Balancing innovation, efficiency, and principled humanitarian action

Navigating trade-offs and the promise of AI

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Content

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Abbreviations

AI	Artificial Intelligence
CDAC	Communicating with Disaster Affected Communities
CHA	Centre for Humanitarian Action
CVA	Cash and Voucher Assistance
EU	European Union
GDPR	General Data Protection Regulations
GenAI	Generative AI
HLA	Humanitarian Leadership Group
IDIA	International Development Innovation Alliance
KII	Key informant interview
KPI	Key performance indicator
MUAC	Mid-upper arm circumference
NGO	Non-governmental Organisation
NLP	Natural Language Processing
OECD	Organisation for Economic Co-operation and Development
SCD	Syrian Civil Defence
STEM	Science, technology, engineering, and mathematics
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
US	United States

1. Introduction

The promise of innovation: improving humanitarian response times, cost efficiency, and overall effectiveness

Amid an accountability crisis, the humanitarian system stands at a pivotal juncture, searching and fighting for its raison d'être. Despite rising needs, humanitarian organisations are struggling with massive funding cuts, waning trust, and a reform process that has dragged on for decades. At the same time, the promise of innovation and cutting-edge technology offers unprecedented opportunities to improve humanitarian response times, cost efficiency, and overall effectiveness. **Artificial intelligence (AI),** which includes a wide range of tools and applications, is especially praised for its transformative potential to support a sector in crisis. Yet, AI is not new to the humanitarian system. What is new is the growing **debate over efficiency gains that may come at the expense of principled humanitarian action** – a phenomenon inherently linked to the discussion about the responsible use of Generative AI.

For many years, humanitarian organisations have used what is commonly known as **narrow or weak AI** to address specific challenges and perform defined tasks, such as analysing satellite imagery to detect damaged infrastructure, providing voice and language assistance to inform people affected by crises, using predictive analytics to support early warning systems, or applying biometric verification to identify aid recipients. These more traditional AI innovations rely on specific datasets and predefined rules to carry out their functions. They operate within a limited scope, producing outputs like probabilistic recommendations, categorisation, or automated responses based on pre-established parameters and algorithms (OCHA 2024; Deutscher Ethikrat 2023).

> "Artificial intelligence (AI) refers to systems designed by humans that, given a complex goal, act in the physical or digital world by perceiving their environment, interpreting the collected structured or unstructured data, reasoning on the knowledge derived from this data and deciding the best action(s) to take (according to predefined parameters) to achieve the given goal. AI systems can also be designed to learn to adapt their behaviour by analysing how the environment is affected by their previous actions" (European Commission 2018, 7).

The rapid advancement of data availability, computational power, and massive private sector investments, however, has accelerated technological development, culminating in the emergence of **Generative AI (GenAI)**. Unlike narrow AI, GenAI represents a paradigm shift and is widely regarded as one of the most transformative innovations in human history. Its data models are designed not only to process and classify data, but to generate entirely new content. In other words, GenAI, trained on data and the information it receives, is capable of producing new text, images, audio, or code. This new generation of AI systems exhibits capabilities often associated with "common sense reasoning" (European Commission 2018, 6), and a degree of self-directed task performance, described as "the ability to define its own purpose" (ibid.). Examples include generating content for grant proposals, automatically summarising reports or identifying aid recipients, and simulating complex humanitarian scenarios such as displacement or disease outbreaks. Many of these innovations remain largely experimental or in pilot phase, and they blur the line between assistance and automation, raising important questions about accountability, transparency, and the preservation of humanitarian principles (OCHA 2024; Wilton Park 2024; Pizzi et al. 2020).

Recent surveys conducted by Sphere, the Centre for Humanitarian Action (CHA), and the Humanitarian Leadership Group (HLA) demonstrate that the majority of humanitarian actors already use AI tools on a daily or weekly basis. While AI is increasingly integrated into individual workflows, many humanitarian organisations still face **challenges in formally adopting** it at the organisational level. Only a few have implemented AI tools for natural language processing, project management tasks like proposal writing, monitoring and evaluation, data analysis or knowledge management. The majority remain in the experimental or pilot phase with various tools. Respondents to the CHA survey cited data protection and privacy concerns, lack of trust, and uncertainty about the reliability of AI tools as the main barriers to organisational adoption. In contrast, participants in the Sphere survey identified a lack of technical expertise as the top barrier, followed by concerns over data protection, privacy, and tool reliability. As a result, most organisations aiming to introduce AI tools face the challenge of balancing efficiency with humanitarian principles, while striving to keep pace with rapidly evolving technologies and the trade-offs they bring.

To better understand whether this scepticism is justified, it's helpful to distinguish between narrow or traditionally

How can humanitarian innovations be scaled in ways that are both effective and principled?

used AI tools and GenAI, which is capable of producing novel outputs. Without clearly differentiating between types of AI applications, their intended purpose and capabilities, and the context in which they are used, it becomes difficult to weigh their potential benefits against associated risks. Like any innovation, AI presents both significant opportunities and serious ethical challenges – its adoption and scaling inevitably involve trade-offs. Recent discussions within the humanitarian sector reflect both **enthusiasm for the transformative potential of GenAI and concern over its unintended consequences**, including algorithmic bias, diminished human oversight, and erosion of trust among humanitarian actors. The growing use of AI in humanitarian action raises pressing questions around the **protection of core humanitarian principles, transparency and accountability, data protection and privacy**. While the sector is drawn to AI's promise of enhanced efficiency and predictive power, it must also contend with the ethical and practical risks of dehumanised decision-making, exclusion, and harm. This tension – between AI's potential for optimisation and the risk of undermining humanitarian values – underscores a much deeper dilemma facing the humanitarian system: How can humanitarian innovations be scaled in ways that are both effective and principled?

It is within this contested space between opportunity and risk, performance and principles that this paper intervenes. We shift the focus from the question of whether innovations like AI should be used to how they are being implemented and scaled in practice, and what this reveals about the operational ethics of humanitarian innovation. We critically analyse how successfully scaled AI and non-AI humanitarian innovations manage competing demands between performance-driven efficiency and people-centred humanitarian principles. Rather than treating "innovation", "scaling", and "success" as fixed or objective concepts, we examine how different stakeholders define and negotiate these terms in practice.

How do key success factors interact, reinforce, or conflict with one another during the scaling process ?

Drawing on seven use cases of both AI and non-AI innovations, we explore how key success factors interact, reinforce, or conflict with one another during the scaling process – and how innovation owners navigate these dynamics through strategic ethical positioning and stakeholder alignment. This approach allows us to understand not only which innovations scale successfully, but also why and how they do – and the role that context, collaboration, ethics, and power relations play in shaping those outcomes.

Following a brief description of our methodology and limitations of this paper, the analysis unfolds in five parts. Chapter 2 begins by unpacking the contested concepts of innovation, scaling, and success. Building on the key success factors identified earlier (see Düchting 2025a), chapter 3 analyses how these factors interact – through reinforcements, qualifiers, and trade-offs – drawing on insights from seven case studies. Chapter 4 then explores how the innovation owners of our case studies navigate the ethical tensions that emerge when scaling innovations from the trade-offs through strategic ethical positioning. Chapter 5 focuses specifically on AI-driven innovations, illustrating how these digital technologies amplify existing ethical dilemmas – particularly around accountability, explainability, and adaptability. This section positions AI as an ethical stress test for the humanitarian sector, challenging it to confront and navigate enduring tensions in innovation scaling and practice.

Methodology

For this project, we used a two-phase mixed-methods approach. In the first phase, we conducted a **structured literature review** of published evaluations, reports, and academic studies on humanitarian innovation and scaling. This desk-based research was complemented by a **stakeholder workshop** in November 2024, which brought together key experts from across the humanitarian innovation ecosystem, including innovation owners, donor representatives, and researchers. This generated a consolidated list of key success factors – to be read in conjuction with the failures identified by Elrha (see Townsend 2024) – for innovation scaling in humanitarian action. They were identified as interrelated and context-dependent, and published in a policy brief (Düchting 2025b).

In the second phase of the research, we analysed seven **in-depth case studies** to explore how innovation scaling plays out in practice and how ethical considerations shape these trajectories. The cases were purposively selected through a snowball sampling approach to capture a diverse range of innovations in terms of geography, type (AI and non-AI), organisational model, and scaling strategy (see figure 1). We sought to include innovations at different stages of maturity and facing varied ethical and operational challenges to enable meaningful comparison.

The AI-based cases include the AI Safety Label, which promotes voluntary standards for the safe use of AI in humanitarian settings; Child Growth Monitor, an AI-pow-

ered tool that detects malnutrition through image analysis; and Sentry Syria, which uses AI to monitor and verify attacks on civilian infrastructure. The non-AI cases include Cash and Voucher Assistance (CVA), with a focus on scaling digital CVA models; Commit Global, an international NGO offering a wide variety of open-source digital tools that support locally led humanitarian action; Missing Maps, a collaborative initiative to map vulnerable areas before crises occur; and WeRobotics, which strengthens local capacity to deploy drones and robotics in humanitarian settings.

Each case was analysed using a combination of desk review of project documentation and semi-structured key informant interviews (KIIs) involving implementers, funders, and – where possible – local stakeholders. This approach allowed us to reconstruct each innovation's scaling journey and understand how contextual factors, strategic decisions, and ethical frameworks influenced its development. A central comparative question guiding the analysis was how the dynamics of scaling and ethical positioning differ between AI and non-AI innovations. In each case, we focused on two analytical dimensions:

(1) the **interrelations** among key success factors in the innovation's scaling process, and

(2) the role of **ethical frameworks** in guiding its scaling journey.

Methodological tools such as process tracing and structured comparison (Seawright 2016; Goertz 2017) supported a nuanced understanding of how success factors interact in practice, both across and within the categories of AI and non-AI innovations.

