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Humanitarian Innovation: The State of the Art

ALEXANDER BETTS AND LOUISE BLOOM

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Copy Editor: Matthew Easton

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For more information, please contact:

Policy Development and Studies Branch (PDSB)
United Nations Office for the Coordination of Humanitarian Affairs
(OCHA)
E-mail: ochapolicy@un.org

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Humanitarian Innovation: The State of the Art

ALEXANDER BETTS AND LOUISE BLOOM

The humanitarian system faces grave challenges, as record numbers of people are displaced for longer periods by natural disasters and escalating conflicts. At the same time new technologies, partners, and concepts allow humanitarian actors to understand and address problems quickly and effectively. To contend with these growing, and changing, demands, organizations are increasingly exploring the idea of “humanitarian innovation,” which draws upon concepts from the private sector to adapt and improve the humanitarian system. As a sign of its importance, “Transformation through Innovation” will be one of four themes of the 2016 World Humanitarian Summit.

Humanitarians have used the term “innovation” to refer to the role of technology, products and processes from other sectors, new forms of partnership, and the use of the ideas and coping capacities of crisis-affected people. However, as

with many emerging ideas, use of the term in the humanitarian system has lacked conceptual clarity, leading to misuse, overuse, and the risk that it may become hollow rhetoric.

A better understanding of the potential and purpose of the innovation cycle and an innovation mindset can bring great benefits to the humanitarian system. This paper sets out to develop a common language and framework as a basis for dialogue, debate, and collaboration. The purpose is not to provide a definitive or comprehensive account but to offer ideas and examples to inspire further discussion.

Each section of the paper highlights an aspect of the concept: 1) the rise of humanitarian innovation and the innovation ecosystem; 2) the unique challenges of humanitarian innovation; 3) the innovation cycle in practice; 4) the role of crisis-affected people; and 5) advancing the debate.

1. The Rise of Humanitarian Innovation

The first source of consolidated thinking on innovation within the humanitarian system was the Active Learning Network for Accountability and Performance in Humanitarian Action (ALNAP). It held an initial Innovations Fair in November 2009, followed by a series of meetings. That same year the UK Department for International Development (DFID) announced a £3 million investment in innovation in the humanitarian system. Since then, an increasing number of organizations have formally adopted innovation processes to stimulate new thinking on the provision of humanitarian assistance (DFID 2012, Ramalingam et al. 2009, Steed 2010). UN agencies and many NGOs have dedicated staff, innovation labs, challenge grants or other initiatives to prompt new ways of solving problems and adapting to opportunities. Meanwhile, a growing number of donors, private sector actors, univer-

sities, and others outside of the traditional humanitarian system have entered into innovation partnerships.

Despite this trend, the term “innovation” remains poorly understood in some humanitarian circles and its meaning and value remain contested. Building on existing literature and practice, this paper adopts the following definition for innovation: a means of adaptation and improvement through finding and scaling solutions to problems, in the form of products, processes or wider business models. There are a number of additional elements to the term. First, the concept can be applied to nearly any specialized area, from logistics, to medicine, to media, and may include technology but is not reducible to it. Second, innovation is not the same as invention: it need not involve the creation of something absolutely

novel, but often takes the form of adapting something to a different context. Third, a solution does not require a particular threshold of change to qualify as innovation. It may be “game-changing” in having a high degree of technological progress and market impact, or it may be incremental.ⁱ

Factors Driving Humanitarian Innovation

Demand for a New Business Model

The trajectory of humanitarian assistance is unsustainable. The number of people affected by humanitarian crises has almost doubled, and the cost of international humanitarian aid has more than tripled, in the last 10 years.ⁱⁱ Further, humanitarian tools and services are, in many cases, ill-suited to modern emergencies. Most were designed for rural camp settings and short time frames. However, more than half of all refugees now live in urban areas, with very different coping mechanisms and basic needs. For many, connectivity and access to information are as critical as access to basic livelihoods. In addition, emergencies are rarely short-lived: in the last eight years, six countries have needed humanitarian assistance every year, while UNHCR reported in 2014 that the average period of displacement is 17 years.ⁱⁱⁱ Despite the dramatic change in the operating environment, the structure of the humanitarian system has remained essentially closed and unchanged. As a result, pressure is building to fundamentally alter the way business is done, and many humanitarian actors and donors are looking to innovation as a vehicle for introducing these changes.

Private Sector Engagement

Over the past decade, faced with growing resource constraints, humanitarian agencies have held high hopes for contributions from the private sector, particularly the business community. Initially seen simply as an alternative source of funding, since about 2010 the private sector has been acknowledged as playing other roles, most notably in product and process innovation. It has also been increasingly recognized as operating at various scales, from multi-national corporations to national companies to small businesses created by refugees and internally displaced persons.

A variety of motives and modes of engagement characterize private sector involvement in humanitarian innovation,

such as philanthropic contributions from foundations or individuals, and corporate social responsibility (CSR) initiatives that connect humanitarianism to brand or to existing research and development (R&D). Some private sector actors are motivated by the opportunity to develop solutions that, if proven to work in a disaster, could be commercialized for the bottom two billion who live on less than \$2 per day. In addition, with globalization comes the recognition that a company’s bottom line is linked to the risks and vulnerabilities of their offices, supply chains and staff, and that an effective humanitarian response is also in their interest. In addition, a growing number of “social entrepreneurs”, such as Samasource, Dimagi, and Technology for Tomorrow, illustrate the potential for this kind of humanitarian enterprise. Meanwhile, larger corporations such as Deloitte, Ericsson, and IKEA (through the Ikea Foundation) are providing humanitarian goods and services in the name of corporate social responsibility.

While many humanitarian actors are drawn to the funding and know-how that the private sector offers, some remain hesitant about whether a profit motive compromises the ability to uphold humanitarian principles and to operate in the most resource-scarce conditions. Furthermore, across the humanitarian system, more systematic research on the role of the business sector is needed.

Partnerships

A range of actors now bring unique capacities to the international humanitarian system, including diaspora groups, businesses, and local first responders. However, traditional humanitarian actors have been slow to establish partnerships that leverage the assets that each has to offer. As noted in the 2013 report of the UN Secretary General to ECOSOC, “as new actors emerge, the current system has not adapted quickly and flexibly enough to meet the new realities. There is a need to build a more inclusive global humanitarian system, with stronger relationships at the global, regional and national levels.” As a central component of innovation, partnership is important not just for coordination within the system, but also as a means to draw in ideas, good practices, and resources from private technology developers, military R&D agencies, universities and affected people themselves.

Technology Development

The innovation trend builds upon earlier and parallel debates on the potential for technology to strengthen emergency response. In just one example of the transformative potential of technology, cellular phones have provided a new platform for needs assessment and feedback mechanisms for affected people. While only 4 per cent of households in Sub-Saharan Africa have Internet connections, for example, cell phone penetration is at 75 per cent in Africa as of 2012, and is expected to reach 97 per cent by 2017.^{iv} New technology-based tools and volunteer and technical communities, such as Crisis Mappers, are available to respond to emergencies like the 2010 Haitian earthquake and 2013 Typhoon Haiyan in the Philippines, further stimulating this debate. Prominent examples of humanitarian technology include GPS-enabled mapping systems for response coordination, social media analysis to conduct damage assessments, use of dedicated hashtags on Twitter to coordinate rescues and relief, and mobile phone-enabled funds transfers in the aftermath of crises.

Actors and Types of Innovation

These factors have spurred humanitarian innovation by practitioners and donors in three broad categories: grants and finance, research and development, and collaborations and networks. Table 1 provides a snapshot of initiatives emerging in each category. Some of these initiatives are happening at a large scale across several countries, while others are nascent or localized. The projects and institutions in each category interact and collaborate in diverse and dynamic ways, so these categories are not narrowly fixed, but illustrative of the roles that different actors can play. Table 1, on the following page, reflects the dynamic nature of interactions within the humanitarian system.

