

Mitigating risks and overcoming logistics challenges in humanitarian deployment to conflict zones: evidence from the DRC and CAR

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Abstract

Purpose – The purpose of this study is to analyze the challenges encountered by international nongovernmental organizations (INGOs) operating in armed conflicts within the Democratic Republic of the Congo (DRC) and the Central African Republic (CAR). Through a 20-month fieldwork analysis, this research maps logistical risks and highlights key obstacles on the ground for successful humanitarian deployments in dynamically changing and complex environments. The study brings together academics and practitioners, providing practical and concrete recommendations for nongovernmental organizations (NGOs) to focus on in the conflict zones studied.

Design/methodology/approach – Using a mixed-methods approach that combines qualitative and quantitative methods, this research provides valuable insights into the challenges faced by INGOs in conflict zones. After collecting data from the field, including interviews with key stakeholders and on-the-ground observations, the data analysis uses software tools such as Text Analysis Markup System analyzer and Macbeth. By adhering to ethical principles and incorporating a reflexive analysis, the study sheds light on the multidimensional nature of successful humanitarian deployments.

Findings – The primary risk in all armed conflict zones, including the DRC and CAR, is insecurity. However, to achieve a successful humanitarian deployment in such contexts, a multidimensional approach is required. This involves first securing the acceptance of local communities and conflict parties, which can be achieved through a deep understanding of both political and customary structures, with a focus on respecting key engagement leaders. Sustainability also plays a crucial role, and NGOs must maintain a secure stock of energy and provide greater initiative for on-the-ground managers to meet the expressed needs of beneficiary populations and involve them from the planning stage onwards. Finally, effective communication, cooperation and collaboration with United Nations Office for the Coordination of Humanitarian Affairs are essential to overcome procurement, technical and security risks, particularly during the initial deployment phases.

Originality/value – This study provides an illustration of the uncommon practice of conducting collaborative research in humanitarian settings amidst two neighboring areas of armed conflict. The authors identified 268 common risk factors across eight categories during five deployment phases. To analyze these risks based on criticality and NGO responsiveness, the authors used a multicriteria method. This approach allowed the authors to validate unanimous judgments, resulting in valuable insights and concrete recommendations.

Keywords Humanitarian logistics, International NGOs, Collaborative research, Case study, Armed conflict areas

Paper type Case study

1. Introduction

Over the past two decades, there has been a significant escalation in the number of armed conflicts, with the figure rising from approximately 30 in the late 1990s to around 100 today (Nikolic *et al.*, 2020). These conflicts give rise to urgent humanitarian needs and pose considerable challenges in effectively addressing them. Consequently, the academic community has witnessed a surge in research projects aimed at understanding and mitigating the risks faced by aid workers operating in conflict zones. These efforts have resulted in substantial scholarly contributions that strive to identify and overcome barriers and complexities inherent in such contexts.

Prior studies have delved into various domains, including security risk management approaches (Childs, 2013; Collinson *et al.*, 2013; Jackson and Zyck, 2017), challenges arising in insecure environments (Cunningham, 2017), targeting of humanitarian personnel by armed groups (Johnson and Thurber, 2020), attacks on local aid workers (Hoelscher *et al.*, 2017) and the management of disinformation threats in complex contexts (Stoddard *et al.*, 2017).

Although these investigations have yielded valuable insights, there is an increasing demand for evidence-based research in humanitarian logistics (HL) that uses rigorous field research

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and comprehensive case studies (Kovács *et al.*, 2017, 2019). Such an approach enables a profound understanding of the multifaceted dynamics involved in delivering aid within conflict areas (Larson, 2021). Furthermore, Chirambwi (2023) emphasizes the necessity of using multiple sources and methodologies to effectively address the research challenges arising from new forms of warfare.

Recent studies and notable cases have focused on examining logistics risks and challenges in conflict-affected regions, covering diverse topics and locations. For example, Pöysti's (2019) master's thesis explored the challenges and adaptation strategies in the conflict zones of Cameroon's North West and South West regions, with a specific emphasis on the response phase.

Researchers such as Munyaka and Yadavalli (2021) and Elkahlout *et al.* (2022) conducted studies on localizing humanitarian action during the response phase, specifically examining the activities of nongovernmental organizations (NGOs) in the war-torn Eastern region of the Democratic Republic of the Congo (DRC) and the Yemen Republic, respectively.

Prakash *et al.* (2022) conducted a comprehensive global online survey involving 289 field executives, focusing on the interplay between governance, contractual agreements, trust and environmental uncertainty in HL.

Listou (2021) proposed a research agenda to study the impact of mission infrastructure on host nations during UN force redeployment, incorporating theoretical frameworks, field data from Darfur, Sudan, and insights from studies in the DRC, Central African Republic (CAR), Mali and Somalia.

Other relevant studies include Grace *et al.*'s (2023) work on a typology for understanding the relations between humanitarian and military actors, Yuste *et al.*'s (2019) research on coordinated efforts among the military, commercial and humanitarian sectors in disaster relief and Płachciak and Marcinkowski's (2022) focus on the macrologistics potential of humanitarian assistance in the G5 Sahel region, addressing infrastructure, disaster and macroeconomic challenges.

Our research focuses on logistics risks in conflict zones, building upon existing studies. To bridge the gap, we conducted collaborative research in the DRC and CAR, engaging stakeholders to gain a comprehensive understanding of the challenges faced by international nongovernmental organizations (INGOs) throughout various humanitarian deployment phases.

Given the complex and challenging nature of the humanitarian deployment in conflict zones, our in-depth investigation required more than a year and a half, spanning from mid-2020 to early 2022. Our research placed a strong emphasis on methodological rigor, relevance, reflexivity and data quality. To guide our research process, we integrated the methodologies proposed by Sabri *et al.* (2019) and Vega (2018).

Sabri *et al.*'s methodology provided us with a comprehensive framework for conducting collaborative research in humanitarian supply chain (HSC), emphasizing stakeholder engagement and knowledge co-creation. By adopting this approach, we expanded the scope of our research and gained valuable insights and concrete recommendations. This collaborative approach has allowed us to bridge the gap between academic research and the practical realities faced by humanitarian actors in the field.

Furthermore, we integrated Vega's case study framework into our study design, which offered a systematic approach to data

collection, analysis and interpretation. By following this framework, we ensured methodological rigor and increased the validity and reliability of our findings. Vega's approach allowed us to structure our research process, ensuring that we considered various aspects of the humanitarian deployment in conflict zones and captured the intricacies and complexities involved.

Throughout our research journey, we acknowledged the challenges of accessing and conducting fieldwork in conflict-affected areas (Oloruntoba and Banomyong, 2018). However, our commitment to maximum rigor, relevance, reflexivity and data quality remained unwavering. We collaborated closely with our research partners on the ground, aiming to gather comprehensive field data and generate insights that can inform and shape future humanitarian interventions.

Our ultimate goal is to contribute to the existing knowledge base on HL in armed conflict zones. By leveraging the insights from previous studies and cases, along with our own empirical research, we aspire to provide practical and feasible guidance that can enhance the success and safety of humanitarian deployment in such challenging contexts.

Consequently, our paper offers four key contributions:

- 1 high-quality primary data obtained through direct observations, document analysis and stakeholder interviews;
- 2 a hybrid method that combines qualitative and quantitative data collection using multiple criteria decision-making (MCDM) for objective evaluation;
- 3 an updated, structured and comprehensive risk assessment of INGOs' deployment in CAR and DRC, involving both academics and practitioners in the humanitarian field; and
- 4 practical and specific recommendations for NGOs operating in the studied conflict zones, considering the significant risks involved.

The remainder of the paper is divided into four sections. Section 2 describes the methodological approach adopted in our collaborative case study. Section 3 presents the detailed conduct of our fieldwork. Section 4 summarizes findings and identifies key contributions to both research and practice domains, as well as some specific avenues from which future research can be drawn. Finally, we conclude the paper in Section 5.

2. Methodology

2.1 Research objective

The study aims to explore the complex and multifaceted risk factors that affect a humanitarian deployment factor in armed conflict areas in DRC and CAR and suggest improvement hypotheses or propositions. In other words, our objective is to achieve practical and empirical research in the field of HL by witnessing, assessing and describing the risks and logistics obstacles in the deployment of INGOs in DRC and CAR, before trying to provide some recommendations for further enhancement or solutions.

To do so, it becomes more than necessary to first understand the environment settings and gain an in-depth insight into these complex environments. The remainder of this section explains the path taken during our methodological reflection.

2.2 Environment settings

The history of violence and resource extraction in Central Africa has led to institutional complexities and limited access to

the outside world. Nonstate armed groups (NSAGs) play a central role in the region, attempting to extract and commercialize resources and destabilize neighboring countries (Mlambo and Dlamini, 2019). The Great Lakes region, particularly eastern DRC, and CAR are the two main areas of violent communal conflicts in the region (Schouten, 2019).

The attached map (Figure 1) is the result of extensive cross-referencing by the authors. It attempts to help readers understand the situation in the two countries.

In addition, while the complex and dynamic situation in both countries evolves continually over time, Table 1 gives a brief overview on the severity of their critical humanitarian situation.

2.3 Reasoning process

The aforementioned defining characteristics of the environment in which INGOs operate, as well as the level of involvement required to understand and describe humanitarian deployment, led this research to adopt an interpretive paradigm, making abductive reasoning an appropriate approach (Kovács and Spens, 2005).

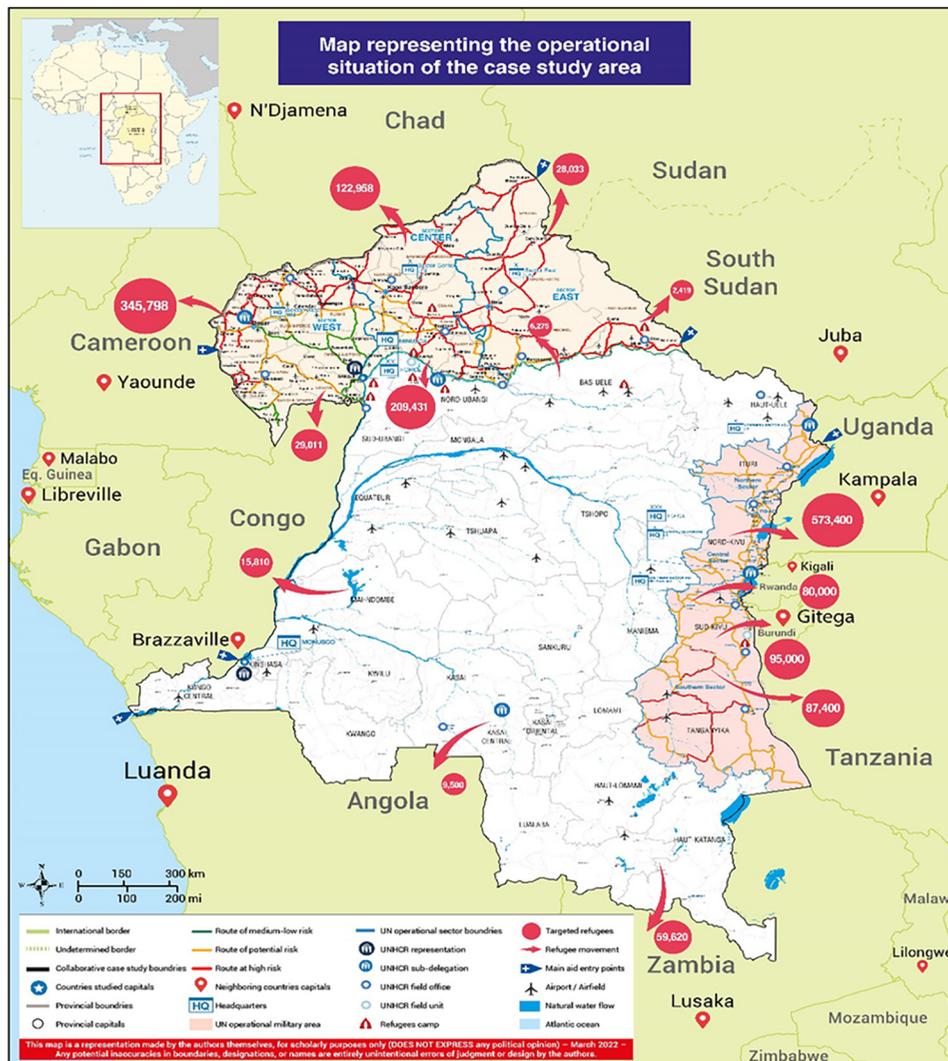
To align with our research paradigm, we have selected qualitative methodology (Miles and Huberman, 1994) and case study design (Vega, 2018). This approach allows us to gain a detailed understanding of the complexities of the research context, as well as to identify and analyze potential risks and obstacles.

