

Frameworks for recovery

A literature study



Part of the project National Recovery Guide NL

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Summary

Despite the justified attention paid by policymakers and academics to disaster and crisis preparedness and response, the so-called post-phase – the period following the acute phase of a disaster or crisis – remains relatively underdeveloped and underexposed. In the post-phase, the consequences of the impactful event and the extent of the damage often only become truly visible. A unifying, interdisciplinary framework for crisis authorities within municipalities and regions that aligns with the current threat landscape and enables the post-phase to be addressed in collaboration with partners is currently lacking. The aim of this literature review is to identify and analyse internationally available frameworks for recovery in order to establish a theoretical basis for a framework for coherent and integrated guidelines on recovery and aftercare in the Netherlands.

Based on the search strategy employed, nine frameworks have been identified.

- > Framework 1. Management framework for disaster recovery projects
- > Framework 2. Organisational Capability Framework for Earthquake Recovery
- > Framework 3. Build Back Better Framework
- > Framework 4. National Disaster Recovery Framework
- > Framework 5. Framework of Key Activities and Processes in the Preparedness and Recovery Phases of Disaster Management
- > Framework 6. Framework for Community Participation
- > Framework 7. Inclusive Disaster Risk Management Framework
- > Framework 8. Community-Based Recovery Framework
- > Framework 9. Integrated Framework for Evaluation of Sustainable Disaster Recovery

These frameworks can broadly be divided into two categories: frameworks that focus on a wide range of themes and processes relating to recovery, and frameworks that focus on the key issues, problems and solutions associated with a specific theme.

The frameworks cover a wide range of themes relating to recovery, including basic support (housing, food, medical care), restoration work, claims settlement and finances, provision of information, and research and evaluation. Although some frameworks address several of these themes, no single framework was found that describes all of them. Furthermore, based on the results, it can be concluded that, apart from a few brief references, the selected articles pay insufficient attention to the psychosocial impact of disasters and crises.

What else stands out is that the frameworks identified are mostly described from the perspective of governments and the private and public organisations involved. Although themes such as inclusivity and social participation are mentioned, and some frameworks address recovery needs within communities following a disaster, the specific needs and challenges faced by those affected are not elaborated upon in the frameworks. These, like the content of the identified frameworks, will need to be given a central place in the guideline for recovery.

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Introduction

Background

Threats are evolving. In addition to climate change, European society is increasingly confronted with geopolitical tensions and the threat of war. Concrete examples of this are the war in Ukraine (since February 2022) and the Middle East (particularly since October 2023). In an era characterised by increasing global tensions, armed conflicts on European soil and a growing frequency of (unprecedented) crises, the need for a well-prepared and resilient society is more urgent than ever. The Dutch government must anticipate potential disasters and crises that could potentially disrupt society.

Despite the justified attention paid by policymakers and scientists to disaster and crisis preparedness and response, the so-called post-phase – the period following the acute phase of a disaster or crisis – remains relatively underdeveloped and underexposed.

In the post-phase, the consequences of the impactful event and the extent of the damage often only become truly visible. The specific post-phase activities required, the organisations involved and the duration of the post-phase depend on the situation. It generally has a much longer time horizon than the acute phase (Bakker et al., 2026; Berke et al., 1993; Dückers et al., 2014; Ligthart & Dückers, 2011; Mannakkara & Wilkinson, 2014; Muller et al., 2020; Zannoni, 2010).

Although guidelines and action plans exist for sub-themes and specific aspects (such as psychosocial support and care for citizens and professionals; ARQ, 2023; ARQ, 2025), a government-wide vision and strategy for recovery in the broadest sense has been developed (Dücker, 2012) and a broad 'post-crisis team' is mentioned in the *National Crisis Management Handbook* (NCTV, 2022), there is no comprehensive guideline for recovery. Although the broad range of relevant themes has previously been identified (see Zannoni, 2010; Dücker, 2012), the attention paid by policymakers and academics to developing comprehensive, practical approaches based on scientific research and focused on this broad range of themes has so far been limited.

It is, however, important that Dutch crisis management better prepares for the post-crisis phase by working specifically on guiding frameworks, education, training and exercises, and methods to facilitate this. Such processes require coordination with stakeholders from policy, practice and academia, whereby knowledge from practice and research is incorporated into the development of guidelines and tools (Te Brake et al., 2022; Dücker et al., 2022; Abderhalden et al., 2025; Vollmer et al., 2025). The present literature review forms part of a project, funded by the European Commission, aimed at establishing a coherent, interdisciplinary and integrated framework for crisis authorities within municipalities and regions, enabling them, together with partners, to address the various tasks during the post-crisis phase in a manner that aligns with the current threat landscape.

Objectives and research questions

The aim of the literature review is to identify and analyse internationally available frameworks for recovery and aftercare in order to establish a theoretical basis for a framework for a coherent and integrated guideline on recovery in the Netherlands.

The central research question is:

Which frameworks for recovery are described in international academic literature?

The following sub-questions are addressed:

- > How is recovery defined within the frameworks?
- > What is the core (objective, context and key elements) of the frameworks for recovery?
- > What similarities and differences exist between the frameworks?
- > What relevant themes for recovery are described – in addition to the frameworks – in the selected articles?

Reading guide

Chapter 1 explains the choices made regarding the research method used. Chapter 2 provides a description of the term 'recovery'. Chapter 3 describes the frameworks included after which these are compared in Chapter 4. Chapter 5 describes several specific themes of recovery that were described in the articles within the context of the frameworks. Finally, Chapter 5 contains the conclusion and discussion of this study.

1 Method

This chapter discusses the type of literature review that was conducted: a scoping review. First, the databases and search strategy are described, followed by an explanation of the selection process and the screening of the articles. Finally, the chapter describes how the information obtained was analysed.

1.1 A scoping review

A scoping review is a systematic method for mapping the size, scope and characteristics of existing literature on a particular topic (Arksey & O'Malley, 2005).

1.1.1 Databases and search strategy

To identify relevant studies, searches were conducted in Web of Science, PsychINFO and MEDLINE. The three databases cover peer-reviewed journals from various disciplines, such as sociology, psychology, engineering and public administration.

The search strategy is based on a combination of search terms: (guideline* OR framework*) AND "disaster recovery" AND ("disaster management" OR "crisis management" OR "emergency management" OR "management of disasters"). The searches were conducted in March and April 2026 and yielded 152 articles. After checking for duplicate articles, 7 articles were removed, leaving 145 articles for screening.

1.1.2 Inclusion and exclusion criteria, screening

Following the searches, a selection process took place to identify the most relevant articles for the study.

Criteria

Inclusion: The search strategy focused on peer-reviewed articles on frameworks for recovery following a disaster or crisis. Frameworks are defined as evidence-based, guiding organisational frameworks or models that enable policymakers, professionals or researchers to determine key themes, tasks, objectives, criteria to be pursued or proposed methods for addressing the post-disaster or post-crisis phase. The research methodology of the articles could be qualitative, quantitative or conceptual in nature.

Exclusion: Articles on technological or simulation frameworks were not included, as the focus is deliberately on frameworks designed to support citizens in their recovery following disasters and crises. Studies published in languages other than English or Dutch were also excluded.

Screening

The screening of the 145 articles identified took place in two phases. During the first round, two researchers independently screened the identified articles based on their titles and abstracts, using the inclusion and exclusion criteria. During the second round, the full text of the selected articles was screened.

1.2 Illustration of the selection process

The steps in the literature review and how these led to the final selection of the articles are shown in Figure 1.1.

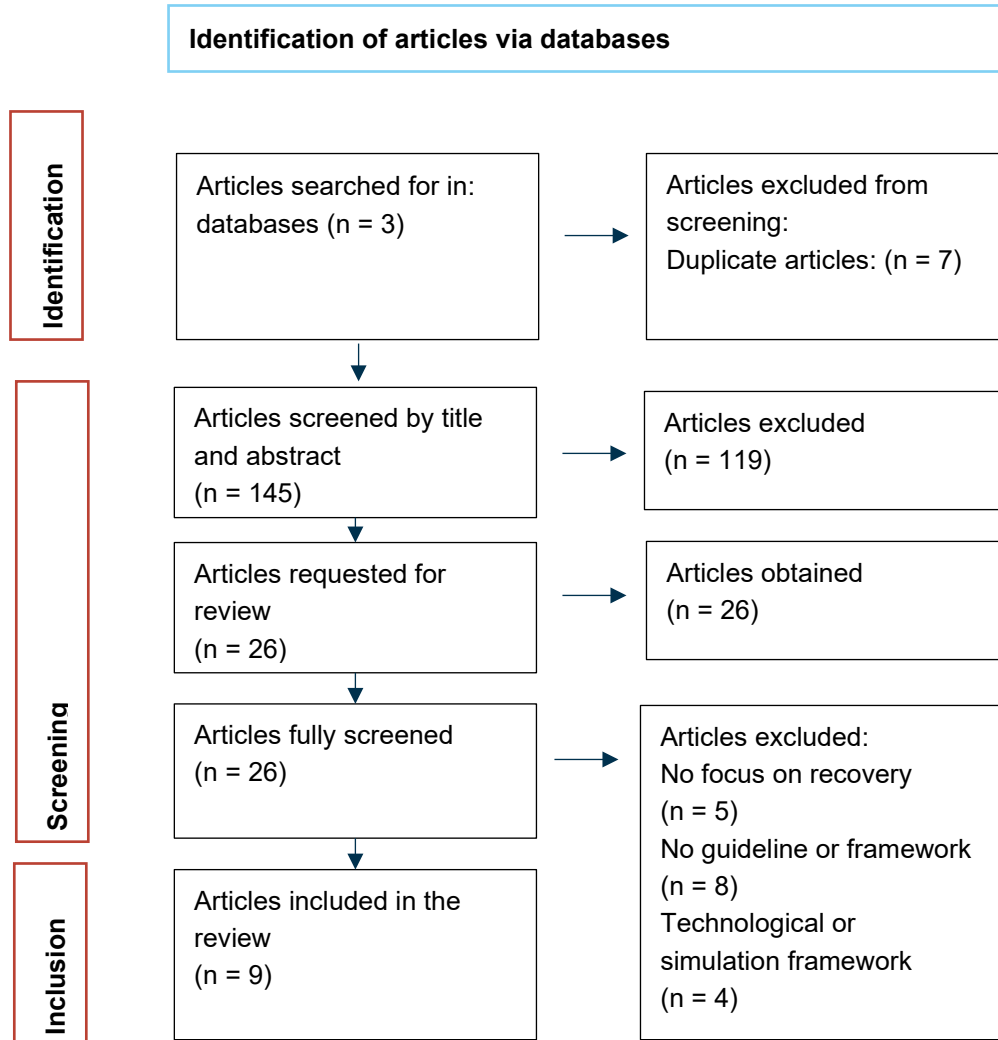


Figure 1.1 PRISMA flowchart

1.3 Analysis

The selected articles were studied, after which relevant information was extracted from the publications and categorised. The frameworks were then compared with one another based on their objectives and focus, the elements addressed within the frameworks, and the context in which the frameworks were developed. This information was subsequently incorporated into Chapters 2 to 5.

