

Paradox-responding in Humanitarian Temporary Supply Networks: Exploring Strategies and Enabling Mechanisms

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Abstract

Purpose:

This study investigates paradox-responding strategies and enabling mechanisms in humanitarian Temporary Supply Networks (TSNs). Given the high stakes involved in life-saving supply networks, understanding how diverse, often under-resourced, organisations jointly tackle paradoxical tensions under time pressure is crucial.

Design/methodology/approach:

A qualitative single case study approach is adopted and a TSN deployed to meet shelter needs following the 2015 Nepal earthquake is selected as the case. We use diverse secondary data sources to establish how the TSN responded to paradoxical tensions.

Findings:

Our results show that paradox-responding in humanitarian TSNs is ongoing, dynamic, and a collective effort. Most strategies entail tackling the paradoxical tensions at the same time, using the same TSN structure, but there are differences in the treatment of the paradoxical elements. Additionally, we find that the execution of the responding strategies is enabled by the

appropriate types of network-level mechanisms which can vary in novelty, complexity, depth, and reach.

Originality:

To the best of our knowledge, this is the first study that investigates paradox-responding strategies in humanitarian TSNs in particular and enabling mechanisms in general.

Research limitations/implications:

Our study provides rich explanations of paradox-responding and develops insights into collective action within TSNs. However, further research is needed to extend and refine insights given the single-case setting design.

Practical implications:

This study develops a framework of paradox-responding strategies and a corresponding mix of enabling mechanisms that can guide decision-makers in the humanitarian sector when deploying TSNs.

Keywords: Paradox-responding Strategies, Enabling Mechanisms, Temporary Supply Networks, Humanitarian Sector.

1. Introduction

There is growing interest in the temporality construct for organising and strategising (Hernes et al., 2021; Sirén et al., 2020) in response to unplanned disruptive events, such as natural disasters and conflicts. Temporary supply networks (TSNs) are increasingly deployed to provide the necessary resources for the accomplishment of specific tasks (Fernandes, 2018) to offset the destabilising impact of such events. Despite that, considerations of temporality in the Operations and Supply Chain Management (OSCM) field remain limited (Klassen and Hajmohammad, 2017). Although TSNs are widely deployed in disruption situations, notably in humanitarian operations, but also more broadly in planned events (e.g., filmmaking and the Olympics) (Bakker et al, 2016; Day et al, 2012; Fernandes, 2018), the factors affecting the functioning of TSNs are not well-understood. In emergent TSNs formed in response to unplanned events such as in humanitarian operations, paradoxes – conflicting yet interdependent elements (Lewis, 2000; Smith and Lewis, 2011) – further complicate response operations. Given the high stakes involved in humanitarian TSNs, understanding network-level paradox-responding and its enablers is crucial.

This study explores paradox-responding in humanitarian TSNs as a special case of a temporary setting where network-level response dynamics are crucial. Humanitarian stakeholders face multiple paradoxical tensions (Day et al., 2012; Van Wassenhove, 2006) in their efforts to provide life-saving relief to victims of natural and man-made disasters. Tensions primarily stem from the multiplicity of under-resourced organisations with divergent values, beliefs, and missions (DeFillipi and Sydow, 2016; Kovacs and Spens, 2007; Van Wassenhove, 2006) but must work together. They can also be due to a combination of external factors such as the typically large scale of humanitarian operations, changing conditions, and high stakes under time pressure. The extensive research on paradox-responding challenges and corresponding strategies (e.g., Carmine and De Marchi, 2023; Schad et al., 2016; Smith and Lewis, 2011) overlooks such unstable temporary network contexts.

Our study, therefore, seeks to answer the following question: “How does paradox-responding take place in humanitarian TSNs and what enables response?” We adopt a single qualitative case study approach to achieve in-depth insights, producing context-specific theory (Eisenhardt, 1991). Using the 2015 Nepal Earthquake as the research setting and extensive secondary data sources, we investigate how an emergent TSN responded to major paradoxical

tensions. Specifically, we focused on the TSN deployed to provide shelter to affected communities. The selected case exhibits “conditions of plurality, change, and scarcity” that make paradoxes salient (Smith and Lewis, 2011, p.390).

This study makes three key contributions to the literature. Firstly, research has sought to understand managerial thinking, decisions, and actions (e.g., Jarzabkowski et al., 2013; Lewis, 2000; Poole and Van de Ven, 1989; Schad et al., 2016; Smith and Lewis, 2011) but this has predominantly been at the organisational level and in relatively stable contexts. By exploring paradox-responding in an extreme TSN context, this study unearths tensions that would otherwise be latent (Smith and Lewis, 2011), leading to important insights about network-level strategies that can benefit enduring supply networks (ESNs) well beyond the lifetime of the TSN. Secondly, we identify enabling mechanisms for the execution of paradox-responding strategies in temporary inter-organisational (network) settings. Thirdly, we unpack strategies covered in the literature (Andriopoulos and Lewis, 2010; Jarzabkowski, et al. 2013; Smith and Lewis, 2011), providing richer insights on how paradox-responding manifests in humanitarian TSNs.

2. Literature Review

Paradoxes are persistent contradictions/tensions between interrelated elements that seem logical in isolation but irrational when they appear simultaneously (Lewis, 2000; Schad et al., 2016). Although they are common in organisational life (Gaim et al, 2022), how they can be dealt with is not so straightforward. Within OSCM, there are several instances of paradox manifestation that make the accomplishment of performance objectives challenging. For example, when: supply chains must be lean and agile; competitors must collaborate; and change and stability must be addressed simultaneously (Guo et al, 2023; Harper, 2022; Kocabasoglu-Hillmer et al, 2023; Maalouf and Gammelgaard, 2016; Matos et al., 2020; Pagell et al., 2015; Xiao et al, 2019; Zehendner et al., 2021).

Although there has been comprehensive work on paradoxes and paradox-responding in various fields (see, e.g., Andriopoulos and Lewis, 2010; Carmine and De Marchi, 2023; DeFillippi and Sydow, 2016; Matos et al., 2020; Miron-Spektor et al, 2018; Schad et al, 2016), it just began to gain traction in OSCM. Thus far, researchers have sought to describe operational and supply chain paradoxes but largely focus on focal companies rather than the

supply chain/network level. Additionally, the focus has been on enduring operational settings. For example, Pagell et al. (2015) investigate the roles of routines and relational coordination for the accomplishment of contradicting objectives of safety and operational effectiveness in a production system. Mena and Schoenherr (2020) describe a “supply chain position paradox” phenomenon whereby performance decreases as proximity to end-customers increases. Kocabasoglu-Hillmer et al. (2023) explore the paradoxical tension between change and stability that buying organisations face in their upstream supply chains following a radical innovation. They also examine paradox-responding by focusing on strategies undertaken by buying firms in relation to their supply chains. Similarly, Xiao et al (2019) explore paradox-responding by buying firms in sustainable supply chains.

2.1 Paradox-responding Strategies

The mainstream paradox literature distinguishes four main types of paradox: *organising, belonging, performing, and learning* (e.g., Smith and Lewis, 2011; Schad et al, 2016). Although this literature considers tensions related to short vs. long-term objectives as performing paradoxes, DeFillipi and Sydow (2016) conceive of them as *temporal paradoxes*.

Paradox-responding strategies involve accepting and/or working with tensions (Lewis and Smith, 2014; Stadtler and Van Wassenhove, 2016). Although some authors use different terms, the most widely recognised classes of paradox-responding strategies are *acceptance, separation, and synthesis* (also referred to as synergy) (Lewis, 2000; Poole and Van de Ven, 1989; Smith and Lewis, 2011). *Acceptance* implies that organisational actors “learn how to live with paradox” (Poole and Van de Ven, 1989, p.566), i.e., they accept paradoxes by “appreciating their differences” (Smith and Lewis, 2011, p.385). While some researchers conceive of acceptance as a strategy, others argue that it is the first step to strategising (Smith and Lewis, 2011; Schad et al., 2016; Smith & Lewis, 2014; Poole and Van de Ven, 1989).

The *separation* strategies are also referred to as “splitting” (Andriopoulos and Lewis, 2010; Jarzabkowski, et al. 2013). There are two main strategy types associated with separation. *Spatial separation* entails using differing structures and processes to manage polar elements (Poole and Van de Ven, 1989). *Temporal separation* involves allocating conflicting demands in different time periods, thus dealing with them sequentially over time. While separation

strategies might help to insulate tensions, they can also reduce potential opportunities or synergies created by the paradox (Andriopoulos and Lewis, 2010; Smith and Lewis, 2011).

