



DISASTER RELIEF 2.0

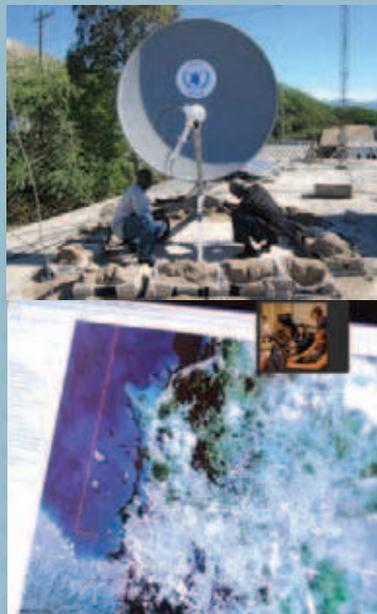
THE FUTURE OF INFORMATION SHARING IN HUMANITARIAN EMERGENCIES



Vodafone Foundation



HARVARD HUMANITARIAN INITIATIVE





REPORT PARTNERS

UN Office for the Coordination of Humanitarian Affairs

UN OCHA is the arm of the United Nations Secretariat that is responsible for bringing together humanitarian actors to ensure coherent response to emergencies. OCHA also ensures there is a framework within which each actor can contribute to the overall response effort. OCHA's mission is to mobilize and coordinate effective and principled humanitarian action in partnership with national and international actors in order to alleviate human suffering in disasters and emergencies; advocate for the rights of people in need; promote preparedness and prevention; and facilitate sustainable solutions.

<http://ochaonline.un.org>

The United Nations Foundation & Vodafone Foundation Technology Partnership

Created in October 2005, the United Nations Foundation & Vodafone Foundation Technology Partnership leverages mobile technology programs to support and strengthen UN global health and disaster relief work. Our core areas of focus are to: (1) strengthen communications in humanitarian emergencies through capacity building and support for disaster response missions that connect aid workers and the affected community; (2) support the development of mobile health (mHealth) programs that tackle critical public health challenges and improve public health systems, decision making and, ultimately, patient outcomes; and (3) promote research and innovation using technology as a tool for international development.

www.unfoundation.org/vodafone

Harvard Humanitarian Initiative

The mission of the Harvard Humanitarian Initiative (HHI) is to relieve human suffering in war and disaster by advancing the science and practice of humanitarian response worldwide. HHI is a leader in providing applied research, education and training on disaster man-

agement, humanitarian assistance, and humanitarian action. As an inter-disciplinary organization it has a history of producing high impact research that translated directly into evidence-based policy and programming.

<http://hhi.harvard.edu/>

Contact



United Nations Foundation
1800 Massachusetts Ave., NW Suite 400
Washington, D.C. 20036 USA



The Vodafone Foundation
One Kingdom Street Paddington,
London, W26BY UK
Registered Charity No: 1089625

Suggested citation

Harvard Humanitarian Initiative. Disaster Relief 2.0: The Future of Information Sharing in Humanitarian Emergencies. Washington, D.C. and Berkshire, UK: UN Foundation & Vodafone Foundation Technology Partnership, 2011.

The views expressed in the report are those of the authors and do not necessarily reflect those of the United Nations Foundation, The Vodafone Foundation or the Technology Partnership.

ACKNOWLEDGEMENTS

The report partners, the Harvard Humanitarian Initiative, the United Nations Foundation, the UN Office for the Coordination of Humanitarian Affairs (OCHA), and The Vodafone Foundation are thankful to the numerous individuals who have shared their ideas and experiences to inform this report. In particular, our thanks go out to the 41 experts who were interviewed by the research team:

Andrew Alspach, OCHA	Robert Kirkpatrick, UN Global Pulse
David Aylward	Martin Kristensson, WFP
David Bitner, Sahana	Charlotte Lattimer, Save the Children
Heather Blanchard, Crisis Commons	Brendan McDonald, OCHA
Oscar Caleman, World Food Program (WFP)	Patrick Meier, Ushahidi and Crisis Mappers
Kate Chapman, Humanitarian OpenStreetMap Team	Rob Munro, Stanford University and Mission 4636
Kurt Jean Charles, noula.ht	Gisli Olafsson, NetHope
Nicolas Chavent, Humanitarian OpenStreetMap Team	Jacobo Quintanilla, Internews
Choi Soon-hong, ASG and UN CITO	Daniel B. Prieto, IBM
Craig Clarke, U.S. Marine Corps	Mark Prutsalis, Sahana
Paul Currier, humanitarian.info	Eric Rasmussen, InSTEDD
Noel Dickover, Crisis Commons	Nigel Snoad, OCHA
Ramiro Galvez, UN Disaster and Assessment & Coordination (UNDAC)	Andrew Turner, Crisis Commons
Stuart Gill, World Bank Global Facility for Disaster Risk and Reduction (GFDRR)	Suha Ulgen, UN CITO
Alfred Gilman, WFP	Katrin Verclas, MobileActive
Chris Fabian, UNICEF	Andrej Verity, OCHA
Shelly Gornall, UN High Commission for Refugees (UNHCR)	Jeffrey Villaveces, OCHA
Wendy Harman, American Red Cross	Jaroslav Varuch, Ushahidi
Sanjana Hattotuwa, ICT4Peace Foundation	Bartel Van de Walle, Tilburg University
Dennis King, U.S. Department of State Humanitarian Information Unit	Nigel Woof, MapAction
	Jen Ziemke, Crisis Mappers