2 Recovery

The frameworks in the selected articles all concern 'recovery': a term used in the international literature to denote a phase in the 'disaster cycle'. Within the Sendai Framework¹, 'recovery' is defined as: "The restoring or improving of livelihoods and health, as well as economic, physical, social, cultural and environmental assets, systems and activities, of a disaster-affected community or society, aligning with the principles of sustainable development and "build back better", to avoid or reduce future disaster risk." (UNDRR, 2017). This chapter discusses what the articles say about the term recovery.

2.1 What is meant by recovery?

In less than half of the articles, the researchers describe what they mean by recovery. Oloruntoba et al. (2018) describe recovery as the entirety of activities and processes aimed at reducing both the immediate consequences of a disaster and its long-term effects, and at facilitating a rapid recovery. The consequences of disasters are diverse and can range from injuries, deaths and mental health issues to damage to buildings, economic losses and environmental damage (Bahmani & Zhang, 2022). At the individual level, recovery contribute to the resumption of normal life patterns and the restoration of psychosocial stability. In addition, recovery reduce the vulnerability of communities by providing information, guidance, materials and other resources (Oloruntoba et al., 2018).

According to Thapa and Pathranarakul (2019), recovery is aimed at both restoring and ensuring improvements in society in terms of livelihood security, health, and economic, social, cultural, physical and ecological systems. Zhang and Tao (2018) view recovery as a sustainable endeavour. This involves striving to meet current needs without compromising the opportunities of future generations.

2.1.1 From traditional recovery to 'Build Back Better'

In the past, recovery mainly involved repairing physical damage to buildings and infrastructure (Mannakkara & Wilkinson, 2014). However, various studies show that simply rebuilding the situation as it was before a disaster often leads to the re-creation of known vulnerabilities (Kennedy et al., 2008; Lyons, 2009; Mannakkara & Wilkinson, 2014). When communities are restored to pre-disaster standards, they remain exposed to similar risks in the event of a subsequent disaster.

Practice shows that recovery can also offer an opportunity to address and correct structural vulnerabilities within a society (Lewis, 2003; Mannakkara & Wilkinson, 2014). This is referred to in the literature as the 'Build Back Better' concept (in line with the Sendai definition of 'recovery'; UNDRR, 2017). According to Clinton (2006), Khasalamwa (2009) and Roberts (2000), Build Back Better entails using the reconstruction process to improve the physical,

¹ The Sendai Framework for Disaster Risk Reduction is a policy framework adopted by the Member States of the United Nations in 2015. It helps countries to prevent disasters as far as possible, mitigate their impact and make societies more resilient.

social, ecological and economic conditions of a society, with the aim of creating a more resilient society. The concept advocates a broad, holistic approach to recovery, focused on future-proofing and societal resilience (Mannakkara & Wilkinson, 2014). Such a holistic approach is also mentioned by Bahmani and Zhang (2022). They argue that the consequences of disasters require an integrated and detailed approach. According to Lizarralde (2004), recovery projects should be regarded as a portfolio of autonomous yet interdependent projects, ranging from physical recovery to economic and cultural development.

2.2 The time dimension of recovery

Various researchers distinguish between two phases of recovery: short-term and long-term. According to Bahrama and Zhang (2022), short-term recovery focuses more on restoring the situation as it existed before the disaster or crisis, whilst long-term recovery provides scope for improving that situation, such as enhancing the resilience, equity and sustainability of societies. Thapa and Pathranarakul (2019) and Zhang and Tao (2018) assign a slightly different meaning to short-term and long-term recovery. They define the short term as the rapid restoration of basic infrastructure and social and economic functions. Long-term recovery encompasses physical reconstruction, but also concern livelihoods, the economy, culture and risk reduction; in short: activities aimed at returning to life to normal (Zhang & Tao, 2018).

The post-disaster phase is often long-lasting and political in nature. Whereas the acute phase focuses, for example, on rapid technical assessments of a building's structural safety, the recovery phase relating to that same building may involve issues such as safety, liveability, aesthetics and broader contextual factors. Factors such as infrastructure, population dynamics, administrative structures, mobility, access to education and healthcare, and available resources influence the pace and outcome of recovery processes, which can last from years to decades (Thapa & Pathranarakul, 2019; Vallance, 2015).

In their article, Olshansky and Johnson (2014) introduce the concept of *time compression*: the concentration of urban development activities that, in the aftermath of a disaster, must take place within a short timeframe and often in the same location. The time pressure this creates increases the complexity of recovery and requires intensive planning, rapid decision-making, the involvement of multiple stakeholders, and effective communication. Recovery and aftercare are therefore not linear processes with a fixed endpoint, but a complex, non-linear journey that ultimately transitions into 'business as usual' (Olshansky, Johnson, & Topping, 2006; Spangle & Associates, 2002).

2.3 Inequality

Disasters do not affect everyone in the same way. Not everyone is equally exposed, the consequences do not affect everyone equally, and some individuals or communities are more vulnerable than others. Groups that had greater resources and social networks prior to the disaster tend to recover more quickly, whilst less resilient communities, women and marginalised groups are disproportionately affected and recover more slowly (Thapa &

Pathranarakul, 2019). During the recovery phase, a way must be found to address such inequalities.

3 Frameworks for recovery

The international literature consulted contains only a limited number of frameworks on recovery in the aftermath of a disaster. This chapter outlines the core elements of the individual frameworks (listed in alphabetical order by first author). It examines the objectives, context and key elements of the frameworks.

3.1 Management framework for disaster recovery projects

Bahmani and Zhang (2022) describe a conceptual management framework for disaster recovery projects. This framework aims to simplify the management process of disaster recovery projects by identifying the most common activities and tasks and positioning them at appropriate points on a timeline. By applying the proposed framework, an integrated and comprehensive post-disaster phase can be achieved.

3.1.1 Background and context

The framework is based on a systematic literature review, in which scientific articles were examined. The articles dealt with various disasters and crises, such as earthquakes, floods, tsunamis and hurricanes, which mainly occurred in Asia, North America and Oceania.

3.1.2 Elements of the framework

In the framework by Bahmani and Zhang (2022), a distinction is made between activities that take place in preparation for a disaster or crisis and the planning for recovery after a disaster or crisis has occurred. In addition, some activities take place in the integration phase. These are the activities that belong to both disaster preparedness and recovery.

- > Recovery takes place across four phases of project management: planning, design, construction and procurement.
 - Planning plays a crucial role in recovery projects due to time and budget constraints, and the complexity and uncertainty of recovery projects. It is essential to achieve comprehensive and detailed planning due to the increasing frequency of disasters and their sudden and destructive effects.
 - During the design phase, a distinction is made between housing and infrastructure. Common challenges in housing regeneration include high costs, low sustainability and the neglect of socially vulnerable groups (which can widen the poverty gap). Several preconditions are important for the successful design of infrastructure: effective management, clear and well-established regulations, competent managers, effective consultation and communication with stakeholders, user-friendly information management systems and adequate resource management.
 - The construction phase requires proper management based on the three primary objectives of construction projects (cost, time and quality), which must be balanced against one another. A poor understanding of building standards, the use of non-engineering structures and materials, and a lack of supervision during construction

- are among the most common mistakes that can lead to low-quality structures in post-disaster recovery projects.
- Procurement is vital for securing adequate resources: labour, materials and logistics. Many recovery projects struggle with a shortage of resources, which can lead to delays.
- > Preparation for a disaster or crisis falls into two categories: mitigation and preparedness. Mitigation involves the measures taken to reduce risks and potential damage. Examples include community-focused disaster planning, insurance, taxation and policy aimed at spatial planning. Preparation involves getting ready for a potential disaster or crisis, so that swift and effective action can be taken if the disaster or crisis occurs. Examples include assessment of available resources, training sessions, raising risk awareness and organising emergency shelters.
- > Recovery following a disaster or crisis is divided into six categories within the framework.
- Recovery of housing and infrastructures. Reconstruction following a disaster has two aspects: the restoration of damaged or destroyed facilities (housing and infrastructure) and development. The restoration of facilities is closely linked to improving the general well-being of residents (Cheng et al., 2013). Developments are crucial for prevention and preparation for future disasters (Hidayat and Egbu, 2010).
 - Management recovery. Due to the numerous issues requiring guidance, there is a need for an administrative and organisational body in the post-disaster phase. In addition to strategic decision-making (rules and legislation), management is an essential prerequisite for ensuring compliance with and the legitimacy of established rules. Examples of activities within this category include assessing the damage, prioritising recovery activities, ensuring the provision of information, process evaluations and developing implementation plans.
 - Social recovery. Disasters can have serious consequences for both the physical and mental well-being of people (Akiyama, 2019; Ge et al., 2010; Liu and Han, 2009; Opdyke, 2017). Conditions for successful social recovery in the post-disaster phase include stable institutions, the availability of human capital (knowledge, skills and competencies) and financial support (Liu and Han, 2009). Other important factors for social recovery are social relationships, trust in the government, public health, the availability of schools, gender and power equality, and taking people's needs into account.
 - Economic recovery. Generally speaking, the restoration of livelihoods (local economic activity) following a disaster is central to research on economic recovery. Economic recovery can be divided into three main dimensions: planned and fair financial assistance, recovery of livelihoods (means of subsistence) and support of residents' business.
 - Policy recovery: Regulations established by public authorities influence recovery projects following disasters and crises. Due to the specific requirements of such projects, changes and adjustments to policy are frequently observed (Johnson, 2006). Activities included here: policy adjustments, the use of financial incentives, approaches to policymaking (top-down, bottom-up) and government supervision.
 - Environmental recovery. Most of the available research reveals environmental damages, as one of the greatest obstacles on the way to a successful recovery of disaster recovery projects (Xu and Lu, 2012). Post-disaster recovery projects should

focus on ecological-friendly decisions, whilst simultaneously striving to restore the damaged environment (Lizarralde, 2004).