Synthesis strategies aim at synergies between the contradictory elements (Andriopoulos and Lewis, 2010; Lewis, 2000; Smith and Lewis, 2011) and seek a view that accommodates the opposing poles (Smith and Lewis, 2011), potentially creating something larger than the individual parts (Kocabasoglu-Hillmer et al, 2023).

Given that paradox-responding strategies have been mostly developed and applied at the organisational level in more enduring settings, little is known about pertinent factors in temporary and inter-organisational settings. Examining them at the supply chain/network level “requires careful thought” (Kocabasoglu-Hillmer et al, 2023, p.12) because jointly responding to paradoxes can bring about additional challenges due to the diversity of organisations involved and their different ways of working.

2.2 Temporary Supply Networks in Humanitarian Operations

TSNs are “deployed provisionally to provide the necessary goods and services to enable the accomplishment of specific tasks” (Fernandes, 2018, p.270). They are usually terminated once a task is accomplished (Day et al, 2012) and involve multiple inter-organisational relationships. In this regard, they are similar to project networks (DeFillippi and Sydow, 2016) and temporary multi-organisation projects (Thomé et al, 2016). They can be planned (e.g., project ventures, movie sets, mega events) or emergent (e.g., pandemics and disaster relief operations) (Bakker, 2010; Day et al, 2012) and can perform important functions for ESNs (e.g., tackling circumstances of change and dealing with disruptions) (Day et al, 2012).

Humanitarian TSNs are usually embedded in, or cut across, processes of planning, implementing, and controlling the flows of goods, materials, and information to serve people affected by disasters (Haavisto *et al.*, 2016; Kovacs and Spens, 2007; Tatham and Pettit, 2010; Van Wassenhove, 2006). Humanitarian TSNs are crisis-driven, diverse, task-orientated, evolving, and time-sensitive (Tatham and Kovacs, 2010). They exist for a given period of time and are intended to end when certain conditions are met (Bakker et al, 2016; Day et al, 2012). The key goals include acquiring necessary resources, getting them to the affected sites, deploying them to help victims of disaster to survive and begin the process of recovery (Day et al., 2012).

Temporality generally impacts how actors execute tasks and interact with each other in supply networks, and how organisations integrate their internal and external processes (Bakker et al., 2016; Fernandes, 2018). For example, while temporality can leverage outcomes as actors enforce routines and collective efforts in order to accomplish the final task, it can also discourage operational improvements (Fernandes, 2018). Therefore, temporality is inherently a source of tension. In humanitarian TSNs, given that there is no guarantee of future collaborations, humanitarian organisations may have less incentive to collaborate in the present (e.g., Haavisto et al., 2016).

2.3 Paradoxes in Humanitarian Temporary Supply Networks

Humanitarian TSNs often have elements that are enduring and temporary, formal and informal, as well as local and international. While new, temporary, and decentralized elements are deployed in specific disasters and contexts, there are old, enduring, and centralized elements that may be used across contexts and/or for future purposes (Bakker et al., 2016; Fernandes, 2018). Because these elements change over time, “what is enduring and what is temporary are sometimes fuzzy and often intertwined” (Bakker et al., 2016, p.1708). Thus, humanitarian TSNs are dynamic, changing across contexts and response phases to achieve particular objectives longitudinally, yet through temporary elements and characteristics. These characteristics lead to several paradoxes.

Learning paradoxes – Humanitarian TSNs usually build on previous knowledge across disasters (e.g., Day et al, 2012; Scholten et al., 2014). However, they are also likely to create new knowledge when responding to specific disasters. Therefore, they must integrate the old and the new knowledge, which can create issues. Furthermore, tensions between standardised and customized knowledge creation generally lead to challenges in knowledge circulation (DeFillippi and Sydow, 2016) and this is the case of humanitarian TSNs. Apte et al. (2016), for example, find that conflicting approaches in information gathering and knowledge sharing between high-ranking officials in the army and “boots on the ground” personnel lead to execution challenges.

Organising paradoxes – Following a disaster, multiple humanitarian organisations can join the response efforts spontaneously, often uninvited. Despite their good intentions, they can create multiple issues and complicate coordination, communication, logistics, and sustenance

capacity (Day et al., 2012; Schneiker, 2020; Van Wassenhove, 2006). Their involvement can lead to operational inefficiencies and turbulence, for instance, through duplicating efforts, bringing unwanted donations, and disrupting essential activities (Apte et al, 2016; Day et al, 2012). This worsens tensions that make it difficult to organise and manage TSNs properly (DeFillippi and Sydow, 2016).

Performing paradoxes – Humanitarian TSNs have multiple conflicting performance goals. Notably, efficiency (e.g., number of people reached) vs. effectiveness (e.g., equitable access to assistance) (Gralla et al, 2014) and short lead times (due to urgency) vs. cost-effectiveness (because of limited and scarce resources) (Van Wassenhove, 2006). There are also differences in how various stakeholders measure performance (Day et al, 2012; Fernandes, 2018). Additionally, there can be tensions between humanitarian organisations’ key performance objectives (e.g., reduce the disaster impacts and the suffering of the affected people) and suppliers’ objectives (e.g., commercial interest in the sale of aid supplies) (John and Gurumurthy, 2022). Earmarked donations, whereby donors define and restrict the use of resources (where, how, and for whom) (Dube et al., 2022), can also lead to tensions between donors’ specified objectives and humanitarian organisations’ objectives based on their missions and beneficiaries’ requirements.

Belonging paradoxes – Due to the proliferation of actors in TSNs (Schneiker, 2020), organisational values, beliefs, and missions vary profoundly, creating tensions (Kovacs and Spens, 2007). Differences in geographical (e.g., local vs. international organisations) and cultural (e.g., religious vs. non-religious) values and policies also contribute to tensions and barriers for the humanitarian work (Van Wassenhove, 2006). Therefore, a challenge facing all temporary (inter) organisational forms is that of “creating a collective identity” while respecting the individual identities of all participating organisations (DeFillippi and Sydow, 2016, p.13).

Even though paradoxical tensions are well documented in the humanitarian supply chain literature (HSCM), an understanding of paradox-responding remains elusive. There are effective ways of dealing with paradoxes in supply networks (Kocabasoglu-Hillmer et al., 2023; Xiao et al., 2019). However, there is a question of how this can be achieved under the conditions faced in humanitarian TSNs.

3. Methods

3.1 Research design and setting

This study adopts a qualitative case study approach to investigate an ill-understood phenomenon and explore the related complex issues in depth (Ketokivi and Choi, 2014; Yin, 2014). The research setting is the 2015 Nepal earthquake, focusing on the case of a shelter TSN deployed to reconstruct and rehabilitate structures after the earthquake. This single-setting approach leads to in-depth insights, producing context-specific theory (Eisenhardt, 1991). The event also has an “unusual” and extreme combination of factors, presenting an opportunity to “explore a significant phenomenon” under rare circumstances (Eisenhardt and Graebner, 2007, p.27) and make significant contributions to theory (Ketchen and Craighead, 2020). The shelter TSN had limited response resources and faced insurmountable challenges brought on by extensive damage across regions, unprecedented needs, limited availability of supplies, and a race against time due to an ensuing monsoon season. The multiplicity of actors involved also provides an opportunity to increase understanding of paradox-responding beyond the organisational level.

3.2 Background and Case Selection

3.2.1 Background

Several data sources were used to establish the background of the study and explore paradox-responding in the selected TSN: secondary documents (numbered D#001 to D#151) and videos (numbered V#01 to V#38). The data collection process is described in section 3.3.

On 25 April 2015, a 7.8 magnitude earthquake hit Nepal and surrounding areas. A series of aftershocks followed over a few weeks causing further damage and loss of life. More than 9,000 people were killed and around 22,000 were injured. Forty districts were affected; 14 of them declared ‘crisis-hit’ and, therefore, prioritised (D#042-044; D#051-053; D#057). Almost one-third of the population (around 8 million people) were impacted (D#006; D#008; D#043-044). Many of the capital’s roads, schools, and landmark buildings were destroyed while hundreds of thousands of houses either collapsed or were badly damaged (D#006; D#042-044; D#118). The earthquake caused massive landslides and avalanches which rendered many affected places further inaccessible and led to the suspension of most air operations (D#006-008; D#043-044). The estimated value of damages and losses was US\$7 billion (D#043).

The response operation involved hundreds of actors; for example, the government of Nepal had 461 partner organisations (D#057) while the UN-commissioned shelter cluster had 308 (D#059). Although some organisations were part of the capacity building and scenario planning before the earthquake struck (e.g., Lewin et al., 2018), most activities were focused on immediate response and minimising the impact of the earthquake. More organisations became involved after the earthquake to assist with reconstruction and rehabilitation efforts (D#057; D#059; D#078; D#080). Large and complex TSNs emerged, comprising of various organisations and groups of organisations, e.g., the Disasters Emergency Committee (DEC) with 15 member organisations¹. They sought to fulfil immediate priorities, which included shelter, food, clean water, and medical supplies (D#006-D#008; D#061; D#104; D#118).