2.4 Case study method

Prior to the conception of our study, several methodological choices were made following a thorough analysis of how the risk assessment could be conducted. In fact, many experts in HL have emphasized the need for more empirical research and collaboration between Academia and humanitarian organizations (HOs) to improve the field and avoid its main limitations.

For instance, Kovács and Spens (2011) have highlighted the need for more practice-based research and theory development, bridging the gap between practice and research in the field. This involves engaging with HO and formulating research questions (Kunz et al., 2017), using real-world and field data (Gupta et al., 2019) and mapping methods to HL research questions (Kovács

Figure 1 Map representing the operational situation of the case study area



Source: Created by authors

Table 1 Main features common to DRC and CAR crises with examples

Aspect	Eastern DRC	CAR	Sources and resources
Main conflict causes	<ul style="list-style-type: none"> – Internal power struggles – Ethnic rivalries – Political instability – Fragility of state institutions – Natural resources – Power struggles – Territorial control – External influences – Economic interests 	<ul style="list-style-type: none"> – Internal power struggles – Ethnic rivalries – Political instability – Fragility of state institutions – Natural resources – Power struggles – Territorial control – External influences – Economic interests 	Mlambo and Dlamini (2019)
Long-duration conflict	<ul style="list-style-type: none"> – Congo Crisis (1960–1965) – First Congo War (1996–1997) – Second Congo War (1998–2003), from whom erupted recent conflict 	<ul style="list-style-type: none"> – Political instability and coups d'état since independence in 1960 – Civil War since 2004 – Séléka Rebellion (2012–2014) from whom erupted recent conflict 	
Powerful presence of NSAGs	<ul style="list-style-type: none"> – Allied Democratic Forces (ADF) – Mouvement du 23 mars (M23) – Forces démocratiques pour la libération du Rwanda (FDLR) – Forces de résistance patriotique de l'Ituri (FRPI) – Various Mai-Mai militias 	<ul style="list-style-type: none"> – Séléka – Union des Forces Républicaines (UFR) – Mouvement des Libérateurs Centrafricains pour la Justice (MLCJ) – Front Démocratique du Peuple Centrafricain (FDPC) – Anti-Balaka – Union pour la paix en Centrafrique (UPC) 	Schouten (2019)
High rate of food insecurity	25.8 million people	2.4 million people	World Food Programme (WFP)
High rate of acute malnutrition	2.8 million children	1 million children	Integrated Food Security Phase Classification (IPC) for April to August 2023
High number of refugees	853,000	762,700	UNHCR's Global Report for 2022
High number of IDPs	5.4 million	515,700	
Large-scale humanitarian interventions	118 INGOs	Over 50 INGOs	<ul style="list-style-type: none"> – Forum ONGI (DRC) – Comité de Coordination des ONGI (CAR)
Recurring challenges of accessibility	89 incidents	69 incidents	UNOCHA's Report on Humanitarian Access and CMCoord in April 2022
High rate of attacks on aid personnel	<ul style="list-style-type: none"> – 4 deaths – 10 abductions – 3 injuries 	<ul style="list-style-type: none"> – 1 death – 18 injuries 	(Regarding the first half of 2022)
UN mission	<ul style="list-style-type: none"> – MONUSCO (UN Stabilization Mission) since July 2010 	<ul style="list-style-type: none"> – MINUSCA (United Nations Multidimensional Integrated Stabilization Mission) since September 2014 	UN website (June 2023)
Strong presence of UN forces	16,316 blue helmets	17,885 blue helmets	

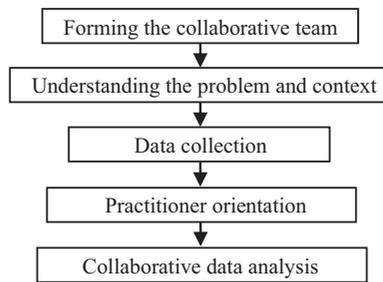
Note: IDPs = Internally displaced people

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and Moshtari, 2019). Moreover, Kovács *et al.* (2019) stress the need for designing research projects and co-defining research questions with HO, rather than relying on assumption-based models tested with hypothetical data. Similarly, Altay *et al.* (2021) advocate for more collaborative research to enhance the relevance and impact of HL.

In line with these ideas, we opted for a collaborative research approach for our case study. Besides, given the unique circumstances of the study area, we chose to focus exclusively on the first five steps of the Sabri *et al.* (2019) framework for collaborative research, as depicted in Figure 2, while omitting the remaining three steps related to

Figure 2 The five-step collaborative research undertaken in the case study



Source: Created by authors

joint planning, implementation and evaluation, and monitoring. This approach involved working in close collaboration with practitioners to conduct a thorough and comprehensive risk assessment of key factors and to develop practical and effective recommendations for addressing the identified challenges. Our decision to use this approach was motivated by the desire to leverage the expertise of practitioners who possess firsthand knowledge and experience in managing the significant situational risk factors that have a strong impact on their organization's performance.

2.5 Case study design

The chosen methodology for this study involves a comprehensive approach that focuses on both the headquarters and affiliated subunits of HO operating in both DRC and CAR. This embedded multiple case study methodology allows for an in-depth analysis and aims to increase the quality of results.

The case study design is based on best practices as outlined by Vega (2018), who identified common mistakes to avoid in HL case studies and provided a framework (4 Check-Questions) that the research team adopted as a model for their research. This enables us to address our research objectives more effectively, generate valuable insights and contribute to the existing knowledge in the field of HL and supply chain management.

2.6 Case selection

Our research team was interested in studying armed conflict and humanitarian deployment in Central Africa, a region heavily impacted by various types of armed conflicts. The study focused on HO providing assistance to populations whose lives or health are threatened due to armed conflict in the study areas. We selected case study organizations based on their relevance to the research topic and identified eight large organizations operating in the study area.

To engage these organizations, we used our professional networks and established contact with eight NGOs located in the DRC and CAR. Out of the eight NGOs contacted, six expressed interest in our research project, leading us to develop a research proposal. After a two-month period of initial communication and several email exchanges, meetings and discussions, three NGOs conditionally agreed to participate in our collaborative case study. An Memorandum of understanding (MOU) formalized the agreement between the research team and three organizations, outlining a

one-year contract, renewable once, joint development terms, a timeline guideline, confidentiality, ownership, authorship and publication responsibilities. Figure 3 illustrates the main components of the MOU.

2.7 Data management

In early 2020, the study's three organizations appointed logistics and security managers to join the collaborative team. The team consists of 10 members, including university researchers and practitioners from each NGO (Figure 4). Effective management of risk assessment data was prioritized for accurate findings (Figure 5). To achieve this, we used an extensive triangulation approach, combining academic literature, formal literature and various data sources, including stakeholders. Despite potential varying responses and views, steps were taken to ensure data validity and reliability through source documentation and rigorous analysis methods.

2.8 Research quality

Our research methodology aims to contribute to the development of HSC theory and promote a deeper understanding of the humanitarian field through practical engagement and rigorous data collection and analysis. It aims to advance the theory of HSC by engaging both researchers and practitioners (Coughlan and Coughlan, 2002). By bridging the gap between academic terminology and practitioner perspectives, we seek to build trust, address real-world problems and improve data collection (Pedraza-Martinez *et al.*, 2013; Refstie and Brun, 2012).

Our approach is contextualized, preventing generalization of results and allowing for richer insights (Touboulic and Walker, 2016). We use a cyclical process, with multiple iterations of planning, intervention, action and reflection to lead to transformation in the humanitarian setting (Canterino *et al.*, 2016; Sabri *et al.*, 2019).

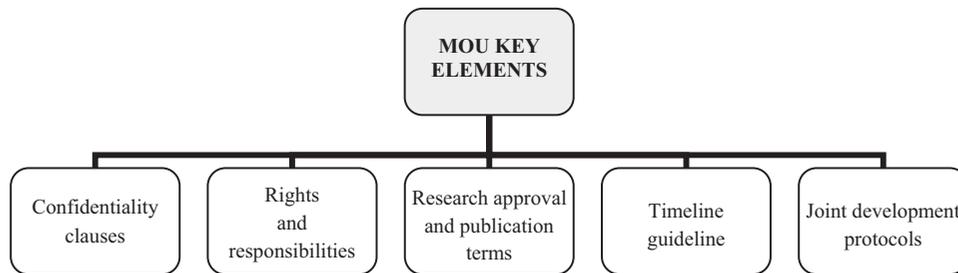
To ensure the credibility and transferability of our findings, we use prolonged engagement, building relationships and establishing trust with organization members. We also use persistent observation, data triangulation and peer debriefing. Our case study process is summarized in Figure 6.

3. Collaborative research conduct

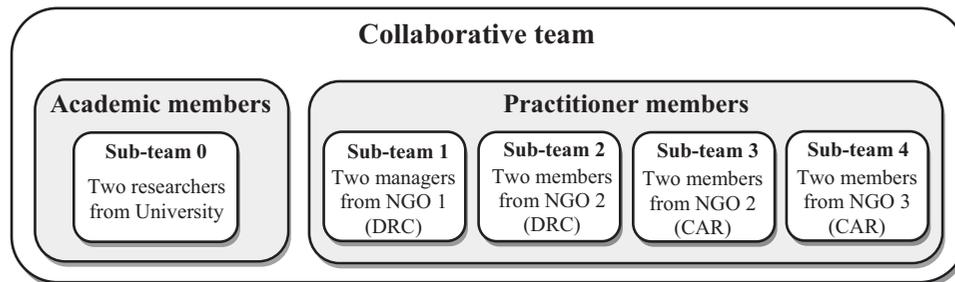
As previously stated, we implemented a collaborative research approach for our case study and incorporated the first five steps from the comprehensive eight-step methodology developed by Sabri *et al.* (2019). The entire process, including fieldwork, was conducted over a period of 20 months. Figure 7 presents a visual representation of the precise sequence of steps followed and their corresponding dates, ensuring transparency and accuracy in our methodology.

3.1 Forming the collaborative team

Our collaborative research project begins with the crucial step of forming the collaborative team. Creating such a multidisciplinary alliance can be challenging due to team dynamics, personal characteristics, structural factors and leadership qualities that may negatively impact our research. We were also concerned about the head offices' full cooperation and potential difficulties in supporting our challenging field research.

