Recommendations

DRM requires a combination of skills knowledge and data that will not be held within one firm, one industry, one institution, one discipline, one country or even necessarily one region. Europe contains a concentration of expertise on DRM, perhaps unique in the world; the opportunities here are greatest and should be seized.

Historically, many in industry and the private and public sectors found it challenging to engage with academia. For example, industry often works within tight timescales, wanting to hear a single right answer with certainty, wanting dissemination of what is known now as opposed to new research and wanting it in a form that can be easily incorporated into existing models and processes not requiring detailed assessment, adjustment and review. But there is an increasing awareness of what science has to offer, which often leads to an even greater demand for collective engagement. This engagement has been encouraged by EU research projects encouraging public/private/academic linkages all involved in DRM, where practitioners, scientists and policymakers need to actively seek engagement with others working in the broad DRM space: within their organisation and within their sector, as well as more broadly. This is easy to say but rather more difficult to do.

Only positive interaction will make the practitioner aware of what is possible: what new data, models and techniques are available and how these may be adapted for practical use within their organisation or department. The practitioner lies in the centre of the process. It is they that understand the gaps of knowledge and data, where true value for additional research lies. But often unconsciously there may be 'group think' — an accepted way of working that is not adequately challenged. It is healthy to develop links with other practitioners in their field, in other sectors or industries and in academia. Increasing knowledge and expertise can be both a push and a pull: both learning from others and also using in-house expertise to drive knowledge for the common good.

Areas where other practitioners or academics may have valuable information include the fields of data, methodologies and models. Knowledge may be siloed: restricted to particular risks, hazard or exposure types. The practitioner is in a position to break down these silos, spotting where data or processes in one area may have value in another. This is particularly true when looking at the interaction of hazards, secondary hazards and non-physical impacts such as business interruption and broader economic loss.

It is important to learn from other sectors facing similar issues and learn from their experience. For example, methods have been developed in the insurance industry to model and manage catastrophe risk that can be applied almost di-

rectly to societal risk including to people, property and the environment. There are quick wins available; early adopters are not starting from a clean sheet but building on a framework that is already well founded. No innovation is risk free, but development of a risk management strategy for a city, for example; is based upon well-developed methodologies and so is very likely to deliver real value and be seen to deliver real value.

Science can respond to identified needs but only if it hears the call, as it were. Very often the need is not for new research but for directed application of what is known within academia, not elsewhere. Information and data need to be offered in forms that are accessible, appropriate and affordable. More work is required to build publicly available datasets and models (for example the global earthquake model initiative). Where governments hold data, it is important to balance the desire to exploit that data for profit against the greater good of making the information available to all those who can use it to develop tools that ultimately benefit and protect the broader European population.

Before embarking on a DRM project, like for any other project it is important to understand what the objectives of the project are: what needs to be done and when it needs to be done. DRM is an area where there is always a need for further understanding and knowledge in each of the three pillars of risk assessment: hazard, exposure and vulnerability. Each element requires different skills, different data and different techniques; the process can seem daunting. There are many real examples of best practice, methodologies, data sources and assessment and analytical techniques to act as a template. The process will not necessarily be smooth, but the process of developing understanding and awareness is arguably where the real value lies. It is important not to let the fear of lack of knowledge or data prevent this vital work from commencing. Innovative thinking is required to meet the challenges of a lack of data and partial information endemic in the process, for example new methods to assess exposure by remote sensing or vulnerability, particularly to economies and ecosystems. The challenge is to focus innovation on where it has the most value, a proper risk assessment process will provide a guide to where the greatest requirement for innovation and further research lies.

Risk assessment and analysis provides an objective basis against which policy decisions can be made and transparently justified and the cost and benefits of different strategies and options can be compared in an objective way, open to scrutiny and challenge. All models are assumption dependent, but it is important that the policymaker has some knowledge of the limitations of the modelling done and the key assumptions upon which it depends. The issue is balance: clearly a policymaker cannot be expected to be a risk management expert, but uncritically relying on one source of information can lead to political as well as practical risk — a culture of challenge and evidence- based analysis is required. It is important that policymakers are able to interpret the risk assessments given to them. European insurance regulators demand that directors of insurance companies are able to understand and defend risk assumptions and decisions

made within the firm; they cannot hide behind the judgement of employees or consultants however well qualified. The same scrutiny is applied to policymakers and practitioners in the public sector who respond to disasters. Whilst not hiding behind experts, it is important that policymakers can demonstrate that appropriate expertise has been engaged and risk management decisions have been made firmly founded.

At its best, DRM not only adds to the information available to policymakers, but it also creates a new way of looking at risk within organisations. Risk management should not be seen as just the responsibility of a risk management department but should be understood by all those involved in decision-making. Embracing risk management and risk modelling has transformed the insurance industry in the last 30 years, making it infinitely more aware of the risks that it and its clients face and much more able to meet their needs (and pay their claims). It is a virtuous circle: greater knowledge feeds an understanding of what is missing and a drive to fill those gaps; it demands an engagement with academia, the adoption of best science and the development of best practice via interaction with other practitioners. The process of improvement becomes self-sustaining, increasing knowledge and understanding to the benefit of all. Europe demands better DRM, so the opportunity must be seized.