

SPECIAL ISSUE ARTICLE

Sustainable humanitarian operations: An integrated perspective

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Abstract

The immediate response to disasters, while well intended, sometimes causes avoidable humanitarian challenges later on. Drinking water may be essential, but it is not necessary to provide it in small plastic bottles. Injections may save lives, but inappropriately discarded syringes are hazardous. Can humanitarian relief be made more sustainable? This paper summarizes a 1-day workshop on this topic, held at INSEAD in 2019 in connection with Luk Van Wassenhove's transition to emeritus professor. This workshop involved over 100 academics and practitioners. Five areas were discussed in detail: material convergence, coordination between humanitarian organizations (HOs), logistics, partnerships with industry, and health. The discussions demonstrate the possibility of better integrating sustainability with humanitarian operations despite the inherent tension between the immediate need to save lives and the longer term perspective associated with sustainability. This requires that various stakeholders, including HOs, donors, and watchdog organizations, think differently about the balance between short-term and long-term interventions, the metrics and incentives they apply, and the role of local versus global organizations. Leading practitioners and scholars in humanitarian operations are well aware of these challenges and opportunities in each domain separately; this paper aims to introduce these issues to a broader audience in a single more integrated overview, based on the themes that were discussed at the workshop.

KEYWORDS

coordination, disaster management, health, humanitarian operations, logistics, material convergence, partnerships, sustainable operations, workshop

1 | INTRODUCTION

A devastating earthquake struck Haiti in 2010. After the immediate disaster response, mountains of plastic water bottles were left in the stricken country.¹ In the short run, this humanitarian action provided relief from the drinking water shortage, but it also exacerbated the inadequacy of the country's deficient waste disposal infrastructure. Water was a necessity, but not in the form of half-liter bottles. In 2011, Japan suffered an earthquake and tsunami. The public donated millions of unsolicited blankets that ended up undistributed and thus occupied scarce warehousing space in the field. Something similar happened to the tons of clothing donated in New York City after Hurricane Sandy in 2012. After Mozambique was struck by Typhoon Idai in 2019, the United Nations stopped the flow of unsolicited bilateral

donations to the disaster area to avoid airport congestion. Every year, patients receive over 16 billion injections worldwide, but many syringes are not safely disposed; 15% of the waste generated by healthcare activities is considered hazardous.² This issue is even more complicated during humanitarian responses to disasters when waste collection systems fail.

No one disputes the need to respond to crises, but these examples demonstrate that the responses can lead to further humanitarian challenges down the road. How can humanitarian relief be provided in a way that reduces such unintended consequences? In other words, how can humanitarian relief be made more sustainable, or at least less unsustainable?

This question is becoming increasingly acute. Currently, humanitarian crises last more than 9 years on average.³ They result from natural disasters (e.g., Hurricane Dorian in the Bahamas) and from complex emergencies (e.g., the Syrian

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refugee crisis). In response to crises, multiple stakeholders—ranging from international donors to local communities—make decisions quickly, and often with poor information and constrained budgets. At the same time, they must also plan for the next phases, such as rehabilitation, mitigation, and preparedness for future disasters. Humanitarian operations take place in challenging contexts, and addressing short-term needs to relieve acute suffering must be balanced against the long-term need to sustainably recover and strengthen local communities.⁴

The *disaster management cycle* (DMC) framework (Alexander, 2002) identifies four disaster management phases: *preparedness*, *response*, *rehabilitation*, and *mitigation*. *Preparedness* begins after a disaster warning or the identification of a disaster risk. *Response* takes place in the aftermath of a disaster. *Rehabilitation* follows the response and aims to rebuild to restore the quality of life in the affected community. *Mitigation* is about long-term improvements aimed at reducing the impact of future disasters.

We use the term “sustainability” in a broad sense, including a range of economic, social, and environmental factors, as in the United Nations sustainable development goals (SDGs). Blind (2019) establishes links between the SDGs and the “Agenda for Humanity,” which came out of the World Humanitarian Summit in 2016. Besiou et al. (2021) offer a framework showing how the SDGs are interlinked and how humanitarian operations can support the SDGs.

There is an inherent tension between the notion of sustainability and the urgency involved in disaster response, but humanitarian operations span the entire DMC, as Besiou et al. (2021) point out. The way humanitarian organizations (HOs) operate within each phase of the DMC can be more or less sustainable. For example, refugee camps (such as those operated by Oxfam in Greece) are considered temporary because, ideally, refugees are expected to find a permanent home elsewhere. In practice, refugee camps often last a decade or longer (Jahre et al., 2018), and often involve wasteful practices related to transportation, sanitation, waste disposal, or energy provision. These practices might be considered acceptable for a few months, but they could be avoided by implementing a better initial design. Even if the humanitarian response itself is temporary, it can have long-lasting unintended after-effects. The “humanitarian – development gap” has been recognized for decades and has long been contentious in academia and government (Blind, 2019); it is fundamentally impossible to meet the SDGs if displaced people are left behind. Spiegel (2017, p. 6) observes that protracted situations are becoming the norm, so it is essential to make humanitarian interventions “efficient, effective and sustainable.” Despite that, Besiou et al. (2021) suggest that many stakeholders in the humanitarian sector still treat development and relief in separate silos, and argue that research in humanitarian operations should not follow this historical divide. Kunz and Gold (2017) also argue that more sustainable performance in the rehabilitation phase requires a more long-term perspective on humanitarian supply chain management. They point out that despite calls from research and

practice for more sustainable rehabilitation operations, theory on sustainable humanitarian supply chain management is still scarce, though we point to some exceptions throughout this paper.

The fields of humanitarian operations and sustainable operations have formed the cornerstone of Luk Van Wassenhove’s research agenda since the mid-1990s. To mark his transition to emeritus professor in late 2019, we organized a workshop around the theme: *How can we make humanitarian operations more sustainable?* This paper summarizes the insights from that workshop. Leading practitioners and scholars in the field of humanitarian operations are already well aware of these challenges and opportunities in their respective domains, as was clear from their contributions to the workshop. This paper aims to introduce these issues in a more integrated fashion to a broader audience that may be interested in exploring how the fields of humanitarian operations and sustainable operations interact.