- > Activities in the integration phase are those that form part of both disaster preparedness and recovery. These include activities such as stakeholder participation, communication, reducing vulnerability to disasters and crises, financial support and updating regulations.

3.2 Organisational Capability Framework for Earthquake Recovery

Chang-Richards et al. (2017) have developed an organisational capacity framework for effective recovery following earthquakes. The framework identifies the five key challenges faced by organisations operating in the post-earthquake recovery phase. It also describes three core capacities required to address these challenges.

The framework offers practical insights that can help the engineering and construction sector to anticipate and prepare for capacity challenges, both at the level of individual organisations and at sector level, and in collaboration with government agencies within the context of disaster management.

3.2.1 Background and context

The framework is based on longitudinal, empirical research involving fifteen construction organisations that were actively involved in recovery work following the earthquake in Christchurch, New Zealand, between 2012 and 2015.

3.2.2 Elements of the framework

The framework describes the five main challenges for the engineering and construction sector during the recovery phase following an earthquake, namely: (1) technical incompetence (lack of knowledge and expertise), (2) additional technical requirements, (3) a lack of training in disaster psychology and social interaction, (4) shortfalls and temporary supply of talent pool (lack of capacity), and (5) delayed, fluctuating and uncertain demands.

The core capabilities required to address these challenges include:

- > (A) Knowledge and expertise in the field of disaster recovery, addressing the first three challenges (as mentioned above).
- > (B) Adaptive capacity within the organisation, which responds to the fourth and fifth challenges. Possessing adaptive capacity, including through organisational- learning, innovation and collaboration, is crucial for dealing with disruptive events such as earthquakes.
- > (C) Collective support between organisations that enables solutions to be provided for all five challenges. During the recovery phase following the earthquakes, recovery agencies released inconsistent information regarding workflows. For example, there was a lack of information regarding when construction projects would come onto the market and what resources might be required for them. This had a detrimental effect on staff planning within the engineering and construction sectors. In addition, for example, a training course should be offered that incorporates all the technical and social lessons learned from the earthquakes.

3.3 Building Back Better Framework

Mannakkara and Wilkinson (2014) developed the 'Building Back Better (BBB) framework' to support the practical application of BBB principles to improve post-disaster recovery. The framework, including its associated categories and principles, can be used as a basis for formulating recommendations to strengthen the applicability of BBB concepts in the areas of risk reduction, community recovery and effective and efficient implementation. In addition, the framework provides guidance for developing solutions to common, yet previously overlooked, bottlenecks in post-disaster recovery. At the same time, it maintains a comprehensive overview of all relevant aspects.

3.3.1 Background and context

The framework is based on core concepts and principles from existing guidelines that directly or indirectly approach recovery and reconstruction activities from the perspective of the Build Back Better concept. Examples of existing guidelines include: the document *Key propositions for BBB* (Clinton, 2006) and the Federal Emergency Management Agency's *Rebuilding for a more sustainable future: an operational framework* (FEMA, 2000). The framework is not designed for specific types of disasters and is not targeted at any specific country.

3.3.2 Elements of the framework

Within the framework, Build Back Better encompasses four core categories: risk reduction, community recovery, implementation and monitoring, and evaluation. For each core category, two principals have been formulated based on the findings.

- > Risk reduction encompasses measures aimed at increasing a society's resilience. This is mainly achieved through improvements in the structural design of the built environment, with the aim of preventing or limiting damage caused by disasters, and through spatial planning that avoids or manages existing risks. These findings make it possible to subdivide the risk reduction category into two principles, enabling its integration into reconstruction and recovery. Principle 1, the improvement of structural designs, focuses on improving structures and enforcing these improvements through amended building regulations. Principle 2, spatial planning, focuses on applying knowledge of risks and hazards in spatial planning to minimise risks.
- > Community recovery focuses on involving the community in recovery processes, strengthening the community, providing needs-based recovery solutions, addressing social aspects, and supporting psychosocial recovery. Supporting the community's economic recovery and the restoration of livelihoods and entrepreneurship are also key components of recovery. Community recovery therefore encompasses two central principles. Principle 3, social recovery, focuses on the psychosocial aspects of the post-disaster phase. Principle 4, economic recovery, focuses on improving the economic situation of the affected community.
- > Implementation brings together the resources needed to achieve risk reduction and community recovery in an efficient and effective manner. Implementation comprises two central principles. Principle 5, stakeholder management, advocates for coordinated roles and cooperation between stakeholders. Principle 6, legislation and regulations, focuses on applying legislation and regulations to guide and support recovery operations.
- > Monitoring and evaluation encompass the monitoring and evaluation activities that should be carried out throughout all recovery activities. By learning from experience and translating these lessons into recovery plans and training programmes to prepare for

future events, a society can respond more effectively to a future disaster. This category spans the three other categories: risk reduction, community recovery and implementation.

3.4 National Disaster Recovery Framework

Olshansky and Johnson (2014) describe a national post-disaster framework in their article on developments in the role of the federal government in supporting community recovery following disasters. The framework constitutes the first explicit elaboration of the United States' federal recovery policy and serves as a guide to promote a unified, collaborative and effective approach to disaster recovery.

3.4.1 Background and context

The framework was published in 2011 by the Federal Emergency Management Agency (FEMA) following the Post-Katrina Emergency Management Reform Act.² The framework focuses primarily on large-scale or catastrophic incidents in the United States, including natural disasters.

3.4.2 Elements of the framework

The framework contains several features that are important in relation to promoting disaster recovery (FEMA, n.d.):

- > Extensive federal support: The framework describes how the federal government supports recovery operations within states, local authorities and territories, and indigenous communities.
- > Flexible and clear structure: The framework provides a flexible structure that enables officials and crisis managers to operate in a variety of contexts.
- > Focus on complex recovery processes: The framework takes into account the multifaceted and interlinked nature of recovery operations and highlights the challenges arising from the increasing frequency and severity of disasters.
- > Emphasis on resilience and sustainable recovery planning: Recovery planning is seen as a key opportunity to rebuild communities in a resilient and sustainable manner.
- > Recognition of the cyclical nature of recovery: The framework recognises that recovery is not a linear process: response, recovery and reconstruction often take place simultaneously, thereby illustrating the ongoing nature of the disaster cycle.

3.5 Framework of Key Activities and Processes in the Preparedness and Recovery Phases of Disaster Management

Oloruntoba et al. (2018) describe a framework that focuses on activities and processes in both the pre-disaster and post-disaster phases. The framework was developed to support policymakers in identifying key activities and processes within the preparedness and recovery phases. It offers opportunities for analysis and contributes to a better understanding of the interactions within and between different activities, processes and stakeholders. In

² In October 2006, Congress passed the *Post-Katrina Emergency Management Reform Act* (PKEMRA). The Act directed the Administrator of FEMA to lead a coordinated effort among federal agencies to develop two national strategies: a National Disaster Recovery Strategy and a National Disaster Housing Strategy (Olshansky & Johnson, 2014).

addition, it serves as a guide for making informed choices between the available options for designing preparedness and recovery processes.

3.5.1 Background and context

The framework is based on empirical data drawn from case studies of bushfires and a cyclone in Australia. The researchers deliberately selected case studies from Australia (a prosperous and developed country), as many published frameworks on the preparedness and recovery phases of disasters are based on international operations in developing countries (Galindo and Batta, 2013; Oloruntoba et al., 2018). This framework explicitly excludes search and rescue operations, operational incident response and emergency aid.

3.5.2 Elements of the framework

The framework developed by Oloruntoba and colleagues (2018) distinguishes between processes and activities in the preparedness and recovery phases. It also focuses on investments in both tangible and intangible aspects.

- > The preparation phase comprises procedures and processes designed to provide protection against disasters and crises. Well-developed plans, processes and activities help to ensure that recovery processes in the event of a disaster proceed efficiently, effectively and adaptively. An example of an activity is the inventory of available equipment and supplies, such as chainsaws and water pumps. In addition, risk communication, contingency plans and training activities play an important role in increasing resilience in preparation for a potential disaster or crisis.
- > The recovery phase requires targeted government investment in both tangible and intangible resources, activities and processes.
 - Tangible investments focus on the physical and ecological recovery of the affected area. This includes the restoration of infrastructure, as well as the implementation of ecological recovery programmes for affected flora and fauna. The restoration of the environment includes, among other things, the clearance of rubble, the removal of hazardous substances and the restoration of critical community infrastructures, such as television stations and town halls. In addition, activities such as the mobilisation of resources and the transport of building materials and equipment fall into this category.
 - Intangible recovery activities and processes include, among other things, research into the recovery needs of communities. Effective process management is essential in this regard, with recovery efforts being directed by a competent leader. Community participation and local ownership of decision-making are also crucial to shaping recovery in a sustainable and socially supported manner. Furthermore, management of knowledge plays a central role. Evaluations, experiences, documents and lessons learnt must be systematically recorded and fed back into all phases of disaster response, so that the resilience of communities can be strengthened in the long term. Finally, investment in financial resources is necessary to enable reconstruction, restoration and rebuilding. Public funding can be used to support affected communities in meeting their basic daily needs and to support organisations that contribute to employment and livelihood security. The ultimate goal is to restore economic activities as quickly as possible and to prevent residents from leaving the affected areas (permanently).