3.2.2 Case selection

The main unit of analysis is the shelter TSN. Although this TSN comprised several organisations, some of which had been involved in some preparedness activities, it had emergent characteristics for several reasons. Typical factors that determine which organisations respond following a disaster include the ability to obtain sufficient funding on time, the degree to which the organisations are personally impacted by the earthquake, and the proliferation of new actors if the disaster leads to unprecedented needs. Furthermore, organisations often specialise in particular activities but might take on new roles depending on the needs. All these factors were present in the studied TSN (e.g., D#057; D#059; D#068; D#077; D#092).

For tractability (Kim et al., 2015), we selected five key shelter TSN member organisations responsible for coordination and/or significantly involved in the reconstruction and rehabilitation activities. The selection was based on the list of government of Nepal's named partners (D#057), the list of the UN-commissioned shelter cluster organisations (D#80), and the richness of data on available activities of these organisations through the response phases (D#006; D#040-D#45; D#057; D#078; D#147). Combining these criteria with the publicly available organisational reports, the following five (groups of) organisations were selected: (i) IFRC, (ii) United Nations agencies (e.g., UNICEF and UNOCHA), (iii) World

Food Programme, (iv) DEC (group of organisations), and (v) the Nepal Government agencies involved in reconstruction (e.g., National Reconstruction Authority (NRA) and the Ministry of Urban Development).

We retrospectively selected the most dominant tensions we could find in the data based on four types of paradoxical tensions identified in the literature. We used three conditions for paradox selection. Condition 1: the tensions had to be experienced by several key shelter TSN members for the purpose of comparison. This would enable the establishment of “consistent tendencies”, elimination of “chance associations”, and reducing the risk of drawing “erroneous conclusions” (Eisenhardt, 1991). Condition 2: as an indicator of major tensions affecting inter-organisational relationships characteristic of networks (Carter et al., 2015), the tension had to lead to collective action at the network-level (reflected in actions taken by various shelter TSN members). Condition 3: the secondary data available had to be rich enough to enable exploration of the paradox-responding strategies and enabling mechanisms. The instances of each paradox we could identify that met all three conditions satisfactorily are presented in Table 1.

----- Insert Table 1 approximately here -----

3.3 Data collection

We gathered historical secondary data from online, verified sources. These include reports from the five key (groups of) organisations that make up the TSN, meeting minutes, and news articles. The historical records were essential for reducing the likelihood of “convergent retrospective sensemaking” (Eisenhardt and Graebner, 2007). We also collected information from data repositories such as the Global Shelter Cluster (Nepal earthquake 2015)², Relief Web repository of Nepal Earthquake Humanitarian Response 2015³, and Humanitarian Data

² The global shelter cluster reporting on the Nepal Earthquake had 392 documents and 11 events on 19 March, 2023. Source: <https://sheltercluster.org/response/nepal-earthquake-2015>

³ The Relief Web repository had 48 relevant documents about the 2015 Nepal Earthquake Humanitarian Response https://reliefweb.int/updates?view=reports&advanced-search=%28C168%29_%28DA20150401-20190430%29&search=%222015+nepal+earthquake%22 on 27 March, 2023.

Exchange⁴. Additionally, we relied on videos published by news agencies and NGOs to capture more details about the response.

We ultimately selected 151 documents (D#001 to D#151) and 38 videos (V#01 to V#38), yielding more than 2,000 pages and 175 minutes of footage to analyse. We mainly relied on 58 documents (D#001 to D#058) to develop insights into how the shelter TSN members navigated the tensions (Appendix I). The other sources enabled further exploration of the dynamics of the paradoxical tensions, triangulation of evidence from the key documents – to mitigate the risk of biases inherent in self-reporting (Eisenhardt and Graebner, 2007) and ensure that findings were interpreted within context.

3.4 Data analysis

Given the vast amount of data, terminological differences across reports, and the limited empirical knowledge of the phenomenon, the analysis process began with categorising the data sources into broad topics. These included contextual background, disaster effects in relation to shelter, response needs, tensions/ contradictions, and associated challenges/ trade-offs affecting the shelter TSN, operational aspects and shelter TSN member actions.

Following the data categorisation, we began coding the secondary data documents and summaries of the video contents using an abductive approach (Ketokivi and Choi, 2014). We initially focused on deductive codes for paradox-responding strategies for the selected paradoxes (Table 1). We analysed and classified the data based on ideas and concepts from the literature on temporary organising (e.g., Bakker et al., 2016; Day et al, 2012) and paradox-responding (e.g., Lewis and Smith, 2014; Smith and Lewis, 2011). The analysis process was iterative, going back and forth between theoretical ideas and the data as it was reduced to second order concepts and third order themes (Voss et al., 2002). As themes on these aspects emerged from the data, they were inductively coded for in an iterative process. For instance, the authors interrogated each theme, its meaning, whether it was sufficiently reflected in the labels chosen to describe the themes, and if it sufficiently accounted for relevant contextual factors.

⁴ The Humanitarian Data Exchange had 13 datasets about the 2015 Nepal Earthquake Response, <https://data.humdata.org/dataset?q=nepal+earthquake> on 05 April, 2023.

Throughout the analysis process, we triangulated data across the different data sources to achieve internal validity (Eisenhardt and Graebner, 2007; Voss et al., 2002) and increase rigor (Yin, 2014). The concepts and themes were achieved either literally (directly from the data) or by logical extension (Dube et al., 2016). Regarding the latter, for example, this involved consolidating and summarising statements from different reports to piece together the evidence. This process led to three classes of paradox-responding strategies (separation, synthesis and transcendence, an emergent strategy) and four strategy types (*temporal separation, structural separation, combination, juxtaposition*). We also identified four main enabling mechanisms; the coding structure is presented in Figure 1 and exemplar codes are presented in Appendix II.

The analysis process led to the theoretical insights necessary to move from the empirical data and to develop a framework of paradox-responding strategies and related enabling mechanisms.

----- Insert Figure 1 approximately here -----

4. Findings and analysis

This section presents the findings on paradox-responding strategies and enabling mechanisms focusing on how the Shelter TSN navigated tensions amid extreme contextual challenges.

4.1 Paradox-responding in the Shelter TSN

4.1.1 Learning Paradox: Local vs. Global Knowledge

To provide appropriate shelter, the TSN had to combine conflicting local and international knowledge (e.g., on laws, standards, and policies): a learning paradox.

A complicating factor in seeking to reconcile knowledge tensions was that local knowledge kept changing. Some local policies, procedures and guidelines changed frequently, creating issues among stakeholders (D#007, p.12; D#040, p.13-14; D#042, p.11; D#069, p.13; D#131). Ultimately, TSN members lacked clarity on the regulations in place and authorities' roles, which challenged the response (D#040, p.13-14), especially in joint working (D#040, p.13-14) and coordination (D#042, p.11, 36, 50). Consequently, some districts suffered delays

in shelter provision because of delays in signing crucial agreements and in getting the certification of new buildings (D#007, p.15; D#042, p.11, 34; D#040, p.14; V#037).

“Delayed signing of the agreement with the NRA [National Reconstruction Authority], constant development and frequent changes in government policy, procedures and guidelines created lot of confusion as well as took more time than actual plan (almost 1-year delay).” Red Cross (D#042, p.11).

In response, the TSN either combined the conflicting knowledge aspects or adhered to local knowledge for some parts of an operation and international knowledge for others; in all instances, they used the same structure. This is in line with the *combination* and *juxtaposition* strategies, respectively.

In one instance, they combined the conflicting knowledge by subordinating international requirements to local ones. For example, to select beneficiaries for shelter grants, the TSN followed the NRA guidelines (i.e., local knowledge) (D#006, p. 2, 4, 31; D#075, p.1-2) and, where possible, also embedded international criteria. To ensure equity, it further prioritized vulnerable groups (D#042, p.13; D#043, p.6, 10; D#044, p.189, 225, D#073, p.1-5; D#074, p.10-16; D#075, p.2-5).

“In addition to following the NRA beneficiary selection criteria and guidelines for the shelter grants, NRCS [Nepal Red Cross Society] supported by the IFRC [International Federation of Red Cross and Red Crescent Societies] ensured that the other activities within the shelter interventions (...), [met] IFRC’s standards of gender and diversity sensitive analysis in beneficiary selection, i.e. by targeting women-headed households, pregnant or lactating women, widows, third gender, men and boys made vulnerable, people with a disability and people facing caste-based exclusion.” Red Cross (D#042, p.13).

