New technologies for disaster management
– a multi-stakeholder approach
Session Summary

New ways of working are required to address the unprecedented challenges we are facing, and technology can be a part of the solution. The Connecting Business initiative (CBi) organized this session on 28 April 2021 to showcase multi-stakeholder approaches for advancing the adoption of new technologies for disaster management. The speakers showcased concrete examples from the perspective of the government, the private sector and humanitarian actors.

Speakers

- **Veronica Gabaldon**, Executive Director, Philippine Disaster Resilience Foundation (PDRF) / CBi Member Network in the Philippines
- **Dr. Renato U. Solidum, Jr.,** Undersecretary of Scientific and Technical Services, Department of Science and Technology (DOST) and Officer in Charge, Philippine Institute of Volcanology and Seismology (PHIVOLCS)
- **Kareem Elbayar**, Partnerships Manager Centre for Humanitarian Data, United Nations Office for the Coordination of Humanitarian Affairs (OCHA)
- **Sahba Sobhani,** Director, Istanbul International Center for Private Sector in Development, United Nations Development Programme (UNDP) (moderator)

Summary of the discussion

Opening with a Mentimeter exercise was provided by the event moderator, **Sahba Sobhani**, Director, Istanbul International Center for Private Sector in Development, United Nations Development Programme (UNDP).

- Sahba emphasized that since its launch in 2016, CBi has noted the interest of private sector networks to support the adoption of new technologies for disaster management. Some inspiring examples can be seen, however, more needs to be done to understand the possibilities and entry points and build the capacity of private sector networks in a more systematic manner.

In the **Mentimeter exercise**:

- 30% of the audience in the session were from the UN, 21% from the private sector, 15% NGO, 15% government, 6% academia and 12% other.
- 19% said they are an expert in new technologies and 81% were interested in the topic.
- Regarding the types of technologies the audience said to use in their work, the following were mentioned (in alphabetic order, some mentioned several times): Autocad, ArcGIS, augmented reality glasses, Cloud storage, Computers, Data analysis and predictive modelling, DBS, Drone, EOC related software, Geoinformatics, GIS, GPS, Ground-penetrating radar, IT software, Microsoft technologies, Mobile apps (e.g., for assessments), Mobile technologies, Phones, Power BI, REDAS, Remote data collection, Remote sensing, RPAS, SAP, Simulations, SPSS, Statistical modeling, Tablet, Visualization, Weather apps.

- In terms of possibilities the audience saw for multi-stakeholder partnerships in the adoption of new technologies, the following were mentioned (some several times): Faster, more effective, more dignified, optimized emergency response; breaking down access barriers; shared technologies; data exchange; data sharing; innovation transfer; avoiding duplication; knowledge transfer and sharing; product development; improved mutual understanding; blockchain and tokenization; up to date situational picture; use of technology and innovation for EM; standardised and recommend tech; easier collection if data; integrated tech from different agencies (there are too many!); integration of multiple tools and streamlining of processes; improved efficiency in implementation; centralized communication and sharing information platform; efficient use of resources; coordination, working together, avoid duplicity; operational assistance, capacity building; wider and faster acceptance of new technologies by the government; Scale up; link response activities to recovery; integration, knowledge sharing, collaboration, training, skills transfer; strong partnership; resource sharing, sharing of expertise, data sharing, cross thematic collaboration; data governance and literacy; using common app, tool.

The private sector perspective was provided by **Veronica Gabaldon**, Executive Director, Philippine Disaster Resilience Foundation (PDRF) / CBi Member Network in the Philippines

- Veronica provided examples of information and communications technologies that are central to their operations for disaster preparedness, response and recovery and mitigation, for example:
- 1) PDRF uses a GIS-based platform called Hazard and Disaster Analysis for Business Resilience (HANDA) which is at the core of PDRF's information management system. It houses hazard monitoring and incident reporting for the application of the PDRF network. It also provides a planning tool for data gathering, analysis, and visualization, for response planning, which allows a more efficient resource mobilization during disasters. During this pandemic, the platform also serves as a vaccine dashboard for PDRF member companies vaccination program to help in data collection and master listing, measuring the preparedness of the organization, managing the inventory of the vaccine doses and monitoring progress.
- 2) PDRF also uses the rapid earthquake damage assessment system, or REDAS, of PHILVOLCS. PDRF uses its ground shaking data as the basis for when they need to activate their Emergency Operations Center. The partnership with PHILVOLCS allows PDRF member companies to take the REDAS training that can help their operations and act as their early warning system and basis for decision-making. PDRF is also on the lookout for new technologies, and this year they are piloting is an early warning system that is called Seismic AI, which provides a short window before an earthquake hits. This vital information can be relayed as an alert to mobile apps, alert units, automation units and command and control systems to switch off elevators, power plants, shut down pipelines before an earthquake to prevent and lessen damages and losses. PDRF has sought the guidance of PHILVOLCS in determining the viability of this system.
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- 3) On digital transformation, during the last year, PDRF converted their training modules into online courses at PDRF's e-learning platform, iADAPT. PDRF currently hosts and co-develops capacity building modules with the government (e.g., with the Department of Health), PDRF member companies and humanitarian agencies, particularly the Connecting Business initiative. In collaboration with OCHA, UNDP and CBi, they have an online platform called SIKAP MSME Resilience Hub, where micro-, small- and medium-sized enterprises can access free resources and opportunities like mentoring so that their business can recover from disasters, like this pandemic.