Figure 1: Overview of AI-based and non-AI-based use cases included in this study

Exploring findings further – especially given widespread concern about the distinct impact associated with AI – we conducted a **rapid survey** to assess current trends, use cases, and perceived challenges of AI in humanitarian action. The survey included 22 questions in single-choice, multiple-choice, and ranking formats and was completed by 32 participants. Respondents represented a diverse range of organisations operating at international, national, and local levels. Of these, 72 % worked at the international level, with 58 % affiliated with international NGOs, while 25 % represented national or local NGOs. The survey provided additional insights into how AI is currently applied, the expectations and concerns it raises, and whether it introduces fundamentally new ethical or operational dilemmas for humanitarian innovation. For triangulation, the survey was aligned with a similar one conducted by Sphere in late 2024, which received 68 responses.

In preparing this paper, we used AI tools – specifically ChatGPT, Consensus, and DeepL – to enhance readability and refine our findings. The tools supported literature review, helped synchronise qualitative input, tested different ways of framing arguments, and streamlined language. While the privacy and confidentiality of our informants were fully respected and all conceptual and analytical decisions remained firmly in the hands of the authors, the use of AI helped accelerate the drafting process and enhanced the clarity and coherence of the narrative. This reflects our broader interest in understanding how GenAI can be used responsibly to meaningfully assist – without replacing – critical thinking, as well as human and ethical judgment in humanitarian knowledge production.

Limitations

Conceptual limitations stem from the dual reliance on mainstream institutional definitions of innovation (e.g., Elrha, ExpandNet) and a critical stance toward donor- and practitioner-centric models, as expressed by our informants. While this tension reflects a real-world dilemma, it may limit this study's ability to separate normative critique from empirical analysis.

Methodologically, the use of snowball sampling to select case studies introduces a potential bias toward more visible or well-recognised innovations. As a result, less successful or locally grounded innovations, particularly those outside formal networks or not leveraging advanced technologies, may be underrepresented. Additionally, while the study draws on both desk research and key informant interviews, it was not possible to directly capture the perspectives of affected people – the intended end-users of humanitarian innovation.

However, these limitations do not detract from the value of our findings. Still, they highlight important areas for future research, particularly the need for more participatory research methods and greater attention to specific technological domains.

2. Innovation, scaling, and success: Norms, tensions, and practices in humanitarian action

What qualifies as an "innovation", what constitutes "scaling", and how "success" is defined vary significantly – not so much between AI and non-AI cases, but across all innovations – depending instead on each innovation's objectives, the actors involved, and the context in which it operates. We, therefore, start by outlining the different interpretations of these core concepts and critically examining implications. This is to lay down the conceptual foundation for the analysis that follows.

Defining "humanitarian innovation"

Innovation is typically understood as a process

In the humanitarian sector, "innovation" is commonly defined as the **introduction and implementation of new or significantly "improved" products, processes, or ways of working that "add value" within a humanitarian context**. It encompasses not only radical or disruptive breakthroughs but also incremental adaptations of existing tools, systems, or methods. As such, innovation is typically understood as a process – an iterative, adaptive, and non-linear cycle that involves identifying a problem, developing potential solutions, testing, refining, and ultimately scaling what works (Obrecht and Warner 2016).

However, this seemingly straightforward definition masks important questions about who defines the problem, who drives the process, and whose criteria are used to determine whether an innovation constitutes a "solution", "adds value" or "improves" a humanitarian context. As Bruder and Baar (2024), Finnigan and Farkas (2019), and Hunt et al. (2019) note, humanitarian innovations are frequently **developed by and for key humanitarian professionals**, rather than by and for affected people. In practice, many humanitarian innovations are shaped more by the institutional imperatives of these major actors, such as donor requirements, reporting cycles, or a drive for technological novelty, than by the lived experiences or articulated needs of crisis-affected communities.

In this context, it is important to distinguish between leadership and ownership of an innovation and the specific term "innovation owner". The term "**innovation owner**" refers to the individual, organisation, or consortium that initiates, develops, and drives the scaling of a particular innovation. Innovation owners are responsible not only for the technical or conceptual development of the innovation but also for strategic decisions related to its implementation, adaptation, governance, and scaling. They are accountable for aligning the innovation with ethical principles, engaging stakeholders, securing funding, and navigating the practical and political challenges of adoption and scale (Obrecht and Warner 2016).

This may be due to the absence of internal "pull factors" within the humanitarian system. Unlike the private sector, where market demand, user feedback, and customer satisfaction offer continuous indicators of success, humanitarian innovation often lacks equivalent mechanisms. As a result, success is more easily defined by funders, for example, rather than through community feedback or system-wide learning (Taylor and Salmon 2022).

Humanitarian innovation is framed as being in service of humanitarian goals, while drawing heavily on conceptual models from the private innovation sector

What distinguishes humanitarian innovation is its focus on improving outcomes in times of crisis and uncertainty. It is framed as being **in service of humanitarian goals**, such as alleviating suffering, optimising process efficiency, and ensuring more timely and effective responses. At the same time, it draws heavily on **conceptual models from the private** innovation sector, particularly those driven by start-up and tech-driven entities. These models typically emphasise metrics like value for money, scalability, and measurable performance improvements. While these are important and often resonate with the institutional imperatives of key humanitarian actors, they risk sidelining critical considerations such as context-specificities, local ownership, cultural relevance, inclusion, and power asymmetries – considerations that are deeply rooted in humanitarian principles (Bruder and Baar 2024).

An emphasis on innovation as a performance tool also tends to sideline **relational and procedural forms of innovation**, such as shifts in partnership models, governance arrangements, safety measures or community-led knowledge practices. These forms of change are more

complicated to quantify but may have a more profound, lasting impact over time.

As this brief exploration has shown, "humanitarian innovation" clearly sits at the intersection of humanitarian principles and efficiency-oriented goals. It balances aspirations to improve outcomes for affected people with institutional imperatives such as scalability and donor accountability. Establishing a shared understanding of the foundations, assumptions, and intended impacts of innovation is therefore essential to guide its responsible development.

The politics of "scaling"

Scaling is not simply about making an innovation bigger or more visible

In the humanitarian innovation context, "scaling" refers to expanding an innovation beyond its initial scope of application to achieve broader, more sustainable impact. Over the past decade, the concept has evolved and become more nuanced. Organisations such as Elrha (2023), and Scaling-up (2018) define scaling as a **deliberate effort to increase both the reach and impact of proven solutions**. Scaling is not simply about making an innovation bigger or more visible. It involves strategically adapting and embedding it across different geographies, institutions, users, or systems to ensure its relevance and sustainability over time. Like "innovation", "scaling" can take various forms. It may include expanding to reach more end users or communities. **Horizontal scaling**, for instance, transfers innovations across different social, political, or institutional contexts. **Vertical scaling** embeds innovations into policy, regulatory frameworks, organisational structures, or across ecosystems (Simmons et al. 2025; World Health Organization and ExpandNet 2011).

Each scaling pathway requires distinct capabilities, partnerships, and governance models, often involving changes to the operational model or the adaptation of the innovation itself to suit new contexts and users. Scaling is therefore not a straightforward act of replication. It is **a process of change and transformation**. Yet, this process is far from neutral. A core tension that underlies humanitarian innovation scaling lies in its underlying purpose: Who is the innovation ultimately for, and how do key stakeholders conceptualise, integrate and manage the design and development process across sectors, and systems?

Scaling organisations often follow a **linear, step-by-step model** from ideation to pilot and scale. Donors, in contrast, tend to focus on outputs, often defining innovation by its tangible end-result rather than its ongoing processes or community relevance. In line with this, the IDIA report by Fab Inc. and the International Rescue Committee (2023) identifies three main donor investment stages: proof of concept, transition to scale, and scaling.

However, the problem statement stage, where community needs should be identified and validated, is frequently overlooked and underfunded. When innovations are scaled without grounding in this early phase, and without continued engagement throughout the scaling journey, they risk being disconnected from the lived and evolving realities of the communities they aim to support. This tension becomes particularly visible when funders prioritise cost-efficiency, replicability, or visibility, while communities value relevance, adaptability, and ownership.

These competing logics place innovation owners in the difficult position of balancing donor expectations with the needs and priorities of end users and those who are meant to benefit from the innovation. As our analysis will show, understanding and addressing these tensions is essential to building innovation pathways that are not only scalable but also meaningful and sustainable across diverse humanitarian contexts and for a wide range of stakeholders, sectors, and systems.

"Success" in scaling humanitarian innovations

Shaped mainly by donor interests, several efforts have been made to formalise success criteria in humanitarian innovation scaling (Bruder and Baar 2024). Acknowledging the varying definitions of "success" among different stakeholders, our earlier work (Düchting 2025b) identified ten interrelated success factors that support principled and effective scaling of humanitarian innovations (see figure 2). We underscored that success – or failues as identified by Elrha (see Townsend 2024) – is not driven by any single factor, but by the dynamic interaction between multiple elements tailored to specific contexts and users. In this paper, we analyse how this interplay unfolds across seven use cases, highlighting key similarities and differences between AI and non-AI cases.