Another instance of local and international knowledge *combination* resulted in innovation. Two DEC organisations introduced an environmentally friendly technology to produce bricks locally, using locally available materials. Thus, it contributed to long-lasting benefits for the affected communities.

Adherence to international knowledge for certain aspects and local knowledge for other aspects was observed at the materials sourcing level, leading to products incorporating both.

For example, the TSN members sourced some materials based on international standards, like corrugated galvanized iron sheets, while households helped provide and collect local materials, such as wood, mud, and stones to complete the project (D#007, p.12, 23, 27; V#038).

To ensure network-level functioning in responding to the learning paradox, the TSN primarily engaged with the community and regulatory authorities. At community level, it established: information/knowledge sharing mechanisms like newspaper columns, banners, radio programmes, street drama, and puppet shows; put up suggestion boxes to promote beneficiary participation; and established two-way communication through hotlines and help desks (D#006, p.31; D#040, p.12; D#043, p.4-5). Education and information campaigns were also initiated to address initial public reluctance to use the new environmentally friendly bricks; they were successful, resulting in widespread use (D#040, p.13). Engagement with regulatory authorities focused mostly on knowledge transfer and collaboration. For example, some TSN members created a working group of technical experts (local, regional, and global) and mobilised them to different districts to work closely with government-appointed engineers (D#007, p.26; D#042, p.11, 44). This group remained vital for coordinating activities, transferring jointly created knowledge (e.g., the production process of the aforementioned bricks), and sharing good practices (D#042, p.44).

4.1.2 Organising Paradox: Procedures for immediate-needs vs. development

The procedures for addressing immediate and unprecedented shelter needs caused by the earthquake were incongruent with development-focused ones: an organising paradox.

In response, the TSN dealt with the conflicting procedures by dealing with the needs causing the tensions either sequentially or simultaneously, using predominantly the same structures. This is in line with *temporal separation* and *juxtaposition* strategies, respectively. For *temporal separation*, the limited resources shared by TSNs and ESNs (e.g., human, organisation, material, and financial) were diverted to prioritise the more urgent needs caused by the earthquake. This includes the Open Defecation Free campaign which had been established prior to the earthquake to provide sanitation and mitigate the risk of disease outbreaks through toilet construction (D#006, p.2, 29).

Later, in 2018, the TSN transitioned from the life-saving to development focus as a matter of priority (D#040, p.1; D#042, p.8, 11, 14, 42). The TSN facilitated reactivation of

livelihoods and community infrastructure activities, e.g., the Open Defecation Free campaign. Core activities included site preparation, continuing work with debris management, and strengthening capacity for reconstruction activities and other long-term needs (e.g., D#006, p.11; D#040, p.8, 9, 11; D#042, p.8, 41, 42; D#043, p.4, 12, 54; D#044, p.3-4).

“Technical staff from the response community will be trained to build a local pool of expertise to support technologies and sustain equipment going forward. The ETC [Emergency Telecommunications Cluster] project also includes working with government authorities, building on the experiences from this operation, to strengthen their capacity to respond to future emergencies.” UNOCHA (D#083, p.48)

For juxtaposition, although providing decent temporary shelter was prioritized, the TSN also facilitated the reconstruction of permanent earthquake and weather-resistant homes (D#007, p.13-14; D#040, p.11; D#042, p.9-10, 48).

“Solutions for transitional shelter are needed so that people can live with a certain degree of comfort and dignity until permanent reconstruction or repair and retrofitting work is completed. People must be informed of ways to improve the transitional shelters as they may have to inhabit them for a couple of years.” GoN (D#044, p.10)

At the same time, they facilitated the attainment of long-term priorities. Within the TSN, there were increased fundraising efforts for reconstruction and sourcing/provision of resistant construction materials, e.g., corrugated galvanized iron sheets and shelter kits for rebuilding (D#007, p.23, 27). They also worked with multiple stakeholders. For example, they funded families to build their new permanent homes through construction grants (D#040, p.14; D#041, p.12, 23; D#042; D#043, p.88; D#103, p.3; V#015; V#024) and ensured that all new houses were built according to the earthquake-proof standards (D#006, p.25; D#040, p.5; V#006; V#038).

To ensure network-level functioning in responding to the organising paradox, different mechanisms were adopted for each paradox-responding strategy. For *temporal separation*, collaboration, coordination, and specialization were the main enabling mechanisms. TSNs members that were already working in Nepal prior to the earthquake had specialised staff and procedures for the ongoing programmes. To respond to immediate needs, they brought in local, international, and global experts to provide customized disaster response trainings (specifically

on shelter interventions in emergencies) to key staff and volunteers (D#007, p.13, 25; D#042, p.33). In order to facilitate the transition to development programming, organisations within the shelter TSN gradually refocused coordination/collaboration efforts accordingly. Once all activities had been handed over to relevant line ministries and stakeholders, the shelter TSN was disbanded; TSN member organisations resumed their typical operations.

Under *juxtaposition*, the TSN members engaged with each other (internally) and other stakeholders (externally). Coordination was the main approach, e.g., meetings and the establishment of community focal points and committees (D#006, p.28; D#040, p.5, 12; D#041, p.4; D#042, p.3, 11, 33-35; D#104, p.3; D#109, p.2). Additionally, through meetings, situation reports (e.g., D#009-034), and working groups, different members communicated about, for example, key achievements, updates by affected region, gaps and challenges yet to be covered, identified risks, priorities, and next steps (D#083, p.43, 44, 50). Resources were also dedicated to addressing common causes of vulnerability, including low-risk awareness (e.g., Disaster Risk Reduction and Build Back Safer campaigns) (D#007, p.25, 26; V#038) and limited skilled labour for ensuring safe construction practices (e.g., artisans, engineers, and builders) (D#007, p.26; D#040, p.15-16; D#041, p.5; D#042, p.11, 29; D#043, p.16, 57; V#006-009; V#022-024).

4.1.3 Performing Paradoxes: Diverging Needs Across Regions

Diverging needs across affected regions due to the varying impact of the earthquake (D#051 to D#053) meant that the TSN was pulled in different directions: a performing paradox. This implied that differentiated approaches for shelter provision were required to meet the different needs of affected people (D#006, p.3, 6; D#007, p.14, 28).

In response, the different members of the TSN specialized in particular functions and adopted different sub-structures to deal with divergent needs. This is in line with *spatial separation* strategy. We found three variations of this approach. Variation 1: the government set up the NRA to formally coordinate construction efforts and guide the TSN members involved (but also other stakeholders, e.g., affected households) (D#040, p.3). Variation two: the Red Cross coordinated the actual delivery of input materials and services to the affected people in different districts (D#059, p.1; D#078, p.3, 7; D#080, p.1); this was also in conjunction with the UN-commissioned Shelter Cluster— in line with the pre-specified

relationship between the Red Cross and the UN Cluster system in different contexts (e.g., D#003, p.1; D#004, p.95; D#005, p.42, 44). Variation three: some TSN members set up hubs in different locations to enable efficient distribution (D#035, p.1; D#036, p.1; D#037, p.1; D#038, p.1); different shelter structures were deployed to those hubs in line with different needs across regions to tackle their particular objectives, needs, and features (e.g., urban, rural, and mountainous) (D#035, p.1; D#036, p.1, 2; D#037, p.10; D#038, p.1, 2; D#051-053, D#057; D#066, p.10-12). For example, the Western hub addressed access challenges in remote and mountainous areas (D#035, p.1) while the South-eastern hub dealt with regions with easier road access (D#038, p.4). Thus, different approaches were taken in recognition of such differences:

“In certain high-altitude districts like Gorkha, the response was particularly strong. These districts obtained greater attention owing to levels of damage, the numbers of NGOs working there, as well as extraneous reasons, such as the connections with the British Army Gorkha Regiment. However, lower altitude districts and those stuck by the second earthquake received less assistance”. Global Shelter Cluster (D#007, p.14).

To ensure network-level functioning in responding to the performing paradox, specialisation of different group actors was implemented. All specialising members had oversight on their focus areas: construction efforts; supplies; logistics and distribution. They also relied on other stakeholders beyond the shelter TSN (e.g., affected households under variation 1 and the UN shelter cluster under variation 2). Coordination was a crucial enabler in ensuring adherence to standards and, at the same time, a differentiated approach to addressing divergent needs. For variation 3, coordination took place at the district hub level and between the hubs (network-level) mainly through situation reports and meetings, sometimes enabled by technological tools (D#59, p. 1; D#042, p. 10, 13, 49-50; D#062, p.1). The hubs also shared information about government directives, e.g., minimum standards for model houses specified by the Department of Urban Development and Building Construction (D#039) and construction standards and techniques (D#062, p.1-8). There was also knowledge creation and transfer across hubs, for example, about gaps in shelter services, demographics, vulnerabilities, and protection needs (D#006, p.12, 28; D#007, p.16, 17, D#094, p.1, 5, 9).