- Regarding the benefits for the private sector to collaborate with the government and humanitarian actors, she mentioned the importance of government leadership and legal framework for DRR plans and programs, ensuring continuity and resilience of critical infrastructure. The private sector also has a lot to offer in collaboration with the government. In the private sector they develop innovations and in partnership with the government offer inclusive business models and improve existing offer of products and services and expertise in DRR and resilience. PDRF encourages the government to consider the core competencies of the private sector in managing the risks in the country. It has also been beneficial for PDRF to work with the UN and incorporating humanitarian principles in their work extending assistance to the communities. They also receive technical assistance and linkages with other humanitarian actors. Especially in a country with a lot of hazards and risks, collaboration with the government and other stakeholders in the community is very important.

The government perspective was provided by **Dr. Renato U. Solidum, Jr.,** Undersecretary for Disaster Risk Reduction and Climate Change Affairs, the Department of Science and Technology (DOST) and Officer in Charge, Philippine Institute of Volcanology and Seismology (PHIVOLCS).

- The Department of Science and Technology and the Philippine Institute of Volcanology and Seismology (PHILVOLCS) have developed many technologies to understand the risks, starting from monitoring of hazardous events, evaluating what areas will be affected by the hazards and trying to determine the potential impacts of these hazards before they would occur in order to prepare and respond properly. They also work on information communications, training people in various levels of government and the different organisations, like PDRF, and the public. He explained various technologies they have developed, for example:
- 1) The GIS-based Rapid Earthquake Damage Assessment System (REDAS), which initially was developed to simulate the hazards, develop an exposure database and determine the potential losses and impacts. Originally this was developed for earthquakes but it can also be used for flood, for strong wind, for tsunami and for agricultural crops. He explained that now they are trying to develop a centralized geographic information system platform, built on GIS, to have centralized data of exposure and hazards so that people on the ground can assess their hazards, evaluate their impact, and most importantly be able to contribute to the database development of exposure hazards and risk. *They also have* the HazardHunter PH, where just by double tapping the screen people will be able to assess all the hazards that a particular point or area will be affected.
- 2) GeoAnalytics app can provide analysis, visualization tools, maps, tables and charts for assessing an area's exposure to various hazards.
- 3) GeoMapper data collector tool where everyone can contribute. They have developed a 16-digit code for every feature on the ground, complete with standards, so that the information can be updated rapidly. For example, a big bank in the Philippines is using this for assessment of the properties and the insurance commission has directed the insurance association to use this platform.
- He also elaborated on the need to engage with the private sector, and the need to have a platform for everyone to have the most up to date data and multi-hazard, multi-exposure information. Businesses are also critical for the economy and it needs to be ensured that they are protected, especially the micro-, small- and medium-sized enterprises (MSMEs) and everyone needs to understand the hazards and potential impact om themselves. They have also developed an app How Safe Is My House for earthquake safety.

Examples of OCHA's work were provided by **Kareem Elbayar**, Partnerships Manager Centre for Humanitarian Data, United Nations Office for the Coordination of Humanitarian Affairs (OCHA)

- OCHA's Centre for Humanitarian Data focuses on increasing the use and impact of data in humanitarian response. They are very interested and excited about the potential for new sources of data that can be used to inform a more effective efficient and dignified humanitarian response.
- They are also looking at how to integrate data from unmanned aerial vehicles or soil sensors, satellite data, to do more rapid and in some cases automated needs assessments, plug those data sources into the humanitarian system and humanitarian programming cycle.
- The Center for Humanitarian Data is also focusing on predictive analytics and modeling and refining their predictive models, identifying and standardizing the data sources that go into these models. They help to establish clear ethical and technical standards, to build trust and understanding of how to use this technology in a responsible manner. They operate the Humanitarian Data Exchange, a place to share and exchange data among trusted partners. Predictive modeling is not really a new technology per se, it has been used by the private sector for some time now, using past or current data to make predictions about the future, powers everything from global supply chains, to things like the Amazon and Netflix recommendation engines. These have only just started to be applied to humanitarian emergencies, where anticipatory action frameworks can be put in place, including plans for money allocations, and dedicated pots of money that can be distributed when we have early warning signals, not after the disaster has already struck. At the Center, they supported one of the first anticipatory allocations by the UN's Central Emergency Response Fund (SURF). It was an allocation of US$ five million, which was used to support communities that were expected to be affected by monsoon flooding in Bangladesh. An independent review by the Center for Disaster Protection at the university of Oxford confirmed many of our assumptions which was that releasing these funds and having these systems in place in advance of the monsoon flooding and being able to release funds and respond before the flooding was faster, cheaper and more dignified for the affected people. They are increasingly focused on scaling the anticipatory action work around the world at OCHA, including refining their predictive models, the ones that they use and the ones that are used by others in the humanitarian system, identifying and standardizing the data sources that goes into these models, thinking about the ethical implications of these models, making sure they are transparent and understandable, both of the people using them and the people affected by them, and then continuing to customize these tools of predictive analytics for use in humanitarian emergencies. The UN Central Emergency Response Fund has allocated US$ 140 million for anticipatory action pilots this year in 2021.
- They of course utilize technologies like GIS, data analysis and visualization, but new and emerging technologies are not necessarily the most important focus for them right now but it is about making sure that the existing technologies and information communication technologies frameworks are in place. OCHA is trying to promote awareness within the humanitarian sector of the technologies that are available to us now and how they can be used, for example through its recently launched report [From Digital Promise to Frontline Practice: New And Emerging Technologies in Humanitarian Action](#).
- He also emphasized the data responsibility concerns, data privacy and ethics. There are enormous opportunities but there are also risks and challenges that need to be taken into account. At OCHA they are trying to work with our humanitarian and private sector partners to think about the complex challenges and risks that come with deployment of these technologies. Inadequate data protection can cause severe harm, intensify insecurities and hinder delivery of humanitarian assistance. Unequal connectivity and access to technology,

