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CONFLICT & WAR

RESCUE, HUMANITARIAN, MEDICAL

PLUS: Earthquakes in Italy; Tehran Fire Department; TalkTalk cyber attack; Business resilience & continuity; Social media in emergencies; The growing use of child suicide bombers; Disaster diplomacy; Attacks on healthcare; Drones & capacity building; Safe surgery in crisis zones; Canada wildfire

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comment

The global picture has darkened considerably on many fronts over 2016.

This year is predicted to be the hottest on record, setting a new high for the third year running. The WMO said in November that human-induced global warming had contributed to at least half the extreme weather events studied. These high temperatures help to fuel climate change and the ensuing deadly consequences many regions are experiencing.

A swarm of lethal earthquakes struck Italy this year (p14); Japan and New Zealand were similarly afflicted, thankfully with fewer fatalities.

Also released in November, the *Global Terrorism Index* (*GTI*) noted a ten per cent decrease in terrorist acts in 2015, but it was still the second deadliest year on record – what will the figures be for 2016? The *GTI* said there were 5,556 fewer deaths in Iraq and Nigeria, attributed to Boko Haram and ISIL becoming weaker in these countries. But constriction of one part often leads to expansion into another: terrorism is leaching into other areas. On p46 we explore the growing use of children as suicide bombers. Although this may indicate a certain weakening of these terrorist groups, it is nevertheless a distressing and perturbing trend.

And of course major conflicts claim far more lives than terrorism. The feature starting on p50 explores the consequences for humanitarian actors attempting to operate in such hostile arenas. This segues into our feature looking at attacks on healthcare (p63).

We had hoped that by the time the journal was published a more positive picture would be emerging. But *CRJ* went to press in the week that east Aleppo lost its last functioning hospital after a relentless wave of airstrikes.

More positively, this issue also covers IT innovations developed to assist IDPs and refugees (p80); new medical equipment and research that can help in crisis areas (p74 and p78); and how robotics and drones are building capacity and fostering resilience (p84).

In a world where international humanitarian law is blatantly disregarded, where efforts to curb climate change often appear to be a Sisyphean task, and where civilians and those trying to assist them come under deliberate attack, maybe there are a few glimmers of hope amid the darkening shadows.

Emily Hough

The role of IT in sustainable development goals

Alina O'Keeffe explains how communications technology and connectivity are paramount to all stages of the work and energy going into achieving the Sustainable Development Goals that have been set by the United Nations

Information and communication technology (ICT) is the key driver for accelerating innovation, improving economic development, social development and environmental protection. As such, the International Telecommunications Union (ITU) and Unesco launched the Broadband Commission for Sustainable Development to showcase and document the power of ICT and broadband-based technologies for sustainable development. Connectivity also plays a fundamental role in how aid agencies and NGOs gather, collect and share information, as well as deliver life-saving services to those in need. However any communication solution is only as reliable as the infrastructure that supports it.

With more than 65 million people having to flee for their lives as a result of violent conflicts and natural disasters, the world is facing an unprecedented displacement crisis. The most prominent challenges and potential responses to the global refugee crisis were discussed at this year's Global Disaster Relief Summit, organised by the Aid & International Development Forum (AIDF) in Washington DC.

Communication and access to up-to-date information, facilitated by digital networks and mobile devices, play an even greater importance in lives of refugees and migrants. Staying in touch with their families and being aware of the situation in their home countries has significant impact on their wellbeing and self-reliance, enhancing their safety, security and livelihood opportunities. Improved connectivity allows refugees to access basic services, like health and education, which otherwise would not be available to them. Lack of connectivity limits the potential of refugees to empower themselves and create a multiplier effect in the communities that host them. Considering that 60 per cent of the refugees do not live in camps, but in informal settlements among the local population, unified response is required to support those communities. With 86 per cent of refugees residing in low and middle income countries, there is a need for global solidarity to enable longer term development assistance, not only for the refugees, but also those countries that host them.

The UNHCR carried out a global assessment of refugees' access to mobile phones and Internet as a basis for its *Global Strategy for Connectivity for Refugees*. While refugee communities in urban areas have the highest level of access to Internet and mobile communications owing to the developed digital infrastructure in the cities, the largest connectivity gap exists for those living in rural areas, with 20 per cent of refugees having no access to either 2G or 3G networks.

The main obstacle to refugee connectivity is cost, whereby refugees spend up to a third of their disposable income on staying connected.

The largest contributions to displacement – war, persecution and disasters – have left countless victims without a home, identification or means to access the banking services. There are numerous solutions developed in response to the world's escalating refugee crises.