3.6 Framework for Community Participation

Sadiqi et al. (2017) developed a framework in response to the bottlenecks they identified in community participation in post-disaster reconstruction. This framework supports the planning and implementation of a participatory approach to reconstruction projects in Afghanistan and focuses on restoring social structures, strengthening a sense of project ownership, supporting post-disaster recovery and creating livelihood opportunities.

3.6.1 Background and context

The framework is based on insights from an earlier quantitative study on barriers to community participation (Sadiqi et al., 2016) and a subsequent qualitative study involving interviews with professionals with extensive experience in disaster management (Sadiqi et al., 2017). Although the framework was developed for post-disaster reconstruction projects in Afghanistan, Sadiqi et al. (2017) argue that, with a few adjustments, it can also be applied in similar contexts elsewhere in the world.

3.6.2 Elements of the framework

Sadiqi et al. (2017) identify barriers to community participation in post-disaster reconstruction: an opaque reconstruction process, donors' desire for rapid reconstruction, limited capacity and engagement within the community, gender issues, a lack of competency among NGOs, inherent difficulties and weaknesses within the community, a slow land acquisition process, government policy and practice, and a lack of security.

To address these bottlenecks, the framework identifies four objectives with corresponding tasks.

- > The restoration of social cohesion within a society can be promoted by identifying displaced persons, organising meetings with affected citizens, and restoring basic infrastructure, such as roads and water supplies.
- > Strengthening the sense of ownership of the project requires that the reconstruction strategy be clearly communicated to affected citizens and that the roles and contributions of both the community and NGOs be clearly defined.
- > In addition to infrastructure restoration, post-disaster care also requires the provision of psychological support. Traumatic events, such as the loss of family members, social cohesion and self-confidence, can seriously undermine citizens' ability to actively participate in the reconstruction of their community.
- > Creating livelihood opportunities focuses on identifying existing skills within the community, offering skills training, utilising local labour, and restoring sources of income. This makes use of existing local capacity.

3.7 Inclusive Disaster Risk Management Framework

Thapa and Pathranarakul (2019) refer in their work to the 'Inclusive Disaster Risk Management Framework'. The framework supports disaster management professionals in assessing the degree of inclusivity of their actions based on a number of criteria.

3.7.1 Background and context

The framework was developed by Inclusive Community Resilience for Sustainable Disaster Risk Management (INCRISD) South Asia and is the result of a two-year project in

Afghanistan, Bangladesh, India, Nepal, Pakistan and Sri Lanka (INCRISD South Asia, 2014). The overarching aim of this project was to create and strengthen safe and resilient communities. The framework is widely applicable across a range of disaster situations. Thapa and Pathranarakul (2019) applied it to the recovery following the 2015 earthquake in Nepal.

3.7.2 Elements of the framework

The framework comprises four dimensions:

- > Participation in decision-making: within this dimension, an assessment is made of the extent to which residents are actively involved in disaster risk management and programmes, whether they have a genuine say in decision-making processes, and whether they can hold relevant institutions to account.
- > Tailored approach: this dimension focuses on whether disaster risk management practices and strategies are tailored to existing challenges, fit the context, and are sufficiently flexible to respond to changing circumstances.
- > Recognition of diversity: the central issue here is whether practices take into account the diversity of people in different positions of power, the diversity of risks and disasters, the varying nature of challenges, and the variety of institutions and sectors involved at different levels.
- > Removing barriers: this dimension emphasises the importance of removing barriers to inclusion, addressing the underlying causes of exclusion, redefining power relations and achieving sustainable results.

3.8 Community-Based Recovery Framework

Vallance (2015) describes a framework setting out the key elements of the Waimakariri District Council's approach following the earthquakes in Canterbury, New Zealand. The aim was to provide insight into the council's ongoing efforts by documenting the problems, as well as the opportunities, that arose after the earthquakes.

3.8.1 Background and context

The framework is based on the efforts of the Waimakariri District Council (a medium-sized local authority with 235 staff in New Zealand) following the 2010 earthquakes. A literature review and interviews were conducted to develop the framework.

3.8.2 Elements of the framework

The framework shows that the earthquakes placed significant demands on the local authority, but that these could be met through the development of several integrative mechanisms: mechanisms that ensure that people or parts of a community work well together and remain connected. The framework identifies the following mechanisms:

- > The appointment of three 'recovery managers' immediately after the earthquakes, who identified bottlenecks by being present in the affected area.
- > The co-location of both social and infrastructure recovery teams in a single building created an integrated and community-focused recovery framework. This led to the breaking down of barriers.

- > Familiarity with the local context. The council possesses local knowledge, direct access to maps, information on, for example, land use and other risks, and has relationships with local contractors, NGOs and community organisations.
- > Two-way communication through frequent meetings with residents and by actively engaging with them to inform decision-making.
- > New committees were set up to, among other things, facilitate the flow of information from the community to elected representatives in the municipality and to ensure that post-earthquake recovery aligned with broader needs in the district.
- > Consensus on the view that it is the municipality's role to empower the community to take charge of its own recovery.

3.9 Integrated Framework for Evaluation of Sustainable Disaster Recovery

Zhang and Tao (2018) developed the 'Integrated Framework for Evaluation of Sustainable Disaster Recovery' with the aim of analysing and evaluating the sustainability of post-disaster recovery.

3.9.1 Background and context

The framework is based on findings from multiple studies on post-disaster recovery. Zhang and Tao (2018) apply the framework in their article to evaluate the implementation of the Paired-Assistance Policy (PAP³) in response to the Wenchuan earthquake in China.

3.9.2 Elements of the framework

In the framework, sustainable recovery is approached as a cyclical process consisting of four components.

- > Sustainable recovery as a goal: According to Zhang and Tao (2018), sustainability must be central to recovery policy. The recovery measures are aimed at improving quality of life, strengthening the local economy and improving living conditions.
- > Sustainable recovery as a process: Sustainable recovery is seen as a phased process that begins with emergency measures such as the construction of temporary shelters, followed by replacement reconstruction that can take months to years and is aimed at restoring the normal situation. Ultimately, the recovery process evolves into a long-term phase focused on remembrance and on the development and strengthening of future-proof infrastructure. This phase can span many years and contributes to economic progress and structural improvements for the local community.
- > Sustainable recovery as a structure: Sustainable recovery creates an organisational structure that promotes the self-reliance of individuals and communities. Recovery operations are successful when they align with the needs of the local community and are carried out by organisations capable of realising the programme's objectives.
- > Sustainable recovery as the goal: When sustainable recovery is seen as the goal, these efforts lead to community improvement. This is characterised by long-term and multi-pronged approaches that mitigate significant risks in affected areas, supplemented by mutual aid agreements for response and recovery, multi-organisational partnerships, vertical and horizontal inter-governmental cooperation, strengthening of disaster

³ The basic principle of the PAP is that one prosperous county or city supports one severely affected county or city (Zhang & Tao, 2018).

management capacity at state and sub-state levels, and appropriate funding systems and processes (Rubin & Popkin, 1990).

4 Comparison of frameworks

In this chapter, the frameworks discussed are compared with one another on the basis of a number of factors: the approach to recovery (generic (holistic) or specific), the objective (focused solely on recovery or also on improvement), the elements (themes) addressed in the frameworks, and the background and context in which the frameworks were developed. See Appendix 2 for an overview.

4.1 Generic or specific

The frameworks differ from one another in terms of a generic or specific approach to recovery. Frameworks with a generic, holistic approach focus on both preparation for and recovery from a disaster or crisis (Bahmani & Zhang, 2022; Mannakkara & Wilkinson, 2014; Oloruntoba et al., 2018). The specific frameworks that focus on a particular theme concentrate purely on the recovery phase of a disaster or crisis (Chang-Richards et al., 2017; Olshansky & Johnson, 2014; Sadiqi et al., 2017; Thapa & Pathranarakul, 2019; Vallance, 2015; Zhang & Tao, 2018).

The generic frameworks developed by Bahmani and Zhang (2022), Mannakkara and Wilkinson (2014) and Oloruntoba et al. (2018) describe a wide variety of themes and processes relating to post-disaster care, rather than focusing specifically on a single process or theme. This is also reflected in the objectives of the frameworks. The objectives of Bahmani and Zhang (2022) and Oloruntoba et al. (2018) are very similar: identifying the key activities and processes for disaster preparedness and recovery following a disaster. Mannakkara and Wilkinson (2014) aim, through their framework, to facilitate the practical application of Build Back Better concepts to improve recovery.

The specific frameworks all focus purely on the recovery phase of a disaster and have diverse and (often) narrow objectives. Chang-Richards et al. (2017), for example, focused on the construction sector to help it anticipate capacity challenges during recovery work. The objective of Olshansky and Johnson (2014) was to develop guidance for the federal government to promote a consistent, collaborative and effective approach to disaster recovery. Sadiqi et al. (2017) aimed to support a participatory approach to reconstruction projects. Thapa and Pathranarakul (2019) sought, through their framework, to support disaster management professionals in assessing the degree of inclusivity of their approach. Vallance (2015) aimed to provide insight into the efforts of a local authority. Finally, the framework by Zhang and Tao (2018) aimed to analyse and evaluate the sustainability of post-disaster recovery.

