



DELTA IN TIMES OF CLIMATE CHANGE II INTERNATIONAL CONFERENCE

OPPORTUNITIES FOR PEOPLE, SCIENCE, CITIES AND BUSINESS
ROTTERDAM THE NETHERLANDS, 24-26 SEPTEMBER 2014

Deltas in Depth scientific sessions	
Deltas in Depth 8. Disaster reduction and emergencies	
DD 8.1 Disaster reduction and emergencies, regional perspectives	
Chair	Ed Thomas, Natural Hazard Mitigation Association, USA
Presentations	<ul style="list-style-type: none">● Dr. Michelle Lim, Centre for Water Law, Policy and Science, University of Dundee, United Kingdom● Hannelore Mees, Antwerp University, Belgium● Keming Hu, Royal HaskoningDHV, United Kingdom

This session covered disaster reduction and emergencies, and stressed the importance of those measures that can be employed *before* a disaster takes place – planning, preparation, etc.

The session began with a presentation by Michelle Lim on the disaster management governance framework in Bangladesh. As illustrated by the case of Bangladesh, law and regulatory frameworks are key elements in disaster management, though with certain limitations. Bangladesh is one of the most disaster prone areas in the world. Recent decades have seen a number of powerful cyclones – in 1970, 1991, 2007, 2009 and 2013. Despite the severity of all of these cyclones, they have resulted in progressively fewer deaths over time – a phenomenon which may largely be attributed to the regulatory framework for disaster management in Bangladesh.

The current disaster management framework in Bangladesh is composed of 4 pillars – Standing Orders, the Disaster Management Plan, the Disaster Management Act and Disaster Management Regulations. The *Standing Orders* – which define roles and procedures to be followed in the case of a disaster – are largely responsible for the progressive reduction in loss of life caused by cyclones. Despite a very polarized political context, the Disaster Management Act came into force in 2012 and incited the development of a national level ministry for disaster management.

While the Disaster Management Act has been successful, it does not overcome certain systemic governance problems and it has not incited the development of partnerships as suggested on paper. The Act can be improved by enhanced oversight and monitoring, and perhaps a link with the climate change strategy and action plan. Use of zoning could also help to improve the Act, though this may be challenging in the Bangladesh context. Bangladesh's Disaster Management Framework offers some potentially transferrable lessons in terms of bringing together people from different sectors. Similar frameworks may be applicable to the management of manmade disasters and of ecosystems.

The session continued with a presentation by Hannelore Mees on the topic of flood crisis management in Flanders. This research is part of the STAR-FLOOD project, which focuses on 6 different European countries. In Belgium, each of the regions - Wallonia, Flanders and Brussels – has its own policy on flood management, while crisis management is a national level activity. The methodology for the presented study entailed conducting interviews at the national and Flemish level, and comparing 2 urban cases – Antwerp and Geraardsbergen.

The results identify several bottlenecks. The first of these has to do with coordination. In particular, there is a challenge of coordination between water and crisis management at the Flemish level and the national level. Furthermore, there is a problem of communication between Wallonia and Flanders, which is a particular issue for Geraardsbergen, located close to Wallonia.





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A second bottleneck is a lack of community resilience, which relates to citizen engagement in flood management. Traditionally, flood management has been viewed in Belgium as being the responsibility of the government. However, policy makers are now shifting some of the responsibility to citizens. Interestingly, citizens groups tend to have exactly the opposite perspective. A third bottleneck is a lack of resources. In recent years, there has been a reduction in army support in disaster situations, and many municipalities find it financially difficult to support a professional fire brigade. This has made some places more reliant on a volunteer force, and has increased requirements on the training and engagement of volunteers.

A key conclusion is that the population may not be ready for a discourse of self-reliance. In this context, it is an open question to what degree citizens can compensate for a lack of resources in crisis management.

The session concluded with a presentation by Kenming Hu on the Firths of Forth and Tay Flood Warning System. The Scottish Environment Protection Agency (SEPA) launched a new flood warning system in December 2012. The objective of this system is to provide reliable and timely flood warnings via enhanced flood forecasting through better understanding coastal flooding processes. By better understanding coastal processes, it is possible to forecast flood depths, and thus to better determine when to issue flood warnings.

Coastal flood warning began with efforts to measure water levels at key stations, for instance in the Leith in Forth and Tay area. Nowadays, offshore measurements are ultimately used to forecast wave overtopping and inundation depth. The TRITON system, which is the core of the new warning system, is a data display platform, data processor and data manipulator that translates Met Office forecasts on waves, tides and surges to the warning site. The new system: (1) transforms tidal surge forecasts from Leith to 28 warning sites along the Firth of Forth and Tay, (2) transforms offshore wave forecasts to inshore locations, and (3) transforms inshore wave forecasts to mean wave overtopping forecasts. The system enabled better flooding response during the storm of December 2012 and that of December/January 2013/14, and it has also led to enhanced awareness of coastal flooding issues. The next step is to be able to forecast actual flood levels in different areas.

Discussion following the presentations addressed the fact that, fundamentally, we need to find ways to effectively reward good behaviour and discourage bad behaviour. For this, we need laws, standards, financial/economic incentives, etc. In the Netherlands, people expect the government to be responsible for floods. In Bangladesh, people often have dikes around their houses and boats outside - they prepare themselves. A key question is: *How can you make people capable of adapting/preparing themselves?*