The workshop focused on five main areas: material convergence, coordination between HOs, logistics, partnerships with industry, and health. The workshop had over 100 participants: humanitarian practitioners, sustainability practitioners, and scholars conducting research on humanitarian operations or sustainable operations. This is not in any way a representative sample, but the diversity of perspectives was valuable. We also conducted a preworkshop survey following the same five themes. This paper reflects the opinions expressed during the workshop, using the tone and examples provided by the participants; we have not independently verified all statements made. Throughout the paper, we provide some references to related literature; however, the workshop was not based on presentations of research and this paper is therefore not intended as a complete review of the literature on this topic. The special issue of *Production and Operations Management* on “Humanitarian Operations and the Sustainable Development Goals,” and the introduction to that issue by Besiou et al. (2021), provide a much more complete overview of ongoing research in this field. This paper, however, demonstrates the possibility of better integrating sustainability with humanitarian operations despite the inherent tension between the immediate need to save lives and the longer term perspective associated with sustainability.

We examine the five main topics in Section 2, while Section 3 summarizes several other themes that emerged during the workshop. Section 4 offers conclusions.

2 | FIVE AREAS WHERE HUMANITARIAN RESPONSES CAN BE MORE SUSTAINABLE

This section summarizes insights from the workshop on the five areas we selected. For many people, the first issue that comes to mind when hearing “humanitarian operations” is emergency shipments of supplies being sent to a disaster area. The challenge of managing these emergency shipments,

known as material convergence, is the first area we discuss. Integrating these flows requires coordination between HOs, the second area. Managing flows of supplies, in the immediate aftermath but also in the longer term, inevitably requires attention to logistics, the third area. Particularly in logistics, partnerships with industry are essential and have advanced substantially, our fourth area. Finally, one objective of HOs is restoring and maintaining a population's health, in the short and long term; this is our fifth area.

We organize our discussion of these areas around several themes that emerged repeatedly:

- practical examples of the need and potential for sustainability improvement,
- local versus global perspectives,
- metrics and incentives,
- some necessary conditions to improve the sustainability of responses in each area.

These areas and themes overlap to some extent with the topics that Besiou et al. (2021) identify as needing further research: localization (the need to reconcile local and global perspectives), environmental sustainability, and interconnected supply networks, which refers both to coordination between HOs and partnerships with the private sector. Clearly, the five areas overlap substantially; for instance, some challenges related to metrics that we discuss under “health” apply equally to “logistics.” Below, in deciding which theme to include in which section, and in how much detail, we largely followed the way the discussions unfolded at the workshop; the result is inevitably less equally balanced than would be the case for a more traditional literature review.

2.1 | Material convergence

2.1.1 | Practical examples of the potential for sustainability improvement in material convergence

Material convergence refers to the tangible (in-kind) items that arrive on site in the aftermath of a disaster. Some items may be needed and are formally requested by HOs (*solicited* donations), while other items are neither needed nor requested (*unsolicited* donations). The Pan-American Health Organization classifies donations as either *urgent*, *high priority*, *low priority*, or *nonpriority*. Only 5% to 10% of all the material that arrives in a disaster area is considered high priority. Between 50% and 60% is not a priority at all. Holguín-Veras et al. (2016) characterize 60% as “completely useless.” Some low-priority items may become useful at a later stage, but sorting and storing them diverts scarce human resources from more urgent tasks. This tremendous inflow of nonpriority items creates bottlenecks and prevents high-priority items from reaching the beneficiaries in time. José Holguín-Veras (a professor at the Rensselaer Polytechnic Institute) and colleagues—who estimate they have

interviewed over 2000 disaster response participants ranging from volunteers to government ministers, in the aftermath of multiple disasters over the last 20 years—reported that a plurality of these individuals consider unsolicited in-kind donations the main challenge during response to large disasters. These floods of unsolicited in-kind donations have been labelled as a “2nd disaster” or “a disaster within the disaster.”

For many disasters, water is critical only during the first 2 or 3 days. After this, it quickly becomes a low-priority item, and later is categorized as “junk” (i.e., no priority). After the 2011 earthquake and tsunami in Japan, 750 tons of water was left unused. In Puerto Rico, unused water in plastic bottles quickly became undrinkable after being exposed to the sun. Relief workers had to dispose of these bottles on the island. Plastic bottles in Haiti cluttered drains and caused flooding after the heavy rains that followed the 2010 earthquake. Other nonpriority items researchers have observed include wedding gowns, tiger costumes, tuxedos, and a truckload of left-foot shoes; Holguín-Veras et al. (2014) document many examples. Holguín-Veras et al. (2016) refer to Fritz and Mathewson's (1957) report on material convergence, illustrating how persistent this challenge is, and Besiou et al. (2021) note that the volume of “trash” donations has increased further during the COVID-19 pandemic. Even items that are appropriate, such as solar-powered lights, pose challenges as often no mechanism exists to systematically pick up used batteries, which end up discarded locally causing future health problems for children trying to extract potentially valuable materials.

Lack of visibility complicates matters. Recipients at the destination have to deal with material convergence, as opposed to donors at the origin. There is often little control at the source over the items that donors send. Once those donations arrive at the disaster areas—after using scarce and expensive transportation—humanitarian workers have to deal with random surprises such as the infamous tiger costumes. It would be better if materials could be sorted at the origin or if donors could be persuaded to give cash or at least limit themselves to the items actually being solicited. Ideally, a donor would be required to specify what is being donated in a bill of lading, and would not receive permission to send the goods until a party is ready to accept them. In practice, donors may not have that information or may have no incentive to give what is actually needed.

2.1.2 | Local versus global

The trade-off between a *push* and a *pull* approach in material convergence is related to the division between *local* versus *global* control. A *push* approach begins at the global level and allows for a shorter lead time, but can result in more bottlenecks and a mismatch between needs and shipments. A *pull* approach, where shipments are based on urgent needs, is driven at the local level; it reduces bottlenecks and waste but results in longer lead times because local

demand assessments often take time. Moreover, the feasibility of a particular push–pull strategy also depends on the available data: A pull strategy only works if local demand is mapped and reliably transmitted in real time to suppliers. Some redundancy or waste may actually be desirable in emergency situations. If one does not know exactly how many people need basic relief items immediately after a disaster, it may be better to push enough priority items into the area to be on the safe side, and adjust after more reliable information becomes available. It is critical to understand the operational implications of the push–pull boundary in this context. Özpolat et al. (2015) compare the recipient-country approach favored by the United Nations and European Union with the donor-country approach prevailing in the United States, and suggest that a contingency approach is preferable; Eftekhari et al. (2022) analyze the trade-offs involved in prepositioning centrally sourced materials versus locally sourcing after a disaster strikes and offer insights on what such a contingency approach might involve.

2.1.3 | Metrics and incentives

The key metrics in managing material convergence depend on the deprivation level involved. This can vary heavily among disasters and determines the deprivation cost, that is, the degree of suffering of the population (Shao et al., 2020). Material convergence is a complex community problem that involves donors, governments, humanitarians, logisticians, beneficiaries, and other stakeholders, including very important persons (VIPs) and the media (especially social media). Governments and HOs launch appeals for in-kind items without specifying lead times. For example, they may ask for water, but shipping times lead to a mismatch between supply and demand, even for high-priority goods: What is urgent now is not necessarily urgent in a few days or weeks. By the time the water arrives, it may not be needed anymore.

