DEALING WITH DISASTERS

DESPITE A CATASTROPHIC EARTHQUAKE IN NEPAL LAST YEAR, FIG SURVEYORS GATHERED IN THE COUNTRY IN NOVEMBER TO DISCUSS HOW THEY COULD HELP WITH THIS AND OTHER DISASTERS. BUDDHI NARAYAN SHRESTHA, GANESH PRASAD BHATTA, LIZA GROENENDIJK AND RESHMA SHRESTHA REVEAL THE RESULTS

The amount and magnitude of natural and human-made disasters are on the rise worldwide. Many people face disasters, including earthquakes, flooding, storms, tsunamis, drought and the after-effects of conflicts. These disasters and their consequences are a worldwide challenge, especially taking the effects of climate change into consideration.

Surveying and spatial professionals play an essential role in preventive activities, immediately after a disaster and longer-term in rebuilding and planning areas. They can also make an important contribution to improve, simplify and shorten disaster mitigation, rehabilitation and reconstruction with their skills in land management, geodetic engineering, geo-informatics, satellite technology and remote sensing. In addition to these engineering skills and knowledge, good governance and capacity development are central.

On 25 April last year, Nepal was hit by a devastating earthquake followed by more than 300 aftershocks. It killed 9,000 people and injured 25,000. A recent report by the government of Nepal indicates that these earthquakes have affected the lives of eight million Nepalese people – about one-third of the population. At the time of this immense tragedy, FIG Commission 2, Professional Education, was working together with the Nepal Institution of Chartered Surveyors and the Nepal Remote Sensing and Photogrammetric Society in organising an international workshop.

Despite the difficult situation in the country, the committee conducted from 25-27 November the International Workshop on the Role of Land Professionals and SDI in Disaster Risk Reduction in the context of Post 2015 Nepal Earthquake, in Kathmandu, Nepal. More than 300 participants, many of them young professionals and students, attended the event. Key and plenary speakers addressed country cases and global developments in disaster risk reduction. The technical sessions offered a rich picture of the experiences of Nepal following the earthquake, the lessons learned, including innovative and unique approaches and tools developed.

Professor Donald Grant from the RMIT University, Melbourne, Australia, presented the lessons learned from previous earthquakes, such as Haiti and New Zealand. He identified a number of key land administration challenges faced during recovery and reconstruction, including setting priorities for tenure security, land use planning and property valuation.

immediately after the earthquake. Support from surveyors and GIS experts increased as the emergency response turned into recovery and then rebuild of the city.

SDIs and crowdsourced mapping

Several attendees addressed aspects of spatial data infrastructures (SDIs) in disaster risk reduction. Although spatial data infrastructures have proven to be successful in supporting disaster management in the past, delays in providing public mapping portals and gaps in data are common. According to Professor Kevin McDougall, of the University of Southern Queensland, Australia, crowd support and crowd-generated spatial data have the potential to speed up disaster management and mitigation. The use of base maps such as OpenStreetMap is commonplace for crowdsourced mapping.

Crowdsourced mapping played a key role after the Nepal earthquake, as was shown by the example from the Geospatial Lab, Kathmandu University, and the activities of Kathmandu Living Labs.

Young Nepalese surveyors Suman Baral, Shashish Maharjan, Ram Shrestha and Suresh Manandhar argued that social media suffers from inconsistent, redundant and out-of-context information for disaster management. Its information is ineffective, as it only conveys general information but cannot be used for analytics and planning. They therefore proposed 'earthquake-hashtag-reporting' as a solution: geotagging posts and using standardised hashtags. According to these young entrepreneurs, a single post can save thousands of lives and share happiness among millions.

Conclusion

'Building back better' was the slogan often heard during the workshop and expressed the optimism in rebuilding Nepal. The international speakers placed the Nepal experiences in a broader international context, while at the same time the Nepalese experiences showed new approaches and tools in support of disaster risk reduction that were not used before. The workshop highlighted the importance of involving affected people on the ground while making use of the latest spatial technologies and SDIs in combination with social media tools. Disaster risk reduction has its own issues,

The issue of land being fundamental to recovery was further elaborated by Professor Arbind Tuladhar, ITC – University of Twente. Access to land for shelter, protection of land rights, livelihood and early recovery from earthquakes, he stated, are the land issues to be incorporated into an action-oriented framework for recovery.

Igor Cvetkovski, of the International Organization for Migration (IOM), stressed the importance of finding a balance between the needs and the rights of affected populations, existing legal frameworks, societal demands, and the available state and community resources. A set of principles are needed that guarantee equitable and efficient policies and consultative decision-making.

Professor Marguerite Madden from the Center for Geospatial Research, University of Georgia, US, discussed geospatial technologies used for disaster preparation, response and recovery. Multi-temporal imagery from satellites, aircraft and UAVs can be used to document current conditions and establish baselines for assessing future changes. She argued that the most important component of disaster management is easy access to geospatial technologies, which should be available and accessible for people with local knowledge on-site when disasters strike.

Disaster response planning and image-based modelling were addressed by Professor Emeritus Armin Gruen of ETH Zurich, Switzerland. A large spectrum of different sensors, operating from a variety of platforms are used for simulation of events, risk analysis, the empirical analysis of events and prevention, and the monitoring of events. According to him, the true challenge today lies not so much in sensing, but in processing data, especially if online processing and real-time responses are required.

Alistair Greig from Christchurch, New Zealand, reported on the recovery after the earthquakes in Christchurch in 2011. He stressed the need for geospatial professionals to support the rescue effort by urban search and rescue, civil defence, police and the army

approaches and technologies. Time is important, as in the first moment after the disaster, you have to be able to act very quickly, in a chaotic situation, making use of the resources available at that moment. In the later stages of relief and recovery, other skills and technologies will be required.

These aspects are important to consider in professional surveying education. To include disaster risk reduction in the curriculum of the surveyor or land professional means allocating enough time and thought to the set-up, content and teaching of the programme. Involving students and young surveyors in new curricula is recommended. Their creative use of spatial technologies in combination with social media has largely contributed to the disaster response after the Nepal earthquake – as it will in disasters to come.

Attendees at the workshop

THE WORKSHOP HIGHLIGHTED THE IMPORTANCE OF INVOLVING AFFECTED PEOPLE ON THE GROUND

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RESOLUTION OF THE WORKSHOP

- To formulate, enact and implement a comprehensive land and land-use policy
- To design a multi-stakeholder and action oriented framework that ensures clear and crisp action points, responsibility allocation, implementation time and monitoring system.
- To adopt fit-for-purpose land administration and tools developed by the Global Land Tool Network.
- To adopt appropriate tools and technique for accurate and timely geoinformation acquisition, processing, visualisation and dissemination, as well as strengthen spatial data infrastructure techniques to assist in effective and efficient data-sharing and use.
- To carry out capacity building activities for continuous professional development to support disaster risk reduction in the long-term.

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