Table 1: Examples of Humanitarian Innovation

	Grants and Finance	Research and Development	Collaborations and Networks
United Nations	<ul style="list-style-type: none"> • WHS Regional Innovation Grants • UNICEF First 72 Grant • Innovation Funds: UNICEF and UNHCR • WFP Cooperating Partners Innovation Fund • OCHA Humanitarian Research and Innovation Grant 	<ul style="list-style-type: none"> • WFP: Division for Policy, Programming and Innovation; Business Innovation Support Office • UNICEF: T4D; Innovation Labs • OCHA Humanitarian Exchange Language 	<ul style="list-style-type: none"> • UNHCR Ideas (SpigitEngage platform) • UN Innovation Network (multi-agency) • UNHCR's Innovation Circle • UNHCR's iFellows
NGOs	<ul style="list-style-type: none"> • Humanitarian Innovation Fund 	<ul style="list-style-type: none"> • World Vision (e.g. Last Mile Mobile Solutions) • MSF Innovation • Mercy Corps Social Innovation • Oxfam Open Innovation • ICRC Innovation • CARE: Digital Early Warning Program • Norwegian Refugee Council • Internews Center for Innovation and Learning 	<ul style="list-style-type: none"> • START Consortium, Beta • Cash Learning Partnership (CaLP): NGO partners, IFRC and Visa. • Digital Humanitarian Network
Private Sector	<ul style="list-style-type: none"> • Deloitte Humanitarian Innovation Programme • IKEA Foundation • Google.org • GlaxoSmithKline Healthcare Innovation Awards 	<ul style="list-style-type: none"> • IKEA Foundation • DHL logistics partnership with OCHA • IDEO.org (e.g. <i>MobileMoney</i>; <i>Drones for Good</i>) and Open IDEO platform • Gates Foundation 	<ul style="list-style-type: none"> • UN Foundation Accelerator • Aidmatrix supply chain management • Kenyans for Kenya • CiYuan Initiative (Business for Social Responsibility) • Philippines Corporate Network for Disaster Response
Universities and Think Tanks		<ul style="list-style-type: none"> • University of Oxford HIP • Harvard Humanitarian Initiative & Humanitarian Academy • Duke University (<i>Innovation Co-Lab</i>) • Massachusetts Institute of Technology (e.g. <i>Development Innovation Network</i>) • Qatari Computing and Research Institute • EBS Business School • Stanford University's Design School and Center for International Security and Cooperation 	<ul style="list-style-type: none"> • Singularity University • Stanford University's <i>Center for Innovation on Global Health</i> • MIT's International Development Innovation Network
Government	<ul style="list-style-type: none"> • DFID & USAID Development Innovation Fund (sub-set Humanitarian Innovation Initiative) • Humanitarian Innovation Fund donors include UK DFID, Canadian International Development Agency and the Swedish Ministry of Foreign Affairs • ECHO innovation financing (e.g. Gargaar project) 	<ul style="list-style-type: none"> • US Government, FEMA Innovation Teams • DFID Research and Evidence Division and earmarked innovation funds. • Luxembourg Ministry of Foreign Affairs' satellite based platform <i>Emergency.lu</i> 	<ul style="list-style-type: none"> • One off events for innovation coordination and discussion (i.e. DFID, ECHO)

The wide range of actors in the humanitarian system offers the potential for new connections, mutual learning, and cross-fertilization. Figure 1 depicts the spread of actors and the opportunities for connections, with both common linkages (solid lines) and less-common ones (dotted lines). With greater engagement in the kinds of initiatives highlighted above, this network has the potential to provide an innovation “ecosystem” that can accelerate adaptation and learning.

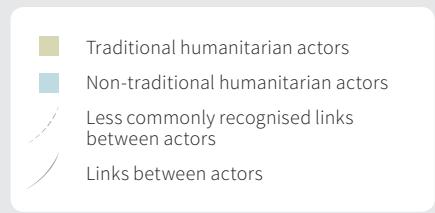
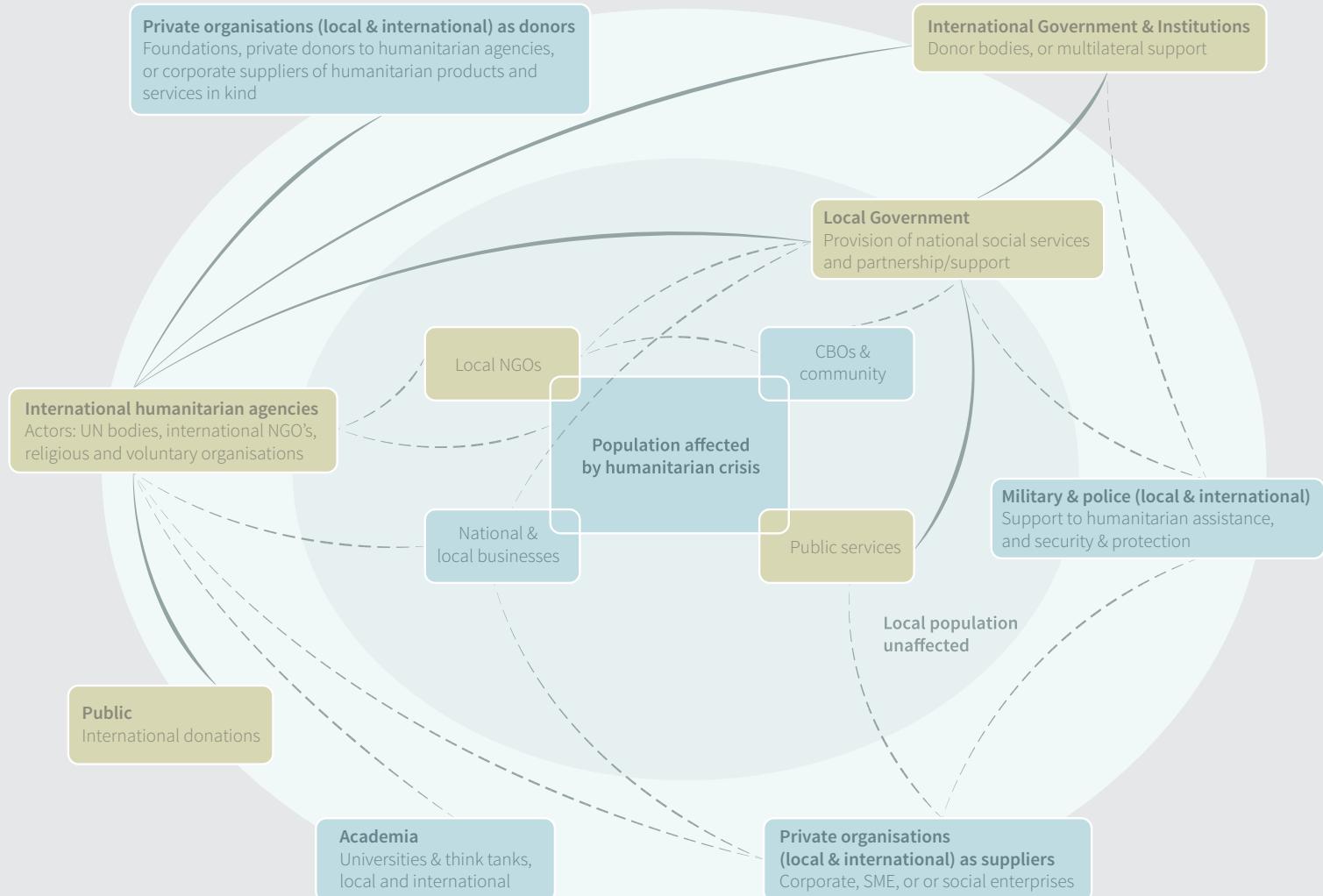


Figure 1: The Humanitarian Ecosystem



Local context

- Disruption to local, physical, social and economic environment and systems
- Varying capacity of local regulation for organisations, customs, business, and welfare, local public support services, local private market systems
- Humanitarian systems – clusters and information flows
- Typical flows of goods and services to affected population predominantly from humanitarian agencies and government

International context

- International law
- Humanitarian standards e.g. Sphere Standards and Red Cross Code of Conduct
- International trade and markets

2. The Unique Challenges of Humanitarian Innovation

The rich ecosystem depicted in the previous page reflects the depth of capacities and opportunities for cross-fertilization, but it also illustrates the complexity of the humanitarian system. Innovators must contend with a system that lacks flexible financing, an appetite for risk, and a market-place for new ideas. This section explores some of these and other challenges unique to humanitarian innovation.

A Closed Market

The humanitarian system's market structure differs from that of many other goods and services. On the demand side, humanitarian goods are generally thought of as "global public goods". Rather than conferring a benefit exclusively on the purchaser, the reduction of suffering benefits all governments and other humanitarian actors, whether or not they actually contribute to providing the goods. This logic leads to the widely held belief that humanitarian goods must be exclusively or predominantly funded by the inter-governmental public sector, through the collective action of governments, because there is no incentive for private actors to take part.

Conceptual History

The modern concept of innovation began with the development of **theories of diffusion**, which explain how new ideas come to be adopted over time (Rogers 1962, Rogers 1971). Subsequently, management theory developed the notion of **innovation for businesses**, exploring how private actors move from problem identification to solutions. The concept of **social innovation** then adapted traditional innovation management to social challenges (Mulgan 2007, Brown and Wyatt 2010, Mumford 2002).

Popular literature has highlighted innovation within private companies like Google, Apple, and Facebook. Steven Johnson's 2011 book *Where Good Ideas Come From*, for instance, highlights the centrality of **cross-fertilization**, recognizing that breakthrough ideas often come from collaborations among people of diverse backgrounds and different sectors. Ron Adner's 2012 book *The Wide Lens* notes that innovation often emerges from **ecosystems**, within which complementary networks of actors enable the development of ideas.