Biometrics, such as iris scans and digital fingerprints, have been utilised to address the lack of identity information. Poor documentation is pervasive in a number of developing countries. According to the Centre of Global Development (2015), there are 2.4 billion people who are not identified on official government documents anywhere in the world. Biometrics present an innovative solution to this challenge, ensuring the secure and accurate identification of beneficiaries. Moreover, the price of biometric technology has fallen to levels that make mass enrolment into electronic identification systems a reality. For example, the Crossmatch DigitalPersona Altus is an identity management system with multi-factor authentication and biometrics-based proof-of-presence. Exeros Technologies offers a portable biometric data scanner that can read any form of identification (passports, ID cards or driving licences) and offers quick data cross-check against active databases. The accuracy of identification is supported by a fingerprint scanner and built-in camera for facial recognition.

Using biometric identity verification also avoids many of the issues that can occur with bank cards. PIN codes can be forgotten and cards can be lost. Unlike biometrics, a bank card can also be used by someone else. Using iris scans for example, guarantees that the allocated cash reaches the intended recipient not just once, but every time money is withdrawn from the account.

More recent of the technological advances is that of digital identity solutions built on blockchain technology, which help to identify refugees and internally displaced people. The digital ID is not issued by any government and can be applied for online.

Alongside digital ID solutions, AID:Tech has created an intelligent voucher to support financial democratisation of refugees. A digital record of a person's ID is stored on a smart card, alongside additional information like electronic cash, social welfare entitlements, dental/health records and languages spoken. The smart card can be topped-up remotely, acting like a mobile bank account, empowering the refugee to spend digital cash freely in participating stores. Electronic transfers have a ▶

The EU is supporting UN partners to introduce biometric registration in the refugee camps, as illustrated in Ali Addeh, Djibouti

Massimo La Rosa | EU Echo

▶ positive impact on financial inclusion of vulnerable populations, while simultaneously driving local economic development.

On a similar note, Bitnation Refugee Emergency Response (BRER) offers two programmes for refugees: the Blockchain Emergency ID (BE-ID) and Bitnation Bitcoin Visa cards. These debit cards can be loaded using bitcoins and used through the traditional Visa card network and cash ATMs. The benefit of using Bitcoin technology is that anyone in the world can load the card electronically and help the holder financially. Digitising the delivery of humanitarian aid offers a more efficient, secure and transparent way of getting help to those who need it, even in the most hard to reach places.

The International Rescue Committee (IRC) ATM card-based payments experiment with refugees in Lebanon suggested that e-payments were better received than in-kind payments. As a result many donors and development partners are looking for ways to incorporate e-transfers into programmes. USAID and Nethope have published an E-Payments Toolkit as a guide to assessing why and how to use electronic payments within the programmes, while the Red Cross Movement's Cash in Emergencies Toolkit contains a number of important questions that should be considered when looking at different types of providers.

Some innovative digital solutions focus on the integration of refugee communities and internally displaced persons by reducing the barriers to accessing the labour market and bridging the gap in necessary skills. Finalists of the European Social Innovation Competition – Refugeeswork.eu, TextFugees and Digital Skills Assessment – provide platforms to apply for jobs, register competencies and interviews in a person's native language, while Pitlanes and Raising Together offer practical learning and training to bring migrants and local residents together in an entrepreneurship programme.

The Bitnation Bitcoin Visa card can be loaded using bitcoins and used through the traditional Visa card network and cash ATMs

Bitnation

When disaster strikes, real time updates about evolving crisis situations and information about those affected, including their needs and locations, are paramount to effective emergency response and better decision-making. Gathering essential data to provide rapid disaster relief involves many challenges, ranging from security of aid workers, to cultural barriers and difficulties in communication.

While mass broadcasting channels continue to be part of the emergency response, remote areas face greater risk of being unreachable because of their underdeveloped infrastructure or infrastructure that has been compromised by a disaster.

Space-based systems play a vital role in providing communications and other important services following a natural disaster. Overcoming issues of unreliable infrastructure, satellite solutions allow aid agencies to monitor field teams and vehicle fleets and to track critical emergency assets, increasing their security and safety. Post-disaster imagery, GPS tracking, calls and texts, M2M connectivity and CCTV, underpinned by satellite connectivity, reduce risks of damage and have a positive impact on operational efficiency. While Inmarsat offers a range of voice and data services powered by mobile satellite network to support the wellbeing of first responders, DigitalGlobe has released high-resolution satellite imagery of pre-hurricane Haiti as open data to help the Humanitarian OpenStreetMap Team (HOT) respond to Hurricane Matthew's destruction. Using satellite imagery, a crowdsourcing platform – Tomnod – allows the tagging of damaged buildings and roads, as well as flooded areas, giving first responders on the ground further data about what areas most urgently need help.