Emotional responses often drive private donations. Donors make in-kind contributions altruistically but with no consideration of the needs or supply chain issues involved. Donors may think tiger costumes will make some children in the disaster zone happy, but in reality, such items do not help. Logistics companies serve as a channel but do not sort in-kind donations before shipment. Local relief organizations often accept any donations out of desperation. They quickly realize that many unsolicited in-kind donations are useless, but by then they are left with the burden of disposal. Other stakeholders such as VIPs try to share information about needs, but may not have timely and accurate data.

During normal times, donations such as clothing may be welcome and easily processed, and in short supply, while the opposite can hold during a disaster. Media attention contributes to peak donations of clothes during a disaster response, but time delays are insufficiently understood. For example, a disaster could happen during a period of cold weather, prompting the media to encourage people to send

warm blankets that may not arrive until the onset of a heat wave, as occurred after the earthquake and tsunami in Japan (Holguín-Veras et al., 2012). Donors may seek the visibility associated with sending a payload of water bottles to a disaster zone even if water is already abundant. HOs are reluctant to refuse these gifts out of concern of upsetting donors.

2.1.4 | What would it take for material convergence to be more sustainable?

Improving material convergence entails reducing waste. If donors give cash, HOs can convert that into the most-needed relief items. The next best option is to prevent nonpriority items from entering the disaster area, for example, by sorting and staging further upstream. Appropriate packaging provides another opportunity (USAID, 2020); for example, small bottles are often provided, but 10 L ones are more useful.

Research on material convergence requires new modeling paradigms for complex problems (de Vries & Van Wassenhove, 2020). One workshop participant commented, “We need to broaden the focus of humanitarian logistics. About 80% of the papers are about inventory prepositioning.” Moreover, assuming that “one size fits all” is too simplistic. One survey respondent asked why we mobilize insurance payouts after disasters in the developed world, but automatically switch to material hand-outs in less-developed countries; instead, one should ask how markets would respond to a disaster of a certain scale and complexity in the developed world, and then transpose the answers to reimagine how the response could play out in the developing world. The ongoing push among some HOs and donors to move toward cash and voucher programs rather than in-kind aid can help to rebuild a stronger local economy as well as reduce the economic and environmental costs associated with in-kind supplies. Holguín-Veras et al. (2022) highlight the collective action nature of the material convergence problem, which helps to elucidate how the incentives faced by the various stakeholders conspire to thwart obvious and simple solutions from being implemented in practice. They propose that trusted change agents such as local churches, fire departments, and international organizations may be able to persuade individuals to switch from donating physical supplies to giving cash instead.

2.2 | Coordination between HOs

2.2.1 | Practical examples of the potential for sustainability improvement in coordination between HOs

One example of the need for coordination comes from a survey respondent's comment that the World Food Programme (WFP) in Kenya depends on local transportation service providers for last-mile distribution to populations in need, but

that many other HOs rely on those same providers. The cluster system for international humanitarian responses aimed to improve accountability, predictability, and partnerships, and began in 2005–2006 after the Humanitarian Reform Agenda.⁵ Notable members included the UN and the Red Cross Movement. It was first deployed after the 2005 Pakistan earthquake and has been operational ever since, with clusters such as logistics, nutrition, and health. However, workshop participants commented that this system was designed with no input from some stakeholders, such as local NGOs. This issue remains despite a later redesign to be more inclusive. Some participants claim that there is still no coordinating voice for the humanitarian sector. These concerns echo those raised by Comes et al. (2020), Jahre and Jensen (2010), and others.

There are two distinct approaches to humanitarian response, each adopted by various global HOs. The first focuses only on the initial response to a humanitarian crisis. The second considers all the phases of the DMC: preparedness, response, rehabilitation, and mitigation. A workshop participant from an HO described how one organization “parachutes in, saves lives, then gets out,” while another takes a longer term perspective, aimed at preventing disasters and educating people. The second approach lends itself more naturally to a sustainability perspective because of its longer term mindset. However, even HOs that are closer to the first view can coordinate with HOs that stay in the field longer, for instance, to ensure appropriate disposal of medical waste used during the initial response.

2.2.2 | Local versus global

Local knowledge is key to ensuring sustainability. When a disaster strikes, HOs sometimes do not adequately include local communities, even when these communities have invested in disaster preparedness. Instead, HOs bring in the “big guns,” the “experts” from abroad, who may interfere with the established relationships between that HO’s in-country office and the local organizations. Local NGOs are often numerically underrepresented in coordination efforts, and they are often included only as observers, not as participants in the decision-making process. Other organizations, such as local religious groups, may be deeply anchored in the local society, but they are seldom connected to global NGOs or the UN. A great deal of work remains to be done to improve coordination between global HOs and local NGOs. The study by Frennesson et al. (2020) indicates that global HOs agree that more localization is needed but that they struggle with operationalizing these intentions.

The three detailed case studies provided by Jahre et al. (2015) on the International Federation of Red Cross and Red Crescent Societies’ (IFRC) Global Logistics Services illustrate many of the challenges associated with making coordination work in practice, often related to the local versus global distinction. Among others, they find that

standards developed by the IFRC did not always work well in the varying local contexts. The case studies by Comes et al. (2020) describe the fragmented nature of coordination in practice, documenting how informal parallel coordination systems emerged to support local operations, next to the formal coordination through the cluster system. Salem et al. (2019) highlight the importance of interpersonal leadership for successful collaboration between locals and expatriates, in particular when those subgroups are more internally cohesive. Shaheen and Azadegan (2020) examine the collaborative relationships between local and national governmental and nongovernmental agencies; they find expectations vary substantially between agencies, some seeing the relationships as more communal while others seeing them as exchange based, and these perceptions also change during the DMC. Such different and changing perceptions clearly pose additional challenges for successful coordination.

2.2.3 | Metrics and incentives

Despite the potential benefits, few explicit incentives exist for coordination. The funding system supporting HOs does not help. Metrics are often used more for reporting back to donors or to respond to audits, rather than to support managerial decision making. Even then, money usually comes late in the game because donors rarely give money for preparedness or rehabilitation or the mitigation of future disasters. Donors do not always allow funds that are earmarked for emergency response to be used for long-term investments. Overcoming these barriers requires discussion with the communities, the HOs, the local governments, international donors, and other stakeholders. Investing in better coordination between HOs, locally and globally, takes time and effort, and therefore money, but such investments in coordination are typically categorized as overhead and hence frowned upon by potential donors (Parsa et al., 2022). Furthermore, coordination with other HOs risks diluting the media attention and hence future donations that an individual HO might receive, providing a further disincentive (Eftekhar et al., 2017).