We would like to acknowledge the team that worked on creating and producing this report. At the Harvard Humanitarian Initiative, this includes authors John Crowley and Jennifer Chan; researchers Vincenzo Bollettino, Mark Foran, Gregg Greenough, and Gisli Olafsson; assistants Margeaux Fischer, Tara Suri, and Alexa Walls; and transcriber Ciara Jevon. At OCHA, this includes Oliver Lacey-Hall, Andrew Alspach, Mark Dalton, Brendan McDonald, Nigel Snoad, and Andrej Verity. At the UN Foundation and Vodafone Foundation Technology Partnership, this includes Adele Waugaman, Trinh Dang, and Sarah Hiller. Finally, we wish to thank copy editor Kate Sparks at Active Voice, LLC, designer Ambica Prakash at Eighty2degrees LLC and Hal Kowenski and Andre Temoney at Linemark Printing.

Of course, misunderstandings and errors remain the fault of the authors, who are indebted to those who will raise concerns and help us correct the record.

This report would not have been as compelling without the rich photos, graphs and tables contributed by those acknowledged throughout this report. Lastly, the research team would like to thank their spouses and partners for their patience during an intense writing process: Becky, Vaughan, and Wade.

HEALTH FACILITY MAPPING WITH SAHANA, OPENSTREETMAP, AND CRISIS MAPPERS

One of more difficult problems during the Haiti operation was determining where the health facilities were. The lists prior to the disaster were already out of date. Once the quake destroyed hospitals and clinics, the list became a critical must-have for OCHA.

The task was daunting. No agency had the definitive list; each had what is assumed was a fragment with some unknown number of facilities overlapping with other lists. Some lists listed the same place in three different lines of spreadsheet: one for French, Creole, and English. Some facilities appeared multiple times for other reasons, like doctors' offices that were inside a hospital.

Faced with a task that required speed and human labor, OCHA and MapAction asked the Crisis Mappers community if it could crowdsource the effort to geo-locate 105 health facilities that had no location data. WFP made a similar request, as did the U.S. Embassy in Haiti. Planning for this effort began on the evening of 20 January. Coordinated through Sahana and OpenStreetMap, this effort planned to use satellite imagery, OpenStreetMap data, and outside sources to locate almost all these facilities, using crowdsourcing to fill in the data by distributing the effort among dozens of people. The request to the crowd went out at 2:40AM on 22 January. Approximately 35 hours later, the team working on the problem had located the de facto list of 102 of the 105 missing hospitals used on the ground, inputting all the data into the Sahana disaster management system. They had verified each facility by having an OpenStreetMap member locate the hospital or clinic on high-resolution satellite imagery (15cm resolution) and verify that health facility was located at the submitted coordinates.

What happened next is critical to lessons learned from the response. Sahana made the data available in open data formats via several feed formats, including XML, KML, GeoRSS, and the XML schema designed for tracking hospital data, EDXL-HAVE. This resource became one of the best resources for health facility data for the next month. Over 8,000 unique individuals visited the site or pulled from these feeds. Crowdsourcing had taken a responsibility that would have taken OCHA days to complete and reduced it to a little more than a day of work. In the process, a group of V&TCs had built a process for locating health facilities—a process that is now being revised for the next disaster.

and technology sector. Together these activities can be seen as an attempt by the V&TC community to make sense of their own activities, and to start to apply both individual and collective intelligence to the problem of information overload and harmonization of effort.

Crisis Mappers and Open Aerial Mapping

High-resolution imagery—defined here as being able to see to the level of one meter—has not traditionally been available at the field level for operating agencies immediately after a disaster. Imagery can be critical to making operational decisions, especially in regards to logistics. But imagery also is time consuming to process and analyze—a task for which field staff has precious little time. During the response to the 2004 Indian Ocean tsunami, the UN staff in Aceh had asked for detailed imagery of bridge outages so that they could design supply chains around the island. They had also requested nighttime infrared imagery of the island, hoping that heat of campfires and congregations of (warm) people would help the UN identify where the populations of destroyed villages had moved. While they eventually received some imagery, they never received a data set that answered their operational questions.

Haiti was an entirely different case. A GeoEye/Google partnership released high-resolution imagery of the disaster 26 hours after the quake. Digital Globe soon followed. What was remarkable was that these providers released the imagery under an “attribution only” license, instead of the usual restrictive licenses that prevent derived works and redistribution via other online and offline channels.

Working in coordination with Crisis Mappers, the Disaster Risk Management group in at the World Bank commissioned the Rochester Institute of Technology (RIT) and ImageCat to collect 15 cm aerial imagery of Port-au-Prince. From 21–29 January, the teams flew a prop aircraft in box patterns, releasing the imagery into the public domain. This transformed the work of the response.

The Haiti imagery would have been useful under any circumstance, especially for the UN and the NGOs that possessed the requisite geospatial information systems experts to process the raw imagery into the formats that laptop clients and web services could read and write. However, in this case, something unexpected happened.