4.2 Recovery or improvement

The frameworks differ from one another in terms of their focus following a disaster or crisis. Does the framework focus on a return to a 'normal' situation, or does it also address the improvement of vulnerabilities within society?

Five frameworks focus primarily on social recovery and specific areas of focus within the approach (Bahmani & Zhang, 2022; Chang-Richard et al., 2017; Olshansky & Johnson, 2014; Sadiqi et al., 2016; Thapa & Pathranarakul, 2019; Vallance, 2015). For instance, Vallance (2015) focuses on inclusivity, Olshansky and Johnson (2014) on central support for local government, and Chang-Richard et al. (2017) on the capacities to cope with challenges.

The other four frameworks also focus on addressing and improving structural vulnerabilities within communities to make them more resilient in the event of a future disaster or crisis. Oloruntoba et al. (2018), for example, have specifically included knowledge management in their framework, so that previous experiences and lessons are systematically recorded and fed back into all phases of disaster response and crisis management. The frameworks of Mannakkara and Wilkinson (2014) and Zhang and Tao (2018) are entirely focused on improving structural vulnerabilities. Mannakkara and Wilkinson (2014) emphasise improving reconstruction and recovery processes by developing solutions to common bottlenecks. Zhang and Tao (2018) approach sustainable recovery evaluatively in four ways: as a goal, process, structure and outcome.

4.3 Elements of the frameworks

The frameworks differ from one another in terms of the elements they comprise. Nevertheless, there are also significant similarities, particularly when the frameworks are divided into two groups. The first group consists of the generic frameworks that focus on both recovery and the improvement of society. The elements in these frameworks describe a broad range of themes and processes for recovery. The second group consists of frameworks that describe a specific theme or process. The elements of these frameworks mainly consist of the bottlenecks of the specific themes or processes and solutions to them.

The comparison first focuses on the similarities and differences between the elements of the generic frameworks. This is followed by a comparison of the elements of the specific frameworks.

4.3.1 Generic frameworks focused on recovery and improvement

The three generic frameworks (see section 4.1) that primarily describe the key themes and associated activities for preparing for and recovering from a disaster or crisis (Bahmani & Zhang, 2022; Mannakkara & Wilkinson, 2014; Oloruntoba et al., 2018) contain (partly) comparable elements.

- > All three frameworks focus on physical recovery efforts. Bahmani and Zhang (2022) and Oloruntoba et al. (2018) both mention the restoration of infrastructure and the ecological environment. In addition, the framework developed by Oloruntoba et al. (2018) also includes restoration of the living environment. Bahmani and Zhang (2022) specifically mention the restoration of housing.

- > The frameworks of Mannakkara and Wilkinson (2014) and Bahmani and Zhang (2022) both include an element of risk reduction to prevent damage. The framework of Oloruntoba et al. (2018) does not mention risk reduction.
- > All three frameworks contain process-oriented elements. The management and/or participation of stakeholders is mentioned in all three frameworks. The framework by Mannakkara and Wilkinson (2014) also includes the element of legislation and regulations, as does the framework by Bahmani and Zhang (2022).
- > All three frameworks contain a financial element. Oloruntoba et al. (2018) identify the financial resources required for rebuilding, reconstruction and restoration. Bahmani and Zhang (2022) and Mannakkara and Wilkinson (2014) focus more on matters necessary for economic recovery, such as planned and equitable financial support, restoration of livelihoods and support for local businesses.
- > Both the framework by Oloruntoba et al. (2018) and that by Mannakkara and Wilkinson (2014) identify (the need for) psychosocial aftercare for the community. This element is absent from the framework by Bahmani and Zhang (2022).
- > Two frameworks identify research and evaluation as a theme for recovery. Oloruntoba et al. (2018) refer to knowledge management to learn from previous experiences and lessons. In the framework by Mannakkara and Wilkinson (2014), this is referred to as monitoring and evaluation. This element is missing from the framework by Bahmani and Zhang (2022).

4.3.2 Specific frameworks focused solely on recovery

A common feature of the six specific frameworks (Chang-Richards et al., 2017; Olshansky & Johnson, 2014; Sadiqi et al., 2016; Thapa & Pathranarakul, 2019; Vallance, 2015 & Zhang & Tao, 2018) is that they consist primarily of points for attention and/or solutions to bottlenecks that have arisen during the recovery phase. At the same time, there are significant differences between the frameworks in terms of the nature of the bottlenecks, points for attention and solutions.

For example, Sadiqi et al. (2016) describe several bottlenecks in the participation of affected communities in reconstruction and formulate objectives to address these bottlenecks. Community involvement is cited as a bottleneck, for instance, and the restoration of social cohesion as an objective. Chang-Richards et al. (2017) describe a number of challenges in post-earthquake recovery and propose solutions to these challenges through core capacities. Technical competence, for example, is cited as a challenge, whilst knowledge and expertise in the field of post-disaster recovery (core capacity) are identified as solutions.

Olshansky and Johnson (2014) describe several elements, such as a flexible and unambiguous structure, which together form a framework to promote a clear, collaborative approach to recovery. Thapa and Pathranarakul (2019) identify four dimensions for assessing the inclusivity of a recovery approach, such as participation in decision-making. Vallance (2015) describes the problems and opportunities that arose within a municipality following an earthquake. One problem was that the municipality lacked sufficient insight into the issues affecting the affected area. As a solution, a number of 'recovery managers' were appointed who would be physically present in the area and thus able to provide clarity on the issues.

Finally, Zhang and Tao (2018) describe various sustainable recovery measures based on a cyclical process. For example, by placing sustainable recovery at the heart of recovery

policy, measures can focus on improving quality of life, strengthening the economy and improving living conditions.

4.4 Background and context

Just as with the content, the background and context of the frameworks also differ. Firstly, the research methods used to develop the frameworks vary. Oloruntoba et al. (2018) and Zhang and Thao (2018) based their frameworks on case studies. Chang-Richards et al. (2017), Sadiqi et al. (2016) and Vallance (2015) used interviews and documents, Bahmani and Zhang (2022) reviewed the literature, and Thapa and Pathranarakul (2019) employed a combination of qualitative and quantitative methods. The framework by Mannakkara and Wilkinson (2014) was developed based on existing guidelines.

Secondly, a distinction can be made regarding the context in which the frameworks were developed. For instance, there is variation in the types of disasters and/or crises that have been studied. Four frameworks focused on a specific type of disaster: wildfires and cyclones (Oloruntoba et al., 2018) or earthquakes (Chang-Richards et al., 2017; Thapa & Pathranarakul, 2019; Zhang & Tao, 2018). The other four frameworks examined a broad spectrum of crisis types (Bahmani & Zhang, 2022; Mannakkara & Wilkinson, 2014; Olshansky & Johnson, 2014; Sadiqi et al., 2016).

Furthermore, the cultural and socio-economic contexts of the countries in which the frameworks were developed differ. Thapa and Pathranarakul (2019) and Sadiqi et al. (2016) based their frameworks on low-income countries. The remaining frameworks are based on higher-income countries (Bahmani & Zhang, 2022; Chang-Richards et al., 2017; Oloruntoba et al., 2018; Olshansky & Johnson, 2014; Vallance, 2015; Zhang & Tao, 2018).

5 Additional themes

Some of the articles discussed address specific themes related to recovery that have not yet been covered in this document. To ensure this knowledge is not lost, this chapter focuses on these themes: the role of local government, leadership, community participation and the provision of information.

5.1 Role of local government

Local authorities play a key role in the recovery phase following a disaster or crisis (Olshansky & Johnson, 2014; Vallance, 2015). Even in the context of a disaster, local authorities possess a legally enshrined and democratic mandate to influence a wide range of issues within the local context. Furthermore, they have access to local knowledge and a local network of other (local) authorities, community organisations, NGOs, businesses and other key figures (Vallance, 2015). Furthermore, local authorities continue to exist after the 'official' recovery phase has ended, unlike ad hoc organisations that emerge during a disaster or crisis. As a result, local authorities are better positioned and motivated not only to look at the short term, but to adopt a strategic and long-term vision (McGuire & Schneck, 2010).

Research by Olshansky and Johnson (2014) shows that the most successful organisations focus on the efficient, effective and equitable management of financial flows; gathering and disseminating information to support decision-making; building capacity for long-term recovery through collaboration with and coordination of local groups; and balancing the provision of immediate needs with the exploitation of opportunities for long-term improvements (Johnson & Olshansky, 2013). Henstra (2010) has identified five useful areas in the field of recovery for local authorities. These are developing a recovery plan, identifying partner organisations and assigning responsibilities, combining crisis management with regular ('business as usual') activities, having a strategy and budget for damage assessments, having a plan for clearing debris, and addressing the psychosocial consequences for victims and aid workers.

5.2 Leadership

The literature emphasises the importance of leadership during the recovery phase. Cigler (2007) argues that the recovery phase requires specific skills, such as the ability to delegate, good communication skills, decisiveness and the capacity to coordinate. According to various researchers, the leadership style must evolve as the recovery process progresses. Whereas a command-and-control approach may be more appropriate in the early stages of recovery, this should gradually shift towards a more collegial, deliberative and inclusive leadership style, in which the community plays an active role (Pearce, 2003; Sullivan, 2003; Coles & Buckle, 2004; Olshansky, 2006; Waugh & Streib, 2006; Wilson, 2009; Olshansky & Johnson, 2010). Vallance (2015) describes how the situation may also require the

simultaneous use of both leadership styles. For example, some quick decisions can be taken without lengthy and formal consultation processes. However, they must then align with people's needs. These needs can be assessed by being actively present within the community. Potentially controversial decisions, such as the closure of popular community facilities, do require a more collaborative leadership style. Such decisions can be problematic if they are not accompanied by effective communication explaining why the measures are necessary.