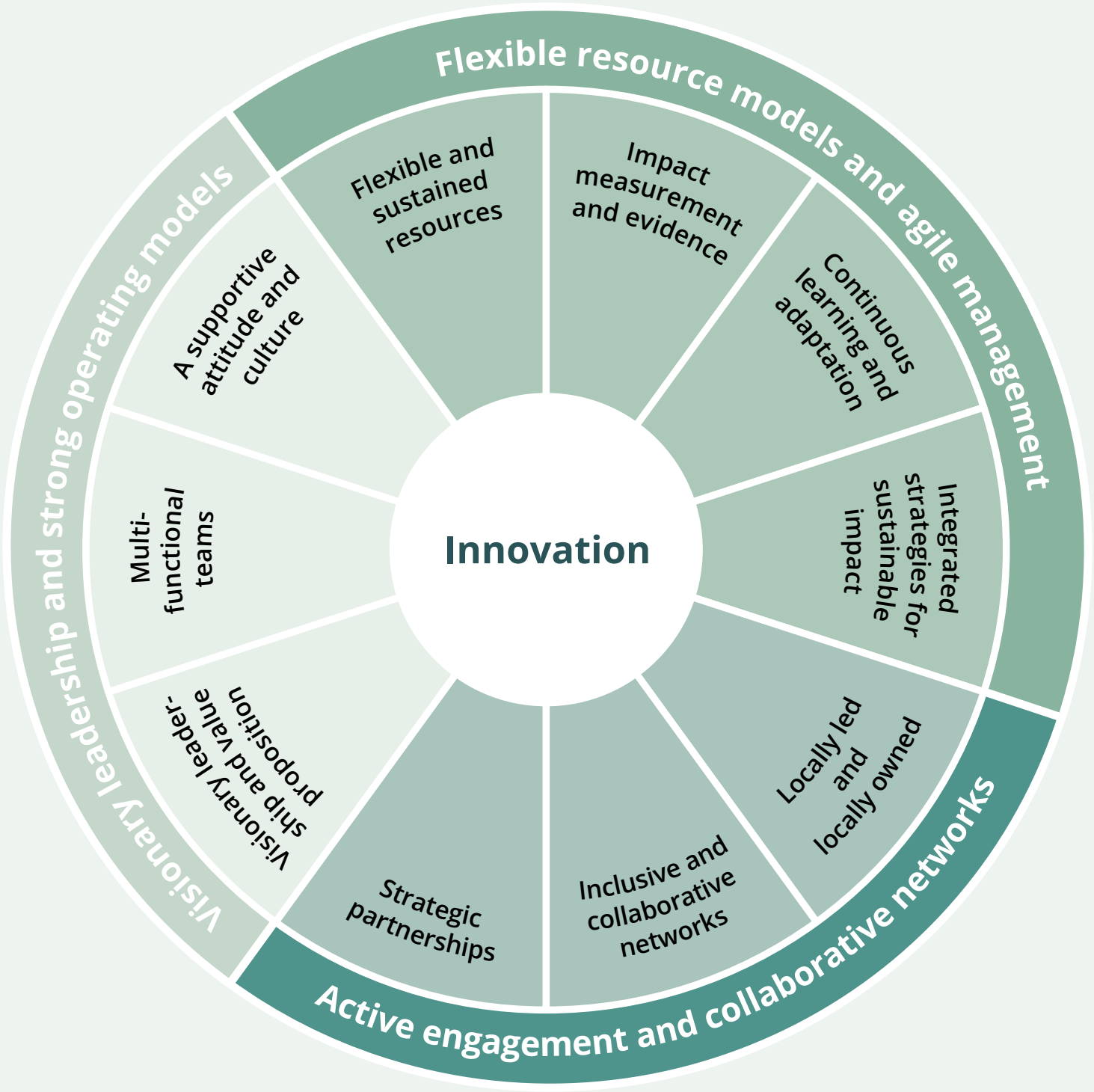

Figure 2: Overview of success factors for innovation scaling in humanitarian action

3. The complexity of scaling

Drawing on both AI and non-AI case studies, this section explores how innovations scale not simply by assembling the "right" elements, but by managing how these elements align or conflict in practice. We examine how reinforcing dynamics generate momentum, how key qualifiers influence outcomes, and how trade-offs surface in real-world scaling efforts. Together, these insights provide a more grounded and strategic understanding of what successful scaling entails, building and refining our earlier findings.

Reinforcements

Across the diverse use cases in our study – spanning AI and non-AI innovations – five key factors emerged as consistently influential to successful scaling. While each matters on its own, we found that it is the way they reinforce and support one another that drives real momentum.

Strong collaborative networks and strategic partnerships are most effective when grounded in local agency

One of the most prominent factors across all cases was the presence of **strong collaborative networks and strategic partnerships**. But they were most effective **when grounded in local agency**. The AI-cases of the AI Safety Label and Sentry Syria clearly showed how partnerships with technical actors, humanitarian organisations, local communities, and authorities enabled not just access to expertise and infrastructure, but also co-development of context-sensitive risk mitigation standards and tools. This collaborative approach was equally essential in non-AI innovations. Commit Global and WeRobotics both use decentralised, networked models that intentionally positioned grassroots actors as co-creators rather than mere implementers. In doing so, partnerships became vehicles for empowerment rather than control, anchoring innovation in local knowledge, boosting adoption, and helping sustain long-term relevance.

All use cases effectively connected (local) users with (global) key stakeholders, enabling a two-way flow of knowledge, resources, and influence. This "glocal" approach not only enhanced legitimacy and credibility at both levels but also reinforced the contextual fit of the innovation. The partnerships extended beyond formal agreements to include open, trust-based relationships, which helped facilitate adaptation, foster ongoing innovation, stay current, overcome barriers, and sustain momentum over time.

This also included an emphasis on building and strengthening existing resources, systems, and capacities. Rather than creating entirely new structures, each initiative leveraged existing assets – be it community knowledge, digital platforms, or collaborative networks. This approach ensured more efficient use of time and funding and promoted local ownership and long-term sustainability.

Local co-leadership both enables and benefits from continuous learning and adaptation

Local co-leadership, in turn, both enabled and benefited from **continuous learning and adaptation**. Because humanitarian innovation takes place in volatile and often unpredictable settings, successful scaling requires flexibility and responsiveness – qualities supported by feedback loops and trust-based relationships. AI cases such as Sentry Syria continuously refined their systems in real-time based on evolving threats and community insights, while CVA and Commit Global used piloting and peer exchange to refine their approaches iteratively. These practices were not merely operational. They were strategic mechanisms for staying responsive, keeping the innovation aligned with changing needs and maintaining legitimacy throughout its scaling journey.

Crucially, these learning processes were sustained by a **supportive organisational culture** – one that valued autonomy, embraced feedback, and created space for open communication and experimentation. In WeRobotics, for instance, a culture of distributed decision-making helped partners engage in iterative design and rapid adaptation. Missing Maps fostered open, bottom-up engagement similarly, while AI Safety Label and Sentry Syria demonstrated that even technical tools could benefit from responsive team dynamics and shared accountability. Visionary leadership across all cases helped maintain this balance, offering clarity of purpose while allowing for flexibility in execution.

Never treating users as passive recipients is key

All these interrelated factors culminated in a shared **emphasis on user-centred design**, which ran as a thread through every successful innovation we studied. Whether it was WeRobotics co-creating drone solutions with local technicians, CVA centring dignity and access in digital transfer design, or the Child Growth Monitor app integrating feedback from frontline health workers, users were never treated as passive recipients. Instead, they were embedded throughout the innovation cycle as testers, informants, co-designers, and validators. This user engagement didn't just increase relevance – it strengthened legitimacy, deepened trust, and supported the long-term sustainability of scaling processes.

Taken together, these factors formed an interdependent web of support. Strategic partnerships enabled local ownership and leveraged pre-existing capacities and capabilities; this was enhanced by adaptability, which in turn thrived in supportive cultures. All of these elements were anchored in a strong commitment to user-centred innovation.

Critical qualifiers

The use cases also revealed important nuances – additional factors that are critical for scaling innovation. These qualifiers apply across the AI and non-AI dichotomy.

Government and regulatory support, for instance, emerged as a crucial dimension within the success factor of strategic partnerships. It became evident that partnerships with local and national authorities are not only beneficial but often essential for gaining legitimacy and acceptance. Government endorsement can enable access, foster community adoption, and may be a prerequisite for funding or operational approval. In this way, partnerships are closely tied to navigating appropriate governmental and regulatory frameworks, embedding innovations within existing political and institutional structures.

Government endorsement can enable access, foster community adoption, and may be a prerequisite for funding or operational approval

The AI Safety Label, for example, relies on collaboration with regulators and humanitarian bodies to set recognised standards, but differing frameworks and bureaucracy can slow down implementation. WeRobotics' Flying Labs frequently faces delays due to drone regulations and government concerns over security and privacy, requiring ongoing advocacy to build trust. OpenStreetMaps has encountered resistance from governments wary of data sharing and open mapping, which limits collaboration due to concerns over sovereignty and security.

Similarly, **patience and cultural sensitivity** are vital qualifiers within the success factors of local leadership, inclusivity and supportive culture. Effective local ownership requires more than simply engaging local actors. It demands an understanding and respect for diverse cultural norms, communication styles, and working rhythms, and it also requires allowing sufficient time and space to provide inputs and feedback without pressure and fear.

AI Safety Label

Innovation owner: Coordinated initiative by Nesta, Sphere, Data Friendly Space, and CDAC Network with support from the UK Foreign Commonwealth and Development Office (FCDO), and UK Humanitarian Innovation Hub (UKHIH)
Founded: 2023
Members: Humanitarian AI community, academic and policy institutions

Overview:
The AI Safety Label promotes voluntary, context-sensitive standards for the ethical and safe deployment of AI in humanitarian contexts. Its goal is to prevent harm and build trust in AI systems deployed in fragile settings. To that end, the label assesses systems across three dimensions: technical performance, the implementing organisation's capacity, and contextual risk and social acceptability. This ensures AI systems are not only technically sound but also appropriate for their deployment environments.

Building blocks of success:
- Strategic partnerships across diverse sectors and stakeholders;
- Multi-dimensional evaluation approach;
- Inclusion of frontline staff and affected communities in risk assessments.

Principle-based ethics: Prioritises end-user safety and community acceptability; applies a contextual sensitivity and precautionary logic.

Effectiveness-based ethics: Focuses on risk mitigation and technical robustness of AI systems.

Tensions: Balancing the precautionary principle and community trust with the push for technical robustness and measurable performance requires ongoing negotiation between ethical integrity and operational accountability.

Sentry Syria presents a good AI-based example: Balancing the urgency of delivering timely conflict alerts with the security and privacy concerns of informants sometimes slows output generation. Commit Global, a non-AI innovation, must balance donor timelines and expectations with community rhythms. Navigating diverse communication styles and internal power dynamics within partner groups demands continuous cultural humility and flexibility, as missteps can erode trust and further delay progress.