Figure 3 Essential components of the MOU signed by research team and NGOs

Source: Created by authors

Figure 4 Composition of the collaborative team during the case study

Source: Created by authors

To ensure accountability and a thorough understanding of our research topic, we fostered discussions on the MOU objectives with the NGO's central offices. This led to agreement on research and data management methods (Figure 4). We highlighted the practitioner team's responsibility for data access, collaboration and active involvement during analysis, emphasizing their crucial role in the research process.

3.2 Understanding the problem and context

The process of understanding the problem and context is a crucial step which involves in-depth discussions among the collaborative team regarding various aspects related to the case study, including (1) the fieldwork roadmap for data collection, (2) research questions, (3) dissecting the phases of a humanitarian deployment, (4) sampling methods and (5) ethical considerations involved in the data collection process. The goal is to achieve unanimous agreement on these key elements, with the aim of ensuring effective and ethical data collection that meets the needs of the study:

- Fieldwork road map for data collection

To accommodate senior executive positions and responsibilities within the collaborative team, the fieldwork roadmap for data collection involves four interdependent steps. The research team will collaborate with subteams of each NGO during visits to their organizations. After three weeks of consultations, an action plan for data collection has been developed, convenient for all participating NGOs and enriching the study. Figure 8 provides the agreed timeline of principal activities during our visits.

- Research questions

Our research methodology, informed by the case study approach (Voss *et al.*, 2002), heavily relies on interviews for data collection. To ensure a comprehensive approach, we followed a two-step process: defining research themes, questions and focus and identifying overlooked issues. The interview guide was developed through a literature review on NGO logistics deployment in conflict areas. Engaging both aid providers and recipients is emphasized for a nuanced understanding. Appendix 1 provides our interview guide.

- Dissecting the phases of a humanitarian deployment

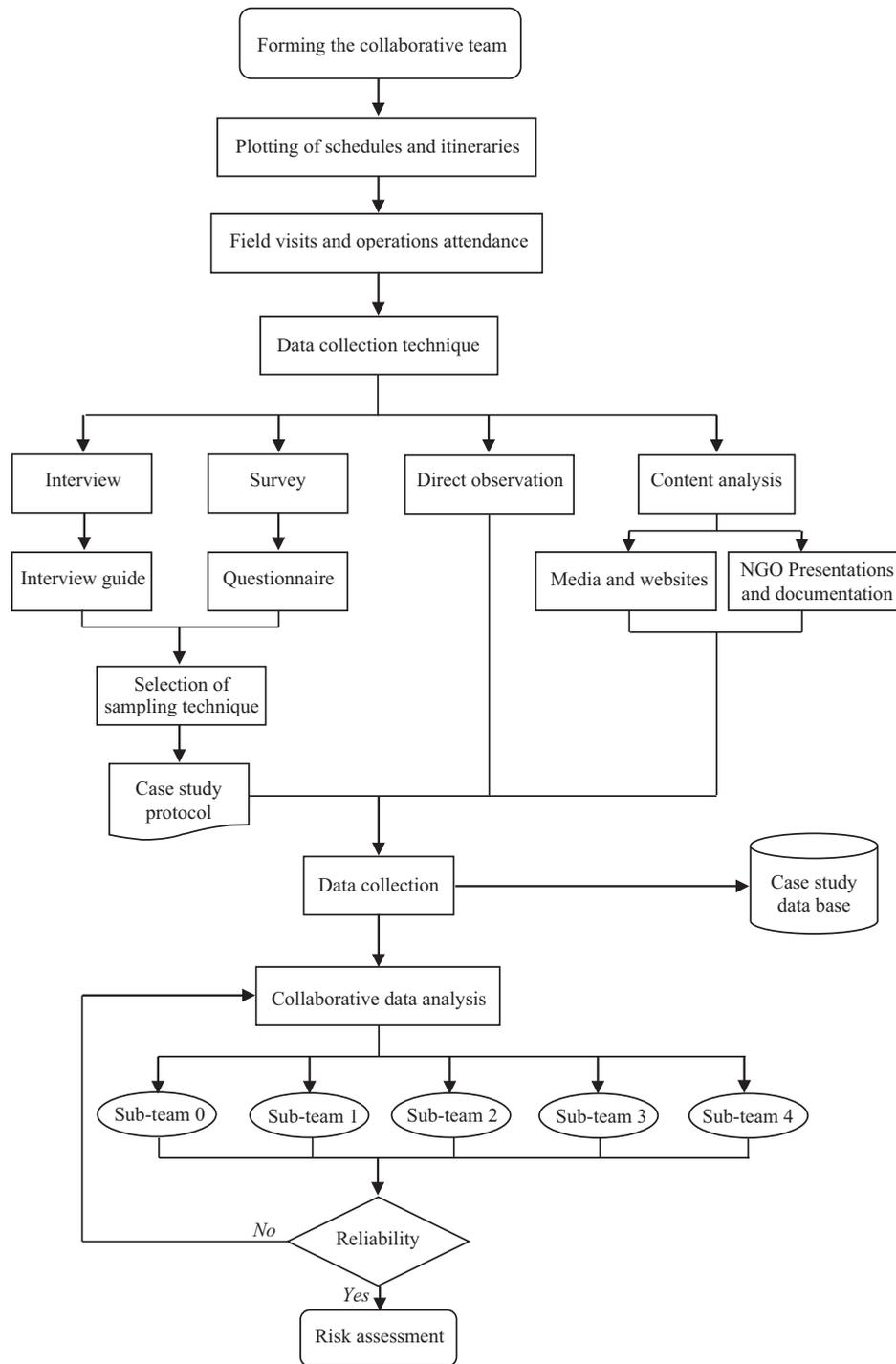
The team analyzed the phases of humanitarian deployment to comprehend the study context. This includes gaining access, customs clearance, deploying sites, providing support and rehabilitation (Figure 9).

- Sampling method

To ensure a diverse sample, we used purposive and snowball sampling. We selected individuals with logistics experience from NGOs, government and UN (Table 2). We also included beneficiaries of different demographics and geographic locations for comprehensive research findings. Clear inclusion and exclusion criteria prevented biases, and an appropriate sample size ensured accurate and representative results.

- Ethical considerations

The collaborative team diligently adhered to ethical guidelines during data collection. We obtained informed consent, safeguarded participant confidentiality and respected privacy. Sensitivity to cultural norms, power dynamics and tribal contexts in the DRC and CAR was paramount, ensuring appropriate and dignified research methods for beneficiary populations.

Figure 5 Risk assessment data management process during collaborative research

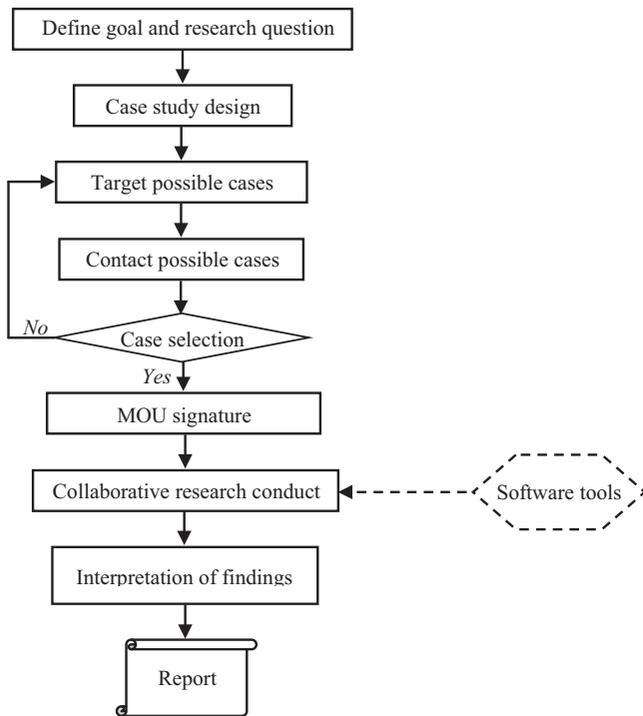
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3.3 Data collection

The purpose of this step was to gain a detailed understanding of the humanitarian landscape in the study area and identify key challenges and opportunities for improving aid delivery in the region.

Our research comprised three stages: visiting NGO headquarters, spending time at subunits, and participating in humanitarian operations. Interviews, facility tours and observations at headquarters provided insight into aid delivery experiences. Interviews with government officials, humanitarian operators and

Figure 6 Overall case study process



Source: Created by authors

beneficiaries were conducted. Subunit visits involved observing planning processes, addressing constraints and conducting interviews. Lastly, participating in humanitarian operations allowed documentation of logistical challenges. Qualitative data collection included notes, photographs and additional interviews at NGO headquarters. Figure 10 outlines the stages of data collection during our fieldwork with each NGO.

Conducting extensive interviews with 792 individuals from different panels and locations in both countries (Table 3) posed the greatest challenge in our collaborative research. First, the interviews, lasting between 30 and 90 min with an average duration of 50 min, consumed a

total of approximately 700 h. Then the transcription process took about 100 min per interview, resulting in a cumulative transcription time of roughly 1,300 h. Finally, we dedicated an average of 75 min per interview to the proofreading and quality check process, amounting to a time investment exceeding 1,000 h.

Following these three processes, we calculated the percentage of engagement for each question and presented the scores in Table 4. While some panels were highly engaged, local military staff showed relatively low engagement, potentially due to their focus on military operations rather than humanitarian aid delivery.

Our data collection revealed significant contradictions among different panels. Partner and other INGOs expressed confidence in their interventions, while national and local NGOs expressed skepticism. Government officials praised the international humanitarian community, but civil society staff had concerns about accountability. UN civilian staff highlighted coordination, while local military staff doubted impartiality. Key leader engagement stressed community acceptance, but local beneficiaries, internally displaced people (IDPs) and refugees were frustrated with slow and inadequate responses.

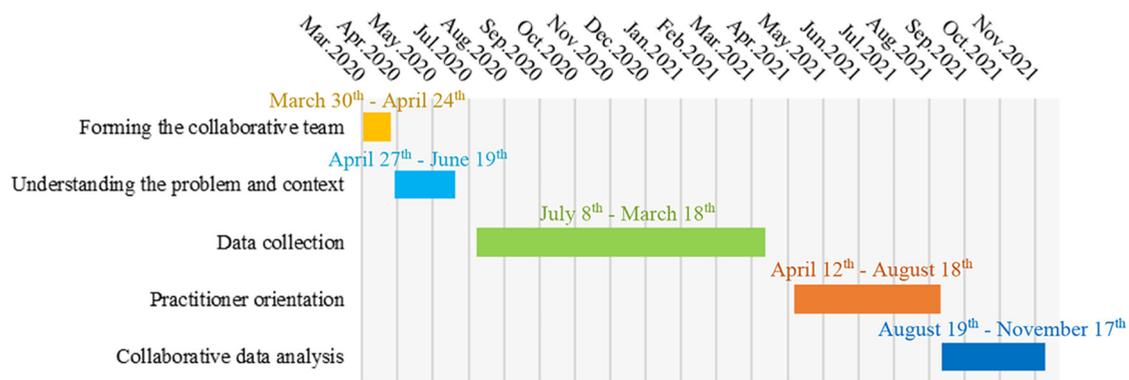
Divergent viewpoints from interview panels highlight the complexity of the humanitarian landscape in conflict-affected countries. A transparent and collaborative approach is vital for a comprehensive and accurate understanding, enabling evidence-based decision-making for effective interventions during practitioner orientation and data analysis.

3.4 Practitioner orientation

To derive meaningful insights during collaborative data analysis, structuring the collected data is crucial. Systematic methods and collaborative discussions among team members are necessary to organize data across case studies and related risk families.

