had the same aim as Twigg's 136 'characteristics', to simplify and measure success of the frameworks impact and guide a more successful recovery. A comparison between the two sets shows that there is significant overlap and Twigg's thematic categories of the HFA align closely to Mannakkara & Wilkinson's framework. Repetitive discovery of similar indictors suggest that it is not the indictors that are insufficient but in how they are being prioritised in their implementation. This would be improved with a universally agreed hierarchy.

A method to achieve this is through hierarchical structural programming of the 87 indictors identified in the framework. These indictors where selected above Twigg's as they represent the latest and most up to date indicators of success in a BBB framework. Hierarchical structural programming is accomplished by first arranging the indictors in a matrix to identify which indictor links to which. An indictor may link to any number of other indictors and the connection in considered to go both ways. Indictors can link across all components, principles and categories allowing the holistic nature of the approach is preserved. The links are then run through a hierarchical software which produces an organizational structure that groups the indictors into sets based on their connectedness reflecting levels of importance. This is visually represented in a tree structure, with a parental node (most connected indictor) at the top and then branches below to other grouped indictors. Several groups which are similar in theme are called a cluster. These cluster then can be named based on the common trend of the indictors contained within them. The result is a prioritised map of the indictors no longer defined by principles or categories yet preserving the frameworks holistic approach (Alexander & Manheim, 1962; Lutz, 2001; Nakada, et al., 2004).

Figure five shows the tree that was produced by the hierarchical programming. The numbers in the groups refer to the indictors in the 2018 publications which were extracted and appropriately numbered 1 to 87. The tree is analysed by considering the types of indicators that have been grouped together at the lowest part of the tree. These have been labelled 'Group 1' to 'Group 22'. Groups that are similar can be simplified into clusters. These can also be seen in figure five, and have been labelled 'Cluster 1' to 'Cluster 7'. These clusters form the lowest part of a diagrammatic map that sets out the priority of the indictors which is explained further in section 4, 'Findings and Discussions'.

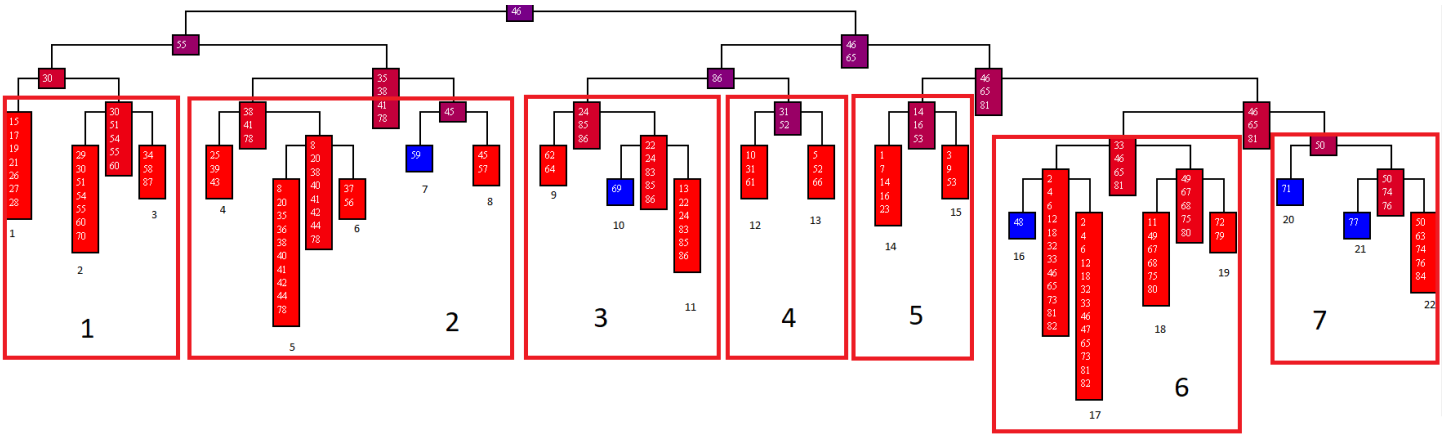


**Figure 4:** Indictors arranged in sets by how linked they are according to the matrix. Groups and clusters identified, created by author, 2022

# 4 Findings and Discussion

## *4.1 Hieratical decomposition programming analysis*

### *4.1.1 Cluster one*

Cluster one is formed by groups one through three. This cluster has 17 indicators total; four concerning 'DRR', six from 'Community Recovery' and seven from 'Effective Implementation' combining principles of multi-hazard-based land-use planning, phycological and social recovery with institutional mechanisms and monitoring and evaluations. the factors that links these indictors concerns the need to have an informed, educated, well advised and support community so they may actively participate in the recovery. Cluster one is supported by addressing community and social drivers first which in turn is only achieved by enforcing mechanisms that allow good communication, full transparency of decisions and strong information management. This also is a foundation to facilitate 'cluster two'