The role of **qualitative data, particularly storytelling**, emerged as an essential complement to continuous learning and impact measurement. While quantitative metrics are important, personal narratives and impact stories provide rich, nuanced insights into how innovations affect communities and practitioners on the ground. These stories inspire and motivate innovators, capturing dimensions of success that numbers alone cannot convey. This highlights the need for learning and evaluation frameworks to incorporate both qualitative and quantitative evidence to fully appreciate and communicate an innovation's impact.

Personal narratives and impact stories provide rich, nuanced insights into how innovations affect communities and practitioners on the ground

For AI tools like the AI Safety Label, practitioner feedback provides vital contextual insights that go beyond metrics, helping refine standards and build user trust. In non-AI cases, personal stories are especially valuable where data is limited, offering emotional resonance and compelling evidence of impact. As WeRobotics notes, "Numbers don't change mindsets, stories do." When paired with strategic communication and strong networks, storytelling significantly boosts visibility, credibility, and support.

Finally, the use cases highlighted **diversification of funding** as a key qualification in terms of flexible and sustained resources. A diversified funding portfolio provides greater sustainability, autonomy, and flexibility. It enables innovations to better align with local needs and strategic goals, reducing dependency on specific donors and mitigating risks associated with shifts in funding priorities. This qualification emphasises that successful funding strategies should go beyond securing resources to thoughtfully balancing multiple streams that support long-term scaling.

A diversified funding portfolio provides greater sustainability, autonomy, and flexibility

In AI cases, Sentry Syria, for example, combines grants from international donors with partnerships involving local actors and private sector technology firms, allowing it to adapt rapidly and sustain operations despite the volatile contexts in which it works. Among non-AI cases, CVA relies on a broad mix of donors, including governments, multilateral organisations, and private sector partners.

In sum, these further qualifications enrich our understanding of what drives successful innovation scaling. They underscore the complexity of these factors and the importance of addressing their multiple dimensions in practice. Recognising these subtleties enables more nuanced strategies and better equips innovation practitioners to navigate the challenges of humanitarian contexts.

Cash and Voucher Assistance (CVA)

Founded: Gained momentum post-2004 Indian Ocean tsunami; institutionalised after 2015
Members: CALP Network (including 90+ members), UN agencies, NGOs, donors, financial service providers, technology providers, academia

Overview:
Cash assistance provides people affected by crisis or conflict with cash or vouchers to meet their needs. It is an unrestricted form of aid that allows people to purchase goods and services based on their needs and preferences. The CALP Network employs an ecosystem approach rooted in collective governance and learning, prioritising coordination and standards, user-centred design, diverse funding models, digital and financial inclusion and evidence-driven advocacy.

Building blocks of success: Strong collaborative networks of cross-sector partnerships; user-centred design; strong evidence base; flexible institutional investment and diverse funding.

Principle-based ethics: Deep commitment to the dignity, agency and self-determination of crisis-affected people, as well as supporting local markets.

Effectiveness-based ethics: Anchored in evidence-based advocacy, cost-efficiency, scalability, and alignment with donor accountability frameworks, among others. Increasing use of data and digital tools for tracking purposes while using performance metrics.

Tensions: The emphasis on dignity and agency can sometimes clash with donor-driven imperatives for standardisation, cost-efficiency, and data-centric monitoring.

Trade-offs

Beyond reinforcing success factors and introducing critical qualifiers, the analysis of the different use cases also found that effective scaling often involves navigating trade-offs and tensions between success factors that can, at times, demand contradictory actions.

For instance, as noted above, diverse **strategic partnerships** are critical for mobilising resources and building legitimacy. Yet forming the "right" partnership is not always straightforward. **Misalignment in goals, values, or operational styles** can delay progress or disrupt scaling entirely.

Diverse strategic partnerships are critical for mobilising resources and building legitimacy, but differing expectations and cultures can complicate efforts to align standards across contexts

The experience of Flying Labs in Namibia illustrates these challenges clearly. While partnerships were essential for gaining local access and institutional buy-in, a lack of coordination among the multiple stakeholders resulted in repeated data collection efforts for different partners. These duplications not only consumed time and resources but also diluted the impact of the innovation, as data was not consistently translated into action. Moreover, a strong commitment to a specific partnership can unintentionally limit opportunities to collaborate more broadly, narrowing the innovation's reach and adaptability.

Adaptability and openness to change are essential, but they can sometimes conflict with the need for strategic clarity and consistency

Similar tensions arise in AI-based innovations. The AI Safety Label initiative, for example, has encountered difficulties when diverse partners lack a shared understanding of what "AI safety" entails. Differing expectations and regulatory cultures can further complicate efforts to align standards across contexts, particularly when scaling into regions with limited AI capabilities and governance frameworks.

Flexibility is another cornerstone of successful innovation scaling, especially in fast-changing humanitarian settings. However, while adaptability and openness to change are essential, they can sometimes conflict with the need for **strategic clarity and consistency**. MapSwipe, part of the Missing Maps initiative, emerged through creative experimentation and crowdsourced mapping. Its openness to user-driven innovation has fuelled its growth, but the absence of a clear framework for long-term development and governance can stall sustainable scaling.

Furthermore, **engaging directly with local communities** is widely recognised as best practice, fostering relevance, trust, and ownership. Yet across both AI and non-AI innovations, such engagement can introduce tensions when **expectations outpace the innovation's scope or capacity**. For example, the Child Growth Monitor, an AI-powered app for detecting malnutrition, generated high hopes among local health workers and communities. However, limited access to infrastructure, such as smartphones or stable internet connections, sometimes prevented the tool from being deployed at the scale or speed anticipated. This mismatch created frustration and risked undermining trust in both the innovation and its promoters.

Limited access to infrastructure can prevent a tool from being deployed at the scale or speed anticipated

A similar challenge emerged in WeRobotics, a non-AI initiative that champions locally led drone and data solutions. While its commitment to supporting local Flying Labs is central to its model, there have been instances where its strong backing risked unintentionally fostering dependence. Consistent presence and hands-on support created expectations that WeRobotics would resolve implementation challenges or provide support indefinitely, sometimes slowing the transition toward independent local adaptation and ownership.

Tensions around openness and data sharing have also emerged across both AI and non-AI innovations, particularly where the **drive for accessibility and participation intersects with concerns over security, protection, and privacy**. In non-AI cases such as Missing Maps and OpenStreetMap, the ethos of open data promotes broad participation, transparency, and local empowerment. However, in crisis and conflict settings, this openness can pose serious risks. For example, the real-time mapping of vulnerable communities or critical infrastructure can inadvertently aid hostile actors. As a result, some national societies have opted to restrict data access or delay publication, creating a necessary but uneasy trade-off between transparency and protection.

Similarly, digital cash systems – while not necessarily AI-based – also highlight how tech-enabled solutions introduce risks alongside benefits. Mobile money, blockchain-based transfers, and biometric verification can increase efficiency and traceability, but they also raise concerns about data protection, privacy, data rights, and the exclusion of individuals without mobile phones or with limited digital literacy or capacity. The push to scale these innovations can inadvertently marginalise already vulnerable people, conflicting with humanitarian principles of equity and the imperative of "doing no digital harm".

Child Monitor Growth

Innovation owner: Welthungerhilfe
Founded: 2018
Members: Microsoft Azure, local health workers, nutritionists

Overview:
The Child Growth Monitor is a smartphone application that leverages artificial intelligence to detect different forms of undernutrition in children. The app uses infrared sensors to capture 3D scans of a child's body to predict height. For training purposes the algorithm height, weight, and mid-upper arm circumference (MUAC) are manually entered by health workers. The collected data is uploaded to Microsoft Azure, where machine learning models trained on datasets from Asia and East and Southern Africa analyse the inputs to assess a child's nutritional status. In line with its product strategy, CGM combines the predicted height with manually entered weight to help identify stunting, wasting, and underweight conditions early, enabling timely interventions and improved child health outcomes.

Building blocks of success: High-impact, low-tech solution; user-centred design; local community engagement; and strong collaborative networks of cross-sector partnerships.

Principle-based ethics: Includes local users in design and testing.

Effectiveness-based ethics: Prioritises efficiency, algorithmic accuracy, donor accountability, and operational performance.

Tensions: Inclusivity vs. algorithmic accuracy and rapid deployment vs. principled action. While community inclusion is valued, it risks being sidelined to strengthen algorithmic performance and operational efficiency. This requires responsible scaling that balances technological efficiency with humanitarian principles.

Internal team dynamics highlight the **tensions between inclusivity and efficiency**. Multifunctional teams, such as those at WeRobotics, combine a wide range of expertise, from drone operators to community organisers, contributing essential perspectives for locally led innovation and long-term impact. However, with more voices and experiences involved, decision-making can become more complex. Conflicting inputs may slow progress, cause confusion, or blur lines of accountability. This makes strong leadership and facilitation critical to ensure that diversity enhances, rather than hinders, effective scaling.

This challenge is also evident in AI-driven innovations. The Child Growth Monitor, for instance, relies on collaboration among software developers, data scientists, nutritionists, and field staff working across diverse cultural and organisational contexts. While this interdisciplinary setup is key to refining the algorithm and ensuring field-level usability, it also introduces friction. Conflicting priorities, such as tech teams emphasising model accuracy while field staff focus on usability and cultural sensitivity, can lead to delays or misalignments if not carefully managed. As with WeRobotics, inclusive team structures enrich innovation but require clear roles, strong communication, and effective leadership to maintain momentum and coherence.

Meanwhile, the **rapid evolution of digital technologies** adds another layer of complexity. Tools like AI, drones, and machine learning develop quickly, but adoption on the ground – particularly by those directly affected – often lags behind. Barriers such as **low digital literacy, inadequate infrastructure, and insufficient contextualisation** of technologies can limit impact. Both WeRobotics and the Child Growth Monitor highlight this common challenge.

Bringing these insights together, it becomes clear that successfully scaling humanitarian innovation demands a nuanced understanding of how different factors interact, at times reinforcing each other, but at other times creating constraints. Trade-offs are not signs of failure, but reflections of the inherent complexity of scaling. Notably, we found no fundamental difference between AI- and non-AI-based cases in this respect. Both faced similar patterns of interplay between enablers and constraints, as well as comparable ethical and strategic tensions.