4.1.4 Belonging Paradox: Conflicting Modi Operandi

Within the TSN, diverse organisational identities led to different modi operandi, i.e., established work practices that reflect organisational identities (Dube, 2022): a belonging paradox. Some of these differences led to various interpretations of the same things. For example, the procurement of input materials took too long because of misaligned processes that were based on different interpretations of an emergency (D#007, p.27).

“Internally, different organisational stakeholders had varying degrees of understanding of what processes needed to be in place, prior to procuring relief materials. This resulted in materials being procured too slowly, as non-emergency processes were being utilized” Global Shelter Cluster (D#007, p.27).

In response, the TSN dealt with these tensions by jointly constructing new approaches through the same, but re-engineered structure. This is in line with a ‘*transcendence*’ strategy. In June 2015, the TSN members agreed to adopt “One Plan” to guide all recovery activities (D#042, p.5-6). The result was a co-created plan. Regardless of how individual organisations would typically work, they had to comply with the new common mandate, values, and work practices embodied in the One Plan. For example, beneficiary selection was now based on a unified approach covering all individuals needing shelter assistance (D#040, p.4, 10).

To ensure network-level functioning in responding to the belonging paradox, several stakeholders took on different roles and responsibilities. The government of Nepal developed a common framework for humanitarian action across all recovery programmes. This was reinforced by the introduction of a reconstruction bill for earthquake-affected structures and the establishment of the NRA (D#006, p.28; D#043, p.52, 91; D#044, p.280-281). The TSN members used these as input in developing a common set of approaches, e.g., for information sharing, tools, and templates, all giving rise to standardized procedures (e.g., for construction D#039). Intra-TSN coordination and with other local stakeholders (and focal points) became central in sharing information about shelter needs/challenges and key achievements (regularly summarised in situation reports, e.g., D#009-026) and overall construction progress (D#087, p.1-2; D#092; D#109). For example, partners from other TSNs focusing on water, sanitation, and hygiene (WASH), livelihoods, and health were regularly updated on the evolving needs

and actions of the shelter TSN (D#006, p.29; D#007, p.17, 19; D#042, p.13, 34-35; D#116, p.3, 7, 11).

4.2 Comparing strategies and enabling mechanisms

Table 2 summarises the similarities and differences across paradox-responding strategies and enabling mechanisms.

----- Insert Table 2 approximately here -----

4.2.1 Paradox-responding strategies: common features and specificities

Although most responding strategies entail tackling paradoxical elements at the *same time* (except temporal separation), using the *same structures* (except spatial separation), and without altering the conflicting elements (Table 2), we find important differences across strategies.

During the *execution* of the combination, temporal separation, and transcendence strategies, subordination of one paradoxical element to the other was common. However, there were differences in the reasons for subordination. When combination was used to respond to the learning paradox, international knowledge was subordinated to local knowledge to increase acceptance of newly built structures; it also had the added benefit of producing structures that could be maintained using local resources in the long run. When temporal separation was used to deal with the organising paradox, the subordination of development programming was mainly down to resource limitations and urgency in providing shelter (in part, because of the looming monsoon season). Under transcendence, individual organisation's identity-based operational approaches were subordinated to new approaches based on pertinent contextual factors but also values that would lead to the best equity outcomes.

For juxtaposition and spatial separation strategies, although conflicting objectives were addressed simultaneously, there were differences in how responsibilities were shared. Whereas for juxtaposition, the TSN took direct responsibility for one objective and facilitated the attainment of another (including via beneficiaries who were building their own homes), under spatial separation, different TSN members were scattered across specialisations – some of them not specialists in those functions.

4.2.2 Engagement and Knowledge as cross-cutting enabling mechanisms

Engagement and knowledge transfer/creation were enablers across all paradox-responding strategies but there were also some important differences between them.

Communication/information sharing and coordination were used in all situations. The transcendence strategy was found to entail the adoption of the most complex mechanisms. Communication, coordination, and even collaboration, almost morphed into one; it was difficult to disentangle the order, priority, and nature of engagement activities. The combination strategy involved the second most complex mechanisms; in addition, they were the most diverse (e.g., radio programmes, street drama, and hotlines). In contrast, for juxtaposition, most of the mechanisms were either arms-length approaches like the use of situation reports or less wide-reaching channels like meetings between relevant groups/committees.

Knowledge was also created and/or transferred across all strategies (Table 2). Although most knowledge could potentially have long-term impacts/benefits, there were marked differences in the specificity, depth, and novelty of the knowledge. Knowledge transfer through training was dominant for the juxtaposition, combination, and temporal separation strategies. It was novel for transcendence and spatial separation (due to the creation of new procedures, processes, or products) – mostly being transferred as it was created; in-depth for transcendence and combination (a blend of knowledge creation and transfer for technical expertise); specific for juxtaposition (e.g., earthquake risk awareness and skills for the construction industry); and some knowledge was also basic for spatial separation (e.g., information on demographics and protection needs).

More broadly, whenever tasks were delegated, there was knowledge transfer to the actors involved through training, provision of necessary response resources, and having a voice on matters they were responsible for. The latter enabled knowledge transfer to the shelter TSN, allowing them to receive real-time feedback on possible implications of certain decisions and take corrective steps in time to secure desired/better outcomes.

4.2.3 Functional specialization vs. Leveraging specialisms

Comparing insights across responding strategies, we observe that (i) specialisation is not always based on specialisms and (ii) the value of different network members' specialisms is not limited to their ability to specialise.

In relation to (i), we find that there is functional specialisation linked to temporal and spatial separation strategies. For temporal separation, some of the network members were specialised in development programming and had to switch focus to life-saving programming. To achieve the latter, they brought in external experts and built internal capabilities, primarily through training. Thus, they became specialised in life-saving programming out of a need to address the new demands brought on by the earthquake. For spatial separation, although different structures were used at the same time, different TSN members were responsible for functions they were not necessarily specialised in; the priority was to coordinate those different activities for oversight. Thus, again, they developed these capabilities alongside what they were already contributing toward shelter provision.

Regarding observation (ii), although there was subordination under the combination and temporal separation strategies, some of the network members' specialisms were leveraged for better outcomes. For example, although development goals were subordinated to life-saving goals (under the temporal separation strategy), the specialism of some members in development programming enabled the TSN to integrate development objectives early in the response (e.g., knowledge transfer on building earthquake-resistant structures). Similarly, international knowledge was subordinated to local knowledge (under the combination strategy) but was still useful for refining beneficiary selection criteria to enhance equitable provision of assistance. Under juxtaposition, a slightly different mechanism seems to have been in place whereby taking more responsibility for one of the paradoxical elements led to focus on some specialisms more than others. Overall, (i) and (ii) open up the TSN to multiple opportunities to simultaneously develop new capabilities and leverage existing ones.

4.2.4 Standardization/Innovation and long-lasting outcomes

Standardisation and innovation were the most advanced enabling mechanisms found; they involved key changes in knowledge and established practices for different reasons across strategies. Under juxtaposition, standardisation of uncontested practices was pursued (likely for efficiency reasons). Under combination, there was innovation motivated by material

shortages and environmental sustainability goals; standardisation was the by-product. Under transcendence, standardisation was the goal, but innovation was necessary to achieve this, i.e., standardisation through innovation.

Overall, despite its temporary existence, the shelter TSN contributed to lasting changes and outcomes that benefited: (i) individual organisations who expanded their capabilities by accessing those of other TSN members, (ii) ESNs operating in Nepal by bringing about several long-term benefits for the community, and (iii) the country's construction industry, and other public service ministries, by resulting in employment opportunities and creating a pool of trained individuals to support quality and safe shelter construction in the future.

5. Discussion and Contributions

This research investigated paradox-responding in humanitarian TSNs. We contribute to the paradox-responding literature (Matos et al., 2020; Smith and Lewis, 2011; Miron-Spektor et al., 2018; Stadler and Van Wassenhove, 2016) by illuminating specificities of the humanitarian context in an exploration of network-level paradox-responding strategies and enabling mechanisms. In line with the extant literature, we find evidence of synthesis and separation strategy classes (e.g., Poole and Van de Ven, 1989; Schad et al., 2016; Smith and Lewis, 2011) and introduce transcendence as a strategy class. We also elaborate on synthesis strategies, identifying juxtaposition and combination as examples. Additionally, we identify and explain the role of enabling mechanisms in paradox-responding.