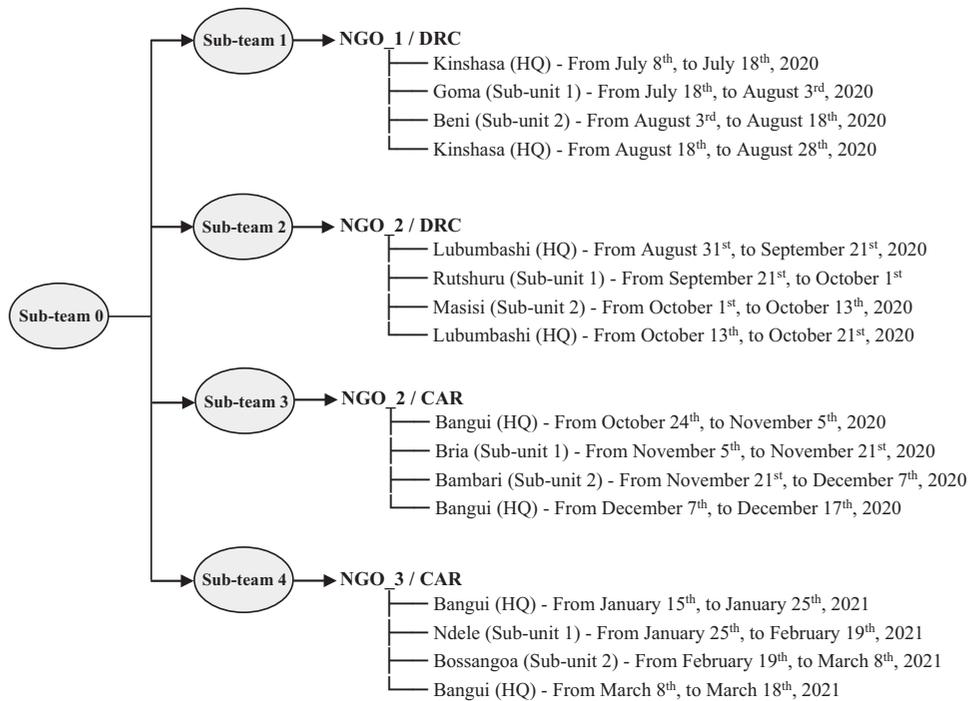
Our risk family categorization combines deductive and inductive approaches. We initially conducted a thorough review of the existing literature on risk assessment in the humanitarian context, including studies by Renteria et al. (2021), Pöysti (2019) and Tay et al. (2022), as well as research on risk assessment in other fields from authors such as

Figure 7 Time frame of the collaborative research steps



Source: Created by authors

Figure 8 Timeline for fieldwork data collection activities



Source: Created by authors

Figure 9 Deployment process for INGOs in a postconflict context



Source: Created by authors

Table 2 Professional panels selected by the collaborative team with profiles

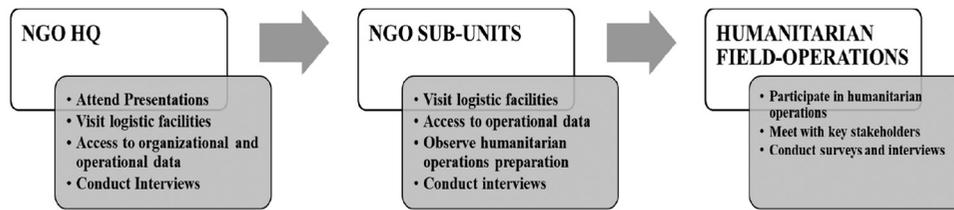
Panels of professionals	Professional ranks	Professional experience	On-site period
INGOs staff	<ul style="list-style-type: none"> Head of office Head of site 	Over 8	2–5 years
National NGOs staff	Representative members	4–12	3–11 years
Local NGOs staff	Representative members	2–15	2–15 years
Humanitarian volunteers and workers	None	1–10	1–10 years
Civil society staff	Representative members	2–15	2–15 years
Government officials	Governmental decision-makers	Over 7	2–15 years
Key leader engagement	Highly honorable status	Over 15	Over 15 years
UN civilian staff	P1–P5	Over 5	1–6 years
Local military staff	Senior officers	Over 15	Over 15 years
UN military staff	Senior officers	Over 15	6–11 months

Source: Created by authors

Pournader *et al.* (2020), El Baz and Ruel (2021), Remko (2020) and Bentaleb *et al.* (2015). This comprehensive review expanded our knowledge and helped us develop a more accurate classification framework. As our research progressed,

we identified emerging patterns and themes that were initially overlooked in the existing risk assessments and extended beyond the logistics domain. To refine our approach, we engaged in extensive discussions among team members and

Figure 10 Main stages of data collection during field visits to each NGO's network



Source: Created by authors

Table 3 Professional panels selected by the collaborative team with profiles

Interviewed panels	Sites of NGO_1			DRC			Sites of NGO_2			CAR			Sites of NGO_3	
	Kinshasa	Goma	Beni	Lubumbashi	Rutshuru	Masisi	Bangui	Bria	Bambari	Bangui	Ndele	Bossangoua		
Partner INGOs staff	4	3	3	4	4	3	2	4	4	3	3	4		
Other INGOs staff	7	3	2	5	1	2	6	3	2	6	3	2		
National NGOs staff	5	2	3	7	2	2	6	3	2	5	2	2		
Local NGOs staff	3	2	4	4	5	2	3	5	6	2	4	5		
Humanitarian volunteers and workers	5	2	3	4	2	3	2	3	2	3	4	4		
Civil society staff	6	1	2	2	1	4	5	3	2	2	3	2		
Government officials	3	1	1	3	1	2	4	1	3	5	1	1		
Key leader engagement	-	1	2	-	1	1	-	1	2	-	2	2		
UN civilian staff	4	1	3	4	2	1	5	3	2	3	1	2		
Local military staff	2	1	1	3	2	3	1	2	4	2	1	3		
UN military staff	3	-	-	2	-	-	2	-	-	3	-	-		
Local beneficiary population	16	13	15	11	17	18	15	16	18	14	19	17		
IDPs	12	17	18	16	12	14	17	16	12	15	16	16		
Refugees	8	-	-	11	-	18	11	17	-	6	16	19		

Source: Created by authors

Table 4 Panels engagement levels by question

Interviewed panels	Q1%	Q2%	Q3%	Q4%	Q5%	Q6%	Q7%	Q8%	Q9%	Q10%	Q11%	Q12%	Q13%
Partner INGOs staff	90	82	69	78	90	59	68	80	79	76	84	69	65
Other INGOs staff	40	56	63	47	53	47	51	59	41	39	38	40	36
National NGOs staff	43	38	41	36	29	31	29	49	40	36	31	40	38
Local NGOs staff	38	33	28	29	31	36	41	52	49	42	41	45	35
Humanitarian volunteers and workers	21	29	30	31	39	30	32	39	31	36	38	27	27
Civil society staff	39	72	49	61	58	68	51	48	41	39	53	38	61
Government officials	19	24	22	21	25	28	26	31	25	37	24	31	37
Key leader engagement	39	42	49	56	51	57	52	42	29	40	43	29	42
UN civilian staff	49	69	51	79	41	69	82	62	49	41	59	68	55
Local military staff	11	26	31	21	17	28	16	21	27	39	25	31	23
UN military staff	35	32	35	34	28	27	21	31	25	25	21	38	30
Local beneficiary population	41	39	41	38	36	37	39	35	39	41	39	49	30
IDPs	31	38	41	26	36	41	37	39	41	36	29	30	40
Refugees	31	42	45	39	49	41	57	39	24	31	41	40	34

Source: Created by authors

incorporated additional works by Sigala and Wakolbinger (2019) and De Camargo Fiorini et al. (2022), resulting in the identification of eight distinct risk families. By integrating established knowledge and emerging perspectives, our categorization process encompasses a wide range of risk factors within their respective families. Figure 11 provides an overview of the approved risk families included in our study.

In the first cycle, we used Text Analysis Markup System analyzer (TAMS analyzer), a user-friendly and open-source software tool that is highly suited to qualitative data analysis, to analyze and systematize our data (Rath, 2016). We assigned a unique code to each risk factor to distinguish between eight risk families, namely, compliance risks (CMP), operational risks (OPL), procurement risks (PRO), brand reputation risks (BRD),

security risks (SEC), safety risks (SAF), staffing risks (STF) and technical risks (TEC). In addition, we assigned a unique code to each risk factor to distinguish between the five deployment phases (as shown in Figure 8).

We then used TAMS analyzer’s sorting and filtering capabilities to organize the data by risk family and deployment phase. Finally, we visualized our results using tables and included a comprehensive breakdown of the distribution of risk factors by risk family and deployment phase. Figure 12 presents the main phases of the TAMS analyzer process that were followed by the collaborative team.

In the second cycle, our objective was to identify a common value for each risk factor by considering both their criticality and the responsiveness of an NGO toward them. To achieve this, we used a rigorous MCDM tool (Zavadskas and Turskis, 2011), specifically the M-MACBETH process. This approach involved a structured and systematic question-and-answer procedure that allowed team members to:

- provide precise semantic judgments (e Costa and Vansnick, 1994);
- compare different alternatives in pairs based on the relative attractiveness of each option (e Costa et al., 1999); and
- arrive at a consensus on common values for each risk factor by testing the consistency of responses (Dyer and Forman, 1992).

Figure 13 presents the main phases of the M-MACBETH process that were followed by the collaborative team. In addition, Appendices 2 and 3 provide some screenshots of M-MACBETH process.

3.5 Collaborative data analysis

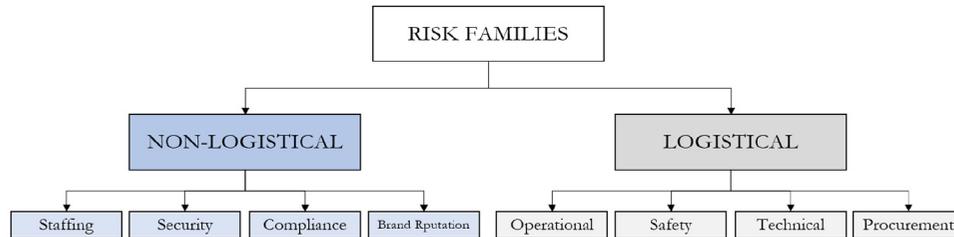
The findings of the practitioner orientation study confirm the widely acknowledged fact that the volatile security situation in the DRC and the CAR poses significant challenges to humanitarian deployment. The top 10 risk factors, presented in Table 5, are exclusively focused on security and identify the presence of foreign mercenaries, NSAGs and other warring forces as major threats to the safety of humanitarian convoys.

These threats are manifested through ambushes, forced detours and restrictions on passage, particularly during Phases 3 and 4. However, the study also highlighted the underestimated importance of soft skills such as negotiation, communication, conflict resolution techniques and clear mission statements as the second most critical risk factor in a humanitarian deployment, specifically during phase 4.

To provide a more comprehensive analysis, the collaborative team compiled a list of the top three risk factors by deployment phase (Table 6) and by risk family (Table 7).