	Type of Good	Basis of Provision	Provider
Conventional View	Humanitarian Public Good	Reduce Suffering	States/IOS/NGOs
Supplementary View	Humanitarian Private Good	Mixed Motives (e.g. Profit, Sustainability)	Humanitarian Entrepreneurs

Table 2: The Demand Side of the Market for Humanitarian Assistance

On the supply side, there is a further assumption that humanitarian goods can only come from a closed and tightly regulated group of suppliers. Inter-agency coordination and procurement tend to privilege a small group of mainly UN organizations and international NGOs, whether or not they are the most efficient or effective providers. These organizations may, in turn, privilege known suppliers rather than reaching out to alternative solution holders.

On the final side of the transaction, the users of humanitarian goods do not have the traditional characteristics that economists ascribe to the individual. Their ability to choose alternative goods is often limited by their circumstances. The system lacks a mechanism for feedback from affected people directly to donors and humanitarian agencies. Rather than being guided by such feedback, the "success" of humanitarian actors is mainly measured by their fulfillment

	Market Structure	Basis of Contract	Diversity of Providers
Conventional View	Oligopoly	Regulatory Privilege	Closed System
Alternative View	Perfect Competition	Price and Quality	Open System

Table 3: Supply Side of the Market for Humanitarian Assistance

of donor requirements, further reducing the pressure to adapt or innovate.

An alternative model would base the opportunity to supply humanitarian goods not just on regulatory privilege, but on performance and value, opening the system up to non-traditional ideas and suppliers, including the military and the private sector.

This conceptual understanding of the market for humanitarian goods and services is of great relevance to the role of innovation. Innovation offers a means to “crowd in” rather than “crowd out” alternative sources of ideas, tools, and services. There may be untapped opportunities obscured by barriers to entry such as the lack of openness to non-humanitarian actors, procurement rules, limited grants and start-up capital for humanitarian enterprise, and the view of beneficiaries as aid recipients rather than consumers or end-users in untapped markets.

Ethical Constraints

Any efforts to bring in outside actors must consider a second unique feature of the humanitarian system: the precarious circumstances of the user. There are inherent power asymmetries between those providing protection or aid and those in need of that assistance. Bringing new actors and new forms of experimentation into the humanitarian context also risks exacerbating conflict, local power dynamics, or cultural sensitivities.

Organizations such as UNHCR and UNICEF, industry groups like the GSM Association and companies such as Deloitte have developed codes of conduct or frameworks related to innovation, and existing humanitarian principles continue to serve as a useful guide. However, while a range of general standards exist for humanitarian action (e.g. Sphere and the

Humanitarian Accountability Partnership Standard), they do not provide a specific set of ethical principles for innovation, particularly regarding issues of experimentation, intellectual property, and the role of for-profit actors. Humanitarian actors have called for a process to reflect on these ethical challenges, bringing together practitioners, the private sector, and academia, as well as experts in applied ethics and the development of humanitarian codes of conduct.

Attempts to innovate by developing pilots at the field level may have ethical consequences at three levels: individuals, their communities, and the wider humanitarian system. Table 4 (page 13) highlights some of the issues and principles to consider at each level, building on recent thinking such as the UNICEF Principles for Innovation and Technology in Development.^v

Aversion to Risk

The consequences of failure in humanitarian efforts are high, and emergencies tend to be high profile and political. As a result, many donors and agencies have a strong aversion to untested approaches, and to activities that do not contribute directly to the immediate response. These two factors have incentivized humanitarian agencies to continue business as usual while discouraging R&D and long-term business development. In contrast, private businesses, particularly in the technology sector, are encouraged to adopt a “fail fast” approach to innovation, investing in a range of ideas with the assurance that many failures will also bring the best solutions in the long run (Babineaux and Krumboltz 2014). Private sector innovation has been driven by the need to look to the future and “get there first” with new products and business models. The financial structure that supports the humanitarian system does not provide such incentives. Rather, it encourages evaluation and lessons learned that are retrospective and rarely feed into future planning. These

forms of evaluation are driven by the demands of accountability for public spending, leaving the system unprepared to respond to trends or opportunities by planning for – and learning from – failure.

There are some recent exceptions to this trend among donors, notably the USAID/DFID Humanitarian Innovation Initiative, which launched its first call for proposals in April 2013, offering up to \$1 million for each selected project.

The Humanitarian Innovation Fund is another example of a seed-funding model for piloting new solutions. Many donors engage through bi-lateral grants, such as Cida's financing for the Last Mile Mobile Solution or ECHO's support to the Gargaar project for Somali refugees, among many others. As funding for innovation grows, some donors note that the pool of solid projects has been small, pointing to the need for greater support for innovative thinking, partnerships, and design tools.

Table 4: Framework for Analyzing Ethical Principles in Humanitarian Innovation

Level of Impact	Innovation Principle	Risk	Mitigation
Individual	Demand-driven and user-centered	Innovations are driven by ideas from outside the affected community or from available products, rather by the priorities of affected people, resulting in limited or even negative change.	Integrate crisis-affected communities in all stages of the innovation process. Adopt user-centered approaches to innovation.
	Open source	Technology and data are not made available to the larger community and new tools are not shared with those who could benefit in other arenas.	Adopt open source approaches that enable all implicated individuals to access, understand and engage with information.
	Informed consent	Consent cannot be meaningfully given due to the vulnerable context of the user and the implicit contingency of aid on participation in pilots.	Ensure all individuals engaged directly or indirectly in the innovation process provide informed consent. Establish ethical review boards to review whether meaningful consent is possible in a given project.
Community	Do no harm	Where data security and privacy cannot be ensured, these can put people at risk of exploitation by private and public actors. Experimental projects can also exacerbate or stimulate conflicts and power struggles.	Consult and work closely with a range of local partners from different sectors to ensure an adequate portrayal of needs, context, and risk. Build in safeguards to mitigate risks.
	Representative consultation	Marginalized and acutely vulnerable sectors of an affected population (women, children, people with disabilities, ethnic and religious minorities, and others) are excluded from critical design and testing decisions that will affect them. Outcomes may exacerbate existing vulnerabilities.	Ensure that those consulted in all phases of the innovation cycle, represent all sectors of the affected population, particularly those subject to marginalization or for whom the project may have unique impacts.
	Sustainability and local ownership	Innovations from the outside will displace local businesses or substitute for government services. They may also introduce tools, technologies, or other processes that are not sustainable, due to lack of funds, training, or infrastructure.	Ensure that the local market and local systems are well understood before implementation, and that measures are in place for long-term impact and sustainability.
System	Proven impact	Without clear definitions of success and proper baseline data, proving the true value and impact of a given innovation will be a challenge, hindering efforts to bring only the best projects to scale.	Establish a clear methodology for defining and measuring success, with baseline data, to assess concrete progress. (DFID: "No innovation without evaluation.")
	Accountability	Risk that lack of responsibility of accountability to the affected population and donors results in short-lived projects which have little impact and at worse cause more harm.	Improve mechanisms for sustained dialogue and communication during all stages of the innovation process.
	Humanitarian principles	These principles are defined to ensure that humanitarian actors are set apart from others in an emergency, particularly where conflict is involved. When violated, humanitarians become indistinguishable from others, undermining access to crisis-affected people. Outside actors may not subscribe to these principles, and their conduct may contradict them, putting the humanitarian system and affected population at risk.	Bring greater awareness to non-traditional humanitarian actors about the principles and how they are to be managed.
	No conflict of interest	Particularly for partners such as corporations or military actors, whose reach may be global and whose motives and aims differ from those of humanitarians, past actions may provoke suspicion from the affected population.	Draw upon best practices from across the sector for setting expectations in partnerships, establishing clear terms of reference that can be applied to humanitarian innovation.

3. The Innovation Cycle in Practice

Despite the many challenges, actors within and outside the humanitarian system have successfully undertaken innovations. This section explores some examples, using “the innovation cycle” as a framework for analyzing them. As noted above, innovation is a means of finding and scaling solutions to problems, in the form of products, processes or wider business models. A range of models have been used for thinking about the innovation process (Ramalingam et al 2009);^{vi} however, the most simple is to view it in four stages (Betts and Bloom 2013): 1) defining a problem or identifying an opportunity; 2) finding potential solutions; 3) testing, adapting and implementing a solution; and 4) appropriately scaling the solution (See Figure 2)

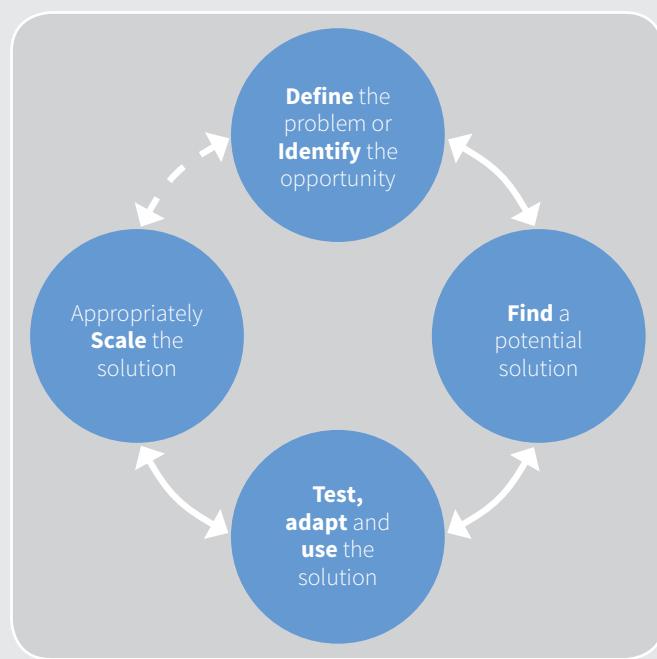


Figure 2: The Innovation Process

The cyclical depiction of the innovation process illustrates the continuous learning and feedback in each stage (Betts et al 2012). The introduction of a solution is not the end of the process, but the beginning of testing, learning and refining. The process may lead back to a redefinition of the problem, to testing that rules out the idea, or to a solution that can be replicated and scaled. Innovations may take the form of

products, processes, positions, or paradigms. This section looks at examples of the most common forms, product and process innovations.