2.2.4 | What would it take for coordination between HOs to be more sustainable?

For global HOs to work more effectively with local HOs, they must accept that they do not know as much about local conditions as the people who live in a disaster area. For example, dark bread was shipped internationally to Albania, but the local population would not eat it. For months, international humanitarian workers were eating dark bread at every single meeting to avoid having to throw it away. Better coordination between local and global organizations could have prevented this. The review by Grange et al. (2020) shows that research on coordination in the humanitarian sector has expanded

but still lags that on the commercial sector; Jahre and Jensen (2021) find that research lags practice by still focusing mostly on coordination in response rather than during preparation.

2.3 | Logistics

2.3.1 | Practical examples of the potential for sustainability improvement in logistics

During the Ebola virus outbreaks, the World Health Organization (WHO) logistics arm had a very clear mission: *Stop Ebola*. If there was a suspected case, the WHO had to bring a team, inspect the case, isolate it, take the sample, bring it back to the lab, then diagnose, treat, surround, vaccinate, and move the patient. The WHO's operating model was designed to stop the outbreak within 3 months. It worked to stop outbreaks, but Ebola virus programs are becoming longer, and the operating model must change.

Initially, the WHO rented 600 vehicles. It did not buy them because its planning horizon was 3 months, although it could have moved them to other operations afterwards. If the WHO had said "We need to buy 250 cars for a three-month operation," its donors would have laughed. By now, the operation has been going for years. The WHO has gained some efficiencies in the fleet, and it has reduced the number of rented cars, the cost per kilometer driven, fuel consumption, and other metrics, but with the benefit of hindsight, their logistics could have been more sustainable.

Motorcycles used by health workers in Africa break down frequently with long repair times, meaning they could not reliably cover long distances. Recognizing that a large proportion of the population in sub-Saharan Africa lives in rural areas with no paved roads, motorcycles are an essential part of efforts to improve health. Initiatives emerged to train healthcare workers to perform preventive maintenance and to improve the effectiveness of repair centers and availability of spare parts, partly through greater standardization of motorcycles. Another approach to reach remote areas without having to rely on air drops is the use of amphibious all terrain vehicles, such as the WFP's Sherp.⁶

Holguín-Veras et al. (2012) identify seven areas of difference between commercial logistics and regular and postdisaster humanitarian logistics; postdisaster logistics is very different from that associated with long-term development, which is more similar to commercial logistics. Jahre et al. (2016) show how merging the supply chains for emergency response and for longer term operations at the UNHCR, while taking a variety of contextual factors into account, enabled an expansion of the global warehouse network while reducing cost and lead time. Stocks that are maintained to support long-term operations can serve a dual purpose as preparedness stock for emergencies, and left-over stock from emergencies can be used in longer term operations, reducing both waste and lead time.

2.3.2 | Local versus global

Although local procurement might often be more sustainable, the effectiveness of the global machinery is a major cause of inertia. Using local procurement would require better interfaces between local and global organizations that operate using different technologies. More standardized responses would help coordinate global and local operations and would reduce the need for detailed information. It would also curb the power of manufacturers by limiting last-minute decision making under severe time pressure. Conversely, if disaster response is too standardized, it may not match local demands, which would lead to more waste. For instance, when drinking water is supplied in large packs with many bottles, refugees cannot carry that when walking, leading to many bottles and other items being left at the curbside. Greater adaptation to local needs means that items are earmarked for specific populations, which reduces the flexibility achievable by prepositioning supplies. This trade-off between the benefits and disadvantages of standardization is a promising area for operations management research (see, for instance, Jahre & Fabbe-Costes, 2015).

Humanitarian response should be beneficiary centric, considering the needs of the people being rescued. The WFP found that people in some refugee camps were buying powdered milk in large quantities, not because they had small children but because it is easy to trade: They were using it as a currency. Researchers using consumption data without understanding the local context could easily develop erroneous models and produce dubious results. Holguín-Veras et al. (2016) propose that integrating civic society in the response effort is crucial for creating logistics structures with the full range of capabilities required.

2.3.3 | Metrics and incentives

Tough trade-offs are sometimes required to include sustainability in humanitarian response. How should short-term and long-term damage and costs be measured and compared? The carbon footprint is one metric for sustainability in supply chains, but other environmental aspects may be more relevant in the humanitarian setting. There are no clear standards for measuring societal impact, even if intergenerational justice is often mentioned. There is a need for more benchmarking in the humanitarian sector, and those benchmarks can be more integrated in decision making.

A key deterrent of sustainability in humanitarian logistics is cost. The individuals who implement a response will usually opt for the solution that is the cheapest in the short term, even though the sustainable solution is sometimes the most efficient in the long term. Given a trade-off between spending money to save lives now versus spending money to improve sustainability in the long term, it is obvious which option HOs will choose. Donors must understand the importance of funding disaster mitigation and preparedness to build

sustainability into humanitarian responses. Consider the case of earmarked funding. Organizations responding to Ebola virus outbreaks are not allowed to use funds earmarked for emergencies to strengthen local health systems overall, even though these local systems are crucial in the early detection of potentially dangerous outbreaks.

The humanitarian sector is fragmented, with many stakeholders, hampering coordination efforts. Supply chain-wide transparency and better information flows can help, as they have in closed-loop supply chains (Ferguson, 2009). More standards and audits would enhance transparency and coordination in the humanitarian sector. On the other hand, standards do not always help (Jahre et al., 2015), and this sector already suffers from an abundance of rules, procedures, and audits. Practitioners say they have to bend rules to get things done.

Information flows shape incentives, and vice versa. Often, HOs post information on social media (e.g., Facebook, Twitter) directed toward disaster victims, but when potential donors and volunteers ask how they can help, they may not receive timely and actionable answers from HOs. This prompts some volunteers to engage in uncoordinated action (see also Yan & Pedraza-Martinez, 2019).

More automated decision making and data management could increase effectiveness, but introduce their own challenges, given the critical importance of neutrality for HOs. Aggregating and sharing information across nongovernmental organizations (NGOs), who might be competing with each other, may not yield immediate benefits and may entail serious risks in conflict areas.

2.3.4 | What would it take for humanitarian logistics to be more sustainable?