4. Principled effectiveness? Smart ethical positioning for scale

Smart ethical positioning enables innovation owners to navigate tensions and leverage reinforcements among factors relevant to their specific context

As the previous chapter demonstrated, scaling success does not differ substantially between AI and non-AI innovations. Instead, it depends on how well innovation owners navigate tensions and leverage reinforcements among factors relevant to their specific context, regardless of the technology involved. This chapter explores how **smart ethical positioning** enables innovation owners to manage these tensions by building and sustaining an ecosystem that aligns the goals, interests, and expectations of diverse key stakeholders, including donors, implementing partners, and affected communities, under a shared ethical orientation.

As highlighted in chapter 3, strong collaborative networks and strategic partnerships that connect (local) end users with other relevant (global) stakeholders were central to all the use cases studied. However, these relationships also bring to light deeper tensions around the normative assumptions underlying innovation, scaling, and success – tensions first introduced in chapter 2. These primarily revolve around a divide between an instrumentalist, effectiveness-oriented understanding and a people-centred, principled one. To scale successfully, innovation owners must position their work in "smart" ways that mediate between these ethical logics – building trust, legitimacy, and the capacity to adapt through a dynamic "glocal" exchange of knowledge, resources, and influence.

To better understand how innovation owners in our use cases navigate these dynamics, we developed an **ethical grid** that positions each innovation along two orientations, as depicted in figure 3: instrumentalist effectiveness-oriented ethics and people-centred principled ethics. In this context, "ethical orientations" refer to the underlying sets of values that guide decisions around the design, implementation, and scaling of humanitarian innovations. These orientations influence what is seen as a legitimate goal, who is recognised as a relevant stakeholder, and how trade-offs are managed.

- **An effectiveness orientation (instrumentalist ethics)** views innovation as a tool to improve the efficiency, timeliness, and effectiveness of humanitarian action (Obrecht and Warner 2016; Taylor and Salmon 2022; Cheves 2023). Rooted mainly in donor accountability, it prioritises measurable outputs and outcomes such as cost-effectiveness, speed of delivery, or technological advancement. Its ethical justification is typically grounded in an instrumentalist logic, seeking the greatest value for money, often through technical fixes and rapid scaling. While this approach is primarily driven by the need to demonstrate accountability and impact, it is also viewed as a way to deliver greater value to crisis-affected populations – for instance, by enabling more people to be reached with the same amount of resources. However, this strong focus on efficiency can sometimes overshadow the importance of contextual appropriateness, equity, and the specific needs and voices of affected communities.

- **A principled orientation (relational ethics)** grounds innovation in the rights, agency, and lived experiences of affected people. Rooted in humanitarian principles and values – particularly humanity, dignity, and accountability to affected people – it emphasises the legitimacy of local knowledge, the need for contextual adaptation, and the importance of participatory decision-making (Krishnaraj et al. 2021; Hunt et al. 2019; Bruder and Baar 2024). Scaling, from this perspective, must reflect local priorities, reduce harm, and support self-determination both in how innovation is implemented and in what is being scaled.

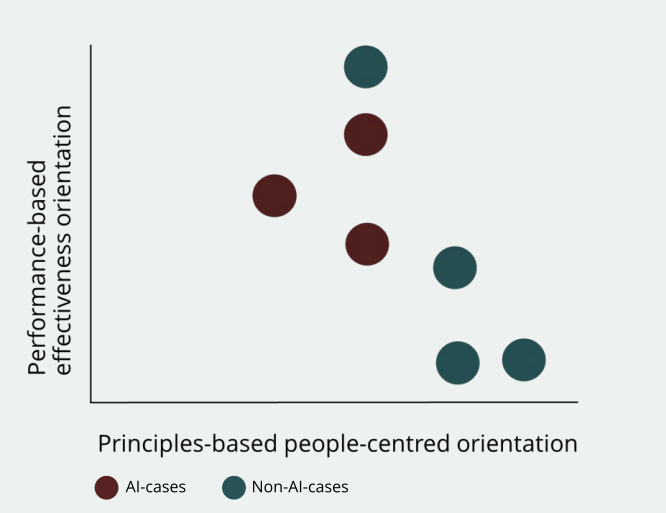

Figure 3: Ethical Grid

As the grid illustrates, these orientations should not be understood as mutually exclusive categories. In practice, they are often blended. This enables innovation

owners to accommodate a range of actors – donors, implementing partners, and communities – while maintaining clarity on who the innovation is for, what it should achieve, and how it should evolve over time.

However, an innovation's positioning within the grid is not defined solely by its owners. It is also shaped by the accountability frameworks – the enforceable norms, expectations, and governance structures – within which innovators and their key stakeholders operate. These frameworks determine how responsibilities are distributed, what forms of ethical scrutiny are applied, and how decisions gain legitimacy. Ethical innovation, then, is not only a matter of internal values and commitment, but also about external pressure from key stakeholders.

As our discussion of case studies below will demonstrate, recognising this interplay between internal commitments and external constraints is essential to understanding how ethical tensions emerge – and how innovation owners navigate them through smart positioning within the ethical grid.

Insights from the case studies

The ethical positioning of the innovation cases examined in this study does not fall neatly along AI versus non-AI lines. Instead, each innovation's location on the grid reflects how it strategically engages with the unique ecosystem of actors, expectations, constraints, and opportunities that shape its operating context.

AI-driven humanitarian innovations tend to occupy a middle ground on the ethical grid

AI-driven humanitarian innovations, however, tend to occupy a middle ground on the ethical grid. This positioning likely reflects certain **AI-specific characteristics** common across the AI-based case studies. On the one hand, AI technologies are often deployed to optimise humanitarian processes towards high scalability, speed, and efficiency – priorities that resonate strongly with donors, technology partners, and implementing organisations focused on measurable impact. On the other hand, these same stakeholders are also mindful of risks such as privacy and protection breaches and potential violations against people's rights and dignity. Consequently, innovation owners in these cases navigate a middle ground, balancing organisational optimisation and donor expectations with their commitment to people's rights and the imperative of doing no digital harm. For example, they may incorporate human oversight mechanisms to build legitimacy and trust, while simultaneously emphasising data-driven results to demonstrate effectiveness.

Many AI innovations are still in the process of developing their ethical parameters

Secondly, many AI innovations are still in the process of developing their ethical parameters. Key stakeholders, including regulators, are still defining their positions on the use of AI in humanitarian action, continuously introducing new needs and requirements. As a result, AI innovation owners often face challenges in finding their footing, experimenting with and adjusting various tools and approaches. It remains a dynamic and evolving landscape. In this context, occupying a middle ground seems to be the most strategic position to accommodate the diverse interests at play.

Regardless of whether an innovation is AI-based or not, the decision to lean more toward a performance-oriented or a people-centred ethical framework involves distinct trade-offs. These trade-offs are shaped more by the priorities and realities of the operating environment, rather than by the innovation/technology itself.

Successful innovations rarely adopt a strongly performance-driven position without incorporating a people-centred approach

Choosing a more **performance-oriented path** means prioritising measurable efficiency, technical robustness, and rapid scale-up. Innovations positioned in this space emphasise outputs like cost-effectiveness, speed, and reach. **All of the use cases we studied respond to this performance imperative**, though to varying degrees. However, the cases also clearly demonstrate that successful innovations rarely adopt a strongly performance-driven position without incorporating a people-centred approach (i.e., the upper left corner of the grid). As the example of CVA highlights, combining strong efficiency values with at least a moderate level of engagement with affected communities is key to building legitimacy on the ground and securing the trust and engagement of end users. Other cases confirm this as well. Whether it's Missing Maps emphasising community empowerment and participatory mapping, Flying Labs prioritising local expertise and contextual adaptation, or Sentry Syria working to put life-saving intelligence "in the hands of the people", all of the initiatives in this study devote at least moderate attention to a principled orientation.

On the other hand, leaning toward moderate to strong **people-centeredness** tends to work well with both high and low efficiency orientation. The trade-off here is that people-centred approaches often struggle to demonstrate rapid, measurable performance gains. They may scale more slowly and require longer timeframes to

People-centred approaches often may scale more slowly and require longer timeframes to build legitimacy and trust

build legitimacy and trust. Key stakeholders seeking quick, quantifiable impact may find it harder to justify investments that emphasise process, empowerment, or equity. Additionally, people-centred innovations can face difficulties in standardising models or replicating solutions across contexts, since local adaptations require flexibility and nuance. Commit Global, positioned high on the people-centred axis and low on performance, is a perfect example of this. However, as the other cases show, it is possible to address these needs too, just gradually over time.

What the grid clearly shows is that, in practice, **successful humanitarian innovations do not fully commit to one orientation at the expense of the other**. Instead, they strategically navigate the tension by acknowledging trade-offs and building bridges between them. They cultivate ecosystems where efficiency demands can coexist with communities' needs, agency and inclusion. This **smart ethical positioning** means innovation owners develop **hybrid models tailored to their specific ecosystems** – a tailored blend of performance and people-centred ethics that helps align with key stakeholders while remaining relevant and legitimate locally.

Rather than eliminating one ethical orientation in favour of another, **scaling emerges as a relational, situated process**. This functions as connective tissue, enabling innovators to clearly articulate their mission, navigate tensions, and determine which collaborations are acceptable. It also allows for selective engagement with dominant logics – embracing them when they enhance legitimacy or impact, and resisting them when they threaten inclusion or ethical commitments. This dynamic ethical positioning allows innovations not just to survive, but to flourish.

Commit Global

Innovation name: Humanitarian infrastructure for good (sector: tech for social good)
Innovation owner: Commit Global – Olivia Vereha (Co-Founder & Director of Product)
Founded: 2015
Members (as of 01/2024): Hala Systems; Syrian Civil Defence (SCD); Syrian American Medical Society (SAMS); Hand in Hand for Aid and Development (HiHFAD); civic tech actors

Overview:
Founded in Romania, Commit Global scaled globally, starting in 2023 with an office in The Hague. The NGO builds and maintains open-source digital tools to support a global response to diverse social challenges. Operating across five regions – Africa, Americas, Europe, Asia, and the Middle East and North Africa – the initiative works directly with local communities and civil society organisations to evaluate needs, assess existing tools and provide tailored support.