Product Innovations

Most product innovations begin outside the humanitarian environment, typically led by commercial enterprises. The consumer market is made up of humanitarian organizations purchasing items for a variety of contexts, often on behalf of crisis-affected people. Individuals, small companies or larger product suppliers define the problem and opportunity for new products and invest in their R&D before pitching them to humanitarian agencies. There is often only a limited commercial market for such products, largely for camping, hiking or for military use. Even sales to humanitarian agencies are often limited due to the lack of consultation with humanitarian actors during the design process, which therefore limits the fit or robustness of the final products. In addition, emergency equipment is often only required in the first phase of a response, while in the long-term local products and more sustainable solutions are preferred.

While humanitarian agencies rarely develop products in-house, partnerships with private companies and academic institutions are becoming more common. Examples include WASH kits designed by Oxfam, World Vision’s Last Mile Mobile Solutions (LMMS^{vii}) distribution tracking software, and the new UNHCR shelter developed in partnership with the IKEA Foundation.^{viii} A common barrier to R&D within humanitarian agencies and through partnerships is donor procurement regulations, such as tenders and supplier offer comparisons, which may not favor suppliers who invest in research and development.

Process Innovations

In contrast, process innovations, which adapt modes of delivery and models of operation, typically originate with humanitarian agency staff themselves, especially in emergency settings. During the first phase of a rapid onset emergency,

process innovation may even happen at the hands of grant writers designing programs and budgets rapidly to respond to changing needs and to secure funding.

Examples of process innovations in the humanitarian system include Cash Programming, Community Led Total Sanitation (CLTS), and the Emergency Market Mapping Assessment (EMMA) toolkit. Process and product innovations often work closely together: it is common to hear people speaking about product innovations that will solve a multitude of process issues or vice versa (Ramalingam et al 2009). The use of cash in emergencies, for example, has been followed by product innovations such as mobile money transfer technology, which have enhanced the effectiveness of the

process innovation. In the case of the Community Managed Acute Malnutrition approach, products such as the high-calorie therapeutic food product Plumpy'Nut, are combined with behavior change programs at the local level, as well as communities of practice at the global level.^{ix} While some innovations can be scaled quickly, the iteration and re-use of ideas is often ad hoc and fails to incorporate feedback or expert findings from outside the sector, leading to misuse of tools and poor adaptation.

The table below shows examples of product and process innovations, the stages of innovation, and lessons learned, while the annexes describe each case in detail.

Table 5: The Innovation Process in Practice

		Product innovations	
			
Defining the problem or finding an opportunity	The lack of clean water among poor communities is a well-understood and widespread problem. There is a secondary problem of limited local employment opportunities.	Ceramic Water Filter	Lifesaver Cube
Finding a solution	The filter was developed in Guatemala and used locally. In the 1990's, Potters for Peace recognized an opportunity to scale up manufacturing and use, working with local materials and potters, for adoption in similar rural and semi-urban locations.		Technical development took 12 months from the time that the basic filtration technology was developed.
Piloting, adapting and implementing the solution	<ul style="list-style-type: none"> Potters for Peace trains partners and potters in standardized production of the filters. The approach has been amended from lessons learnt, including failures. The solution can be adapted for local markets, using local tools, raw materials, clay and skills. More than 40 university studies have been conducted on the ceramic water filters through coordination with Potters for Peace, enabling ongoing research and development. 		<ul style="list-style-type: none"> Consultations with Oxfam and DFID ensured the product was robust and considered the humanitarian environment in its design. The product out-performs others in the market (as measured by the size of bacteria it can filter).
Scaling the solution	<ul style="list-style-type: none"> The solution has been scaled by sharing the design and process with local partners. Local skills are the basis for the manufacture, and a strong network of NGO customers maintains demand. Potters for Peace is a non-profit but get over 50% of income from consulting and pottery sales. A global network of potters produces the filters, for international actors to buy locally. 		<ul style="list-style-type: none"> The product is sold to NGOs, military and camping markets, and is not reliant on any one market. The company is a pre-approved supplier for DFID's Rapid Response Network, giving it access to humanitarian agencies. The product is patented and can only be produced by Lifesaver Systems.
Lessons Learned	<ul style="list-style-type: none"> Local relationships and international networks get the product to a wider market. Local materials and skills create profitable, low-cost solutions for local producers. Existing networks of artisans or technicians foster quality and sustainability. Work and business opportunities builds local support and makes use of skills. Solutions match existing culture and practice, backed by international experts or institutions, encouraging adoption. 		<ul style="list-style-type: none"> Early consultation with purchasers enables acceptance of solutions developed by non-humanitarian actors, silencing concerns that "they just don't get it." Technology exceeds the minimum requirements of experts and makes it preferable in competitive sectors. Appeal to non-humanitarian markets may increase investment in product development.