### *4.1.2 Cluster two*

Cluster two is formed by groups four, five, six and seven. This cluster has sixteen indictors; three concerning 'DRR', ten from 'Community Recovery' and three form 'Effective Implementation' combining principles of structural resilience, multi-hazard-based land-use, early warning and DRR education, economic recovery, institutional mechanism and legislation and regulation. The factors that link these indictors is promoting, well advised and supported industry and business. Cluster two is support by first addressing economic and livelihood recovery drivers. As mentioned, this can only be done once mechanisms of good communication, full transparency and strong information management are enforced. Cluster one and cluster two form one branch of this diagram. The overarching priority that emerged is to choose a local level body (either existing government organization or new recovery authority) most suited to the local context to plan, implement and manage recovery activities, and facilitate coordinating and partnership between stakeholders involved in recovery.

### *4.1.3 Cluster three*

Cluster three is formed by groups nine, ten and eleven. This cluster has only five indicators, only one from 'Community Recovery' and four from 'Effective Implementation'. The principles of economic recovery, institutional mechanisms and legislation and regulation. The factors the link these indicators are in the promoting of education in DRR and promoting lessons learnt to the community and to all other stakeholders.

### *4.1.4 Cluster four*

Cluster four is formed by groups twelve and thirteen. This cluster has nine indicators, four from 'DRR', four from 'Effective Implementation' and only one from 'Community Recovery' combining principles of structural resilience, multi-hazard-based land-use planning, early warning and DRR education with monitoring and evaluation. The factors that link these indicators are in the expanding and improving of knowledge. Cluster three and cluster four extend from a common priority of

addressing the understanding of existing risks and future impacts to avoid community to activities that would exacerbating an unknown issue.

### *4.1.5 Cluster five*

Cluster five is formed by groups fourteen and fifteen. This cluster has eight indicators, seven from 'DRR' and one from 'Effective Implementation' combining principles from structural resilience, multi-hazard-based land-use planning, early warning and DRR education and monitoring and evaluation. The factors that link these indicators are physical reconstruction drivers that facilitate safer rebuilding.

### *4.1.6 Cluster six*

Cluster six is formed by groups sixteen, seventeen, eighteen and nineteen. The largest cluster by far with twenty-two indicators linked. Six from 'DRR', two from 'Community Recovery' and fourteen from 'Effective implementation'. Combining principles from structural resilience, multi-hazard land-use planning, economic recovery, institutional mechanisms, legislation and regulation, and monitoring and evaluation. The factors that link these indicators are concerning the expediting recovery drivers the need to be addressed.

### *4.1.7 Cluster seven*

Cluster seven is formed by groups twenty, twenty-one and twenty-two. This cluster has seven indicators all from 'Effective Implementation' category. Combining all three of its principles, institutional mechanisms, legislation and regulation, and monitoring and evaluation. The factors that link these indictors concerns funding mechanisms. Clusters five, six and seven stems from a group which repeats twice in the tree. This group has three indictors, they are from 'Effective Implementation' and concern, choosing appropriate institutional mechanisms, legislation compliance, and monitoring and evaluation. This can be called 'quality and compliance monitoring mechanisms' which need to be addressed before proceeding to the clusters under it. From this analysis a hierarchical diagram (figure 5) can be produced which would guide the priorities of activities when engaging in a BBB framework approach.