Building blocks of success: Decentralised network model; strong collaborative network of strategic partnerships; local leadership and ownership; continuous learning and adaptation; patience; cultural sensitivity.

Principle-based ethics: Rooted in relational trust, legitimacy, and community ownership – deeply dignity- and context-driven.

Effectiveness-based ethics: Intentionally deprioritised; avoids rapid scaling, instrumentalism and donor KPI logic.

Tensions: The deliberate resistance to instrumental metrics and donor KPIs challenges dominant paradigms of success, exposing friction between relational ethics and mainstream impact models.

5. From findings to debate: Handling the promise of AI innovations

AI innovations highlight and amplify the dilemma of effectiveness-driven performance optimisation versus principled, people-centred action

Building on our analysis of the dynamics of scaling (chapter 3) and the resulting ethical trade-offs (chapter 4), this chapter further explores the distinctive challenges and opportunities presented by AI in humanitarian action, linking our earlier findings to the broader debate. We show that AI innovations, especially Generative AI (GenAI), highlight and amplify the very dilemmas outlined in our ethical grid: effectiveness-driven performance optimisation versus principled, people-centred action. In this sense, **AI functions as a stress test** for the ethical and strategic tensions discussed in the previous chapters.

The successfully scaled AI cases analysed in this study – Sentry Syria, Child Growth Monitor, and the AI Safety Label – do not differ categorically from non-AI innovations regarding the success factors needed for scaling. However, they consolidate many of the identified ethical dilemmas. Their positioning near the centre of our ethical grid reflects an effort to balance effectiveness-oriented goals with emerging people-centred commitments. As we have discussed, this balancing act could be seen less as conceptual ambiguity and more as a strategic response to rapidly evolving technology, expectations, accountability frameworks, and regulatory pressures.

AI innovations are often perceived as riskier and qualitatively different from more traditional forms of innovation

To better understand the specificity of AI-based systems, this chapter aims to deepen the analysis by reflecting on the ongoing debate about the responsible use of AI in humanitarian action, its benefits, potential pitfalls, and the strong sentiments it evokes amongst humanitarian practitioners. While the development of AI – especially GenAI – is highly dynamic and fast-moving, practical experience with its use, let alone its scaling, across the humanitarian system remains limited and isolated. Although the success factors for scaling innovations are generally well understood and documented, their applicability in the context of GenAI still requires further testing and contextual validation. Given the relative novelty of these technologies, AI innovations are often perceived as riskier and qualitatively different from more traditional forms of innovation. In this chapter, we therefore situate our findings within the broader trajectory of AI's emergence in humanitarian action. In doing so, we build specifically on insights from literature, articles, and the results of our workshop and survey.

AI dilemmas and risks

AI innovations, and GenAI in particular, remain a **highly contested technology**. On the one hand, AI is hailed for its potential to streamline heavy processes, accelerate speed and accuracy, reduce costs, optimise decision-making and support cost efficiency. On the other hand, it is critiqued for the risks it poses when applied in fragile settings and among people affected by crises.

81 % of the survey respondents expressed ethical concerns about the use of AI in humanitarian action

Yet, its users generally express a positive attitude towards the introduction of AI – an observation supported by our survey, in which 63 % of respondents reported optimism about the use of AI in humanitarian action. Still, this optimism is accompanied by significant concern: 81 % of the same respondents highlighted ethical risks, data protection and privacy, automation and various forms of bias as major areas of concern.

While the AI cases analysed in this study demonstrate how such concerns can be constructively addressed, particularly through strong end-user involvement and a rights-based approach, the widespread expression of ethical reservations across the sector cannot be overlooked. The summary below reflects the **range of risks and challenges** associated with AI in humanitarian contexts that emerged in our interviews, workshops and literature review. It also reaffirms the central tension that runs throughout this paper: the clash between effectiveness-driven performance objectives and principled, people-centred concerns.

- One of the most prominent risks associated with GenAI is **bias and algorithmic discrimination**

arising from automated decision-making. Biases can reinforce inequality and exclusion, leading to harmful consequences such as misidentifying aid recipients as fraudsters or wrongly allocating assistance. These issues often originate from predetermined or incomplete training datasets, compounded by design decisions made during coding – especially when using ready-made models not tailored to humanitarian settings (Scurrell & Mirković, 2025). As a result, misclassifications can have serious implications in humanitarian settings and fragile contexts where people's lives and rights are at stake.

- The rise of **misinformation, disinformation and AI "hallucinations"**, outputs not grounded in factual data, is especially problematic in humanitarian crises. Many AI models are trained on datasets with little or no representation of crisis-affected people. Humanitarian datasets themselves are often outdated or incomplete, and failures in information integrity are currently among the top global AI-related concerns, particularly in fragile contexts where contested narratives can influence personal opinions and decision-making (UNDP 2025; World Economic Forum 2025).

- The processing of sensitive data in humanitarian contexts raises unresolved legal and ethical questions around **personal data protection and privacy**, not to mention power imbalances and "technocolonialism" (Madianou 2025). Digital accountability, inclusion and data rights are not merely technical matters. They reflect broader issues around political willingness, local agency, meaningful participation, and engagement (Düchting 2023). For example, weak or absent consent mechanisms can exacerbate accountability gaps alongside existing power asymmetries. As Sandvik (2024) argues, humanitarian actors often rely on vague references to ethics without implementing legal safeguards or contesting problematic uses of digital tools. The discussion about GenAI offers a critical momentum to revisit and potentially rectify the sector's historic reluctance to implement or challenge existing regulatory frameworks legally.

- A major deficit in **AI literacy** amongst humanitarian staff is frequently mentioned, which limits organisational readiness to adjust and adopt AI responsibly. Building internal capacity, both technical and ethical, is critical. Without this, staff are ill-equipped to identify potential harm, mitigate risks or apply relevant standards. As noted by Pizzi, Romanoff, and Engelhardt (2020), "last-mile" implementation of AI ethics depends on training and cross-functional collaboration.

- The opacity of many AI-supported systems – often called the "black box" problem, hampers effective monitoring and limits the ability of upstream and downstream accountability to strengthen **transpar-**

Missing Maps

Innovation owner: The Missing Maps Network
Founded: 2014
Members (as of 07/2025): American National Red Cross (American Red Cross), British Red Cross Society (British Red Cross), Humanitarian OpenStreetMap Team (HOT), Médecins Sans Frontières (Doctors Without Borders), CartONG (Cartographie ONG), Netherlands Red Cross (Nederlandse Rode Kruis), GIScience Research Group, Heidelberg University, Heidelberg Institute for Geoinformation Technology gGmbH (HeiGIT), Department of Geography, George Washington University (GWU), German Red Cross (Deutsches Rotes Kreuz), International Federation of Red Cross and Red Crescent Societies (IFRC), Canadian Red Cross – Croix-Rouge canadienne, Cadasta Foundation, YouthMappers, Healthsites.io, CROWD2MAP Tanzania, Spanish Red Cross (Cruz Roja Española), Map Kibera Trust, iMMAP (Information Management and Mine Action Programs), Association pour le Développement de Fond des Blancs (Haiti)

Overview:
Missing Maps is a collaborative humanitarian mapping initiative that aims to map areas at risk of disasters, conflict and disease to improve preparedness and response. Through the OpenStreetMap (OSM) platform, it provides accessible geospatial data to local and international actors for use in crisis management, anticipatory action and disaster risk reduction. Major initiatives include field mapping, volunteer training and digitising satellite imagery. The initiative has improved humanitarian response by enhancing data quality, supporting community preparedness, and enabling evidence-based programming.

Building blocks of success: Participatory, user-friendly low-tech methods, open-source ethos, local leadership, collaborative network, training and capacity readiness.

Principle-based ethics: Strong participatory ethics; "people over data" is its ethical compass. It is strongly community engagement-driven, employs people-based scaling, ensures access to free and open data, is highly user-driven, and seeks to empower people with data and digital inclusion.

Effectiveness-based ethics: Offers geospatial data to strengthen humanitarian decision-making.

Tensions: The strong participatory ethos may come under pressure from demands for rapid data delivery and quantifiable impact, highlighting trade-offs between empowerment and instrumental use of data.

ency and address the lack of **explainability**. It also complicates the requirement for greater responsibility and liability when harm occurs. These issues are further amplified by automation bias and mission creep, where AI tools are applied beyond their original scope without appropriate communication and oversight. Without traceability and transparency, it becomes nearly impossible to introduce feedback measures, let alone grievance or redress mechanisms for people affected by false automated decision-making.

- Survey respondents expressed concern about the lack of **operational frameworks and actionable internal policies**. Although international frameworks like the UNESCO AI Ethics Recommendation and OECD AI Principles exist, they remain either unfamiliar, too abstract or not operational for humanitarian practitioners. Few organisations have adapted or contextualised these global standards into concrete guidelines, much less integrated them into AI-based systems. This gap contributes to a wider climate of scepticism and inertia around AI adoption.

- The **global AI governance landscape** is becoming increasingly fragmented, with diverging regulatory approaches in the EU, US, China, and other regions (Kuner and Zanfir-Fortuna, n.d.). This fragmentation makes it harder for humanitarian organisations operating internationally and relying on commercial systems to implement unified safeguards.

- Most tools are frequently opaque and not designed with humanitarian needs or principles in mind. Many have **dual-use capabilities**: for instance, biometric tools may be used both for fraud prevention and surveillance, or Natural Language Processing (NLP) tools for disinformation as well as translation. Others, such as those used by the military, are reported not to comply with international humanitarian law. These dual standards raise massive ethical dilemmas about intended versus actual use (Coopi 2024; Human Rights Watch 2024; Whittaker 2023).