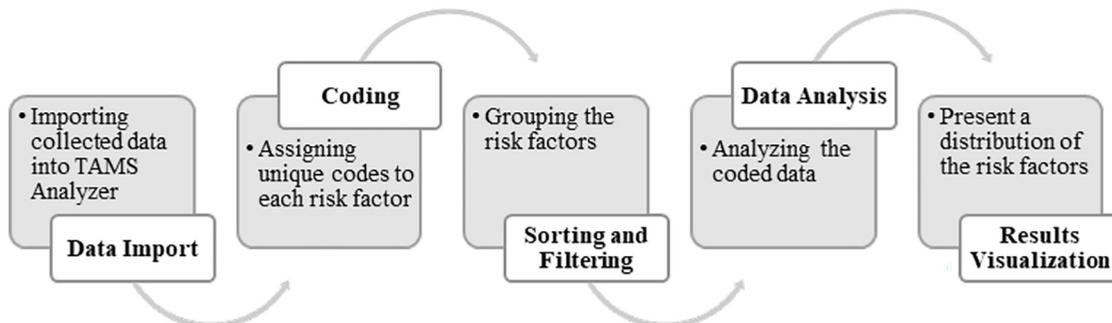
This approach enabled a broader perspective and a deeper understanding of the risks associated with NGOs’ operations, beyond solely focusing on security concerns. Table 5 shows that the main challenges facing a humanitarian deployment are related to security, bureaucratic procedures and corruption in the initial phase. In the later phases, the risk factors were focused on security issues such as attacks, theft and the presence of foreign militias. In the rehabilitation phase, the lack of reverence for certain religious, tribal and community figures who have a strong local influence was identified as a significant risk factor, as well as the underestimation of soft skills such as negotiation, communication, conflict resolution techniques and clear mission statement.

Figure 11 Classification of risk families identified in the study

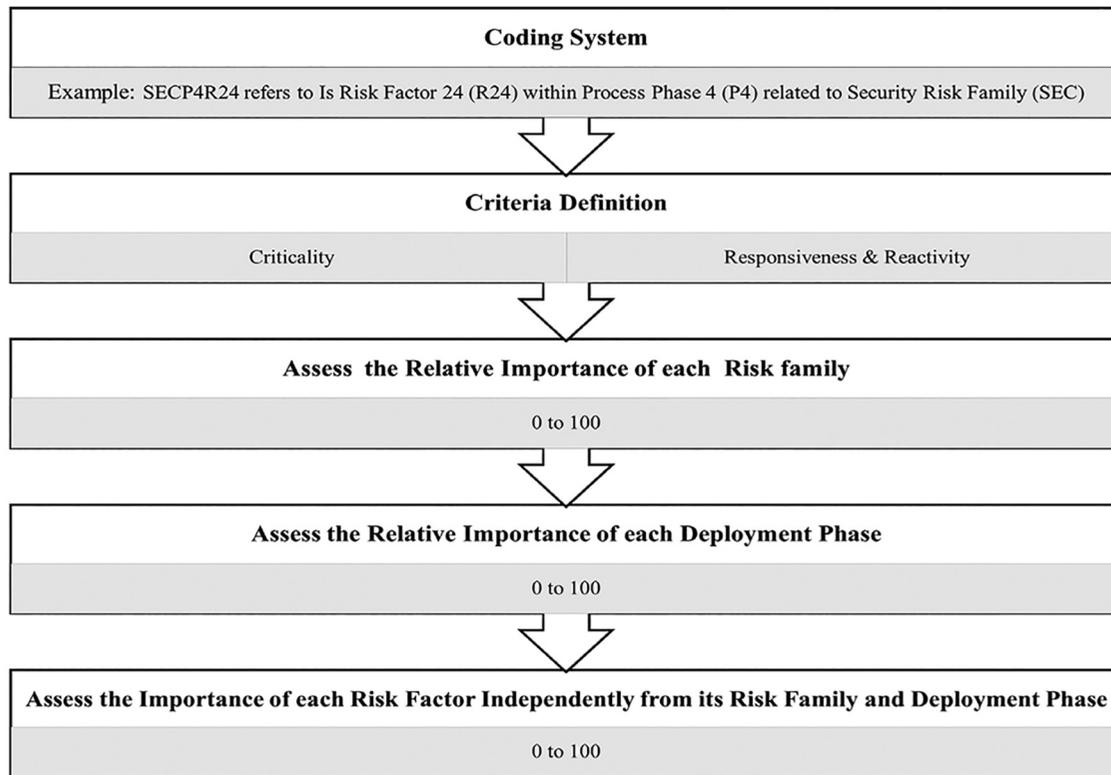


Source: Created by authors

Figure 12 Risk factor data systematization process using TAMS analyzer



Source: Created by authors

Figure 13 Risk factor evaluation process using M-MACBETH

Source: Created by authors

Table 5 Table of the top 10 deployment risk factors

Risk rank	Risk code	Risk factor	Risk value
1st	SECP4R8	Ambushes of humanitarian convoys and forced detour of humanitarian aid	72.14
2nd	SECP4R15	Underestimation of soft skills such as negotiation, communication, conflict resolution techniques and clear mission statement	66.89
3rd	SECP4R24	Strong presence of foreign militias and mercenaries	66.73
4th	SECP5R7	Ambushes of humanitarian convoys and forced detour of humanitarian aid	66.16
5th	SECP4R4	Perception by NSAGs that humanitarian actors are competing for local population control	65.89
6th	SECP4R19	Presence of armed elements outside the control of the parties that signed the peace agreements	64.64
7th	SECP4R11	Security teams settle for tactical approaches to personnel and organizational security without considering the importance of adequate assessment of security risk	64.05
8th	SECP4R14	Warring forces are not convinced of the neutral, impartial and independent status of NGOs	62.55
9th	SECP3R11	Ambushes of humanitarian convoys and forced detour of humanitarian aid	60.06
10th	SECP3R17	Strong presence of foreign militias and mercenaries	57.10

Source: Created by authors

Table 6 reveals that humanitarian deployments face several significant risks, including reputational damage, challenges in establishing quality programs and building relationships with local communities. Reputational damage can result from a failure to meet donor standards and adhere to humanitarian action principles, and it can have serious consequences for NGOs, such as a loss of funding and support. It also highlights the critical importance of upholding NGOs' reputations and brand reputation for the success of humanitarian operations. It also underscores the need for NGOs to have strong program

management and evaluation skills, as well as cultural sensitivity and soft skills such as negotiation, communication and conflict resolution.

To address these challenges, the collaborative team recommends that NGOs prioritize investing in the development of participatory and intercultural management, as well as soft skills among their staff and volunteers. This includes providing training in cultural sensitivity, effective communication and conflict resolution. NGOs should also establish mechanisms for ongoing program feedback and evaluation to ensure that their programs remain

Table 6 Table of the top three deployment risk factors by phase

Deployment phase	Risk code	Risk factor	Risk value
Phase 1: Entry authorization	CMPP1R4	Long, slow and complex bureaucracy	25.10
	CMPP1R1	Host governments' willingness to guide projects and supervise recipient region selection through MOU terms	23.20
	CMPP1R7	Naturalization of corruption in some host country bodies and communities	21.67
Phase 2: Access and clearance	SECP2R1	Sabotage or attacks on offices and storage facilities	37.38
	SECP2R5	Poor understanding of criminal threat sources	31.84
	SECP2R6	Theft of computer systems and/or relief supplies and equipment	30.87
Phase 3: Installation and deployment	SECP3R11	Ambushes of humanitarian convoys and forced detour of humanitarian aid	60.06
	SECP3R17	Strong presence of foreign militias and mercenaries	57.10
	SECP3R7	Perception by NSAGs that humanitarian actors are competing for local population control	54.59
Phase 4: Direct support	SECP4R8	Ambushes of humanitarian convoys and forced detour of humanitarian aid	72.14
	SECP4R15	Underestimation of soft skills such as negotiation, communication, conflict resolution techniques and clear mission statement	66.89
	SECP4R24	Strong presence of foreign militias and mercenaries	66.73
Phase 5: Rehabilitation	SECP5R7	Ambushes of humanitarian convoys and forced detour of humanitarian aid	66.16
	BRDP5R4	Lack of reverence for certain religious, tribal and community figures who have a strong local influence	55.30
	SECP5R22	Strong presence of foreign militias and mercenaries	54.17

Source: Created by authors

responsive to the evolving needs of the communities they serve. Finally, collaboration with community leaders can help build trust and credibility, as well as provide a deeper understanding of the local context.

Based on their field experience and the rigorous comprehensive risk assessment conducted on the ground, the practitioner members of the collaborative team highlighted the importance of coordinating with United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) to mitigate the primary risk factors associated with humanitarian deployments. They unanimously emphasized that effective collaboration with UNOCHA can help address key challenges in the early phases of deployment, including entry authorization, access and clearance, and installation and deployment.

4. Discussion

4.1 Summary of collaborative case study findings

Our research focused on two African countries, the DRC and CAR, both of which face humanitarian crises due to armed conflicts. In these regions, we identified common challenges in humanitarian action, including misinformation/disinformation, poverty, frustrations among IDPs leading to community tensions, and porous borders with neighboring fragile countries struggling to control their boundaries. However, the specific nature of these challenges differs between the two countries.

In the DRC, there is a prevailing belief that the conflict is instigated by external forces from neighboring countries. This belief strengthens the sense of national unity and patriotism among local communities. In contrast, in CAR, the problem is mainly internal, revolving around power struggles and control of mine sites. Since 2017, the involvement of Russian mercenaries has further exacerbated the situation.

Based on our study, [Table 8](#) provides the main root causes that hinder the effectiveness of humanitarian deployments.

These challenging aspects were uncovered through our fieldwork surveys and interviews, enabling us to gain insights directly from the affected communities, local stakeholders and humanitarian actors on the ground. Based on these challenges, our paper proposes three main solutions:

- 1 **Community acceptance:** Empowering local communities through respecting local traditions and social structures, involving local communities in aid project planning, is crucial in gaining acceptance.
- 2 **Ensuring aid sustainability:** Maintaining a safety stock of security supplies, equivalent to two to three months' worth, enables readiness to respond to changing demands, unexpected events and evolving circumstances.
- 3 **Maintaining effective communication with UNOCHA:** It helps engage local authorities, gain advice and establish partnerships with local actors and leaders. It also enables effective coordination, targeted assistance and understanding of political and military sensitivities.

Overall, our research highlights the impact of "disinformation" and "fear" on humanitarian missions and aid worker safety in conflict areas. We prioritize "mutual assistance" to address these challenges, emphasizing trust-building and collective support among stakeholders. [Figure 14](#) provides key recommendations to improve performance in conflict zones in the DRC and CAR.