5.1. Paradox-responding in temporary humanitarian settings

The literature acknowledges some conditions that intensify the salience of, and engagement with, paradoxes (e.g., plurality, change, and scarcity) (e.g., Maalouf and Gammelgaard, 2016; Matos et al., 2020; Smith and Lewis, 2011). These conditions are highly present in humanitarian TSNs: multiple network members must jointly respond to fast-changing situations under resource constraints. Because these conditions are present at different times and at varying levels in the studied TSN, our study reveals rich insights into the paradox-responding phenomenon. We extend the current knowledge by demonstrating how time pressure, institutionalized activation, and termination, diversity of organisational actors, and

operational uncertainty and dynamism influence the response to paradoxical tensions. This confirms the importance of context in paradox research (Hargrave and Van de Ven, 2017).

In humanitarian TSNs, objectives, processes and organisational actors' actions evolve (Besiou and Van Wassenhove, 2020; Tatham and Kovacs, 2010; Van Wassenhove, 2006). Accordingly, we find that paradox-responding is ongoing and dynamic; likely causing the paradoxes to also evolve. We also find that collective effort involving emergent, bottom-up, adaptive, and innovative approaches is essential for paradox-responding. This confirms that response to tensions happens “in and through social interactions” (Sheep, Fairhurst, and Khazanchi, 2017, p.465). Finally, the time-bound nature of needs and the TSN existence additionally imposes pressure to act on paradoxical tensions (Day et al., 2012; Fernandes, 2018; Tatham and Kovacs, 2010). Indeed, in the studied TSN, time (in)directly influenced paradox manifestation and responding strategies as alluded to in works that explore the impact of temporality on execution of tasks and interaction among actors (Bakker et al., 2016; Fernandes, 2018; Haavisto et al., 2016).

5.2 Key research insights

5.2.1 Transcendence as a paradox-responding strategy

We introduce “transcendence”, which we conceive of as *actions* that create new ways of working leading to synergistic *outcomes*. This is different from the way transcendence has been referred to in the extant literature (Gaim et al., 2022; Lewis, 2000), in three main ways. First, Lewis (2000, p.764) refers to it as a *mindset*, the capacity of actors to think paradoxically and critically examine “entrenched assumptions to construct a more accommodating perception of opposites”. Perhaps a transcendent mindset facilitates this transcendent action.

Second, Gaim et al (2022, p.408) argue that transcendence is a “result of dialogue characterized by blended voices, meaning that paradoxes persist dynamically, in other words, were changing permanently”. While the literature argues for a dynamic persistence of paradoxical tensions over time (Gaim et al., 2022), we find that under the transcendence strategy, even if tensions do persist (e.g., TSN members still likely retain their core identities), they become indiscernible or are at least rendered irrelevant. This point significantly differentiates transcendence from the separation and synthesis strategies because even after applying such strategies the tensions remain persistent and discernible (e.g., Jarzabkowski et

al., 2013; Lewis, 2000; Poole and Van de Ven, 1989; Schad et al., 2016; Smith and Lewis, 2011).

Third, we conceive of transcendence as rising above and beyond what is known. In the case of the belonging paradox, we found that it involves giving up individual values, creating collective knowledge, and expanding capabilities through connecting with others. Although the TSN members' unique identities were likely neither lost nor fundamentally altered, for a specific situation, they subscribed to the shared values for a greater good. Transcendence, therefore, is a valuable strategy given the diverse organisations that must jointly work towards the same final outcome in humanitarian TSNs (Haavisto *et al.*, 2016; Kovacs and Spens, 2007; Tatham and Pettit, 2010; Van Wassenhove, 2006).

5.2.2 Separation and synthesis strategies

Our study adds to current knowledge on separation strategies (e.g., Jarzabkowski et al., 2013; Lewis, 2000; Poole and Van de Ven, 1989; Schad et al., 2016; Smith and Lewis, 2011) by elaborating on the interplay between time and structure. The implications of timing for structure in paradox-responding are an important consideration in humanitarian TSNs. The use of separate structures (e.g., teams or organisations) in the spatial separation strategy to deal with the paradoxical elements individually can lead to duplication of efforts or expending more resources. In temporal separation both paradoxical elements can be dealt with by the same structure but redirecting their focus at different points in time. As a result, duplication of efforts, for example, can be avoided. However, this is likely contingent on time; if there is urgency, temporal separation may not lead to desired outcomes. We also demonstrate how separation strategies can be based on specialization vs. leveraging specialisms.

For synthesis strategies (Andriopoulos and Lewis, 2010; Jarzabkowski, et al. 2013; Lewis and Smith, 2014), we add to the current knowledge by unveiling nuances on strategy types in humanitarian TSNs (i.e., juxtaposition and combination). In the process, we elaborate on varying implications for structure and operationalization, as well as identifying synergistic effects (Andriopoulos and Lewis, 2010; Lewis, 2000; Smith and Lewis, 2011). For juxtaposition, the main synergistic effect found was structure optimization through the ability to perform contradicting tasks simultaneously, which can be seen as ambidexterity (Tushman and O'Reilly, 1996). For the combination strategy, we identified multiple benefits regarding

efficiency and quality in construction in the short run, and also outcomes that would benefit the ESNs in the long run (e.g., building community resilience and empowerment, contributing to reducing professional capabilities shortages, and increasing employability opportunities).

5.2.3 Enabling mechanisms

Our study demonstrates that collective paradox-responding at the supply network-level requires key enabling mechanisms, namely engagement, knowledge, specialisation, and innovation/standardisation. In addition to managerial paradoxical sensemaking highlighted in the literature (Matos et al., 2020; Smith and Lewis, 2011; Miron-Spektor et al, 2018; Stadler and Van Wassenhove, 2016), we find that paradox-responding takes place through actions and interactions amongst supply network members. It is a collective and relational effort (Gaim et al, 2022) that involves improvised approaches. Therefore, we contribute to the literature by showing *how* paradox-responding takes place on the ground through inter-organisational mechanisms.

In line with the HSCM literature (e.g., John and Gurumurthy, 2022; Scholten et al., 2014; van Wassenhove, 2006), we also find that engagement and knowledge are essential in disaster response; they are relevant regardless of the paradox-responding strategy adopted. However, we further find that the types, specificity, depth, and novelty of these enabling mechanisms vary across the identified strategies.

5.3 Responding Strategies & Enabling Mechanisms: Proposed Framework

Our results indicate a hierarchy of paradox-responding strategies based on complexity of addressing tensions as well as enabling mechanisms based on implementation efforts.

We find that transcendence is the most complex responding strategy in relation to belonging paradoxes (DeFillippi and Sydow, 2016; Smith and Lewis, 2011; Schad et al, 2016). This is likely because identity can be contentious in the humanitarian sector as it informs policies, practices, and standards (Kovacs and Spens, 2007; Van Wassenhove, 2006). Yielding on any aspect linked to belonging can be perceived as going against an organisation's own identity.

Contrary to the extant literature (Lüscher and Lewis, 2008) our results also suggest that, in humanitarian TSNs, separation strategies (temporal and spatial) are more difficult to

implement than synthesis strategies. This is a counter-intuitive finding. We speculate that this is a contextual issue because, in the studied humanitarian TSN, separation strategies require structural changes in the supply network due to specialisation, sometimes on functions that members have not historically performed and seizing opportunities to leverage specialisms as needs change. Furthermore, we find that the separation strategies largely entail the creation and transfer of technical knowledge by experts, often separated across time and/or structures but having to continuously integrate the separated elements throughout the lifetime of the TSN.

Synthesis strategies (juxtaposition and combination) are likely the least complex to implement in humanitarian TSNs because they draw on existing expertise with outsourcing where necessary. Thus, the necessary enabling mechanisms are engagement mechanisms (e.g., collaboration, coordination, and information sharing), though sometimes difficult to secure (e.g., Scholten et al., 2014), they are always part of any response efforts (Haavisto et al., 2016).

Correspondingly, enabling mechanisms become harder to implement as the complexity of the responding strategies increases. Engagement and knowledge mechanisms are the least complex to implement. Functional specialisation and standardisation/innovation are more complex because, in addition to engagement and knowledge creation/sharing, they demand more resources – which donors do not always support (Dube et al., 2022). Extreme time pressure imposes additional challenges (Day et al., 2012; Fernandes, 2018; Tatham and Kovacs, 2010). Particularly in relation to standardisation through innovation (linked to the transcendence strategy), we struggled to empirically disentangle and order the adoption of all relevant enabling mechanisms – we could only tell that they were all present. Based on this reflection, we propose an analytical framework (Figure 2).

----- Insert Figure 2 approximately here -----

5.4 Practical Insights

This study offers three important implications for practice. Firstly, our framework provides guidance on how to choose strategies for paradox-responding in humanitarian TSNs. The following considerations about the paradoxical elements are crucial as they play out differently across the strategies identified: whether they (i) can be tackled using the same structure, (ii) must be dealt with immediately, (iii) have different importance levels. In addition, (iv) whether

the TSN has the necessary resources, capabilities required. For example, if there are conflicting objectives that must be met simultaneously by the same structure, but the TSN lacks all the necessary capabilities needed to achieve its outcomes, then juxtaposition via delegating or acquiring some specialisms externally seems to be a reasonable choice.