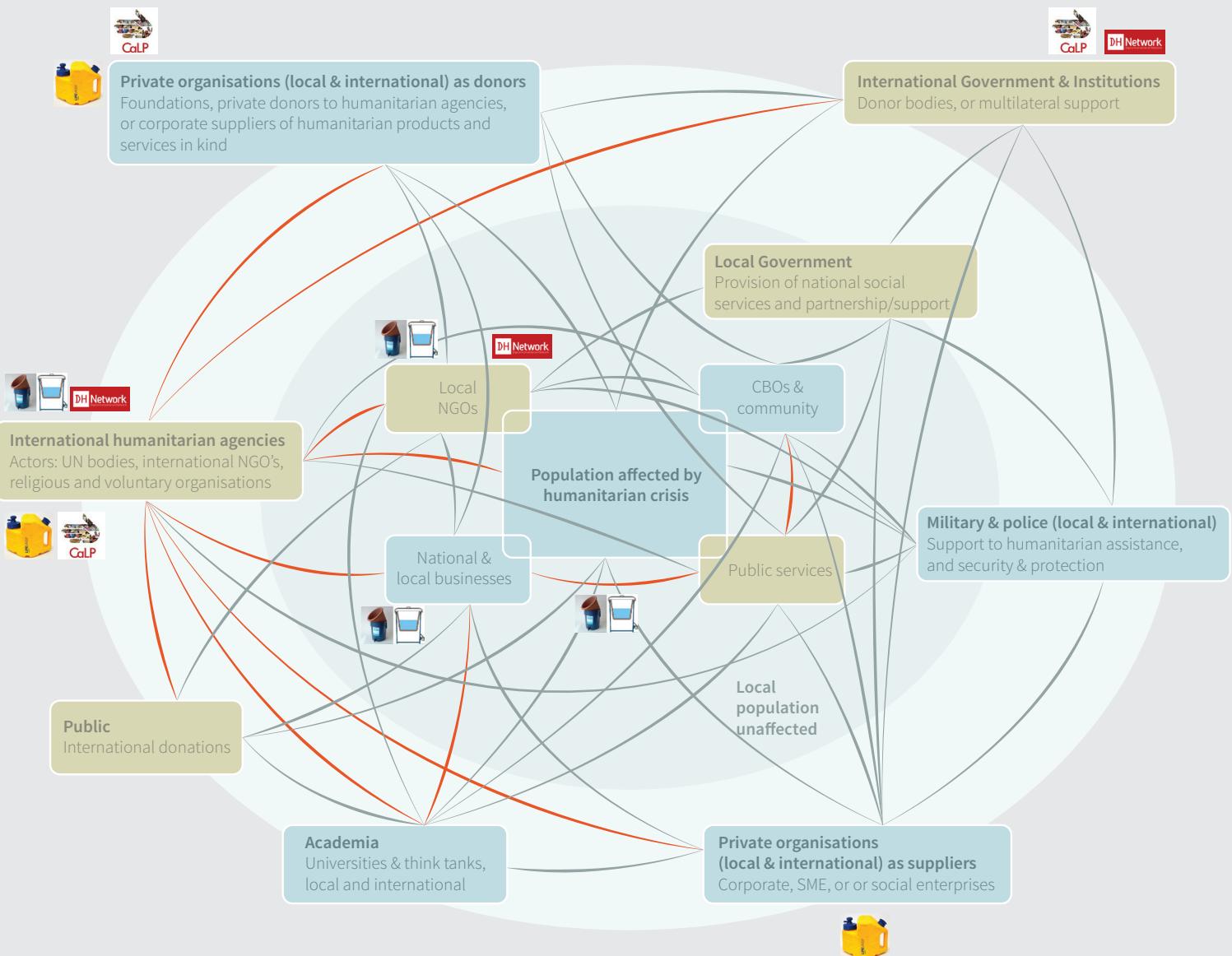
Process innovations

 The Cash Learning Partnership	 Digital Humanitarian Network
Several agencies demonstrated that cash programming could work in the response to the 2004 Tsunami, despite gaps in monitoring and managing implementation.	Initiated in 2012 by two individuals inspired by the need to coordinate digital services among volunteer groups.
<ul style="list-style-type: none"> • A steering committee of five NGOs, with interest from governments and donors, created CaLP to “support capacity building, research and information sharing”. • CaLP is made up of practitioners who understand needs and solutions. • Collaboration with private sector and academia built knowledge. 	Groups and volunteers were already carrying out data collection and analysis. The creation of a network-of-networks provided access to “formal” organizations and a needed service.
<ul style="list-style-type: none"> • CaLP has developed research materials and tools since 2006. • The small circle of users means that the scope of work is well defined and target audience understood. 	Different volunteer groups are activated by formal groups during an emergency. Over the few years of operation, guidelines have been developed to share learning with agencies and volunteers .
<ul style="list-style-type: none"> • Tools are used by humanitarian actors and guided by the steering committee and multi-stakeholder meetings. • Cash programming is now used beyond livelihoods and food-security, to assess and support markets (i.e. WASH). 	The network is still very new but growing in recognition and drawing in more volunteers through its umbrella.
<ul style="list-style-type: none"> • System-wide support for a new practice (cash-based programming) enables greater funding for related products and partnerships. • The relatively small circle of users of its outputs (namely traditional humanitarian agencies), means that the scope of its work is well defined and target audience well understood. • Poorly understood methods may be seen as a panacea and overused. 	<ul style="list-style-type: none"> • Diversity of technical capacities among members contributes to the versatility of the networks. • Individuals are critical to launching new initiatives, particularly in providing vision for voluntary networks.

Building on the system depicted in Figure 1 earlier, Figure 3 illustrates the ways that actors collaborated to contribute to the innovations described on the previous page. Most innovation resulted from partnership among several, though not necessarily all, actors in the system, each with different capacities. The icons representing each innovation are positioned next to the partners involved.

By understanding this wider system and recognizing their role in it, humanitarian actors may better exploit untapped opportunities. Taking full advantage of the capacities in the system will require incentives within humanitarian organizations to encourage interaction, collaboration and partnership, even with non-traditional partners.

Figure 3: The Humanitarian Ecosystem - Examples of Collaboration in Innovation



4. Innovation within Affected Communities

The humanitarian innovation debate has been broadly top-down, focusing mainly on improving the tools and practices of international humanitarian actors. This top-down approach tends to be short-term and project-based, addressing predefined problems with solutions from external actors. While an important part of the debate, this focus overlooks the talents, skills, and aspirations of crisis-affected people themselves. How can the humanitarian system encourage user-led design and innovation by affected people that responds better to their needs?

The literature on user-centered design, indigenous innovation, and participatory methods provides an alternative, bottom-up model that builds on the capacities of affected populations (Betts and Bloom 2013). The concept has two key elements: 1) recognizing and understanding innovation capacity within communities and 2) putting these communities and local systems at the heart of the innovation process, regardless of where ideas or resources originate. The bottom-up, or, community-centered, approach is not a new idea for humanitarian work. Participatory approaches are well known among development and humanitarian practitioners, and can facilitate ideas and solutions within a community. However, participatory approaches have often failed because they take information but offer no new solutions. Combined with these participatory strategies, the innovation cycle offers a hands-on model for engagement.

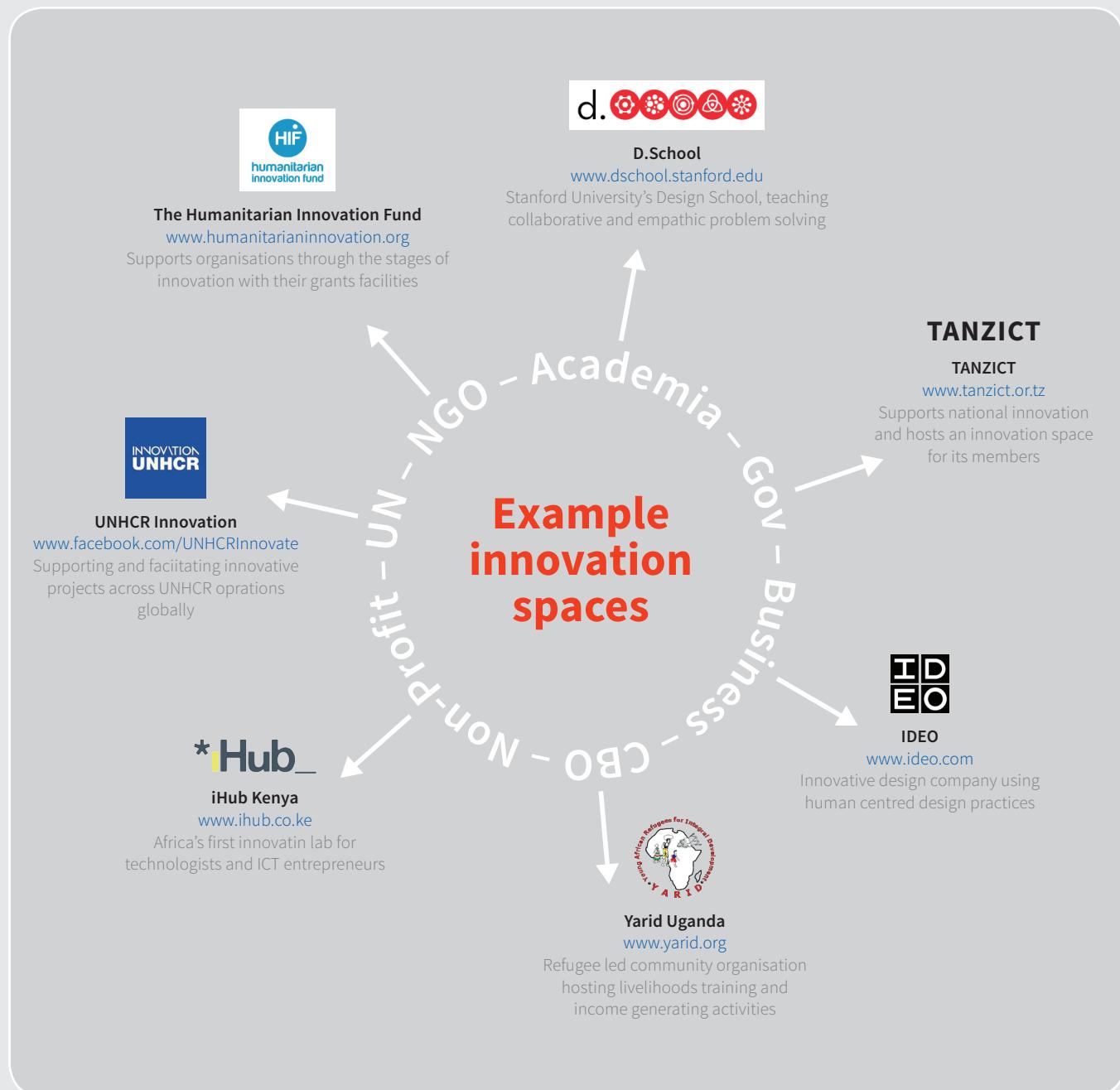
The most cutting-edge research in this area concerns refugees. When refugees cross borders, they must adapt their livelihoods to new regulations, social networks, and markets. In Uganda, where the government recognizes refugees' right to work and allows an unusually high freedom of movement, there is significant innovation that includes engagement with the private sector and technology-enabled livelihood activities. Rather than being isolated communities dependent on humanitarian assistance, refugee settlements like Nakivale and Kyangwali in Uganda

are vibrant and inter-connected economic communities in which bottom-up innovation flourishes (Betts et al 2014; Kaplan and Omata 2013).

This is not to say that bottom-up innovation should be romanticized. Affected populations frequently need significant external support, especially during the emergency phase, and bottom-up solutions are subject to local power dynamics that can exclude the groups most in need of humanitarian response. In more constrained regulatory environments, refugees may not even have a right to work, and even in Uganda livelihoods innovation was constrained by access to capital, training, and infrastructure. International donors wishing to support local innovation have also struggled to provide direct grants, given unwieldy financial and management standards.