5.3 Stakeholder participation within the society

Effective recovery following disasters and crises requires the active participation of stakeholders at all levels of decision-making within society. Decisions regarding reconstruction must not be imposed from the top down but must be reached in close collaboration with the affected community. Key considerations here include the systematic mapping of needs, intensive communication with residents and the utilisation of local knowledge. Initiatives such as a central task force to coordinate community recovery can help to bridge the gap between the community and decision-makers (Oloruntoba et al. 2018).

Sadiqi and colleagues (2017) describe several barriers to community participation in reconstruction projects: a lack of capacity within the community, gender-related issues, insufficient professional expertise among NGOs, government policy and practice, and a lack of security. Various activities can be carried out to remove or reduce the barriers to community participation. For instance, it is essential to engage in dialogue with affected residents. This offers implementing organisations the opportunity to explain their objectives and, together with those affected, to identify both short-term and long-term needs. Restoring basic infrastructure (such as access roads and water supply) and essential services (such as healthcare and education) is seen as a prerequisite for sustainable and permanent housing. A first step in encouraging affected residents to return to their living environment is to provide social support and psychosocial assistance. Furthermore, reconstruction should not be limited to building or repairing homes; it is about restoring society in the broadest sense. After all, in addition to housing, people also need an income and access to livelihoods. Ownership and a sense of responsibility within the affected community are key success factors for reconstruction.

The role of gender, and particularly the participation of women, is a key focus within reconstruction and risk management. Sadiqi et al. (2017) emphasise that the meaning and interpretation of women's participation are highly context dependent. It can also vary considerably between countries and regions (Thapa & Pathranarakul, 2019). Nevertheless, the importance of women's involvement is emphasised. Their participation is seen as a success factor for reconstruction due to the specific knowledge they possess. Women often know best what the needs of households are. At the same time, other studies show that the extent to which women can actually participate is influenced by various systemic and cultural barriers, such as dependence on men, lack of education, limited self-confidence, traditional gender roles, insufficient coordination between organisations, and constraints in policy, capacity and budget (Hemachandra et al., 2017; Thapa & Pathranarakul, 2019).

5.4 Information provision

Intensive communication and central coordination of public information and the media are essential in the aftermath of disasters and crises (Oloruntoba et al., 2018). Research shows that effective communication helps to reduce public anxiety and increase trust between the government and citizens. This trust, in turn, forms the basis for broadly supported planning, more efficient recovery in terms of time and quality, better information flows, and strong cohesion between different stakeholders. Governments play a key role in this by establishing robust structures for information dissemination that enable other actors to make better-informed decisions (Bahmani & Zhang, 2022; Hidayat & Egbu 2010; Olshansky et al., 2008; Rouhanizadeh & Kermanshachi 2019; Sadiqi et al., 2017; Yang 2011).

The media play an important role in disseminating public information during the post-disaster phase. At the same time, media attention can also hinder recovery: critical or negative reporting, for example, can sow doubt and put pressure on decision-making. For this reason, it is important to establish a central hub for information at an early stage. Proactive information provision, for example through regular updates, visualising progress and media briefings, contributes to transparency and trust. It is important that concrete milestones, such as the restoration of the electricity supply, the reopening of a school and the repair of homes, are clearly communicated to the community. Achievements must also be explicitly highlighted and celebrated (Oloruntoba et al., 2018).

6 Conclusion and discussion

The aim of this literature review was to identify and analyse international frameworks for recovery to establish a theoretical basis for national guidelines on recovery in the Netherlands. This chapter addresses the main and sub-questions in the conclusion. It is followed by a discussion of the results.

6.1 Conclusion

6.1.1 Meaning of recovery

One of the few articles that describes what is meant by recovery indicates that this encompasses the entirety of activities and processes aimed at both mitigating the immediate consequences of a disaster or crisis and its long-term consequences.

- > Several frameworks view recovery as a return to the original situation or 'normal'. Other frameworks go further and see disasters and crises as an opportunity to address vulnerabilities in a society in a structural way.
- > Recovery and aftercare are not linear processes with a fixed endpoint, but complex, non-linear trajectories that ultimately transition into 'business as usual'.
- > Recovery is characterised by significant inequalities. Groups that have greater resources and social networks at their disposal prior to a disaster or crisis generally recover more quickly.

6.1.2 Description of the frameworks

The frameworks for recovery can be divided into two categories. The first category comprises generic frameworks that describe a wide variety of themes and processes. These frameworks focus on both restoring and improving society. The second category consists of specific frameworks that focus primarily on a single theme or process.

- > The elements described in the frameworks vary, yet there are similarities.
 - The three generic frameworks describe the key themes and processes of recovery. They address physical recovery work, collaboration with stakeholders and financial settlement. In addition, two frameworks address risk reduction, psychosocial support, and research and evaluation.
 - The six specific frameworks share the common feature of primarily describing points for attention and/or solutions to bottlenecks in the recovery phase. At the same time, there are significant differences between the frameworks in terms of the themes of the bottlenecks, points for attention and solutions: damage repair, community participation, inclusivity, sustainable recovery measures, and the role of local government
- > The background and context in which the frameworks were developed vary. For example, the research methods used, the types of disasters and/or crises studied, and the income levels of the countries on which the frameworks are based differ.

6.1.3 Additional themes

Several articles focus on additional themes:

- > Local authorities play an important role in the post-disaster phase, partly due to their legally enshrined and democratic power to influence a wide range of issues within the local context, their local knowledge, access to a local network, and the ability to combine crisis management with regular activities.
- > Leadership in the post-phase of a disaster or crisis also requires specific skills, such as the ability to delegate, communicate and make decisions. It is also important that the leadership style evolves as the recovery process progresses. In the initial phase, a command-and-control approach is important, but this must gradually shift towards a more collegial, deliberative and inclusive leadership style, in which the community plays an active role.
- > Effective recovery following disasters and crises requires active participation from society at all levels of decision-making. Decisions regarding reconstruction must not be imposed top-down but must be reached in close collaboration with the affected community. The role of gender, and particularly the participation of women, is a key focus within recovery projects.
- > Intensive communication and central coordination of public information and the media are essential. Good communication helps to reduce public anxiety and to increase trust between the government and citizens, which is necessary to build support for recovery plans.

6.1.4 Main question

Which frameworks are described in the international scientific literature for recovery? Based on the search strategy employed, nine frameworks have been identified.

- > Framework 1. Management framework for disaster recovery projects
- > Framework 2. Organisational Capability Framework for Earthquake Recovery
- > Framework 3. Build Back Better Framework
- > Framework 4. National Disaster Recovery Framework
- > Framework 5. Framework of Key Activities and Processes in the Preparedness and Recovery Phases of Disaster Management
- > Framework 6. Framework for Community Participation
- > Framework 7. Inclusive Disaster Risk Management Framework
- > Framework 8. Community-Based Recovery Framework
- > Framework 9. Integrated Framework for Evaluation of Sustainable Disaster Recovery.

No single framework describes all possible themes that may arise in relation to recovery after a disaster. The majority of the frameworks focus on recovery from natural disasters.

6.2 Discussion

This literature review has identified several frameworks for recovery from international literature. The results invite several reflections. It is striking that, given the volume of literature on disaster and crisis management, only a few scientific articles were found that describe frameworks for recovery. This confirms the view that the post-disaster phase is relatively underdeveloped and under-exposed.

The frameworks cover a wide range of topics relating to recovery, including basic support (housing, food, medical care), restoration work, claims settlement and financial matters, provision of information, and research and evaluation. Although some frameworks address several of these themes, no single framework was found in the literature reviewed that describes all themes – although completeness is, of course, difficult to determine, and not every theme is relevant to every post-disaster situation.⁴

Furthermore, based on the results, it can be concluded that, apart from a few brief references, the selected articles pay insufficient attention to the psychosocial impact of disasters and crises. A future Dutch framework should integrate the full range of recovery themes, preferably embedded within the phase models applied both internationally and in the Netherlands. These are the five categories listed in the *Multidisciplinary Guideline on Psychosocial Crisis Management*: basic services, provision of information, emotional and social support, practical support and healthcare (ARQ, 2023).

What is also striking is that the frameworks identified are mostly described from the perspective of governments and the private and public organisations involved. Although themes such as inclusivity and social participation are cited, and some frameworks address recovery needs within communities following a disaster (Mannakkara and Wilkinson, 2014; Oloruntopa et al., 2018; Zhang & Tao, 2018), the specific needs and challenges of those affected are not elaborated upon in the frameworks. To further flesh out this perspective, an additional literature review was conducted within the EU project of which this literature review forms part, resulting in a 'Human-Centered Crisis Expectations Model'. The model combines various elements or 'expectation domains' that together reflect what citizens expect from the government in a crisis context: on the one hand, minimising the primary threat, loss and damage, and procedural burden; on the other hand, maximising recognition, hope and perspective; whereby the personal context, crisis phase and broader characteristics of time and place of an affected population determine the expectations of affected citizens (Dückers, under review).

Then there is the issue of co-creation, which framework development must address to foster a sense of ownership and ensure that relevant perspectives are taken into account. The *Multidisciplinary Guideline on Psychosocial Crisis Management* (ARQ, 2023) was developed based on an assessment of scientific evidence, in dialogue with the intended user group comprising government bodies, service providers and academics, and with input from those affected. This increases the likelihood that the document will be used in practice. The aforementioned guideline (in fact the third version since 2007) is used within the network of psychosocial crisis partners (Dückers et al., 2017) as a central source document for the planning and implementation of courses, training sessions and exercises, not only during preparation, but also as a basis for advice during crises and as an evaluation tool (Jacobs et al., 2019; Van Herpen et al., 2022). The latter applies equally to the Human-Centered Crisis Expectations Model (for example, in the context of the Groningen gas extraction crisis; Van der Molen et al., 2026). These examples demonstrate that it is indeed possible to arrive at standards through co-creation. However, the examples focus on a specific aspect of the post-crisis issues. To arrive at a comprehensive guideline, it is useful to incorporate additional dimensions, points for attention and lessons as described in this report, and to translate these into practical, responsible courses of action in alignment with policy, practice

⁴ For the Dutch context, thematic lists are available for local and national authorities (Zannoni, 2010; Ligthart & Dücker 2011; Dücker, 2012; NCTV, 2022)

and science. Here too, it is important to be mindful of the preconditions that will play a role in the implementation of the guideline and supporting tools for training purposes.