Secondly, our research shows how decision-makers can balance efficiency and building capabilities given the typical resource constraints in humanitarian response. Our findings suggest that where skills needed are context specific (as is the case under juxtaposition), relying on leveraging specialisms becomes more efficient. For combination, we also find that it is more efficient to bring in external experts and leverage specialisms where appropriate. In the studied TSN, this is because the skills needed were more advanced than under juxtaposition but were too specific (e.g., engineering and construction) to develop in-house. Finally, where the skills needed are more generic and strategic (as with temporal separation in the studied TSN), even if external experts are brought in, it is also worthwhile to develop the skills in-house because they are transferrable across disasters and contexts.

Finally, besides humanitarian TSNs dealing with natural disasters, the insights from this research are relevant in other temporary disruption-prone settings overall (e.g., terrorism and pandemics). For example, network-level enabling mechanisms can be useful for determining how different TSNs deal with paradoxical tensions inherent in their response operations. Additionally, the idea of transcendence can help practitioners rise above tensions that have previously held them back, e.g., identity, and find better solutions to specific problems.

6. Limitations and Future Research

The longitudinal focus and extreme single-setting design of our study leads to significant contributions to the literature. However, our research findings are limited by the study's focus on paradox types and the context analysed. Future research could build on our work to explore other temporary and inter-organisational empirical contexts to refine and extend our insights.

A first line of inquiry relates to the relationship between paradox types and paradox-responding strategies. Perhaps because of the sampling approach, our research links, at most, a single paradox type to two responding strategies. Nevertheless, we assume that there could be more relational links than this study unearths. Research could also explore the implications of overlapping paradoxes for strategy selection and related enabling mechanisms. It would also

be worthwhile to establish how the identified paradox-responding strategies play out in planned TSNs and ESNs to advance knowledge on paradox-responding in both.

Second, our research reveals enabling mechanisms that we find to be in line with traditional mechanisms for improving supply chain visibility and overall functioning. Research on paradox-responding at the supply network-levels offers opportunities for understanding contingency aspects related to these mechanisms. Given the high cost of adopting all mechanisms, future research can explore how they can be best deployed in other contexts.

Third, despite their temporary nature, we find that TSNs can have enduring effects, generating long-lasting benefits beyond their lifetime. Since temporality is present at varying degrees in supply networks (Fernandes, 2018), further exploration of the enduring effects of TSNs would improve our understanding of how we can extend their value beyond being a stop-gap measure to deal with unprecedented changes. This would pave the way for exploiting this feature more in different settings. For instance, is there path dependency in disaster response within the same context over time, i.e., do future dynamics and strategies depend on those chosen today? Related to the latter, future research can explore if there are parent and offspring strategies.

Finally, we find transcendence to be a fascinating concept that has the potential to lead to advancements in dealing with unfamiliar crisis situations. Transcendence, as conceptualised in this study, can allow researchers interested in several OSCM issues (e.g., sustainability, innovation, and disruptions) to find solutions that transcend past experience to address new challenges in an increasingly uncertain world.

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Appendices

----- Insert Appendix I approximately here -----

----- Insert Appendix II approximately here -----

Figures

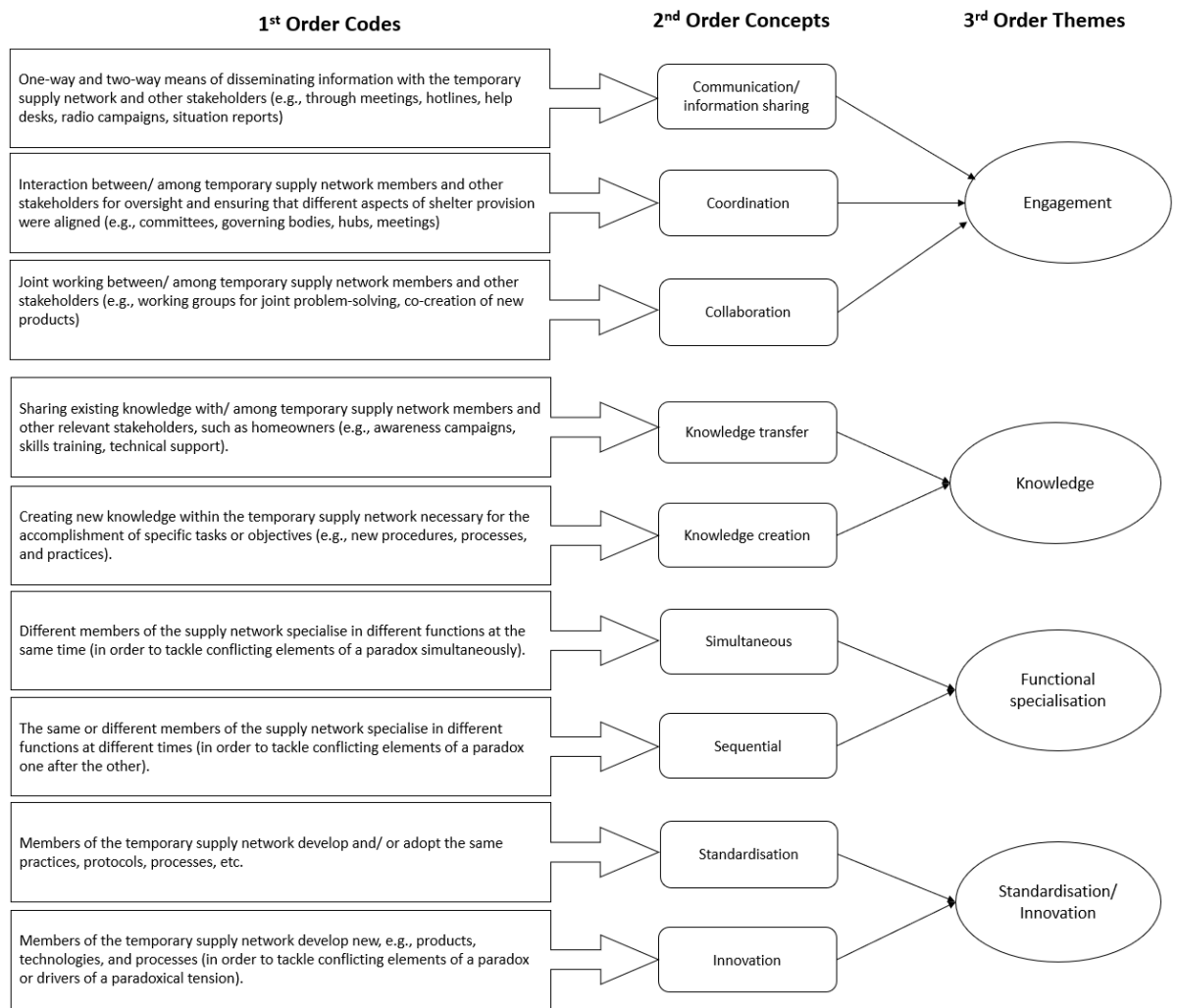


Figure 1: Data coding structure for enabling mechanisms

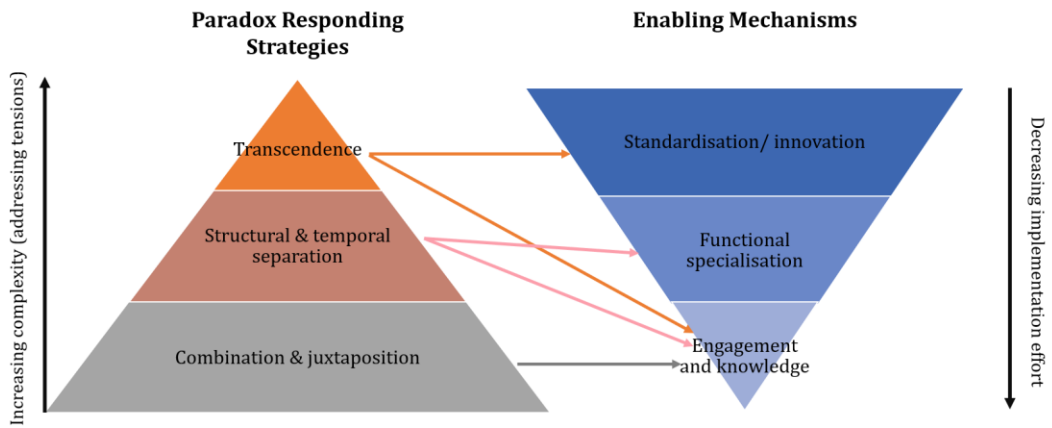


Figure 2: Framework of paradox-responding in humanitarian temporary supply networks