4.2 Contributions to academic knowledge

Our paper significantly contributes to the field of HL in insecure areas by providing a contextualized understanding of challenges in the sociopolitical and geographical contexts of the DRC and CAR. Through a comprehensive risk assessment, our

Table 7 Table of the top three deployment risk factors by risk family

Risk family	Risk code	Risk factor	Risk value
Compliance risks (CMP)	CMPP4R5	Donor standards for recipient monitoring and validation	39.93
	CMPP5R5	Donor standards for recipient monitoring and validation	37.14
	CMPP4R9	Failure to respect humanitarian action principles	36.73
Operational risks (OPL)	OPLP4R7	Fragility of oil support, despite its vital importance for the mobility and functioning of the entire logistics chain	50.77
	OPLP4R8	Denial of access to the population by an armed force (militia or government)	48.55
	OPLP5R6	Fragility of oil support, despite its vital importance for the mobility and functioning of the entire logistics chain	47.37
Procurement risks (PRO)	PROP4R5	Incapacity to deliver timely and relevant services	17.31
	PROP4R3	Weak cross-functional relationships with populations and failure to integrate diverse local staff into the humanitarian support planning process	17.25
	PROP4R1	Difficulty in establishing quality programs that address the most pressing and responsive needs of the community	16.91
Brand reputation risks (BRD)	BRDP4R4	Lack of reverence for certain religious, tribal and community figures who have a strong local influence	55.50
	BRDP5R4	Lack of reverence for certain religious, tribal and community figures who have a strong local influence	55.30
	BRDP4R5	Failure to respect humanitarian action values and codes	37.87
Safety risks (SAF)	SAFP4R5	Weak threat assessment and analysis	31.67
	SAFP5R4	Weak threat assessment and analysis	29.38
	SAFP4R9	Eschewing armed protection wherever possible	27.16
Security risks (SEC)	SECP4R8	Ambushes of humanitarian convoys and forced detour of humanitarian aid	72.14
	SECP4R15	Underestimation of soft skills such as negotiation, communication, conflict resolution techniques and clear mission statement	66.89
	SECP4R24	Strong presence of foreign militias and mercenaries	66.73
Staffing risks (STF)	STFP4R1	Difficulty for country offices to recruit and retain qualified and competent security staff with diverse backgrounds	24.79
	STFP5R1	Standard operating procedures (SOP) do not distinguish between criminality and political violence	22.29
	STFP3R2	Complexity of applying "filtering" and "vetting" processes to all new workers and volunteers	20.93
Technical risks (TEC)	TECP4R5	Scarcity of operational and reliable gas stations	47.76
	TECP5R5	Scarcity of operational and reliable gas stations	44.22
	TECP4R4	Lack of coverage by mobile network and internet operators	43.09

Source: Created by authors

Table 8 Root causes threatening humanitarian deployments in DRC and CAR

Root causes	DRC	Examples CAR	Comments
Prevailing climate of mistrust	<ul style="list-style-type: none"> Concerns raised by communities, particularly in the east of the country, regarding the provision of military assistance by UN forces to armed groups Competition generally outweighing cooperation between the majority of INGOs 	<ul style="list-style-type: none"> INGOs expressing stress and postponing operations to avoid contact with UN peacekeepers in the presence of local populations 	<ul style="list-style-type: none"> Promoting trust and fostering collaboration among INGOs are essential factors in enhancing the overall Effectiveness of humanitarian deployments
Tailoring interventions to the local context and needs	<ul style="list-style-type: none"> Aid packages not considering local preferences, such as cassava flour instead of maize flour, or specific food items like rice and smoked fish 	<ul style="list-style-type: none"> Vulnerability criteria not always accounting for the local age of puberty, resulting in mismatches in targeting interventions for young women 	<ul style="list-style-type: none"> Consulting local communities ensures relevant, effective and aligned humanitarian efforts that meet the specific context and needs of affected populations
Understanding local sensitivity	<ul style="list-style-type: none"> Concerns were raised over the importation of maize flour from Uganda, perceived as coming from an enemy country and potentially harmful to locals' health 	<ul style="list-style-type: none"> Some INGOs were denied access to deliver aid for not considering the religious practices of the Seventh-day Adventist Christian community, who holds worship services on Saturdays 	<ul style="list-style-type: none"> Effectively adapting operations to the diverse backgrounds of beneficiaries is crucial for successful humanitarian interventions

Source: Created by authors

research highlights the importance of direct engagement, methodological integration and adaptive approaches. We draw on insights from [Besiou and Van Wassenhove \(2021\)](#), [Beresford and Pettit \(2021\)](#) and [Kovács et al. \(2019\)](#) to underscore the significance of engaging with local communities and key stakeholders. By integrating academia and practice, our research enriches the theoretical framework of HL across three key axes.

Our study's first axis examines the intricate relationships between humanitarian actors and stakeholders in the HSC, including the UN system. Notable authors, such as [Heaslip and Kovács \(2018\)](#), [Larson \(2021\)](#) and [Prakash et al. \(2022\)](#),

highlight the significance of collaborative and transparent communication in developing effective response strategies. Our paper emphasizes the importance of enhancing the quality of HSC relationships in fragile environments by recommending that humanitarian actors prioritize respect for social structures and diverse backgrounds when involving and supporting local communities. Effective consultation, coordination and information sharing play a crucial role in shaping the reputation of INGOs in African conflict areas.

The second axis of our study aligns with [Altay and Labonte's \(2014\)](#) conceptualization of humanitarian response as a

Figure 14 Key recommendations for humanitarian deployments in the DRC and CAR

Source: Created by authors

complex system influenced by “ambiguity” and “equivocality.” By delving into the intricate dynamics within conflict-affected areas, our research explores the significant impact of two additional key factors: “disinformation” and “fear.” Acknowledging the influence of these factors on the dynamics within armed conflict zones, our research aims to contribute to the development of innovative approaches that go beyond security risks and logistical concerns. Integrating the concepts of “ambiguity” and “equivocality” with the additional factors of “disinformation” and “fear,” we strive to advance the field of HL and enhance the overall effectiveness of humanitarian deployments in these challenging environments.

The third axis of our study emphasizes the significance of “mutual assistance” among humanitarian actors and stakeholders in conflict-affected environments. In the field of HL, factors like delivery lead times, logistics/deprivation costs (Shao *et al.*, 2023; Cotes and Cantillo, 2019) and community acceptance (referred to as public trust by Khan *et al.*, 2019) play crucial roles in shaping accountability during disaster response (Kovács and Falagara Sigala, 2021). Our research highlights the role of “mutual assistance” as a catalyst and performance metric for effective humanitarian action in conflict areas. Therefore, further exploration and investigation are needed to enhance our understanding of the dynamics of mutual assistance in challenging contexts.

4.3 Contributions to practice

Through our in-depth analysis of the various risk factors identified during our fieldwork, we have identified two primary root risk factors that encompass the major challenges and vulnerabilities impacting and threatening the success of humanitarian missions and the lives of aid workers.

The first risk factor is disinformation, which refers to the spread of false or misleading information, often in the form of fake news. Disinformation poses a significant threat to humanitarian action, as it can lead to failures in relief efforts and endanger the lives of aid workers. Misinformation and rumors create misunderstandings, perpetuate mistrust and hinder the acceptance of humanitarian aid by local communities.

The second risk factor is fear, which arises from concerns and apprehensions among local stakeholders in conflict-affected areas, such as the DRC and CAR. Fear is often fueled by the

potential for favoritism, hidden agendas and actions that may worsen already fragile situations.

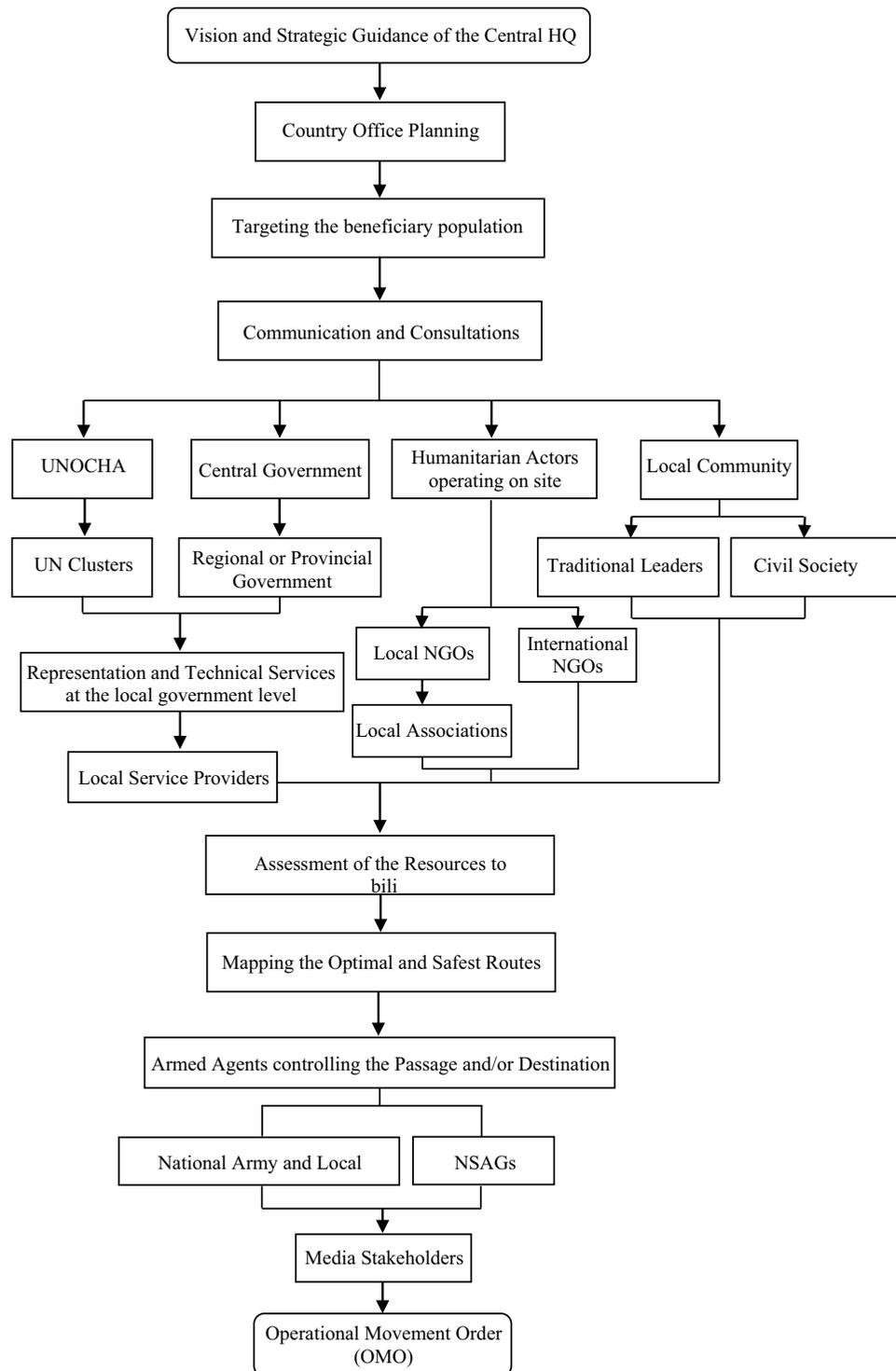
To address these challenges, our study offers two key recommendations. First, fostering partnerships and involving stakeholders in decision-making can lead to more effective humanitarian actions and garner support and protection. Second, clear and transparent communication through channels like the UN, community leaders, civil society and local media is crucial. A chronological model of best practices (Figure 15) guides implementation, optimizing performance, security and relationships with local suppliers in conflict-affected areas. Effective implementation requires negotiation, respect for local values and two-way communication.

In summary, our study contributes to the field of HL by providing clear and actionable recommendations for addressing the risk factors of disinformation and fear in conflict zones. By promoting collaboration, cooperation, stakeholder involvement and transparent communication, INGOs can foster mutual assistance and create a safer and more effective environment for humanitarian actions.

4.4 Limitations and further work

The study provides valuable understandings into the challenges and opportunities of HL in conflict-affected areas, especially in CAR and DRC. However, it is important to acknowledge its limitations. The confidentiality clauses required by the case study NGOs limited the amount of information gathered, which may have implications for the transparency and accountability of HO. During data collection, potential biases were encountered that may have affected the accuracy and completeness of the findings. Language barriers and response bias are examples of such biases that need to be considered when interpreting the results. To mitigate these biases, local translators were hired to assist in communication, and beneficiaries were encouraged to give honest responses.

Moreover, the study highlights the importance of conducting more research on sustainable and locally led approaches to aid delivery, taking into account the social, cultural and economic context in which aid is delivered. Understanding the local cultural norms, beliefs and economic context can ensure that

Figure 15 Consultation and decision-making process proposed by the study

Source: Created by authors

aid is delivered in a way that is culturally appropriate and economically sustainable. Such research could help identify more effective ways of delivering aid tailored to the specific needs of local communities.

Finally, to improve the validity of the results, the study recommends including more INGOs through collaborative case studies conducted in other current conflict areas. This can enhance the effectiveness and

sustainability of humanitarian interventions in such complex contexts.