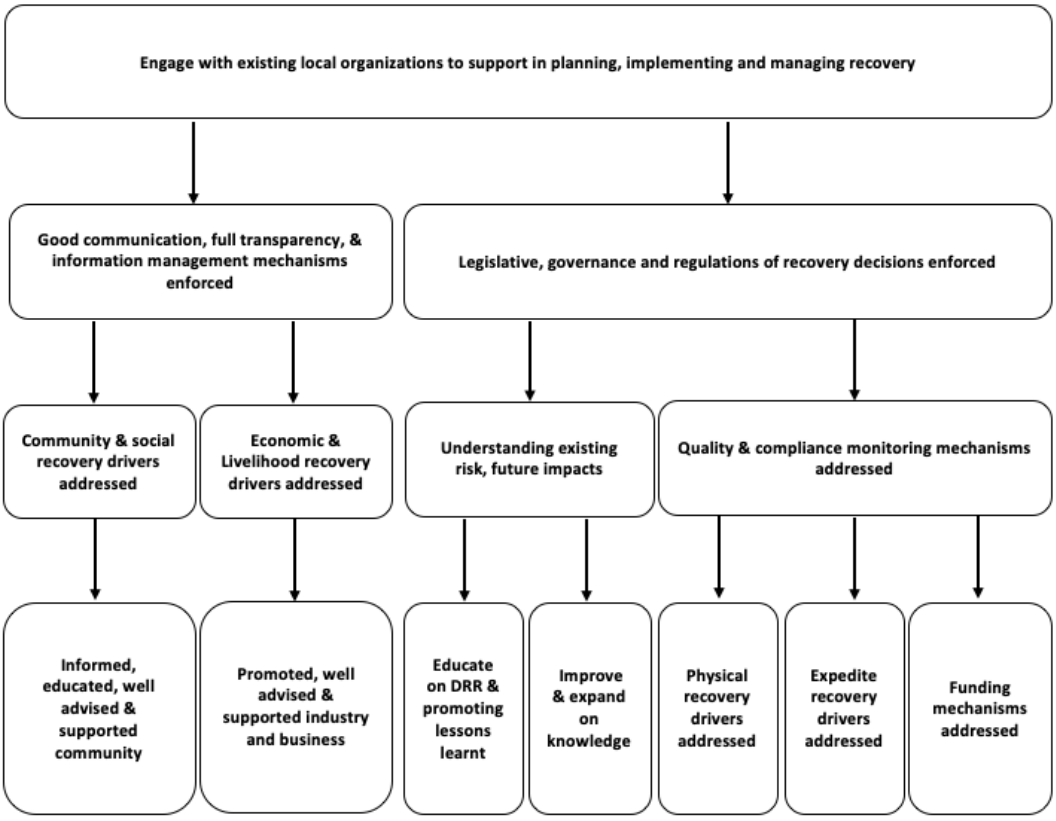


**Figure 5:** Priority diagram of BBB clusters, by author

*4.2 Reflection on case study*

Here we see that BBB using a NBZ policy failed because its focus was solely on the legislative, governance and regulation cluster. While vitally important, this cluster is equal to several others which would give a vital foundation or grounding. The review of this response, using the findings from this paper, shows that the NBZ was not going to work. There were no community, social recovery drivers addressed especially given that there was no communication, transparency and information management mechanism enforced. Likewise, no economic recovery drivers nor quality and compliance mechanisms is evident from the lack of any action even five years after typhoon Haiyan. There was evidence of legislation and regulation being enforced but, as previously mentioned, this was selectively applied. It is so bad that one wonders how such a decision was made and wonders about the future application of NBZ with the additional weight of climate change. The final report of the Typhoon Haiyan (Yolanda) Shelter Response produced in May 2016 concluded that

*"land issues indirectly underpinned almost every challenge related to the recovery of affected populations. Lack of access to safe sites led not only to affected households remaining in NBZ but also to lack of implementation of build-back-safer due to lack of permission to build stronger structures and lack of incentive to build secure structures with durable materials that would later have to be taken apart or were in any case not felt to be intended for long-term use. Lack of safe land near livelihoods and community facilities meant that some relocated communities were travelling long distances for all services and livelihoods. Shelter agencies tried several strategies to mitigate challenges faced due to land issues. Rental assistance had been given to households with damaged houses in NBZ; legal assistance was provided to households to facilitate longer-term tenancy with landowners; some tried coordinating with governmental agencies to procure land; and relocation sites were searched for near livelihoods and services."*

The suggestion from that report is that BBB indictors should be appropriately linked and that such a link would make good future proofing.

# 5 Conclusion and Further Research

It is evident from case studies, including the NBZ in the Philippines, that identifying more indicators of success would not contribute to long term sustainable solution but rather knowing how to approach them would. Often delegates sent to disasters to assist in recovery are limited by time, being on deployment from a few weeks to a couple of months on average. They are also often hindered by lack of clear information prior to arriving and the situations quickly change and develop. While there is quite literally hundreds of indicators available in which to guide success it may be they are simply over overwhelming for practitioners in the field. This paper presents a method by which to set priorities using the existing indictors within the BBB framework. Further research needs to be done to refine the 'priority diagram' that was produced here. Likely this would be by repeating the analysis on similar frameworks with differing indicators and comparing the results. It would also benefit from engagement with practitioners who would offer much needed insight to why it appear current indicators (or the components) are sufficient but are not being used to guide activities. This is some of the initial findings which form part of a larger PhD study. It is intended that this work supports and contribute to the existing BBB framework and indicators not to be a replacement for them.

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