Tables

Table 1: Paradoxes in the shelter TSN based on secondary data sources

Paradox Type	Instance of Tension in the Shelter TSN	Indicators of paradox
<i>Learning</i>	Local versus global (i.e., based on international standards) knowledge	Providing shelter that had to comply with international standards and policies while also complying with local regulations and laws. This caused tensions and confusion especially because local knowledge on construction (e.g., laws, government policies, procedures, and guidelines) was frequently changing and the earthquake damage led to scarcity of construction materials in the local market.
<i>Organising</i>	Immediate, lifesaving versus long-term, development work activities	Executing shelter-related processes/work activities due to the earthquake and execute development programs processes/work activities were competing organizational tasks because they relied, to some extent, on the same limited resources (e.g., human, organization, material, and financial) to fulfil their needs.
<i>Performing</i>	Diverging objectives and demands.	Provide shelter simultaneously in multiple regions with different features and challenges (e.g., isolated mountainous areas, rural areas, historic areas, and urban areas) and with varied impacts of the earthquake (while some districts had most of the impacts on roads, others were completely destroyed).
<i>Belonging</i>	Diverging network-member values/ identities leading to fundamental differences in ways of working	Diverse organisations with different identities (e.g., missions, mandates, values, and beliefs) and, therefore, divergent modi operandi (i.e., typical ways of working). These different identities were sometimes conflicting (e.g., local vs. international, humanitarian vs. development) and created tensions. For example, the procurement of input materials took too long as a result organisations understood ‘emergency’ differently.

Table 2: Summary of findings

PARADOX RESPONDING STRATEGIES					ENABLING MECHANISMS			
Strategy	Key characteristics				Evidence Within and External to the Shelter TSN			
	Timing	Structure	Execution	Features of conflicting elements	Engagement	Knowledge	Functional specialisation	Standardisation/ Innovation
<i>Juxtaposition</i>	Simultaneous	Same	Core focusing on prioritized element; periphery facilitating achievement of goals related to subordinated element (incl. delegation externally) (e.g. short-term versus long-term needs).	Maintained	Coordination, communication/ information sharing	Transfer (awareness and skills training)	No evidence of emphasis of certain specialisms	Standardisation of uncontested practices
<i>Combination</i>	Simultaneous	Same (with new features)	Subordination of one element to another (e.g., international knowledge to local)	Some maintained, others lost	Coordination, communication/ information sharing, collaboration	Creation (joint training for technical experts, new procedures/ processes) and transfer (campaigns, training, technical support)	No evidence of reliance on specialisms	Innovation – development of locally produced sustainable bricks
<i>Temporal separation</i>	Sequential	Same	Subordination of one element to another (e.g., development goals to immediate needs)	Maintained	Coordination, communication/ information sharing, collaboration	Transfer (disaster response training by external experts)	Sequential, separated across time	No evidence found but, rather, evidence of bringing in

								experts in disaster response
<i>Spatial separation</i>	Simultaneous	Different	All elements deemed important; internal delegation (focus) with oversight, some delegation externally	Maintained	Coordination, communication/ information sharing	Creation and transfer (demographics, vulnerabilities, protection needs, shelter services)	Simultaneous, separated across structures	No evidence found
<i>Transcendence</i>	Simultaneous	Same (re-engineered)	Anchoring choices on contextual aspects instead of the internal, tension-creating ones (e.g., members' individual values)	Mostly lost, or at least rendered irrelevant	Coordination, communication/ information sharing, collaboration	Creation and transfer (new shared vision, practices, policies, and standards)	No evidence	Standardisation through innovation

Appendices

Appendix I: Key secondary documents and datasets analysed

<i>Data Types</i>	<ul style="list-style-type: none">• PDF files (e.g., statements, reports, appeals, operational briefs, meeting minutes, procedures, regulations)• Images (photos, maps, and videos)• Others (news and spreadsheets)
<i>Data Sources (Stakeholders)</i>	<ul style="list-style-type: none">• Government of Nepal (GoN)• Humanitarian Organisations (e.g., Disasters Emergency Committee (DEC), World Vision, and Red Cross)• United Nations and its agencies (e.g., UNICEF, WFP, UNOCHA, etc.)• Global Shelter Cluster• Media actors, such as CNN, BBC News, The Guardian, The Kathmandu Post, and The Himalayan
<i>Key documents</i>	<ul style="list-style-type: none">• International Response Regulations and Guidelines (e.g., The Humanitarian Charter (D#001); General Assembly Resolution 46/182 (D#002); Guidance Note on using the Cluster Approach to strengthen Humanitarian Response (D#003) – <i>hundreds of pages</i>)• UN Cluster Approach Evaluation 1 (D#004) and 2 (D#005) (<i>273 pages</i>)• The Humanitarian Response to the 2015 Nepal Earthquake (D#006) (UNOCHA report – <i>32 pages</i>)• Overview of shelter needs for the 2015 Nepal Earthquake response (D#007) (<i>21 pages</i>)• 2015 UNICEF Supply Annual Report (D#008) (<i>92 pages</i>)• Nepal Disaster Response Archive (31 briefs consulted (D#009 to D#039), <i>around 200 pages</i> in total)• 2015 Nepal Earthquake Appeal (D#040) (DEC’s final report – <i>20 pages</i>)• Nepal Earthquake Response – Two Years and Beyond (D#041) (World Vision’s report – <i>27 pages</i>)• Nepal Earthquake 2015 – Emergency Appeal (D#042) (Red Cross’ final report – <i>58 pages</i>)• Nepal Earthquake 2015 – Post Disaster Needs Assessment – Volumes A (D#043) and B (D#044) (GoN – <i>446 pages</i>)• Nepal Emergency Operation Report (D#045) (WFP – <i>19 pages</i>)• Humanitarian Data Exchange database (13 datasets about the Response consulted – D#046 to D#058 in Excel format)

Appendix II: Coding process for the enabling mechanisms

Themes	2nd order codes	1st order concepts (exemplary quotes from the data)
<i>Engagement</i>	Collaboration	“Humanitarian partners in close collaboration with national authorities were able to achieve most immediate and life-saving targets and priorities (...) Partners will continue debris clearance and management activities in collaboration with line ministries as a part of their reconstruction efforts” UNOCHA (D#006, p.5 (...) p. 11).
	Coordination	“The Shelter Cluster is supporting coordination and planning of recovery and reconstruction under the Recovery and Reconstruction Technical Working Groups (TWGs), which provide a platform for technical discussions, planning, and development of key outputs under shelter. Shelter Cluster (D#076, p.4).
	Communication/ information sharing	“WFP country office will conduct periodic risk assessments and communicate regularly progress towards implementing risk mitigation actions to its key stakeholders. Timely communication to partners and other stakeholders on revisions to programme response, increase in beneficiary numbers, etc., will be ensured to maintain high credibility of WFP’s response” WFP (D#045, p.11).
<i>Knowledge</i>	Knowledge creation/transfer	<p>Knowledge <i>creation</i>: “Comprehensive consultations were carried out with children, women, the wider community and local authorities to establish needs and items required.” Shelter Cluster (D#007, p.30).</p> <p>Knowledge <i>transfer</i>: “This national programme for reconstruction will consist of providing a cash subsidy to households accompanied with a large scale, decentralised, technical assistance and training programme to support households to achieve compliance with construction standards” Shelter Cluster (D#076, p.3).</p>
<i>Functional Specialization</i>	Simultaneous	“In order to ensure availability of sufficient masons and carpenters, a task force was formed from the shelter working group to review training needs and trained 853 semi-skilled community people with on-the-job mason and carpentry trainings. At the same time, in water scarcity communities, construction of water supply schemes was prioritized”. Red Cross (D#042, p.11).

	Sequential	“Before the disaster, Nepal was progressing to meet objectives under the Open Defecation Free (ODF) campaign. The needs of the earthquakes, however, disrupted the program with extensive damage to latrines” UNOCHA (D#006, p.29).
<i>Standardization/ Innovation</i>	Innovation	“Two DEC members charities introduced an environmentally friendly technology to produce locally made bricks for house reconstruction. This eliminated the cost of transporting materials and created jobs. These bricks do not require firewood to dry and therefore help discourage deforestation. They are also fully tested as a suitable material to build earthquake-resistant structures. Initially, people were reluctant to use them as they had never seen them before, but with clear information and education on the benefits of the bricks, they were soon accepted as a major construction material.” DEC (D#040, p.13).
	Standardization	“Once the information was compiled across the different communities, in collaboration with the Shelter Cluster and the government, a standardized kit was agreed upon, meeting Sphere standards and IFRC guidelines.” Shelter Cluster (D#007, p.30)