5. Conclusion

In this work, we provide a clear and cross-referenced view of the main risks facing the deployment of INGOs in two conflict-affected countries, namely, DRC and CAR. Indeed, while insecurity is the greatest risk in both war zones, the paper shows that acceptance by local communities and parties to the conflict is crucial to the success of any humanitarian intervention. Difficult to achieve, but empowering local populations requires a deep and thorough understanding of the social and customary structures of each country, which is why it is important to prioritize respect for these structures. Furthermore, our research has demonstrated that the success of INGO deployments in these areas heavily relies on the sustainability of humanitarian interventions. Granting more initiative and autonomy to the NGOs' field managers, particularly in terms of financial resources, can ensure that there are adequate supplies to immediately and sustainably meet the needs expressed by the local populations, following a participatory approach. Without this, any humanitarian deployment is likely to find that the loyalty, sustainability and strength of the relationships between aid organizations and the communities and forces involved are ephemeral and traded for material resources. Furthermore, effective communication, cooperation and collaboration with the UNOCHA are essential for providing valuable insights and assistance in navigating the complex environment of humanitarian work in both studied conflict zones, especially during the first three phases of deployment, namely, entry authorization, access and clearance, and installation and deployment.

References

- Altay, N. and Labonte, M. (2014), "Challenges in humanitarian information management and exchange: evidence from Haiti", *Disasters*, Vol. 38 No. 1, pp. S50-S72.
- Altay, N., Kovács, G. and Spens, K. (2021), "The evolution of humanitarian logistics as a discipline through a crystal ball", *Journal of Humanitarian Logistics and Supply Chain Management*, Vol. 11 No. 4, pp. 577-584.
- Bentaleb, F., Mabrouki, C. and Semma, A. (2015), "A multi-criteria approach for risk assessment of dry port-seaport system", *Supply Chain Forum: An International Journal*, Vol. 16 No. 4, pp. 32-49.
- Besiou, M. and Van Wassenhove, L.N. (2021), "System dynamics for humanitarian operations revisited", *Journal of Humanitarian Logistics and Supply Chain Management*, Vol. 11 No. 4, pp. 599-608.
- Beresford, A. and Pettit, S. (2021), "Humanitarian aid logistics: a Cardiff University research perspective on cases, structures and prospects", *Journal of Humanitarian Logistics and Supply Chain Management*, Vol. 11 No. 4, pp. 623-638.
- Canterino, F., Shani, A.B., Coghlan, D. and Brunelli, M.S. (2016), "Collaborative management research as a modality of action research: learning from a merger-based study", *The Journal of Applied Behavioral Science*, Vol. 52 No. 2, pp. 157-186.
- Childs, A.K. (2013), "Cultural theory and acceptance-based security strategies for humanitarian aid workers", *Journal of Strategic Security*, Vol. 6 No. 1, pp. 64-72.
- Chirambwi, K. (2023), "Rethinking research methods in protracted violent conflicts in Mozambique: fieldwork in complex emergencies", *Journal of Humanitarian Logistics and Supply Chain Management*.
- Collinson, S., Duffield, M., Berger, C., Felix da Costa, D. and Sandstrom, K. (2013), "Paradoxes of presence: risk management and aid culture in challenging environments".
- Cotes, N. and Cantillo, V. (2019), "Including deprivation costs in facility location models for humanitarian relief logistics", *Socio-Economic Planning Sciences*, Vol. 65, pp. 89-100.
- Coughlan, P. and Coghlan, D. (2002), "Action research for operations management", *International Journal of Operations & Production Management*, Vol. 22 No. 2, pp. 220-240.
- Cunningham, A.J. (2017), "Kidnapping and the limits of acceptance", *Journal of International Humanitarian Action*, Vol. 2 No. 1, pp. 1-10.
- De Camargo Fiorini, P., Chiappetta Jabbour, C.J., Lopes de Sousa Jabbour, A.B. and Ramsden, G. (2022), "The human side of humanitarian supply chains: a research agenda and systematization framework", *Annals of Operations Research*, Vol. 319 No. 1, pp. 911-936.
- Dyer, R.F. and Forman, E.H. (1992), "Group decision support with the analytic hierarchy process", *Decision Support Systems*, Vol. 8 No. 2, pp. 99-124.
- e Costa, C.A.B. and Vansnick, J.C. (1994), "MACBETH – an interactive path towards the construction of cardinal value functions", *International Transactions in Operational Research*, Vol. 1 No. 4, pp. 489-500.
- e Costa, C.A.B., Ensslin, L., Cornêa, É.C. and Vansnick, J.C. (1999), "Decision support systems in action: integrated application in a multicriteria decision aid process", *European Journal of Operational Research*, Vol. 113 No. 2, pp. 315-335.
- El Baz, J. and Ruel, S. (2021), "Can supply chain risk management practices mitigate the disruption impacts on supply chains' resilience and robustness? Evidence from an empirical survey in a COVID-19 outbreak era", *International Journal of Production Economics*, Vol. 233, p. 107972.
- Elkahlout, G., Milton, S., Yaseen, T. and Raweh, E. (2022), "Localisation of humanitarian action in war-torn countries: the experience of local NGOs in Yemen", *International Journal of Disaster Risk Reduction*, Vol. 75, p. 102921.
- Grace, R., Alejandria, M.C., Bates, M., Boland, S.T., Nylen, A., Tayyeb, Z. and Levine, A.C. (2023), "Moving humanitarian-military relations forward: a new typology", *Journal of International Humanitarian Action*, Vol. 8 No. 1, p. 2.
- Gupta, S., Altay, N. and Luo, Z. (2019), "Big data in humanitarian supply chain management: a review and further research directions", *Annals of Operations Research*, Vol. 283 Nos 1/2, pp. 1153-1173.
- Heaslip, G. and Kovács, G. (2018), "Governance of service triads in humanitarian logistics", *The Palgrave Handbook of Humanitarian Logistics and Supply Chain Management*, pp. 417-444.
- Hoelscher, K., Miklian, J. and Nygård, H.M. (2017), "Conflict, peacekeeping, and humanitarian security: understanding violent attacks against aid workers", *International Peacekeeping*, Vol. 24 No. 4, pp. 538-565.

- Jackson, A. and Zyck, S.A. (2017), "Presence and proximity, to stay and deliver, five years on", Independent study commissioned by OCHA, the Norwegian Refugee Council, and the Jindal School of International Affairs. Retrieved, p. 18.
- Johnson, P.L. and Thurber, C. (2020), "The security-force ethnicity (SFE) project: introducing a new dataset", *Conflict Management and Peace Science*, Vol. 37 No. 1, pp. 106-129.
- Khan, M., Yong, L.H. and Han, B.J. (2019), "Emerging techniques for enhancing the performance of humanitarian logistics", *International Journal of Supply Chain Management*, Vol. 8 No. 2, p. 450.
- Kovács, G. and Falagara Sigala, I. (2021), "Lessons learned from humanitarian logistics to manage supply chain disruptions", *Journal of Supply Chain Management*, Vol. 57 No. 1, pp. 41-49.
- Kovács, G. and Moshtari, M. (2019), "A roadmap for higher research quality in humanitarian operations: a methodological perspective", *European Journal of Operational Research*, Vol. 276 No. 2, pp. 395-408.
- Kovács, G. and Spens, K.M. (2011), "Trends and developments in humanitarian logistics – a gap analysis", *International Journal of Physical Distribution & Logistics Management*, Vol. 41 No. 1, pp. 32-45.
- Kovács, G. and Spens, K.M. (2005), "Abductive reasoning in logistics research", *International Journal of Physical Distribution & Logistics Management*, Vol. 35 No. 2, pp. 132-144.
- Kovács, G., Spens, K. and Moshtari, M. (Eds) (2017), *The Palgrave Handbook of Humanitarian Logistics and Supply Chain Management*, Springer.
- Kovács, G., Moshtari, M., Kachali, H. and Polska, P. (2019), "Research methods in humanitarian logistics", *Journal of Humanitarian Logistics and Supply Chain Management*, Vol. 9 No. 3, pp. 325-331.
- Kunz, N., Van Wassenhove, L.N., Besiou, M., Hambye, C. and Kovács, G. (2017), "Relevance of humanitarian logistics research: best practices and way forward", *International Journal of Operations & Production Management*, Vol. 37 No. 11, pp. 1585-1599.
- Larson, P.D. (2021), "Security, sustainability and supply chain collaboration in the humanitarian space", *Journal of Humanitarian Logistics and Supply Chain Management*, Vol. 11 No. 4, pp. 609-622.
- Listou, T. (2021), "The infrastructures of war and peace", *Journal of Humanitarian Logistics and Supply Chain Management*, Vol. 11 No. 4, pp. 661-679.
- Miles, M.B. and Huberman, A.M. (1994), *Qualitative Data Analysis: An Expanded Sourcebook*, Sage.
- Mlambo, V.H. and Dlamini, M. (2019), "Conflict and violence in Africa in the 21st century: where is the African union? A case of Libya, South Sudan, Democratic Republic of the Congo, and Central African Republic", *Journal of Public Affairs*, Vol. 19 No. 4, p. e1939.
- Munyaka, J.C.B. and Yadavalli, V.S.S. (2021), "Using transportation problem in humanitarian supply chain to prepositioned facility locations: a case study in the Democratic Republic of the Congo", *International Journal of System Assurance Engineering and Management*, Vol. 12 No. 1, pp. 199-216.
- Nikolic, J., Ferraro, T. and de Saint Maurice, T. (2020), "Aggregated intensity: classifying coalitions of non-state armed groups", *ICRC Humanitarian Law & Policy Blog*.
- Oloruntoba, R. and Banomyong, R. (2018), "Humanitarian logistics research for the care of refugees and internally displaced persons: a new area of research and a research agenda", *Journal of Humanitarian Logistics and Supply Chain Management*, Vol. 8 No. 3, pp. 282-294.
- Pedraza-Martinez, A.J., Stapleton, O. and Van Wassenhove, L. N. (2013), "On the use of evidence in humanitarian logistics research", *Disasters*, Vol. 37, pp. S51-S67.
- Plachciak, A. and Marcinkowski, J. (2022), "Humanitarian assistance in G5 Sahel: social sustainability context of macrologistics potential", *Sustainability*, Vol. 14 No. 14, p. 8862.
- Pournader, M., Kach, A. and Talluri, S. (. (2020), "A review of the existing and emerging topics in the supply chain risk management literature", *Decision Sciences*, Vol. 51 No. 4, pp. 867-919.
- Pöysti, M. (2019), "Mapping logistical challenges in a conflict zone".
- Prakash, C., Roy, V. and Charan, P. (2022), "Mitigating interorganizational conflicts in humanitarian logistics collaboration: the roles of contractual agreements, trust and post-disaster environmental uncertainty phases", *The International Journal of Logistics Management*, Vol. 33 No. 1, pp. 28-52.
- Rath, L.L. (2016), "Low-barrier-to-entry data tools: creating and sharing humanities data", *Library Hi Tech*, Vol. 34 No. 2, pp. 268-285.
- Refstie, H. and Brun, C. (2012), "Towards transformative participation: collaborative research with 'urban IDPs' in Uganda", *Journal of Refugee Studies*, Vol. 25 No. 2, pp. 239-256.
- Remko, V.H. (2020), "Research opportunities for a more resilient post-COVID-19 supply chain – closing the gap between research findings and industry practice", *International Journal of Operations & Production Management*, Vol. 40 No. 4, pp. 341-355.
- Renteria, R., Chong, M., de Brito Junior, I., Luna, A. and Quiliche, R. (2021), "An entropy-based approach for disaster risk assessment and humanitarian logistics operations planning in Colombia", *Journal of Humanitarian Logistics and Supply Chain Management*, Vol. 11 No. 3, pp. 428-456.
- Sabri, Y., Zarei, M.H. and Harland, C. (2019), "Using collaborative research methodologies in humanitarian supply chains", *Journal of Humanitarian Logistics and Supply Chain Management*, Vol. 9 No. 3, pp. 371-409.
- Schouten, P. (2019), "Roadblock politics in central Africa", *Environment and Planning D: Society and Space*, Vol. 37 No. 5, pp. 924-941.
- Shao, J., Fan, Y., Wang, X., Liang, C. and Liang, L. (2023), "Designing a new framework agreement in humanitarian logistics based on deprivation cost functions", *International Journal of Production Economics*, Vol. 256, p. 108744.
- Sigala, I.F. and Wakolbinger, T. (2019), "Outsourcing of humanitarian logistics to commercial logistics service