- Meanwhile, the **environmental cost** of AI is increasingly under scrutiny. Training large language models like GPT-4 consumes vast amounts of electricity, comparable to the annual usage of hundreds or even thousands of households (Guidi et al. 2024). Tools like the AI Carbon Calculator (Rovner et al. 2025) offer early-stage solutions, but the issue of sustainability remains underexplored in humanitarian AI discourse.

As Sandvik (2024) argues, many challenges in humanitarian AI arise not just from general societal concerns but from the complex intersection of policy, programming, protection, and digital transformation. This **"humanitarian AI dilemma" demands a contextual approach** that examines who benefits, who is at risk, and how decisions are made. Defining why AI is used, by whom, and for whom, is as important as assessing its technical performance. The discussion about responsible AI in humanitarian contexts, therefore, requires a nuanced understanding of how AI is used, how it can be used responsibly, and how the different factors that contribute to successfully introducing and scaling AI innovations function and interact. The following section illustrates what this means in practice.

Sentry Syria

Innovation owner: Hala System
Founded: 2016
Partners (as of 01/2024): Hurras, Syrian Civil Defence (SCD), Syrian American Medical Society (SAMS), Hand in Hand for Aid and Development (HiHFAD)

Overview:
Sentry Syria is an early warning system that uses multiple information sources to alert civilians and humanitarian actors to take action to protect themselves and others ahead of incoming airstrikes. It provides accurate, automated and timely warnings by using sensors, media monitoring and human observations to detect aircraft activity and generate accurate, automated, and timely warnings. By predicting strikes, the system helps reduce casualties and protect lives.

Building blocks of success: Easy to use low-tech solution; real-time responsiveness; building on existing and available resources; open communication and being flexible; strategic partnership and collaboration with diverse stakeholders.

Principle-based ethics: Builds on local knowledge, continuous learning and adaptation, emphasising trust with users and partners.

Effectiveness-based ethics: Operates as a for-profit actor; values technical performance and operational scale, with impact measured through reduced casualty figures.

Tensions: Trust-based local engagement coexists with a for-profit logic and technical performance focus, raising ethical questions about commodifying protection in life-and-death contexts.

The way forward: A nuanced AI approach

Humanitarians often speak about AI as if it were a single, uniform technology

Humanitarians often speak about AI as if it were a single, uniform technology, rarely distinguishing between narrow AI and GenAI – or between different use cases, intended purposes, capabilities, contexts, target audiences, or users. These distinctions **are largely absent from current discourse**. AI analytics tools used for weather forecasting, which support preparedness measures, early warning systems and early action, are often grouped with AI chatbots for information sharing, biometric verification systems for fraud detection, or generative tools used for proposal writing, monitoring, and evaluation purposes.

The recent surge in interest in GenAI has intensified calls to revisit humanitarian standards, strengthen accountability mechanisms, and integrate existing guidelines to better **regulate and guide the responsible use of AI** in humanitarian action. Translating these frameworks into practice – and adapting them to humanitarian contexts – is seen as essential to ensuring that AI-supported systems and AI-informed decision-making remain firmly grounded in ethical and human rights principles (Sandvik 2025; Raftree 2024; Pizzi et al. 2020).

Most humanitarian organisations are still in the process of developing internal policies

However, most humanitarian organisations are still in the process of developing internal policies while working to align with regulatory frameworks such as the EU AI Act, General Data Protection Regulations (GDPR) and others. To date, there are only a few organisational frameworks that exist across the humanitarian system and can serve as examples. The available ones follow a structured approach – covering prioritisation, analysis, risk assessments, and change management (WFP 2025) – and suggest assessing the type, purpose, scope, context, impact, and risk level of each AI tool, whether its a traditional or GenAI system, procured from a tech provider or developed in-house (ICRC 2025).

Despite this, the debate about the responsible use of humanitarian AI is **rarely informed by any specific use cases** or considerations of purpose, scope and context. Nor do they typically distinguish between different types of AI, their impacts, or associated risk levels. As our case studies illustrate, such differentiation is crucial: Innovations like the Child Growth Monitor, which supports health diagnostics in field settings, confront very different ethical challenges and operational trade-offs than the AI Safety Label, which seeks to guide responsible AI adoption across organisations. Sentry Syria, by contrast, highlights the dual imperative of life-saving speed and operational accountability, often under extreme conditions. As a necessary first step, several experts interviewed for this paper called for a **sector-wide landscape mapping** to identify the most common use cases. Only then can the sector systematically assess the benefits, risks, and ethical implications of AI and meaningfully advance discussions around its responsible use.

The AI Safety Label itself offers **a promising model for such a structured approach**. It tests specific AI use cases and tools by collecting community feedback and helping decision-makers identify appropriate safety measures based on the risks identified by the community. The model is built on three pillars: (1) tech benchmarks, (2) organisational capacity and capability assessment, and (3) risk assessment and social acceptability. During the testing period, the team concluded that potential trade-offs must be considered when defining safety measures.

Addressing these risks and challenges is increasingly urgent, especially as **many humanitarian professionals are already using AI tools** – ranging from narrow AI to GenAI – primarily to optimise humanitarian processes. Common applications include large-N data analysis, prediction analytics, automated decision-making, project management, information sharing, and knowledge management (see figure 4). Survey respondents from CHA and Sphere, for example, identified NLP for translation and other purposes, project management tasks such as proposal writing, as well as knowledge management and data analysis, as the most common AI use cases.

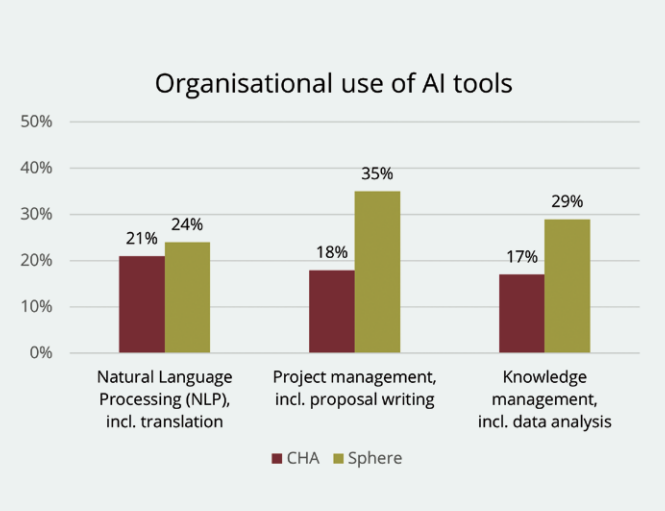

Figure 4: Comparison of survey results on AI used in humanitarian organisations

To do this, most rely on ready-made models and pre-built tools, with 56 % using commercial tools and 16 % turning to open-source alternatives. Both key informants and survey responses confirmed that most humanitarian organisations lack the capacity to design their own GenAI models and instead rely on off-the-shelf solutions. Respondents noted that the **primary motivations for using AI are to improve the efficiency, timeliness,**

and effectiveness of humanitarian processes, while also acknowledging that this may come at the expense of contextual appropriateness, equity, and the meaningful inclusion of affected people.

This leads us to the conclusion that the core dilemma explored throughout this paper applies as much to AI innovations as it does to any other form of humanitarian innovation: each must contend with the persistent tension between performance-driven optimisation and principled, people-centred action. What is often described as the "humanitarian AI problem" (Sandvik 2025) captures not only longstanding ethical challenges but also new risks introduced by rapid digital transformation and the increasingly complex humanitarian contexts.

Navigating the trade-offs and tensions of humanitarian AI requires more than abstract principles or technical safeguards. **It demands continuous reflection, cross-sector collaboration, and a readiness to allow strategic trade-offs**, even when these involve discomfort or seemingly contradictory actions. As this broader analysis shows, such trade-offs are not signs of failure, but rather reflections of the complexity inherent in scaling humanitarian innovation – AI-based or otherwise.

WeRobotics

Innovation name: Drones, data & AI for social good – the Flying Labs Network
Innovation owner: WeRobotics
Founded: 2015
Members: 40+ Flying Labs in different countries and contexts in Africa, Asia, Latin America, Central America, and the South Pacific

Overview:
WeRobotics supports Flying Labs in applying drones, data, and AI for social good in the Global South. The Flying Labs are autonomous, locally-owned and led knowledge hubs hosted by local institutions such as NGOs, universities, government bodies, etc. They connect local experts, civil society, and other stakeholders to responsibly use emerging technologies in sectors including humanitarian aid, agriculture, health, conservation, STEM education, and climate adaptation.

Building blocks of success: "Glocalisation" – linking international and local stakeholders; strong local ownership and community engagement; long-term approach; patience and cultural sensitivity; impact-driven storytelling, diversified funding.

Principle-based ethics: Strong commitment to decolonising technology, dignity and local agency in tech governance. Working in partnerships with autonomous partners only; community-driven engagement and decision making, strong emphasis on decentralised innovation, needs-based responses, tailored to the local context.

Effectiveness-based ethics: Measures outcomes through impact assessments and visibility to donors and partners.

Tensions: The dignity-driven, decentralised model must continually navigate international donor demands for scalability and data-driven metrics, which can put pressure on local ownership.

6. Conclusion

Today's humanitarian innovation landscape is marked by low- and high-tech-enabled solutions – from digital cash transfers and AI-driven crisis monitoring to low-cost renewable energy – and growing collaboration between different actors, sectors and systems. Innovations that tend to scale successfully are those that are adaptable across contexts, co-designed with local users, and backed by diverse funding and strong implementation partnerships. Key challenges remain in securing sustainable financing, navigating political and logistical constraints, ensuring equity in funding access and decision-making, and maintaining ethical safeguards around data and emerging technologies. Looking ahead, trends point toward greater local leadership of innovation, collaboration and matchmaking, climate-resilient design, and modular, interoperable solutions that can be rapidly deployed and scaled across humanitarian crises, stakeholders, sectors and systems.