It is difficult to add sustainability to the requirements of an operation during (short-term) disaster response. When people learn cardiopulmonary resuscitation (CPR), they are taught that it is acceptable to break ribs to keep the person alive. This illustrates why it is difficult to consider sustainability while lives are at stake. At the same time, the decision to accept breaking ribs was made beforehand, so this is not an improvised response. As disasters increase in urgency and complexity, the quality of the response is reduced, and sustainability is less salient in the immediate decision-making context. Thus, there is a conflict between the short-term and long-term visions of a humanitarian response, but preparedness can help reconcile these perspectives. During the workshop, participants commented that humanitarian intervention has an immediate effect on local markets, sometimes disrupting them, and on future local development, which in turn may influence the likelihood and severity of future disasters. They pointed to a range of interconnected factors that jointly influence the short-term and long-term sustainability of an intervention, often in subtle ways or opposite directions. Making humanitarian operations more sustainable takes careful planning to deal with this complexity, and planning typically takes place during the disaster preparedness

phase. However, donations specifically meant for preparedness and capacity building are scarce and investments in those areas are an overhead cost; donors sometimes rely too narrowly on metrics published by watchdog organizations like Charity Navigator such as the ratio of spending that goes directly to relief. Parsa et al. (2022) suggest that improved governance can mitigate that counterproductive aversion to investments in infrastructure and systems.

In the 2010s, UNICEF introduced a procurement policy incorporating social, economic, and environmental sustainability. UNICEF was already quite advanced in economic sustainability after 15 years of efforts to reduce the price of key vaccines. In the case of ready-to-use therapeutic food⁷ (RUTF) in sub-Saharan Africa in 2010–2011, they were able to implement a triple bottom line approach (see Figure 1). In response to a large famine in the Horn of Africa, UNICEF had airlifted 10–15 charters of RUTF, but a few years later, a similar operation required zero airlifts without affecting response times: UNICEF had developed local production capacity in Ethiopia, Sudan, Kenya, and South Africa, which substantially reduced logistics costs and pollution while creating jobs for local farmers and communities. A survey respondent mentioned similar efforts by WFP to enhance local milk production capacity in Africa, providing local employment and reducing the need to import milk from elsewhere. Another obvious example that occurred since the workshop is the desirability of localizing production of COVID-19 vaccines in smaller facilities in Africa. Despite such successes, changing long-established processes to make humanitarian logistics more sustainable remains challenging. One workshop participant from an HO said, “We are creatures of habit ... [c]ertainty is safety.”

2.4 | Partnerships with industry

2.4.1 | Practical examples of the potential for sustainability improvement in partnerships with industry

Cross-sector partnerships are explicitly included as UN SDG17: “Partnerships for the goals.” The UN Office for the Coordination of Humanitarian Affairs remarks that partnerships with the private sector increase the effectiveness of humanitarian action.⁸ An example is the Airbus Foundation, through which airlines can donate the delivery flight of their latest Airbus aircraft to HOs, who can use the otherwise empty flight to transport personnel and goods such as sanitation equipment or emergency aid kits. Between 2008 and 2020, 900 tons of aid materials were delivered to six regions on 71 humanitarian flights.⁹

There are numerous examples of successful partnerships; at the workshop the discussion centered around fleet management, which is no surprise given the participants’ familiarity with that case. In November 2001, Peter Bakker, then CEO of TNT (a major Dutch logistics company at the time), decided to extend their social corporate initiatives globally. They searched for the right humanitarian partner, an organization

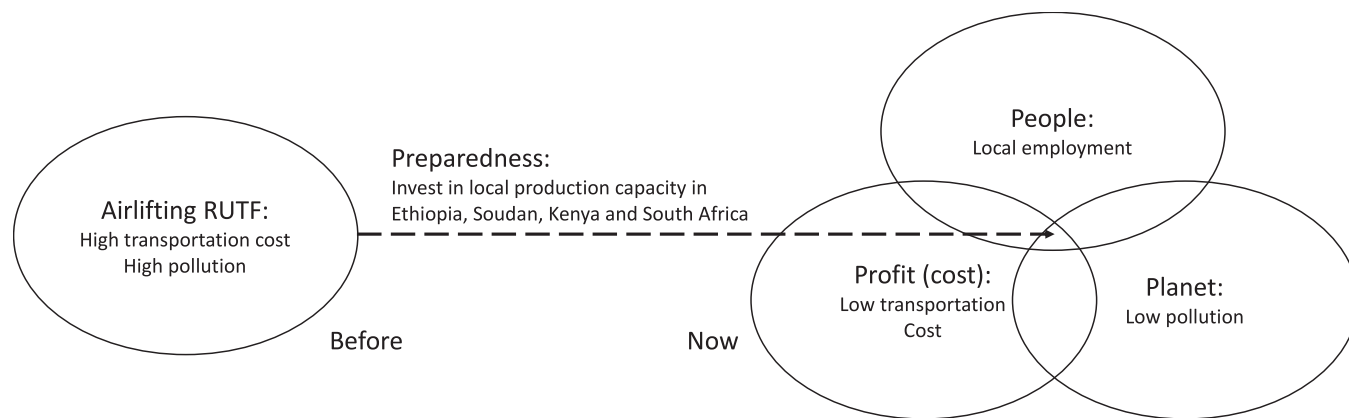


FIGURE 1 UNICEF's triple bottom line approach to distribution of RUTF

that would fit TNT's global logistics mission and share TNT's concern for problems related to extreme poverty. After a systematic search, TNT invited WFP to form the "Moving the World" alliance (Samii et al., 2004). TNT's goal was to improve the logistics capabilities of the humanitarian sector. WFP relied heavily on global logistics to distribute food to the poor around the world. The Fleet Forum was born out of the TNT–WFP partnership. Besides TNT and WFP, other founding partners of the Fleet Forum are World Vision International and the IFRC. The Fleet Forum aims at "... developing practical solutions to address complex aid and development [humanitarian] sector challenges,"¹⁰ and its continued existence suggests that it offers valuable lessons on coordination. Moving the world also created the North Star Alliance, which set up a series of wellness centers to provide health services to truck drivers who were spreading HIV along cargo routes in Africa.¹¹

For a partnership to be successful in the long term, it must benefit all partners. In the case of the TNT–WFP alliance, the benefits to the HOs were quite tangible, but those to TNT were not evident at first glance, such as the staff satisfaction pointed out by TNT's CEO. TNT staff donated significant time to the partnership; some traveled to remote areas to support WFP field programs. As a result, TNT rose to the top of the "best places to work" in Europe at the time. This partnership also helped TNT build CEO-level relationships with other companies (e.g., Unilever) and improved their sustainability rankings.