- providers: an empirical investigation”, *Journal of Humanitarian Logistics and Supply Chain Management*, Vol. 9 No. 1, pp. 47-69.
- Stoddard, A., Harmer, A. and Czwarno, M. (2017), “Behind the attacks: a look at the perpetrators of violence against aid workers”, Aid Worker Security Report 2017.
- Tay, H.L., Banomyong, R., Varadejsatitwong, P. and Julagasigorn, P. (2022), “Mitigating Risks in the Disaster Management Cycle”, *Advances in Civil Engineering*, 2022.
- Touboulic, A. and Walker, H. (2016), “A relational, transformative and engaged approach to sustainable supply chain management: the potential of action research”, *Human Relations*, Vol. 69 No. 2, pp. 301-343.
- Vega, D. (2018), “Case studies in humanitarian logistics research”, *Journal of Humanitarian Logistics and Supply Chain Management*, Vol. 8 No. 2, pp. 134-152.
- Voss, C., Tsiriktsis, N. and Frohlich, M. (2002), “Case research in operations management”, *International Journal of Operations & Production Management*, Vol. 22 No. 2, pp. 195-219.
- Yuste, P., Campbell, J., Canyon, D., Childers, M. and Ryan, B.J. (2019), “Synchronized humanitarian, military and commercial logistics: an evolving synergistic partnership”, *Safety*, Vol. 5 No. 4, p. 67.
- Zavadskas, E.K. and Turskis, Z. (2011), “Multiple criteria decision making (MCDM) methods in economics: an overview”, *Technological and Economic Development of Economy*, Vol. 17 No. 2, pp. 397-427.

Appendix 1

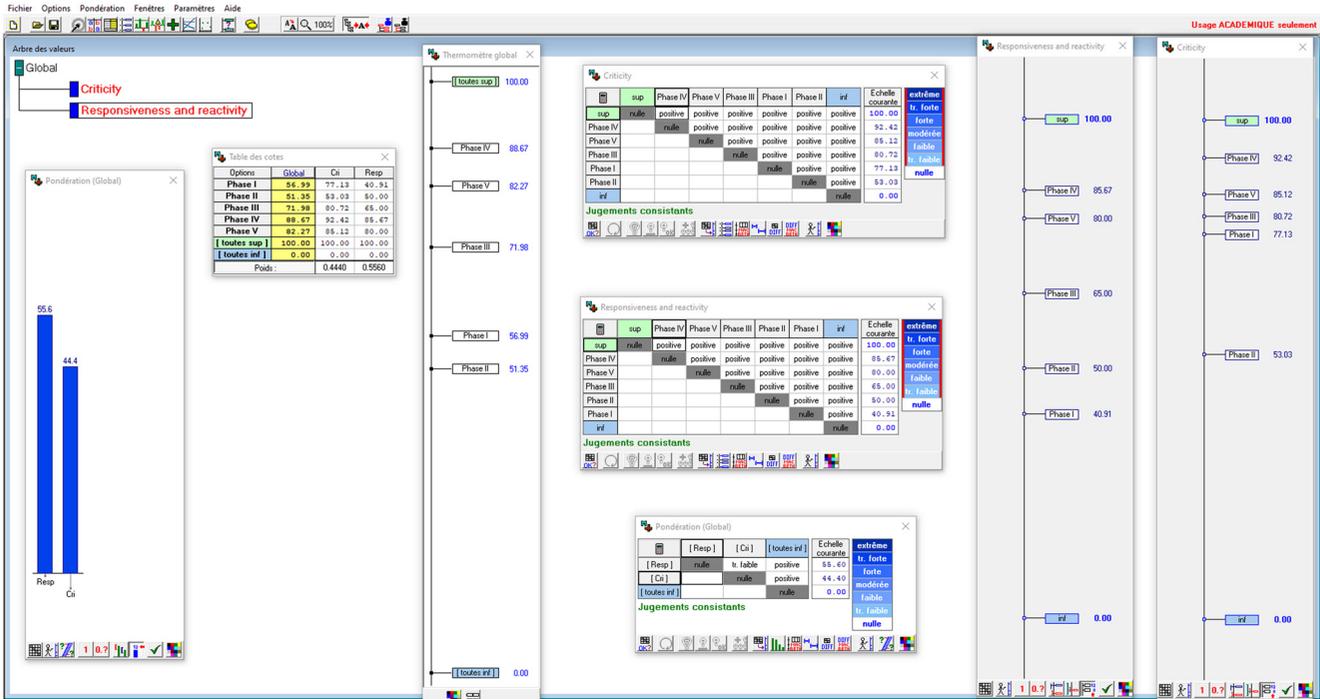
Table A1 Collaborative case study panel interview questionnaire for data collection

Q1	What are the main logistical challenges faced by international NGOs in delivering humanitarian aid in conflict zones in the Democratic Republic of the Congo (DRC) and the Central African Republic (CAR)?
Q2	How do these logistical challenges impact the effectiveness and efficiency of humanitarian aid delivery by international NGOs in conflict zones in the DRC and CAR?
Q3	How do changing situations on the ground in conflict zones in the DRC and CAR, such as sudden displacement or outbreaks of violence, affect the ability of international NGOs to deliver humanitarian aid and respond to changing needs?
Q4	What strategies and approaches have been effective in helping international NGOs overcome logistical challenges and deliver humanitarian aid successfully in conflict zones in the DRC and CAR?
Q5	To what extent do local actors (e.g. community leaders, government officials, other NGOs) influence the work of international NGOs in the DRC and the CAR, and how do these relationships impact the effectiveness of humanitarian interventions?
Q6	What are the main factors that contribute to the success or failure of humanitarian deployments by international NGOs in conflict zones in the DRC and CAR, and how do these factors interact with one another?
Q7	How can international NGOs improve their operations and decision-making processes to better address the challenges and risks associated with delivering humanitarian aid in conflict zones in the DRC and CAR?
Q8	What is the role of local NGOs and community-based organizations in supporting international NGOs in delivering humanitarian aid in conflict zones in the DRC and CAR, and how can partnerships with these organizations be strengthened to improve aid delivery?
Q9	How do political and security dynamics in conflict zones in the DRC and CAR affect the work of international NGOs delivering humanitarian aid, and how do NGOs navigate these dynamics to ensure the safety of their staff and operations while maintaining their neutrality and impartiality?
Q10	What are some practical and concrete recommendations for international NGOs operating in these conflict zones to address the logistical challenges and successfully deploy humanitarian aid?
Q11	How do international NGOs assess and prioritize the needs of different communities affected by armed conflict in the DRC and CAR, and what ethical considerations must be taken into account when working in these environments?
Q12	What are the long-term implications of armed conflicts on the delivery of humanitarian aid in the DRC and CAR, and what strategies can international NGOs use to adapt their operations to meet evolving needs and challenges over time?
Q13	In what ways can international NGOs ensure the sustainability of their humanitarian interventions in the DRC and CAR, and what factors contribute to their long-term success?

Source: Table created by authors

Appendix 2

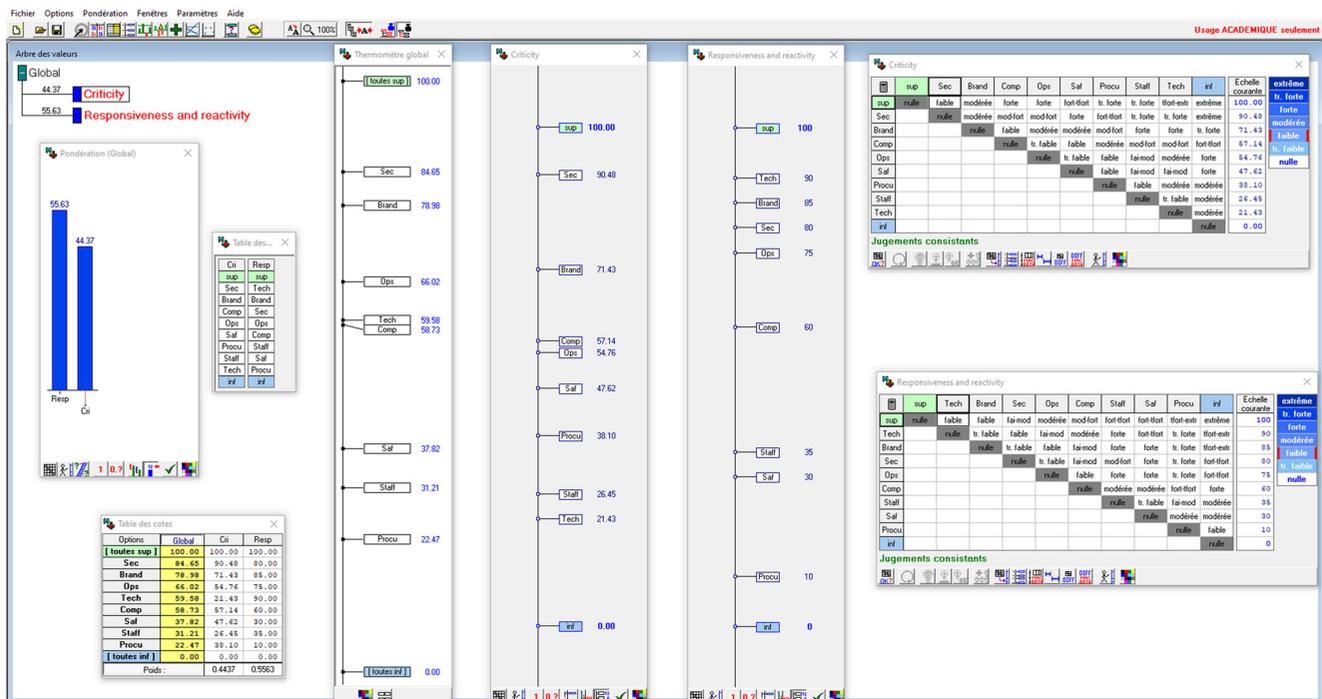
Figure A1 Deployment phases assessment through MACBETH



Source: Figure created by authors using academic M-MACBETH

Appendix 3

Figure A2 Risk families assessment through MACBETH



Source: Figure created by authors using academic M-MACBETH

About the authors

Youssef Malhouni is an accomplished professional with over 15 years of experience as an expert in logistics and crisis management. He holds two master's degrees, one in "Public Management" and the other in "Engineering & Industrial Management: Logistics and Transport," along with three postgraduate degrees in "Administration and Logistics," "Internal Audit," and "War Logistics: Emergencies, Relief, UN and NATO Systems." Currently, Youssef is a lecturer and researcher in the field of humanitarian logistics and supply chain management. His extensive experience in crisis management has allowed him to develop a deep understanding of the intricacies involved in managing logistics during emergencies.

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