Although bottom-up innovation is subject to these legal, economic, and social constraints, enabling conditions can be encouraged. One emerging area of interest concerns various forms of "innovation spaces," which can be physical or virtual spaces for sharing ideas and resources. Many of these spaces are dedicated to innovation for the development sector, but they provide a model that has potential to address humanitarian challenges as well. From major companies like Google, to small hubs like iHub in Nairobi, to Mara Launchpad in Kampala, to "maker spaces" around the world (see Figure 4, next page), a growing litany of spaces encourages and supports sustainable innovation. UNICEF's Innovations Lab Kosovo provides Kosovar youth both mentorship and seed grants to pilot and develop social enterprise initiatives. In response to Cyclone Nargis, the Paung Ku consortium funded the initiatives of self-help groups and community-based organizations,^x and a Learning Resource Centre provided information and training services while acting as a clearinghouse for external collaboration with the local initiatives.

Figure 4: Example Innovation Spaces



Innovation spaces may overcome barriers at different stages of the innovation process, by providing resources, funding, skills, collaborative processes, or simply safe environments to test ideas. The greatest benefit of these seems to come

from the networks that are created, even if virtual or online. They not only support community innovation, but also proximity to community-defined needs and the ability to build on local capacities, rather than duplicating them.

5. Advancing the Debate

A growing group of individuals and organizations is pushing against significant barriers to create a more conducive ecosystem that can invite new ideas, provide transparency about resources, and facilitate scaling. However, further collaboration is needed to encourage strategic and responsible innovation in the humanitarian system. The areas identified below address the unique challenges of innovating in the humanitarian system, drawing on the lessons learned from the case studies.

Focusing on the user:

The humanitarian system has primarily invested in innovation that can improve responses by international organizations. However, the skills, talents, and aspirations of affected communities remain a largely untapped source of sustainable and creative solutions. The case studies indicate that user-led design tends to lead to community buy-in, sustainability, and easier scalability, especially when it builds on local relationships and provides visible economic benefits. At a minimum, early consultation in design can ensure that solutions fit with cultural practices (as with the Potters for Peace ceramic filters). Early consultation is particularly important for researchers and entrepreneurs newly engaging with the humanitarian system.

To encourage a focus on the user, the system needs greater investment in innovation spaces and opportunities that mentor, accelerate, and incubate the initiative of affected populations and local organizations. In addition, international organizations can ensure that users drive the process of defining priority areas for innovation, testing out products and processes to meet those needs, and providing feedback during implementation and scaling.

Expanding the Market:

United Nations organizations have been insulated from free market competition, while a small number of NGOs operate in an artificial oligopolistic market with significant barriers to entry for smaller entities or those from other sectors. Although this small and highly specialized market is unlikely to shift dramatically, other actors can be brought in through

a platform for brokering or facilitating connections. Expanding this “controlled competition” will encourage a wider set of actors to make valuable contributions, as demonstrated by the Humanitarian Innovation Fund’s WASH Challenge, the UN Foundation Accelerator, and the Grand Challenges model used by the Bill and Melinda Gates Foundation and the Government of Canada. In addition to encouraging new actors and greater competition, market forces can be harnessed when there is a viable commercial use for a product, such as Lifestraw’s camping and military uses. Ideally, commercial markets in crisis prone countries would be targeted to develop local production and maintenance capacity for new products.

Encouraging Responsible Risk:

As noted above, humanitarian donors and agencies have historically been risk-averse, driven in part by the fear that failure can lead to immense suffering and even loss of life. In addition, most donors and humanitarian organizations assess performance at the project level, without looking at the larger picture.

However, organizations are starting to look at the overall value produced by a portfolio or series of projects. This portfolio approach spreads risk across a set of projects — some “high risk” and some more traditional — so that “the impact from one or two big, transformational successes in a portfolio can justify the opportunity cost of many failures,”^{xii} and the benefits of iterative development can be seen. Creating a more flexible system of funding and evaluation that supports learning from, and not punishing, failures can help maximize scarce resources and social impact, as long as ethical standards are established and followed.

Fostering Collaboration:

Humanitarian actors have a culture of isolation that creates barriers to innovation, due to funding incentives and the view that only they can uphold humanitarian principles. Business and other actors, many of which have vast technical and financial resources, have aims distinct from, and sometimes in conflict with, those of humanitarian actors.

Even within the system, there is a risk that individual efforts by donors, UN agencies, and NGOs will result in one-off solutions that are not shared and diffused. What many actors are now calling for is not a traditional coordination mechanism but rather a functional ecosystem in which actors can work collaboratively together. This outcome will require a more nuanced and shared understanding of roles, incentives, capacities, principles, financing, skills, knowledge, mindsets, research and development, and resources.

Collaboration is also another way to share the risks that hinder innovation, as each institution can contribute within its capacity, rather than investing in new areas of technical expertise. Collaboration should go beyond institutions to support and connect the individuals who often play a vital role in recognizing and diffusing new ideas. Fostering this will require a re-think on incentives, which today tend to favour competitive models, as organizations compete for public funds.

Building a supporting environment for innovation:

Many organizations, notably UN agencies, face the challenge of building in-house acceptance of innovation activities. Even where innovation is encouraged, field workers often wish to keep their initiatives to themselves rather than sharing what they have learned, for fear of intervention from headquarters. However, innovation needs to be encouraged as part of the work of all humanitarians, within a culture of adaptation, change and constant improvement.

Such cultural change is a challenge, particularly in large organizations. However, an innovation mindset can be fostered through changes in incentives and practices: opportunities to reflect creatively; dialogue that transcends bureaucratic hierarchies; connecting field and technical staff with headquarters and with one another; secondments within other organizations and sectors; greater human resource mobility across organizations; and encouraging rather than punishing early failure as a means of learning. The ultimate aspiration should be to create a humanitarian culture within which support for principled and participatory innovation is the norm.

As part of changing mindsets, leaders must ensure practical measures are in place to support, rather than obstruct, their staff's effort to implement an innovation approach. Many staff are in need of information on resources and support throughout the cycle, not solely in financial terms but also through mentorship, tools and training. Organizations should also review any structures and regulations that inhibit innovation, such as barriers to movement into and out of the system to acquire new experiences or skills or procurement rules that limit flexibility to pilot alternative products, processes or partnerships, particularly with the private sector.

Upholding Principles:

In the context of providing assistance and protection to vulnerable populations, innovators must be vigilant about adherence to humanitarian principles. Even a small number of cases of exploitation could discredit the endeavor of humanitarian innovation. It is important that the humanitarian system develops clear and transparent principles or codes of conduct to ensure that humanitarian innovation upholds ethical considerations. Such principles might take the form of Voluntary Codes of Conduct, for example, creating a brand incentive to new actors to uphold those ethical standards in their humanitarian work.

Conclusion

Innovation is already and irreversibly part of the humanitarian system, driven by a demand for new models, growing private sector engagement, and rapid technological change. By creating shared definitions and principles, identifying good practices, and lifting barriers to ethical, user-led innovation, humanitarian actors can help transform the sector and meet the challenges of an ever-changing world.

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ⁱ Jim Kalbach outlines a model based on four zones of innovation: incremental (low tech progress, low market impact), breakthrough (high tech progress, low market impact), disruptive (low tech progress, high market impact), and game-changer (high tech progress, high market impact). He suggests that the first of these should be the most significant proportion of most organizations' innovation activities, with a 5:2:2:1 ratio for organizations' innovation investments across these four types. <http://experiencinginformation.wordpress.com/2012/06/03/clarifying-innovation-four-zones-of-innovation>

ⁱⁱ "Saving Lives Today and Tomorrow: Managing the Risk of Humanitarian Crises." OCHA, 2014.

ⁱⁱⁱ See "Global Estimates 2014," available at <http://www.internal-displacement.org/assets/publications/2014/201409-global-estimates.pdf>.

^{iv} See GSMA report on "The Mobile Economy 2013", available at <http://www.gsmamobileeconomy.com/GSMA%20Mobile%20Economy%202013.pdf>

^v See <http://unicefstories.org/principles/>. UNICEF innovation principles

have been endorsed or adopted by the following partners: UNICEF, USAID, Gates Foundation, EOSG Global Pulse, WFP, OCHA, UNDP, SIDA, IKEA Foundation, UN Foundation, and UNHCR.

^{vi} See the Humanitarian Innovation Fund's website for how it depicts "the innovation process", <http://www.humanitarianinnovation.org/innovation/process>

^{vii} See Last Mile Mobile Solutions website <http://www.lastmilemobilesolutions.com/>

^{viii} See "Designing a better home for refugee children", available at <http://www.ikeafoundation.org/designing-a-better-home-for-refugee-children/>

^{ix} For more detail see <http://www.cmamforum.org/>.

^x Read the full ALNAP report on the Paung Ku initiative at <http://www.alnap.org/resource/5790.aspx>

^{xii} "Strategic Philanthropy for a Complex World." Stanford Social Innovation Review. Summer 2014.

Annex 1: Examples of Humanitarian Innovation

1) Ceramic Water Filters

A huge variety of low-tech products, also known as appropriate or intermediate technologies, are produced by local inventors and tradesmen using available materials. However, few are scaled and used world-wide due to the challenge of designing low-tech products to be replicable and up to a standard, while remaining appropriate to the local context and materials. The ceramic water filter, made from local clays in small-scale factories, is an exception. Although not originally designed for humanitarian response, the product has made its way into humanitarian supply chains.