2.4.2 | Local versus global

It is natural for international HOs to first turn to large multinational companies when exploring partnerships, and the TNT–WFP alliance is an example where that worked well. In other cases, partnering with local industry might be preferable. For example, a survey respondent recalls that unsuitable materials are often used when rebuilding housing after a disaster, such as concrete in a warm climate when bamboo would be better. These new forms of construction disrupt existing land use and ecosystems, increase risks of further

accidents such as landslides, and can lead to unused housing. Partnering with local construction companies would reduce the likelihood of inappropriate solutions being imposed from abroad.

2.4.3 | Metrics and incentives

For a partnership to be successful, the objectives and corresponding metrics need to be defined. In the context of logistics, such metrics will typically involve a combination of cost and lead time. Although some work in humanitarian operations does explicitly address metrics (such as Acimovic & Goentzel, 2016), the systematic review by Abidi et al. (2014) suggests that metrics for the humanitarian sector often need to be distinct from those in the commercial sector, and are still much less developed.

The Fleet Forum targeted a number of challenges in humanitarian logistics, such as old fleets, low service levels, lack of vehicle standardization, lack of preventive maintenance, high accident rates, and high fleet costs (Pedraza-Martinez et al., 2011, 2020). Some fleet issues were so critical that they compromised the ability of the organization to deliver their services to beneficiaries. The Fleet Forum brought together a number of important HOs to discuss their fleet problems and identify best practices for the sector. Some TNT staff members were assigned to work full time with the Fleet Forum during its first few years. HOs within the Fleet Forum defined key performance indicators that they monitor regularly. These HOs began to find solutions to their more pressing problems (see Figure 2).

2.4.4 | What would it take for partnerships with industry to be more sustainable?

The Fleet Forum exemplifies a successful partnership. It has helped HOs make their fleet management more professional and sustainable. TNT's employees were able to volunteer for humanitarian endeavors, which increased their satisfaction.

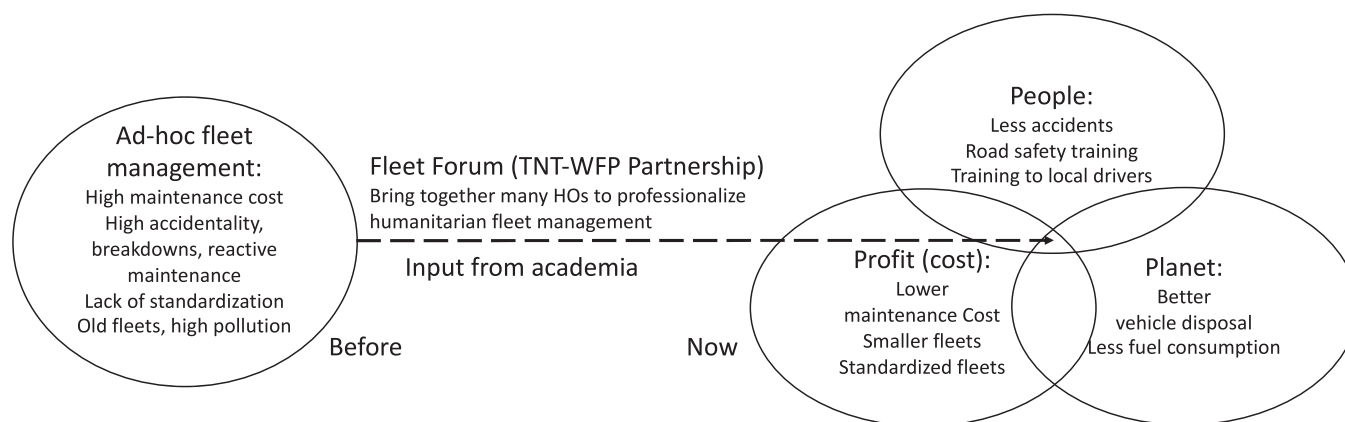


FIGURE 2 Fleet Forum's triple bottom line approach to fleet management professionalization

Partnerships between industry and HOs are different than partnerships between governments and HOs. Companies are among the first responders and have considerable resources, but building trust between HOs and the private sector is a challenge. At the workshop, one of its founding members shared: “The Fleet Forum was successful because people had time to build relationships and trust.” HOs should ask themselves what they expect from the private sector. Balaisyte et al. (2017) formulate several propositions on how the success of cross-sector partnerships depends on partner selection and the partnership formation, implementation and postformation stages, and Stadtler and Van Wassenhove (2016) draw some lessons on how employees at competing logistics firms were able to collaborate successfully within the context of the Logistics Emergency Teams, which supports the Logistics Cluster led by the WFP.

Is it necessary for HOs to start partnerships themselves, or could there be some kind of broker to bridge this gap (e.g., Bhattacharya et al., 2014)? There have been attempts to create platforms (e.g., AIDMATRIX, Google), but more can be done. Participants from industry agree that funding is available for partnerships, but there must be a clear understanding of how to prioritize its use. The private sector can be very influential in filling institutional voids. For example, if governments would have tried to eliminate child labor worldwide without the participation of the private sector, the results would likely have been even more limited.

2.5 | Health

2.5.1 | Practical examples of the potential for sustainability improvement in health

Health is a critical component of humanitarian operations if the local healthcare system is weak and has limited capacity to deal with disasters. For example, diagnostics is an important tool in the fight against the Ebola virus. A newly invented diagnostic machine, comparable to a desktop computer rack, allows health workers to insert a blood sample from a patient

into the device, where a cartridge already contains all the syntenic proteins that indicate the presence of genetic material from the Ebola virus. This machine reduces the exposure of lab technicians because everything is sealed, and it has reduced the time required to conduct diagnostics from days to hours. The cartridges must be incinerated at 1200°C, beyond the capacity of HOs' current equipment, so now HOs need to find innovative incinerators that can do the job while remaining small, portable, and cost effective. Clearly, faster and safer diagnostics is a tremendous step forward, but even more progress would be made if the cartridge disposal problem had been addressed in advance. This is a consistent theme in other contexts as well: Sustainability concerns associated with an innovation should ideally be addressed during its design by taking a life-cycle approach.

Disposal of syringes poses similar challenges; one survey respondent pointed to a more sustainable approach, in the form of sharp containers that come in larger sizes (preferred by many healthcare organizations) and that are shipped flat and assembled when needed. Decouttere et al. (2021) discuss ways in which integrating the planned and emergency immunization systems can lead to more sustainable outcomes.