digital literacy issues, all of this can exacerbate existing vulnerabilities and intensify existing biases including gender biases. Technologies can malfunction, break down and sow mistrust and technology's potential is only as strong as the underlying data that feeds into it.

- During a disaster it is not the right time to deploy a new technology and there is another key role for the private sector. Every technology they have used in the humanitarian field, has been deployed first in the private sector. Finding those lessons learned and that connection is really important.

The session ended with discussion and questions from the audience.

- **Thinking about the proactive anticipatory approaches focusing on disaster management, have there been any recent development in technologies that could assist in the assessment of resilience of coastal livelihoods to climate change?**
- Undersecretary Solidum explained that they have some tools to assess the assets and the impacts but in terms of the social and socioeconomic component and indicators more needs to be done but this is one of the areas they want to improve on. He emphasized the importance of involving multi-disciplinary expertise in data analytics and prediction of what can happen. This is also a data governance issue and that is still a big challenge as there is a lot of data but there are sensitivities with.

- **You mentioned risk indices or risk register for MSME which you do in partnership with PDRF and the Department of Trade and Industry, are these consolidated into a national risk register and how do you use this in national contingency planning activities?**
- Undersecretary Solidum mentioned that this is one of the key performance indicators that they have agreed upon and the work has started. They want every MSME and every individual to know their hazards and risk indices.

- **How can the new and emerging technology be made available to the communities residing in the remote corners of a developing country for the purpose of capacity building? Can the private sector contribute to it in any way despite the existing challenges?**
- In her response, Veronica highlighted that this is a challenge but it can be addressed in collaboration within the private sector. PDRF has offline and online tools that they use. For example, when they go to an area where there is no internet connectivity, they can gather data and upload later. In the network of PDRF they have the largest telecommunications and ICT companies and they are in constant dialogue with them to develop products and services that would cater to the needs of communities in remote areas particularly in DRR. One example of that is in the area of education where a member company of PDRF, Smart Communications, developed School-in-a-Bag project where children can have access to education offline and online. They are also looking into this for data gathering, especially in remote areas to digitize their Rapid Damage Assessment and Needs Analysis (RDANA) to be better used in disaster affected areas with low internet connectivity.

- **Earthquake early warning system helps the private sector to be informed very early, can you tell us how partners are connected to the system and how you get them to participate?**
- In her response, Veronica explained that they are in the process of piloting a system under the guidance of Under Secretary Solidum. The equipment has arrived and they are looking into the systems and it will go through a vetting and study period.
- Undersecretary Solidum added that this is an important opportunity to test this technology and ensure that the system is used correctly. He explained that the technology is there, and in addition, AI or artificial intelligence, can then use it to provide a few seconds of warning

for elevators, train systems, etc. They want to test this into business operations before progressing into warning people.

- **We often hear about tech first being applied in the private sector, then it finds a way to the humanitarian sector. The technology transfer can be great. Can you give us an example from your work where you partnered with the private sector company and introduce new technologies?**
- In his response Kareem explained that the backbone of almost everything they do in the Center is the Humanitarian Data Exchange, which is a Ckan open-source database which was developed by a consortium of actors outside of the humanitarian system. In the field of predictive analytics, they are talking and working with Google, which has a flood forecasting initiative deployed in India to send out early warning messages. The in-house predictive model can predict the severity of floods and send out warnings in advance of those floods. They sent out more than 21 million warnings last year in India. The ongoing discussions include how to plug their model into the anticipatory action frameworks and also whether or not there's an opportunity for the UN system to plug into those warning messages that go out. Kareem also mentioned collaboration with other major companies on data analysis, data visualization and there have been a number of pilots. on the use of drones to deliver vaccines, that's a partnership with a private sector entity and UN entity.

Follow-up activities / next steps
- CBi continues to contribute to this topic through research, online courses and guidance materials, as well as technical support on how private sector networks can help to strengthen national disaster management systems in cooperation with key partners.

Link to the recording
New technologies for disaster management – a multi-stakeholder approach (YouTube)