Background

Although ceramic filters were invented in the late 1800's, Dr. Fernando Mazariegos developed the ceramic pot model in Guatemala in 1981. In the 1990's Ron Rivera of Potters for Peace, a non-profit organization working with subsistence potters in Central America, adapted the design and standardized the manufacturing and training processes used to disseminate the filter. The filter uses the skills of craftsmen and potters and locally available materials, and offers an affordable and familiar product for household use. Potters for Peace helps partners to help establish small factories or workshops. The organization sends volunteers to train local potters and help set up the manufacturing equipment and process to ensure quality. Follow-up visits support over 50 small factories and workshops worldwide.

The devices work by filtering water through small cracks and through air holes created when sawdust or cornhusks mixed into the clay are burnt away during firing. Additional bacteria are killed off by a colloidal silver layer coating the inside and outside of the filter. The filter meets WHO standards and is thought to remove 99.88% of water borne disease agents.

Reflections on the process

The proliferation of workshops to produce ceramic filters has been enabled not just by individual champions, but also by external factors. Good relationships between potters and the organization Potters for Peace were already in place before the ceramic water filter project took off. The

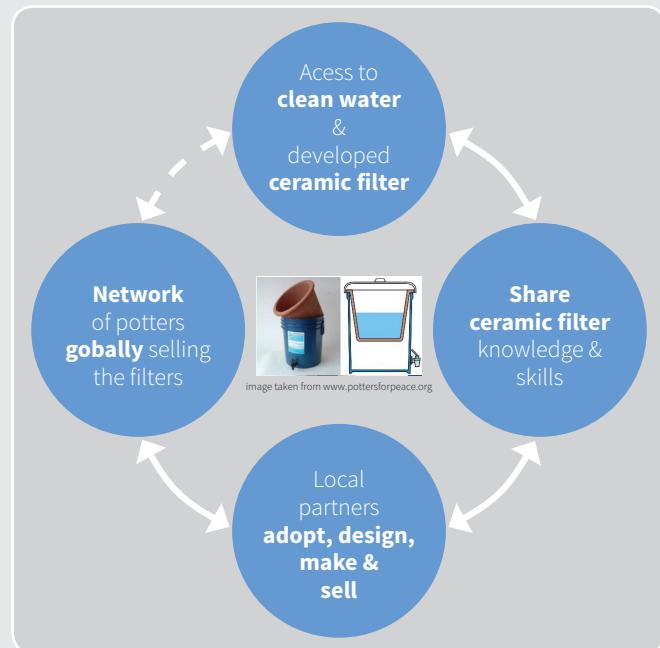


Figure 1: The Innovation process for ceramic water filters

clay material and local crafts skills required to make the ceramic filters are also found in rural areas around the globe, making training relatively straightforward. The relatively low investment needed makes the manufacturing process accessible and replicable. Potters for Peace gained financial independence from these activities, helping the organization maintain long-term relationships with the independent factories in the form of training and support.

The filters are easy to use in the home since people are already accustomed to storing water in similar receptacles. Point-of-use water filtration endorsement by the UN and WHO then helped scale devices such as the ceramic water filter. University interest, as well as support from international organizations, also helped to spread local manufacture and development. Finally, the workshops and small factories are established to meet the demand of local partners who approached Potters for Peace, so there was little need to build buy-in from stakeholders.

The filters have already spread to larger local manufacturers for purchase during emergency responses by NGOs, as in

Myanmar for the response to Cyclone Nargis in 2008. Local suppliers are often sought after in humanitarian procurement, especially in the case of Myanmar due to strict and expensive import regulations. In Myanmar there are currently four suppliers mapped on the Potters for Peace site.ⁱ

The model could be tried with other low-tech products, helping to ensure that quality standards of a locally produced product are met. In fact, there are new ideas and products created each day, but an effective delivery model for getting them into markets seems to be the key determinant for scale and sustainable use in low-income and humanitarian contexts.

2) The Lifesaver Cube

Originally inspired by the aftermath of the 2004 tsunami, Lifesaver Systems water filtration products reach the military, camping and humanitarian markets alike. One of the newest products is the Lifesaver Cube, which carries 5L of water and uses an inbuilt hand pump and filter to provide clean drinking water for household use.

Background

The Lifesaver Cube filters 5000L over its lifespan, enough to provide the WHO daily clean water requirement of up to 3.7L per person for a family of five for nine months. Despite misleading claims selling the product as “the new solution in the fight against water poverty”, like many point-of-use filters, the Lifesaver Cube is a relatively short-term solution for the first phase of an emergency. What makes this product stand out is its performance in filter technology, as the product filters out bacteria and viruses to a smaller size (15 nanometres) than other point-of-use filters. Tests from the Tropical School of Hygiene and Medicine support the performance of the Lifesaver Cube against viruses and bacteria, although, like most other filters, not salt and heavy metals.

Reflections on the process

DFID and Oxfam were consulted in the development of the product, and their feedback was taken into consideration for the design. Lifesaver Systems has been pre-approved to sup-

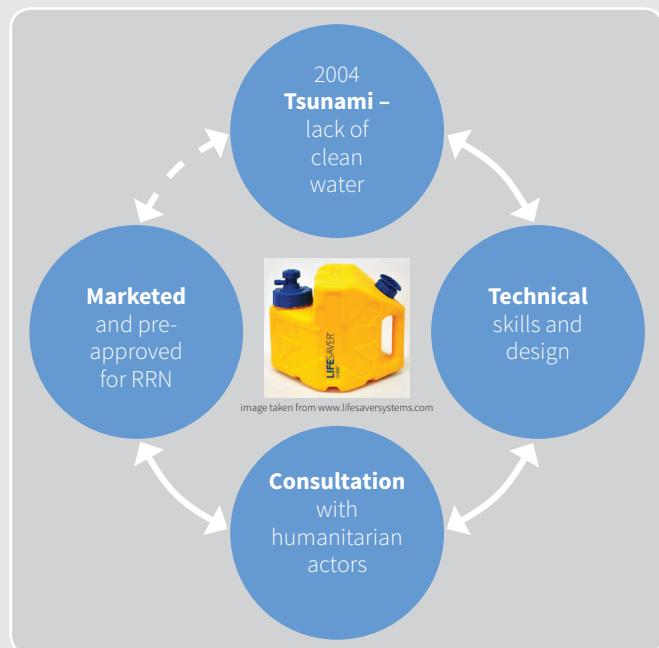


Figure 2: The innovation process for the Lifesaver Cube

ply to emergency responses as part of DFID's rapid response network.ⁱⁱ This buy-in from humanitarian actors may help the scale of the product, and has certainly helped in creating a robust filter for harsh conditions. However, it may face the same challenges for long-term use as most distributed items: maintenance after the emergency phase.

In an effort to quickly scale point-of-use water filters, as UNICEFⁱⁱⁱ and WHO^{iv} call for, companies often oversimplify the problem, lacking a full understanding of the context. The Lifesaver Cube has not faced the same critique as the Lifestraw, which has been criticized for not solving the real problem of water access and transport. However, although its storage capacity addresses this problem, even the Lifesaver Cube requires nearby water sources during an emergency response. The inventor of the Lifesaver Cube has stated, “[W]here do people live? Near water. All we have to do is make that water clean.”^v Unfortunately, the solution is often more complex.

3) Cash Programming

Since 2004, interest has grown in delivering cash or vouchers in place of, or as a supplement to, traditional aid such as food and non-food items. While money has been used as a form of aid for hundreds of years, in modern humanitarian assistance, distributions of cash are only now scaling as a widely accepted response.

Background

As attention builds to empowering communities, recognizing local markets and finding more cost effective ways to deliver aid, cash programming is an attractive new alternative. Along with new practices comes the need for processes and skills to execute them. The Cash Learning Partnership (CaLP), established to better understand and promote the use of cash programming, is developing research, evaluation and other knowledge on the topic.

CaLP produces and shares resources on the topic, disseminating new concepts, developing mechanisms, researching and sharing lessons learned. Recognition of the need for cash programming has led to CaLP's broad funding sources including international donors and States, as well as private sector support from Visa. These resources, combined with buy-in from practitioners and donors, have encouraged collaborative innovation in this emerging area.

Reflections on the process

The interest in promoting effective cash programming comes from several motivations in the humanitarian sector. Proponents argue that cash programming:

- **empowers recipients** and enables them to make their own choices.
- **supports restoration of the local economy** as people use purchasing power to buy locally.
- **is a cost effective way to deliver aid** to beneficiaries.
- **involves low-cost research, development and advocacy** (compared to product development).
- **addresses recent major humanitarian shortcomings.**

The 2004 tsunami and 2010 Haitian earthquake spurred calls for improving practices that came under extreme strain in large responses. Extensive, unrestricted funding facilitated new ideas and approaches.