2.5.2 | Local versus global

Lack of local resources can hinder global initiatives. One HO did not have enough local surgeons for the training program it was developing. Even if the best healthcare products are available, they are useless if no nurses are available to administer them. Reality in the field may be worse than one would think. For example, the entire government of Liberia fled to the United States to escape local conditions during the Ebola virus outbreak in 2014–2015. In the Democratic Republic of the Congo, WHO is the *de facto* ministry of health. Furthermore, recipient countries need staff who can do more than just follow procedures, such as initiating new types of drugs. This expertise is nearly nonexistent in some places, so a “hand-over” to a country does not always work. The capacity of

local regions must be developed to help improve the sustainability of local healthcare systems. Spiegel (2017) cites reports that only 0.2% of international humanitarian assistance was channeled through local and national NGOs in 2014.

Strengthening local health systems is widely recognized as essential, but can involve counterintuitive effects. For example, many nurses leave Kenya for the United Arab Emirates to seek higher pay. This may sound detrimental to Kenya's healthcare system, but that is not necessarily the case. The lucrative career opportunities abroad increase demand for nurse training in Kenya, which helps increase the supply and quality of the local training infrastructure. Nurses are a significant export from the Philippines, but enough nurses remain in the country to improve the local healthcare system beyond the level of other countries with similar incomes.

2.5.3 | Metrics and incentives

It is often much easier to measure inputs than outputs or outcomes, but outputs and outcomes are ultimately more meaningful. Consider an international HO that measures "access to medicines." If the product is available in the HO's country, then the HO's score would increase, but that does not mean people actually have access to the product. The last-mile distribution of medicine in developing countries is a major hurdle. Similarly, health organizations may measure the number of children who are vaccinated, but a better outcome measure is how many children live to age 5. It is imperative to determine the reason why some do not survive, but this is typically unknown. Most case studies focus on success stories, so the reasons for mistakes are poorly understood. Success is also frequently measured based on short-term pilots instead of a successful and sustainable roll-out at full scale, a disconnect analyzed more fully by Banerjee et al. (2017).

Donors tend to continuously create new vertical programs rather than improve horizontal coordination between them. This limits the impact of these programs and leads to redundancy and waste. It would be better to allocate the next marginal dollar to community health workers but such an initiative would require crossing silos.

A different incentive problem arises when private companies donate medicines that are (almost) expired in order to benefit from tax breaks, burdening the recipient country with the disposal costs; this occurred again recently in the context of COVID-19 vaccines (Lazarus et al., 2022).

2.5.4 | What would it take for humanitarian healthcare to be more sustainable?

A common immediate answer is more money. However, it is paradoxically often very difficult to obtain a small amount of money quickly to avoid a tremendous expense later. This is

illustrated clearly in the context of pandemics like COVID-19. Money is typically released only after an epidemic has reached its exponential growth phase, by which time massive funding is required. Buffer funds might help provide money very quickly based on early data. An alternative would be to identify the actors that have incentives to make quick investments earlier, such as insurance companies, who risk of going out of business if a disease exceeds a threshold. Clearly, health needs more innovative financing. While more money would undoubtedly be helpful, current funding levels could be used more effectively. Even investing in the capacity of local health systems introduces the related challenge identified by Spiegel (2017) that humanitarian health aid can disrupt national healthcare cost recovery systems.

Academics can help improve the sustainability of healthcare systems, but need to work more in close collaboration with the field (Besiou & Van Wassenhove, 2020). The first principle of humanitarian action is *do no harm*. To respect this basic principle, academics should familiarize themselves with the specific context. One survey respondent cautioned, based on a study in Nairobi, that software systems for inventory control may be counterproductive in developing countries, as simple manual or intuition-based systems may be more suitable in settings with small scale, low IT literacy, and high staff turnover. Karamshetty et al. (2022) offer a detailed description of the often informal way in which inventory decisions are made at a selection of healthcare facilities in Nairobi.

Because data collection and understanding the context takes more time, it can take longer to publish papers on humanitarian healthcare compared to normal healthcare. One must know exactly how the data were collected and how they can be interpreted. Models of humanitarian healthcare are usually not very sophisticated because of a lack of data, which hurts publication prospects in top academic journals.

3 | HUMANITARIAN OPERATIONS AND SOCIETY

Besides the five main areas discussed so far, the workshop addressed several other relationships between HOs and the societies within which they operate. Understanding these is also vital for the sustainability of humanitarian operations.

3.1 | Media

Mark Hunter (a lecturer at INSEAD) argued that the media sector is no longer dominated exclusively by mainstream organizations, but includes a broad spectrum of stakeholder-driven media, such as High Country News, Heat Street, and Greenpeace.org. As a result, "The audience for the media is no longer the public, it's a community. The first concern is unifying the community instead of a wide media audience. Make sure that people that share your values and vision get involved."

News about disasters reaches us through many channels that have different goals, and that sometimes want to change the outcome. Hunter mentioned how following Hurricane Maria in Puerto Rico in 2017, some (conservative) audiences were presented with a description of a successful response, while Human Rights Watch had a completely different story. This role of the media is illustrated by Long et al.'s (2020) finding that individuals' evacuation decisions in Florida and Texas in 2017 were significantly influenced by political affiliation. It is important to understand the way media works today and its impact on humanitarian operations. HOs are very vulnerable to the new media. The media impact funding and donations to humanitarian operations (Eftekhari et al., 2017), and HOs risk becoming a political target when they point to the factors that caused a crisis. The way forward requires thorough coordination among stakeholder-driven media organizations, such as those managed by NGOs and mainstream media.

3.2 | Governance

Ludo Van der Heyden (an emeritus professor at INSEAD) argues that governance is about *values*, but that in the NGO sector, governance and execution are often intermingled. The boards of nonprofits are responsible for governing, not executing, but often donors receive seats on the board and get involved in making operational decisions and execution rather than limiting themselves to governing. It can be very difficult for an NGO to remove such a donor from day-to-day decision making. Everybody wants to save the world, but each in their own way. Saez et al. (2021) examine the particular challenges associated with governance of HOs in more detail and suggest how some changes in overall governance structure could make humanitarian relief more effective.

3.3 | Gender

Humanitarian operations must consider the way societies are organized (Tomasini & Van Wassenhove, 2009). After the school closures and quarantines during the 2014–2016 Ebola virus outbreak in West Africa, girls and women suffered more sexual violence and exploitation, and did not receive information on how they could better protect themselves from the disease (John et al., 2020). Vaccination campaigns led to gender-based violence when aid workers requested sexual services for treatment. The United Nations Office for Disaster Risk Reduction recognizes that gender perspectives in disaster risk reduction could be better addressed.¹² Patel et al. (2020) point out that although women are often disproportionately affected by humanitarian crises, and although women make up over 40% of frontline humanitarian workers, their role as leaders in humanitarian settings has been largely ignored.