6.2.1 Limitations

Although this literature review was conducted with care, several limitations can be identified. For instance, only a limited number of scientific articles were found that describe frameworks for recovery. Given the scope of the project, a broad approach to the search strategy was deliberately chosen. As a result, frameworks addressing a specific theme of recovery, such as psychosocial support, have likely been missed. It is also likely that there are further frameworks that are not, or are insufficiently, described in the scientific literature. Consequently, the picture obtained is likely to be incomplete.

The majority of the frameworks that have been selected focus on natural disasters; man-made disasters and latent crises are under-represented. Furthermore, the frameworks pay scant attention to situations in which multiple disasters and crises unfold simultaneously. Future frameworks must, however, take this into account, so that they better align with contemporary practice and the diversity of disasters and crises that communities may face. Furthermore, it is striking that most frameworks have not been tested in practice or scientifically. This aspect is important for the development of a framework that enjoys broad support within research, policy and practice. Nevertheless, the frameworks discussed are informative and offer an interesting basis to draw upon in initiatives aimed at developing integrated frameworks and guidelines for the post-disaster phase. This is precisely the aim of the EU project to which this study contributes.

6.2.2 In conclusion

The available frameworks provide building blocks that are, in principle, relevant to crisis authorities worldwide. This applies to the distinct phases, aftercare themes and recovery themes, but also to the challenges identified. What is striking is that these themes and challenges correspond to a significant extent with existing Dutch frameworks and guidelines, as mentioned in the introduction. However, it is also clear that the focus on the needs of affected citizens has been developed to a limited extent within the included frameworks. This has been explored further in a separate publication (Dückers, under review). A next step is to further consolidate the content of the various frameworks and embed it meaningfully within existing frameworks, with a final aim to establish a broadly supported basis for guideline development in collaboration with recovery partners. This is the task facing crisis authorities in various countries if they wish to effectively utilise international insights and incorporate them into the longer-term task of recovering more effectively after disasters.

Appendix 1 References

Abderhalden, J. M., Scolobig, A., Stoffel, M., Lachmann, J. T. H., & Calvello, M. (2025). Barriers and enablers to stakeholder engagement in the co-creation of disaster risk reduction solutions. *International Journal of Disaster Risk Reduction*, 120, 10538

Akiyama, H. (2019). *Who rebuilds? Civil society in post-disaster recovery in China and Japan* (Dissertation, George Mason University).

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19–32. <https://doi.org/10.1080/1364557032000119616>

ARQ. (2023). *Multidisciplinaire Richtlijn Psychosociaal Crisismanagement*.

ARQ. (2024). *Richtlijn psychosociale ondersteuning binnen hoog-risico beroepen*.

Bahmani, H., & Zhang, W. (2022). A conceptual framework for integrated management of disaster recovery projects. *Natural Hazards*, 113(2), 859–885.

Bakker, M., Dückers, M., De Haan, A., Landsman, J., & Leentvaar, E. (2026). *De gemeentelijke zorgplicht in de nafase van lokale (mini)-crises: Aandachtspunten uit recente casuïstiek*. NIPV.

Berke, P. R., Kartez, J., & Wenger, D. (1993). Recovery after disaster: Achieving sustainable development, mitigation and equity. *Disasters*, 17(2), 93–109. <https://doi.org/10.1111/j.1467-7717.1993.tb01137.x>

Chang-Richards, Y., Wilkinson, S., Seville, E., & Brunson, D. (2017). An organizational capability framework for earthquake recovery. *Earthquake Spectra*, 33(4), 1257–1278. <https://doi.org/10.1193/092515eqs142m>

Cheng, Y., He, Z., Xie, T., & Deng, H. (2013). Modeling of urban post-disaster reconstruction using extended cellular automata. In *International Conference on Geo-Informatics in Resource Management and Sustainable Ecosystem* (pp. 86–97). <https://doi.org/10.1007/978-3-662-45737-5>

Cigler, B. A. (2007). The 'big question' of Katrina and the 2005 Great Flood of New Orleans. *Public Administration Review*, 67(1), 64–76. <https://doi.org/10.1111/j.1540-6210.2007.00814.x>

Coles, E., & Buckle, P. (2004). Developing community resilience as a foundation for effective disaster recovery. *The Australian Journal of Emergency Management*, 19(4), 6–15.

Dückers, M.L.A. (2012). *Richting geven aan de laatste schakel: de nafase. Rijksbrede versterking van herstel en nazorg bij rampen en crises*. Ministerie van Veiligheid en Justitie.

Dückers, M., Jacobs, J., Timmermans, S., & Alting, D. (2017). *Psychosociale hulp bij rampen en crises: Inventarisatie rollen en taken van betrokken partijen*. GGD GHOR Nederland, Impact & RIVM.

Dückers, M., van Hoof, W., Willems, A., & Te Brake, H. (2022). Appraising evidence-based mental health and psychosocial support (MHPSS) guidelines—PART II: A content analysis with implications for disaster risk reduction. *International journal of environmental research and public health*, 19(13), 7798.

FEMA. (n.d.). *National Disaster Recovery Framework*. <https://www.fema.gov/emergency-managers/national-preparedness/frameworks/recovery>

FEMA. (2000). *Rebuilding for a more sustainable future: An operational framework*. Federal Emergency Management Agency.

Galindo, G., & Batta, R. (2013). Review of recent developments in OR/MS research in disaster operations management. *European Journal of Operational Research*, 230(2), 201–211. <https://doi.org/10.1016/j.ejor.2013.01.039>

Ge, Y., Gu, Y., & Deng, W. (2010). Evaluating China's national post-disaster plans: The 2008 Wenchuan earthquake's recovery and reconstruction planning. *International Journal of Disaster Risk Science*, 1(2), 17–27. <https://doi.org/10.3974/j.issn.2095-0055.2010.02.003>

Hemachandra, D., Amaratunga, R., & Haigh, R. (2017). Role of women in disaster risk governance. *Procedia Engineering*, 212, 1187-1194. <https://doi.org/10.1016/j.proeng.2018.01.153>

Henstra, D. (2010). Evaluating local government emergency management programs: What framework should public managers adopt? *Public Administration Review*, 70(2), 236–246. <https://doi.org/10.1111/j.1540-6210.2010.02130.x>

Hidayat, B., & Egbu, C. (2010). A literature review of the role of project management in post-disaster reconstruction. In *Proceedings of the 26th Annual ARCOM Conference* (pp. 1269–1278). Association of Researchers in Construction Management.

INCRISD South Asia. (2014). *Inclusive disaster risk management: A framework and toolkit for DRM practitioners*. <https://preparecenter.org/wp-content/sites/default/files/inclusiveness.pdf>

Jacobs, J., Oosterbeek, M., Tummers, L. G., Noordegraaf, M., Yzermans, C. J., & Dückers, M. L. A. (2019). The organization of post-disaster psychosocial support in the Netherlands: a meta-synthesis. *European Journal of Psychotraumatology*, 10(1), 1-33 <https://doi.org/10.1080/20008198.2018.1544024>

- Johnson, L. A., & Olshansky, R. B. (2013). The road to recovery: Governing post-disaster reconstruction. *Land Lines*, 25(3), 14–21.
- Kapucu, N. (2007). Non-profit response to catastrophic disasters. *Disaster Prevention and Management: An International Journal*, 16(4), 551-561
<https://doi.org/10.1108/09653560710817039>
- Kennedy, J., Ashmore, J., Babister, E., & Kelman, I. (2008). The meaning of “build back better”: Evidence from post-tsunami Aceh and Sri Lanka. *Journal of Contingencies and Crisis Management*, 16(1), 24–36. <https://doi.org/10.1111/j.1468-5973.2008.00529.x>
- Khasalamwa, S. (2009). Is “build back better” a response to vulnerability? Analysis of the post-tsunami humanitarian interventions in Sri Lanka. *Norwegian Journal of Geography*, 63(1), 73–88. <https://doi.org/10.1080/00291950802712152>
- Lewis, J. (2003). Housing construction in earthquake-prone places: Perspectives, priorities and projections for development. *The Australian Journal of Emergency Management*, 18(2), 35–44.
- Ligthart, N., & Dückers, M. (2011). Voorbereiding op de fase na de ramp: Nafase in het perspectief van de nationale veiligheid. *Magazine Nationale Veiligheid en Crisisbeheersing*, 3, 30–32.
- Liu, Z., & Han, Y. (2009). Post-disaster reconstruction and social work development in Mainland China. *Journal of Social Work*, 2(3), 221-223.
<https://doi.org/10.1080/17525090903211796>
- Lizarralde, G. (2004). *Organisational system and performance of post-disaster reconstruction projects* (Doctoral dissertation, Université de Montréal).
- Lyons, M. (2009). Building back better: The large-scale impact of small-scale approaches to reconstruction. *World Development*, 37(2), 385–398.
- Mannakkara, S., & Wilkinson, S. (2014). Re-conceptualising building back better to improve post-disaster recovery. *International Journal of Managing Projects in Business*, 7(3), 327–341. <https://doi.org/10.1108/IJMPB-10-2013-0054>
- McGuire, M., & Schneck, D. (2010). What if Hurricane Katrina hit in 2020? The need for strategic management of disasters. *Public Administration Review*, 70(1), 5–20.
<https://doi.org/10.1111/j.1540-6210.2010.02273.x>
- Mohamed Shaluf, I. (2007). Disaster types. *Disaster Prevention and Management: An International Journal*, 16(5), 704–717. <https://doi.org/10.1108/09653560710837019> .
- Muller, Ed., Berndsen, M., de Graaf, B., Kramers, N., Schneiders, B., & Verlaan, P. (2020). *Evaluatie Wet veiligheidsregio's*. Evaluatiecommissie Wet veiligheidsregio's.
- NCTV (2022). *Nationaal Handboek Crisisbeheersing*.