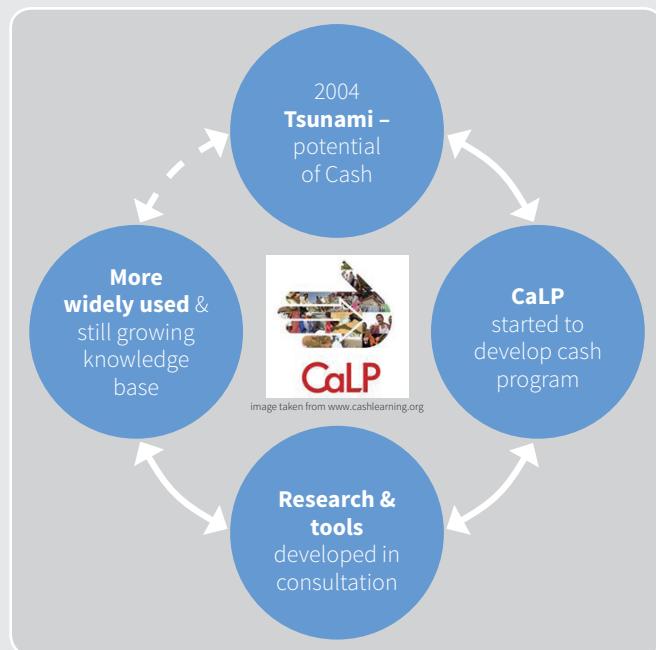


Figure 3: The Innovation process for CaLP

- **acknowledges the changes in the nature of food as a global commodity.**^{vi} Food surpluses are declining the North, even as recognition grows that food insecurity is often linked to a lack of access to markets and not necessarily a shortage of food.

Cash-based responses also expanded rapidly due to the financial downturn, as donors and organizations look for cost effective options. Cash delivery has also been enhanced through existing and emerging technologies, primarily mobile phones and cash transfer cards.

Another enabling factor has been the consensus that learning should be shared among the small pool of practitioners and like-minded organizations. CaLP has demonstrated that partnerships focused on research and guidance can provide accountability and best practices from early in the evolution of a new concept. Buy-in from agencies is helped by the fact that the steering committee is made up of humanitarian organizations.

New approaches can test the skills and expertise of existing staff, while conversations tend to focus on managing the delivery of cash, rather than assessing the impact of the

responses. Centralized resources such as CaLP help address these issues, and there is more potential for collaboration beyond traditional humanitarian actors to incorporate new skills and lessons into design and development.

4) Digital Humanitarian Network

Academics, small start-ups, and a large public volunteer base with coding, mapping or other skills are developing internet and communication-based technologies (ICT) specifically for humanitarian work. Supporting development of ICT in emergencies, the Digital Humanitarian Network (DHN)^{vii} is a volunteer network of almost 20 organizations that provide skills and digital services in emergency settings, such as using data from social media to identify the immediate needs of communities. Information sharing through new technology and networks is also becoming more common among humanitarian organizations, such as the Humanitarian Genome project,^{viii} which is developing a search engine for evaluations and best practices to strengthen emergency response.

The DHN aims to be a “consortium of Volunteer & Technical Communities (V&TCs) and to provide an interface between formal, professional humanitarian organizations and informal yet skilled-and-agile volunteer & technical networks.”^{ix} Members specialize in services ranging from mapping to translation, contributing to data capture and analysis for humanitarian response.

Background

The recent UN OCHA report on Humanitarianism in the Network Age (HINA) covers the key discussions and insights regarding technology and process innovations affecting humanitarian work in the field. The most notable point made by this report concerns the opportunity to enable two-way communication with affected populations and to engage them in making decisions and finding solutions. The report makes four key points:

- Information is a basic need in humanitarian response.
- How humanitarian information is collected, shared, and analyzed needs to change fundamentally.
- There is a need for new capacities and ways of thinking to understand and use new information sources.
- New technologies bring new risks, and humanitarians

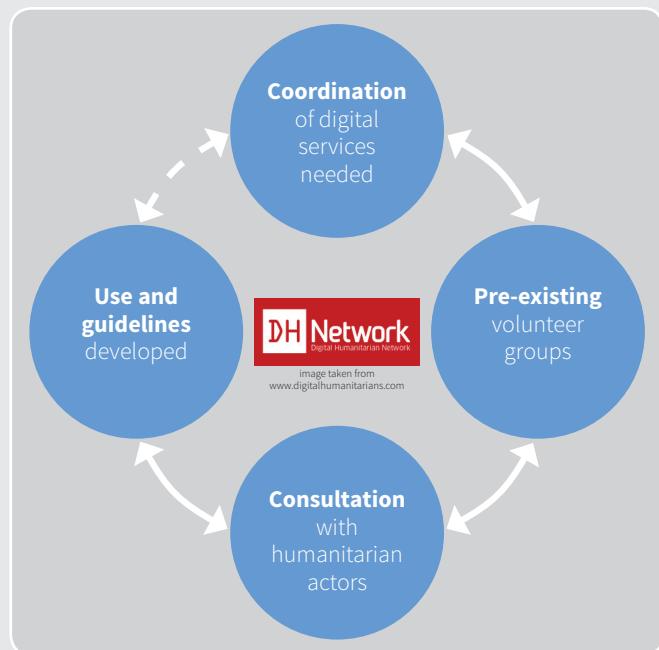


Figure 4: The innovation process for the Digital Humanitarian Network

need to develop guidelines to ensure that information is used in an ethical and secure manner.

Mobile phone technology has become cheaper and more available, accounting for a rise in subscriptions to an estimated 95.5% of the world's population, with an estimated 3 billion actual users by the end of 2014.^x Innovations have piggybacked onto this technology, expanding access to information and communication for humanitarian agencies, affected populations and other stakeholders during a response. Research into a vast range of mobile product and process innovation includes development of mobile health diagnosis and treatment, and new ideas for water point monitoring and distribution. The use of SMS and mobile networks has already shown success for money transfer and capture of mass data that can be fed into online social media and data analysis.

Reflections on the process

The story of the DHN shows the importance of individuals as drivers of innovations and ideas. Innovation thinkers Andrej Verity (OCHA) and Patrick Meier founded the network.

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Another lesson can be found in the HINA report's emphasis on the importance of "connecting raw data to analysis and then analysis to decision makers." Although the DHN can provide capture and analysis of some of the vast amount of publically available data, good decisions still have to be made about what information to use and what to do with the results.

Finally, because humanitarian responses experiment with public and crowdsourced data, the humanitarian community should formulate clear guidelines of how the data can be used. Humanitarians need to reflect on the purpose of that data in particular contexts, and how to engage the populations providing the data. Like many innovations in the humanitarian sector, new and emerging ideas in data analytics should not be seen as a panacea, but appropriately applied where they can have the greatest impact.

5) Implications for humanitarian innovation

Drawing on these examples, a number of observations emerge that may inspire further discussion on humanitarian innovation in practice:

- Key individuals play a vital role in pushing new ideas.
- Collaborative innovation needs to be timely to capture interest and funding opportunities.
- Researchers and entrepreneurs from outside the traditional humanitarian agencies benefit from collaborating with end-users and agencies to define problem statements and designs.
- Existing relationships with partners and the community help obtain buy-in and diffusion.
- Creating solutions that fit into, use, and support local systems and markets may scale faster and more sustainably.
- Positioning a new idea within a wider ecosystem of humanitarian innovation increases opportunities and resources.

ⁱ Potters for Peace factory locations, available online at <http://pottersforpeace.com/filter-map/>

ⁱⁱ "Disasters: Rapid response network ready if crises hit", May 2012, available online at <https://www.gov.uk/government/news/disasters-rapid-response-network-ready-if-crises-hit>

ⁱⁱⁱ UNICEF, Promotion of household water treatment and safe storage in UNICEF WASH programmes, 2008, available at http://www.unicef.org/wash/files/Scaling_up_HWTS_Jan_25th_with_comments.pdf

^{iv} WHO, 2009, Scaling Up Household Water Treatment Among Low-Income Populations, available online at http://whqlibdoc.who.int/hq/2009/WHO_HSE_WSH_09.02_eng.pdf

^v "Lifesaver: Tales From The Inventor", available online at http://inventionstories.com/invention_stories/invention_stories/tales_from_the_inventor/lifesaver/

^{vi} See Norad, "We Accept Cash: Mapping Study on the Use of Cash Transfers in Humanitarian, Recovery and Transitional Response", 2011, available online at <http://www.norad.no/en/tools-and-publications/publications/publication?key=380278>

^{vii} See <http://digitalhumanitarians.com/>

^{viii} "The Humanitarian Genome (HG): Generating Organizational Wisdom", available online at <http://www.humanitarianinnovation.org/projects/small/humanitarian-genome>

^{ix} Digital Humanitarian Network website <http://digitalhumanitarians.com/about>

^x International Telecommunication Union, "The World in 2014 ICT: Facts and Figures", April 2014, available online at <http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-e.pdf>



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