3.4 | Human talent

Any attempt to increase the sustainability of humanitarian operations must include the workers. HOs develop a lot of knowledge but lose it due to high staff turnover. One participant noted that very few staff had prior experience working in a crisis, and nobody seemed to have knowledge of what happened in previous crises.

HOs usually race from one emergency to another. This hectic pace allows minimal time for reflection between crises, and contributes to high staff turnover. Both factors conspire to produce a short-term mindset in which the lessons of the past are often forgotten. Individuals often do not stay with their HO very long, so they do not receive credit when a long-term solution is successful, which is detrimental to sustainability. "Short-termism" is also rife at for-profit corporations, but these organizations have viable options (e.g., stop reporting quarterly earnings), while HOs cannot change the frequency of disasters or the conditions imposed by donors. The combination of more frequent disasters and decreased funding exacerbate this tension.

Recently, the United Nations was involved in a study to understand how the context of a humanitarian response impacts humanitarian workers. The lack of support and recognition awarded to those who respond to crises has created generations of ex-humanitarians who were severely traumatized by what they experienced in the field, which is not sustainable. This lack of support inhibits future generations of humanitarians from taking on challenging assignments and making the emotionally hard choices that are inescapable in effective humanitarian responses. In the words of one participant: There is a need to invest more in how to support people and how we help them to help themselves in this context. If we do not do that, the efforts afterwards to repair those issues that we got wrong in the first place are multiple times more costly than what we could have done if we have prevented it. In other words, the humanitarian sector should not focus only on the well-being of its beneficiaries, but also its own.

4 | CONCLUSIONS

This workshop summary has discussed five main areas in which humanitarian responses could be more sustainable: material convergence, coordination between HOs, logistics, partnerships with industry, and health. We discussed examples in which humanitarian relief is not as sustainable as it could be or has become more sustainable, often revolving around the tension between short-term and long-term responses, as well as between local and global capabilities. Each of the areas would benefit from the use of more appropriate metrics and incentives. The workshop also highlighted several aspects of the changing and complex interplay between HOs and the societies in which they operate: the role of the media, the shortcomings of the governance of

nonprofits, the inadequate attention given to gender-based perspectives, and the damage caused by poor management of human talent. This is by no means an exhaustive list of challenges, but it already pinpoints many opportunities to make humanitarian responses more sustainable. When humanitarian operations are seen through the lens of the DMC, there are long-term actions that can improve their sustainability. Most of these actions must be put in place either before a crisis or during the long-term rehabilitation that follows the immediate response; incorporating sustainability is more feasible during preparation, rehabilitation, and mitigation than during the immediate response.

Sustainability involves several humanitarian stakeholders, ranging from global donors to local beneficiaries. Donors need a better understanding of the implications of funding mechanisms that favor response over preparedness, including responses to epidemics or pandemics, and that favor the use of earmarked funding over flexible funding. The voices of beneficiaries must be heard to implement sustainable solutions that respect their culture and dignity. Coordination between global and local actors is also fundamental to improve the sustainability of humanitarian operations. Local knowledge and connections are vital for success, even for experienced disaster response groups. Global lessons should be combined with local knowledge. Coordination between HOs would also help. Initiatives such as the cluster system, while imperfect, have many potential benefits, such as reducing costs and avoiding duplication. However, coordination has its own challenges, including overcoming cultural barriers or integrating different operating standards. Partnerships between the humanitarian and private sectors are important as well. For such partnerships to be sustainable, the parties involved must build trust and a basic understanding of each other's context. Altogether, the workshop pointed out many ways in which humanitarian operations can be more sustainable, despite the obvious tension between the immediacy of a disaster response and the longer term perspective inherent in sustainable development. Most of what we have discussed is well known to leading practitioners in this field, including many of the workshop participants, but we hope that this overview will encourage others to explore this fascinating and vital domain.

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- ² WHO.int. <https://www.who.int/news-room/fact-sheets/detail/health-care-waste>. Accessed February 21, 2022.
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- ⁴ For example, the Grand Bargain, which is an agreement between large donors and global HOs, commits to “get more means into the hands of people in need and to improve the effectiveness and efficiency of the humanitarian action.” <https://interagencystandingcommittee.org/grand-bargain>. Accessed Feb 21, 2022.
- ⁵ See, for instance, <https://www.humanitarianresponse.info/en/coordination/clusters/what-cluster-approach>, accessed February 26, 2022.
- ⁶ See, for instance, <https://www.wfp.org/support-us/stories/herbert-shep>, accessed February 26, 2022.
- ⁷ “RUTF is used by UNICEF to help the millions of children threatened by acute malnutrition worldwide. It doesn't require refrigeration and stays fresh for up to two years. Best of all, no mixing with potentially contaminated water is required.” From <https://www.unicefusa.org/stories/what-ready-use-therapeutic-food/32481>. Accessed February 21, 2022.
- ⁸ <https://www.unocha.org/es/themes/engagement-private-sector/how-private-sector-helps-emergencies>. Accessed February 26, 2022.
- ⁹ <https://www.airbus.com/company/sustainability/airbus-foundation/partnering-with-the-humanitarian-community.html>. Accessed February 21, 2022.
- ¹⁰ <https://www.fleetforum.org/team-fleetforum>. Accessed February 21, 2022.
- ¹¹ The North Star Alliance—which is still active—was also born out of the TNT–WFP alliance with the mission to “... provide quality healthcare to mobile workers and the communities they interact with.” <https://www.northstar-alliance.org>. Last accessed June 14, 2021.
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APPENDIX A: WORKSHOP DESIGN

The objective of this workshop was to examine how to make humanitarian operations more sustainable. It was intended to include input from a broad range of academics and

practitioners focusing on humanitarian issues or sustainability. First, we sent a preworkshop survey to all the invited guests. This survey asked for examples in which humanitarian response could be more sustainable or was already sustainable.

Next, using these responses and the organizers' research experience on humanitarian operations and sustainable operations, we decided the five areas for discussion in breakout groups. For each breakout group, we invited two participants in advance to act as facilitators, but the rest of the participants could choose which breakout group to join. Each breakout group was assigned an INSEAD researcher or a PhD student to take notes. We included short plenary talks on several other topics that we considered important but not suited for breakout groups.

The workshop counted 106 participants, including 72 faculty members (with five former PhD students of Luk), nine humanitarian practitioners, seven industry practitioners, and five current PhD students. Other participants were predoctoral researchers, postdoctoral fellows, and staff from INSEAD who have supported Luk Van Wassenhove over the years. The data underlying this paper consist of the 11 preworkshop surveys (a total of 3849 words), 477 min of workshop recordings (275 min of video and 202 min of audio), notes from the five breakout groups (14,910 words), and four workshop presentation decks with a total of 37 pages of content.