This paper set out to explore how humanitarian innovations – AI-based and otherwise – successfully scale in ways that are both effective and principled. Through conceptual grounding, empirical case studies and comparative analysis, we have demonstrated that **success in scaling is not determined by the solution or technology alone**, but by how innovation owners collaborate with one another and partner with diverse stakeholders, how they build and integrate the innovation into existing structures and ecosystems, not to speak about how they **navigate reinforcing dynamics, critical qualifiers, and the inevitable trade-offs between key success factors**. Throughout this paper, we have illustrated how selected innovation cases embody these complexities in practice. While AI innovations share many of the same scaling challenges as their non-AI counterparts, they **heighten existing tensions** in specific and often more visible ways:

- **Opacity vs. accountability**: AI systems, especially those using pre-trained models or black-box algorithms, challenge traditional notions of transparency and traceability. This raises the stakes for feedback loops and human oversight, both of which are reinforcements critical to success.

- **Speed vs. rights**: The efficiency gains offered by AI often come at the cost of reduced time for meaningful participation, rights-based approaches, or ethical review. This dynamic deepens the trade-off between performance and principled action.

- **Scalability vs. adaptability**: While AI tools are attractive to donors because of their scalability, they often require heavy contextual adaptation, especially where digital literacy, infrastructure, or regulatory clarity is lacking. This creates tension between vertical scaling logics and local realities – a tension also evident in non-AI cases like CVA and WeRobotics.

These tensions are not new, but AI intensifies them, forcing actors to grapple with ethical trade-offs that many other innovations have previously allowed them to avoid. In doing so, **AI functions as an ethical stress test**, revealing weak spots in humanitarian governance and coordination.

Three key insights emerge from our overall analysis:

- **AI does not create new dilemmas but amplifies existing ones**. The ethical tensions we observe – between effectiveness and equity, speed and inclusion, scalability and local ownership – are not unique to AI but are intensified by its design and deployment.

- **Successful innovations – whether AI-based or non-AI-based – navigate, rather than eliminate, these tensions**. Our case studies show that strategic partnerships, network-type collaboration, local feedback loops, and adaptive leadership enable a form of hybrid ethics – one that is both pragmatic and principled.

- **AI requires nuanced governance and investment in digital literacy**. The pace and complexity of AI development demand not just more regulation, but knowledge-sharing and improved risk mitigation measures tailored to humanitarian contexts. Tools like the AI Safety Label offer early examples of how such frameworks might look in practice.

AI innovations confront the humanitarian sector with long-standing questions it can no longer afford to avoid: Who defines innovation? Who benefits from scale? How to integrate innovation in existing ecosystems? What constitutes acceptable risk, and how is trust built when decision-making is automated or invisible? **These questions are not merely technical or ethical – they are deeply political**. They demand nuanced and collective answers. If humanitarian innovation is to be truly anchored in the ethics of humanitarian frameworks, then AI must be approached not just as a tool, but as a stress test – both for principled humanitarian action in general and for humanitarian innovation scaling specifically. This stress test reflects the deeper dilemmas shaping the future of humanitarian innovation and humanitarian action overall.

Recommendations

While this paper can serve as a reference point for ethical and strategic innovation, turning these insights into operational practice will require further contextualisation and collaboration among research, policy, private sector, and field actors. The following recommendations offer initial entry points for policymakers, donors, and humanitarian practitioners.

1. Drive innovation with clear intent

All actors:
Ensure that innovations are guided by clearly defined objectives, prioritising humanitarian principles and people-centred outcomes rather than efficiency and optimisation alone.

Donors:

a) **Establish clear, contextualised guidance for responsible innovation grounded in ethical frameworks and based on partnerships and collaboration.**
Move beyond general principles to develop or adjust specific norms, policies and operational frameworks that are applied to specific settings and users. Develop standards to assess and policies to mitigate risks related to partnerships, biases, and data (mis)use, especially in high-risk humanitarian contexts.

b) **Promote safeguards and alignment between ethical and regulatory frameworks of AI and non-AI innovations.**
Encourage alignment between humanitarian princples, standards, and broader digital governance regimes such as the EU AI Act or GDPR.

2. Shape a nuanced approach to strategy and policy

All actors:
When scaling innovation, explicitly consider the trade-offs involved – balancing efficiency, ethics, inclusion, and context-appropriateness.

Policy makers and donors:

a) **Develop and communicate clear standards for funding and scaling innovation.**
To attract and guide innovation owners, funding strategies need to be clearly defined – based on standards, criteria, and thresholds. To gain trust and confidence, the strategic and political decision-making needs to be clearly communicated.

b) **Broaden success metrics beyond scalability and efficiency.**
Funders should reward not only reach and speed but also contextual relevance, user friendliness, ethical integrity, and long-term sustainability.

c) **Operationalise clear ethical guidelines.**
Establish best practices tailored to AI and non-AI-specific use cases, offer learning opportunities, and provide adequate financial support to enable the design and/or adaptation of principled AI-based systems.

Practitioners:

d) **Adopt a strategic ethical positioning approach.**
Clearly articulate how your innovation balances performance goals with principled humanitarian values, and use this framing to guide design, partnerships, and scaling strategies.

e) **Initiate human-in-the-loop-processes.**
To navigate humanitarian principles, ethical frameworks, and context specificities, incorporate fact-checkers to ensure the responsible use of AI-based systems.

3. Support locally led and owned innovations

All actors:
Provide funding and policy support for co-designed, locally relevant innovations that foster contextual appropriateness, long-term sustainability, impact, and trust.

Policy makers and donors:

a) **Fund the "unsexy" but essential phases of scaling: problem definition and adjustment, adaptation, and learning.**
Innovations often fail when these early or in-between phases are under-resourced. Explicitly prioritise these phases in funding calls.

b) **Simplify funding processes and, where possible, provide greater flexibility.**
Build networks and engage with other donors to mitigate and share risks but showcase best practices and alternative funding models such as matchmaking that support local leadership and ownership.

c) **Mandate participatory and inclusive design standards, embedding meaningful end-user engagement throughout the innovation cycle.**
Require all innovation proposals to demonstrate how affected communities will be actively involved throughout the scaling process.

d) **Build diversity into AI deployment processes.**
Enhance the relevance and ethical quality of AI-based systems by incorporating people's risk perceptions and lived experience, and by conducting real-world, people-centred testing with diverse stakeholder groups.

Practitioners:

e) **Engage communities in all phases – from problem framing to monitoring and evaluation.**
Involve affected communities not only in piloting but also in defining problems, setting priorities, monitoring and evaluating success to ensure contextual relevance, sustainability and legitimacy.

4. Foster collaboration over competition

All actors:
Encourage cross-functional and cross-organisational collaboration by partnering with "lighthouse" or flagship projects across and beyond the humanitarian system. Share learnings openly to build collective knowledge and consolidate best practices across the sector.

Policy makers and donors:

a) **Encourage network-like partnerships which aim at collaboration, knowledge sharing and learning.**
Foster coordination by linking likeminded stakeholders, funding networks, and requesting collaboration. Create an environment to allow practitioners to learn from failures.

b) **Prioritise innovations that benefit partnerships and serve as a public good across the humanitarian system.**
Support matchmaking between scalable innovations and interested humanitarian organisations to foster adaptation and the intergration into existing ecosystems.

Practitioners:

c) **Allow others to learn from your success and failures.**
Strengthen knowledge management by documenting best practices and lessons learnt and sharing success stories as well as failures.

d) **Strengthen collaborative networks and build strategic partnerships.**
Collaborate and coordinate with traditional and non-traditional partners working across the innovation landscape – from humanitarian organisations to private sector, academia, government, and many others.

5. Encourage creative and responsible adoption

All actors:
Funders and innovators should support not only the development of new innovations but also the responsible adaptation of existing solutions. Ensure accountability through impact monitoring, feedback measures, and user control and redress mechanisms.

Donors:

a) **Enable blended financing models to support diverse scaling paths.**
Encourage funding models that mix institutional, private, and community-based resources to reduce dependency and enhance autonomy.

Practitioners:

b) **Prioritise adaptive learning over rigid metrics.**
Build feedback loops that foster continuous reflection, contextual adjustment, and realignment with humanitarian principles as conditions evolve.

c) **Strengthen internal capacities for ethical and technical literacy.**
Train cross-functional teams on both the technical operation and ethical implications of digital tools, especially AI.

6. Promote multi-disciplinary and cross-functional teams

All actors:

a) **Build diverse teams and collaborate across functions.**
Strengthen capacities in technical, ethical, legal, and humanitarian domains to ensure holistic design, implementation, and oversight.

b) **Enhance AI literacy and AI readiness.**
Developing AI capabilities is both a strategic entry point for adopting AI tools and a legal requirement under frameworks like the EU AI Act. It is also essential to mitigate risks effectively.

7. Promote transparency and accountability

Explore certification mechanisms to validate AI readiness.

All actors:

a) **Apply explainability, opt-outs, audit trails, and redress systems.**
Require clear documentation of AI decision-making processes (e.g. audit trails, label AI-generated content), human-in-the-loop validation, and opt-out options to ensure AI systems are understandable and contestable.

b) **Invest in ethical infrastructure and AI readiness tools.**
Allocate resources to strengthen organisational infrastructure, enhance data security, improve explainability and traceability of AI systems, and develop technical and ethical capacities.

Policy makers and donors:

c) **Require ethical positioning statements in funding applications.**
Ask applicants to describe how their innovation navigates tensions between performance and principles, and how they plan to involve affected people.

d) **Support ethical oversight bodies or audit mechanisms.**
Facilitate the creation of independent bodies that can advise on or assess the ethical implications of humanitarian innovations, especially AI-based tools.

e) **Introduce new benchmarks for AI-based systems.**
Design and agree on accountability benchmarks and architecture beyond traditional performance measures and data protection standards.

Practitioners:

f) **Demand transparency and explainability from tech partners.**
Ensure that any adopted AI tool can be meaningfully explained to both users and affected people, and can be refused or adjusted if risks outweigh benefits.

g) **Introduce grievance and redress mechanisms.**
Ensure that affected people have access to mechanisms that allow them to challenge algorithmic outcomes, raise concerns about bias or harm, and seek redress.

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