Ever since smartphones and social media became more integrated into peoples' lives, they have presented a great alternative to traditional communication channels and a useful tool for data collection. Platforms like Twitter, Facebook and YouTube, played a significant role in Nepal 2014 earthquake relief operations with tweets and hashtags used to gather and disseminate information about where aid is needed.

As timely collection of data is vital to efficient disaster response, the UN's OCHA, together with Standby Task Force, used tweets from the 2014 Nepal earthquake to develop a crisis map of priority areas. The maps were continuously updated to provide relief workers in the field with the most up to date information. CrisisMappers is one of the early pioneers of digital humanitarian action, based on crowdsourced critical thinking, which is essential to sustainable development and effective disaster response.

Communication with friends and family is one of the most important needs identified by refugees

In a post-disaster setting, lack of network coverage and absence of electricity owing to damaged infrastructure significantly impede near real-time data collection via mobile phones. As an alternative, drones or unmanned aerial vehicles (UAVs) are coming to the forefront of humanitarian technology innovation. Relief organisations use UAVs to locate injured persons, survey disaster damage, deliver vital emergency supplies and otherwise operate in disaster areas where access for rescuers is fraught with danger. For example, OxySure Systems, a medical technology company, deploys DJI drones to provide respiratory and medical supplies as part of disaster response and humanitarian relief programmes. IntelliNet Sensors has developed the Lynx6-A, an attachment for drones which can scan areas for heartbeats and breathing.

UAVs have also proved useful in capturing accurate aerial imagery to map areas affected by natural disasters. Drones are cheaper, quicker and less risky in gathering high-resolution imagery, compared to a manned flight or geographical information systems (GIS) mapping.

In his opening speech at the Global Disaster Relief Summit, Dr Patrick Meier, Co-Founder of WeRobotics and Digital Humanitarian Network and founder of UAViators (see p84), discussed the application of artificial intelligence and robotics to aid and development efforts in Nepal.

As Nepal remained cloudy for many days after the earthquake, making satellite imagery obsolete, WeRobotics, in partnership with Kathmandu University, used flying robots to capture the damage and carry out aerial surveys to support local recovery efforts. The robots were programmed via smartphones to reduce human involvement and the images were then stitched together on a computer to create high-resolution maps of the most damaged areas.

By involving local partners in developing countries and allowing them to gain professional skills, impact of humanitarian efforts is maximised and access to robotics is democratised. For example, the DroneDeploy mobile app allows users to explore map data directly from a smartphone and 3DR's Site Scan mapping platform presents fast aerial data acquisition with more detail than satellite imagery.

As a new method of terrestrial data collection, UAVs effectively complement existing technologies. Developed by Médecins Sans Frontières (MSF), MapSwipe app allows users to swipe through satellite imagery of remote areas, marking settlements, roads and rivers. The data is then used to draw detailed maps, locating communities affected by natural disasters, disease outbreaks or conflict. By utilising the crowd power of sharing to process immerse amounts of data, MapSwipe is helping to overcome efficiency barriers, as mappers spend on average 90 per cent of their time scanning through jungles and deserts.

Disaster preparedness and early warning systems are also a key part of reducing the effects of disasters. Together with the Nicaraguan government, General Electric is working on installing 80 wireless sensors inside Masaya, one of the country's active volcanoes, in order to gather real-time data to better predict its eruption. The data collected, including temperature and pressure, will be transmitted through the Internet to an open-source database called Predix, which is also accessible by public.

The American Institute of Physics (AIP) has built a ring laser interferometer to detect storms, earthquakes, hurricanes and tornadoes, demonstrating the technology's potential as an early warning system for natural disasters.

The challenge facing humanitarian and development communities is to ensure that data is readily available and can be used when decisions need to be made. With the help of data mining software, computer algorithms and statistical analysis, Big Data has become useful in providing patterns and insights into complex situations, drawing on massive amounts of data generated by mobile phones, satellites and social media to avoid incomplete or inaccurate information.

Along with crowdsourced data initiatives, Big Data analytics offer a holistic approach to decision-making and co-ordination of disaster response teams.

Data driven solutions are key to optimising the effectiveness and reach of disaster response and in ensuring accountability to donors. OCHA has announced its plans to establish a global humanitarian data centre in the Netherlands for a period of three years, starting from early 2017, to share information about the outcomes of digital platforms implemented around the world and innovations that can be readily adopted in other regions.

While connectivity and ICT tools increase the immediate impact of aid workers, improving the reach and efficiency of humanitarian response programmes and supporting global development, it is still up to individuals to choose and utilise the most appropriate methods of communication and technology.

Open source innovation can change how humanitarian and development stakeholders are able to resolve, not just respond to, global needs. Yet an integrated approach and collaboration between frontline aid agencies, donors, governments and the private sector are needed to address the most prominent challenges in implementing the 2030 Agenda for Sustainable Development. C·RJ

Author

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