- Oloruntoba, R., Sridharan, R., & Davison, G. (2018). A proposed framework of key activities and processes in the preparedness and recovery phases of disaster management. *Disasters*, 42(3), 541–570. <https://doi.org/10.1111/disa.12268>
- Olshansky, R. (2006). Planning after Hurricane Katrina. *Journal of the American Planning Association*, 72(2), 147–153. <https://doi.org/10.1080/01944360608976735>
- Olshansky, R. B., & Johnson, L. A. (2010). *Clear as mud: Planning for the rebuilding of New Orleans*. APA Planners Press.
- Olshansky, R. B., & Johnson, L. A. (2014). The evolution of the federal role in supporting community recovery after U.S. disasters. *Journal of the American Planning Association*, 80(4), 293–304. <https://doi.org/10.1080/01944363.2014.967710>
- Olshansky, R. B., Johnson, L. A., & Topping, K. (2006). Rebuilding communities following disaster: Lessons from Kobe and Los Angeles. *Built Environment*, 32(4), 354–374. <https://doi.org/10.2148/benv.32.4.354>
- Pearce, L. (2003). Disaster management and community planning, and public participation: How to achieve sustainable hazard mitigation. *Natural Hazards*, 3(2–3), 211–228.
- Roberts, P. (2000). The evolution, definition and purpose of urban regeneration. In P. Roberts & H. Sykes (Eds.), *Urban regeneration: A handbook* (pp. 9–36). Sage.
- Rouhanizadeh, B., & Kermanshachi, S. (2019). Investigating the relationships of socioeconomic factors delaying post-disaster reconstruction. In *Proceedings of the ASCE International Conference on Computing in Civil Engineering* (pp. 16–24). <https://doi.org/10.1061/9780784482445.005>
- Rubin, C. B., & Popkin, R. (1990). *Disaster recovery after Hurricane Hugo in South Carolina* (Working Paper No. 39). Natural Hazards Research and Applications Information Center, University of Colorado Boulder.
- Sadiqi, Z., Trigunaryah, B., & Coffey, V. (2016). Community participation in post-disaster reconstruction. *Proceedings of the Institution of Civil Engineers*, 169, 173–186. <https://doi.org/10.1680/jmuen.15.00016>
- Sadiqi, Z., Trigunaryah, B., & Coffey, V. (2017). A framework for community participation in post-disaster housing reconstruction projects: A case of Afghanistan. *International Journal of Project Management*, 35, 900–912. <https://doi.org/10.1016/j.ijproman.2016.11.008>
- Spangle and Associates. (1997). *Evaluation of use of the Los Angeles recovery and reconstruction plan after the Northridge earthquake*.
- Sullivan, M. (2003). Integrated recovery management: A new way of looking at a delicate process. *The Australian Journal of Emergency Management*, 18(2), 4–27.
- Te Brake, H., Willems, A., Steen, C., & Dückers, M. (2022). Appraising evidence-based mental health and psychosocial support (MHPSS) guidelines—Part I: A systematic review on

methodological quality using AGREE-HS. *International Journal of Environmental Research and Public Health*, 19(5), 3107. <https://doi.org/10.3390/ijerph19053107>

Thapa, V., & Pathranarakul, P. (2019). Gender inclusiveness in disaster risk governance for sustainable recovery of the 2015 Gorkha earthquake, Nepal. *International Journal of Disaster Risk Reduction*, 34, 209–219. <https://doi.org/10.1016/j.ijdr.2018.11.019>

United Nations Office for Disaster Risk Reduction (UNDRR) (2017). *The Sendai Framework Terminology on Disaster Risk Reduction*. "Recovery". <https://www.undrr.org/terminology/recovery>.

Vallance, S. (2015). An evaluation of the Waimakariri District Council's integrated and community-based recovery framework following the Canterbury earthquakes: Implications for urban resilience. *Urban Policy and Research*, 33(4), 433–451. <https://doi.org/10.1080/08111146.2014.980401>

Van der Molen, J., Wilborts, V., de Vries, W., Penders, J., Dückers, M., & Scherpenzeel, A. (2026). *Tussen onzekerheid en onveiligheid: een kwalitatieve studie naar ervaringen met versterking: Gronings Perspectief fase 4*. Rijksuniversiteit Groningen.

Van Herpen, M. M., Dückers, M. L., Schaap, R., Olf, M., & Te Brake, H. (2022). Online one-stop shop for disaster response services after the MH17 airplane crash: an evaluation study. *Frontiers in public health*, 10.

Vollmer, M., Berchtold, C., & Annies, J. (2025). Co-creating solutions for Disaster Risk Reduction in multi-country research projects—Opportunities and Challenges. *International Journal of Disaster Risk Reduction*, 117, 105187.

Waugh, W., & Streib, G. (2006). Collaboration and leadership for effective emergency management. *Public Administration Review*, 66, 131–140. <https://doi.org/10.1111/j.1540-6210.2006.00673.x>

Wilson, P. (2009). Deliberative planning for disaster recovery: Re-membering New Orleans. *Journal of Public Deliberation*, 5, 1–25.

Xu, J., & Lu, Y. (2012). Meta-synthesis pattern of post-disaster recovery and reconstruction: Based on actual investigation on the 2008 Wenchuan earthquake. *Natural Hazards*, 60, 199–222. <https://doi.org/10.1007/s11069-011-0003-6>

Yang, B. (2011). *A comprehensive study of the Chinese government's natural disaster communication framework based on the natural disaster management and communication system's response to two natural disasters* (Doctoral dissertation, University of Southern California).

Zannoni, M. (2010). *En nu...? Handboek voor de nafase van incidenten, rampen en crises*. Boom Juridische Uitgevers.

Zhang, H., & Tao, Z. (2018). Evaluating China's paired-assistance policy (PAP) in response to the Wenchuan earthquake: A sustainability perspective. *Sustainability*, 10(10), 3732. <https://doi.org/10.3390/su10103732>

Appendix 2 Overview of frameworks

Framework	Preparation	Recovery	Holistic framework	Specific Framework	Themes framework post-phase
Bahmani and Zhang (2022) Management framework for disaster recovery projects	X	X	X		<p>Four project management phases in recovery: planning, design, implementation and procurement.</p> <p>Six categories of recovery: housing and infrastructure recovery, management recovery, social recovery, economic recovery, policy recovery, ecological recovery.</p> <p>Integration phase: stakeholder participation, communication, reducing vulnerability to disasters and crises, financial support and updating regulations.</p>
Chang-Richards et al.(2017) An organisational capability framework for earthquake recovery		X		X (Challenges for the engineering and construction sector)	<p>Damage repair (technical incompetence, additional technical requirements, lack of training in disaster psychology and social interaction, lack of capacity, delayed, fluctuating and uncertain demand).</p> <p>Core capabilities: knowledge and expertise, adaptive capacity within organisations and mutual support between organisations.</p>
Mannakkara and Wilkinson (2014) Build back better framework	X	X	X		<p>Risk reduction (improving structural design and spatial planning), community recovery (social and economic recovery), implementation (stakeholder management and legislation and regulations), monitoring and evaluation.</p>

Olshansky & Johnson (2014)		X		X	Guidance to promote a coherent, collaborative and effective approach to disaster recovery: comprehensive federal support, a flexible and coherent structure, attention to complex recovery processes, emphasis on resilience and sustainable recovery planning, recognition of cyclical recovery.
National disaster recovery framework				Focused on developing recovery policy	
Olorunfoba et al. (2018)	X	X	X		Infrastructure recovery, living environment recovery, ecological environment recovery, mobilisation and transport of resources and materials, recovery needs of affected communities, process management, knowledge management and financial resources.
Framework of key activities and processes in the preparedness and recovery phases of disaster management					
Sadiqi et al. (2016)		X		X	Challenges in community participation in reconstruction: an opaque reconstruction process, donors' desire for rapid reconstruction, low capacity and engagement within the community, gender issues, lack of capacity among NGOs, inherent difficulties and weaknesses within the community, a slow land acquisition process, government policies and practices, and a lack of security.
A framework for community participation				Focused solely on reconstruction	Four objectives for addressing these challenges: restoring social cohesion, strengthening the sense of project ownership, supporting recovery (providing psychological and financial assistance), and creating livelihood opportunities.
Thapa & Pathranarakul (2019)		X		X	Four dimensions: participation in decision-making, tailoring, recognition of diversity and reduction of barriers.
Inclusive disaster risk management framework				Focused on assessing the degree of inclusivity in disaster recovery	
Vallance (2015)		X	X		Key elements of the approach: appointing three recovery managers, co-locating both social recovery teams and infrastructure recovery teams in a
Community-based recovery framework					

			single building, familiarity with the local context, two-way communication, establishing new committees, shared understanding of the municipality's role.
Zhang & Tao (2018)	X	X	Four approaches to sustainable recovery: as a goal (sustainability is central), as a process (a phased process involving emergency measures first, followed by sustainable adaptations), as a structure (creating an organisational structure that promotes self-reliance; tailored to needs), as an outcome (do the efforts lead to broader community improvement in the long term)
Integrated framework for evaluation of sustainable disaster recovery		Focused on analysing and evaluating sustainable recovery following disasters	