



Third Academic Summit, June 2015
Institute for Risk and Disaster Reduction, University College London

"Disaster Risk Reduction and Resilience
Strengthening the Links between Academics and Practitioners"

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Introduction

UCL's Institute for Risk and Disaster Reduction held its Third Academic Summit on Wednesday 24th June 2015. The day was devoted to panel discussions enhanced with valuable contributions from the audience. There were four sessions, with the following titles:-

- Making academic research more useful to practitioners
- Improving communication between academics and practitioners
- Training, teaching and exercising challenges
- Bridging the gaps with integrated research

In addition, there was a short demonstration of a new website for information exchange, the Network for Disaster Reduction and Resilience (ndrr.info, described later in this report). The Summit was organised in collaboration with the NGO **Rescue Global** (www.rescueglobal.org) and the **Institute of Civil Protection and Emergency Management** (www.icpem.net - www.theicpem.net). UCL-IRDR also worked closely with **London First** (londonfirst.co.uk), a well-established organisation that works to make London an outstanding—and safe and secure—city for business and commerce. Further details of London First's initiatives in resilience, specifically its **Security and Resilience Network**, are given in the penultimate section of this report.

Two documents were circulated prior to the Summit. One was an article by Tony Moore entitled "Uniting academics and practitioners to promote excellence in civil protection." This can be found in the Spring 2015 edition of ICPEM's journal *Alert* (see ICPEM websites). The other was a position paper written by David Alexander, which is appended to this report. It was written in order to stimulate debate at the Summit.

The following distinguished guests served on the four panels chaired by Prof. David Alexander (UCL-IRDR and ICPEM).

Dr Fredrik Bynander - CRISMART, Swedish National Defence University
Mr Hamish Cameron - London Resilience Team, Greater London Authority
Prof. Andrew Collins - Disaster and Development Centre, University of Northumbria
Mr Nigel Furlong - Transport for London and ICPEM
Mr Robert Hall - London First
Prof. Sven Halldin - Department of Earth Sciences and CNDS, University of Uppsala
Mr David Jones - Rescue Global
Dr Ilan Kelman, UCL-IRDR and UCL Institute for Global Health
Mr Gordon MacDonald - University of Loughborough and Vice-Chairman, ICPEM
Mr Colin McQuistan – Practical Action
Dr Lars Nyberg - Centre for Climate and Safety, Karlstad University
Dr Charles Parker - Department of Government, Uppsala University
Dr Mike Rennie - Royal Military Academy, Sandhurst, and ICPEM
Mr Phil Trendall - ICPEM Blue Light Group

[I offer a mea culpa for the inadvertent lack of a gender balance on the panels, which I hope was to some extent compensated for by the very welcome active participation of female members of the audience.]

This report summarises the main observations and conclusions of the Academic Summit. As the panellists and audience returned to some of the issues raised earlier in the day, to avoid repetition, the following sections are not organised as a chronological account of the proceedings, but instead are arranged around the main issues that were discussed. Under this scheme, comments are not directly attributed to their authors but effectively become common property of all the participants.

In this report, 'disaster risk reduction' (DRR) is defined as the process of preparing for, responding to and recovering from disasters, and taking action to mitigate their consequences or reduce risks. 'Resilience' is the process or property of adapting to disaster risk and resisting impacts. 'Academics' are defined as people who work in universities and other institutions dedicated to research and adult education. 'Practitioners' are more difficult to define, as they include front-line emergency responders, planners, trainers, consultants, technical specialists, members of various professions, business managers, policy formulators, decision makers and political leaders. The term 'pracademic' was coined at an ICPEM annual conference and now has an entry in Wikipedia. It usually refers to a person who has moved from a practitioner role to a post in academia, where the person teaches or conducts research into the field in which he or she formerly worked. 'Pracademics' thus span the gap between those who decide or do, and those who investigate why or teach the theory behind the decisions and actions. Mercifully, we have so far avoided neologisms such as "ac-prac" or "praction"!

The following short sections will summarise the observations and discussions made by the panellists and audience during the day. Many key issues were aired early in the day and repeatedly returned to in subsequent discussions, which enriched the common viewpoint—but also made it more difficult to summarise! The reader should note that the following sections are a record of a discussion: they do not necessarily represent a definitive summary of the issues discussed. Nevertheless, I feel that the

discussants were able very effectively to enrich the debate on the uses and usefulness of research.

Who are the practitioners and what do they want?

As noted above, the term 'practitioner' embraces a wealth of roles. Furthermore, many practitioners have several jobs, possibly including emergency planner and manager. Narrowing the definition of 'practitioner' to, for example, first responders and emergency managers would belie the fact that some of the best relationships that academics can form are with senior decision makers. Generally, to be fruitful, the relationship needs to be established with someone who has the ability to effect positive change, and it is not always easy for academics to identify the right person in a given organisation. Nonetheless, despite austerity and recession, many practitioners and businesses have the money and are willing to invest in what they regard as value added. This should be an incentive to seek the necessary relationships.

One of the largest groups of practitioners is the business community, who in the event of a crisis need both emergency management and business continuity. In the UK, 80 per cent of critical national infrastructure is run by the private sector, and this makes it an even bigger player in the life of ordinary citizens. Hence, there is a need to consider, not only how to ensure that infrastructure remains functional during a crisis, but how to minimise the impact of disruptions on business in terms of reputation, revenue stream, stock market values and so on.

Experience suggests that there is a significant gap between international and national, or domestic, practitioners. Both groups work in disasters in which there are common problems, such as co-ordination of relief efforts and communication with the public. However, there is frequently an unwillingness to learn from each other. This may represent lack of awareness of the ways in which indirect experience, perhaps obtained from very circumstances, can by analogy help solve particular problems. It may be that this is an area in which academics can provide a link, especially as the detachment and breadth of vision that academics have—or at least ought to have—should favour the process of making connections between different forms of experience.

By and large, rather than reading the peer-reviewed articles of the mainstream academic literature, practitioners prefer to look at blogs, tweets and social media. They also prefer interdisciplinary research that is focussed on specific problems, not the various disciplinary lenses through which these can be viewed. In business continuity management, for example, the main work-load is at the operational end. A CEO faced with the need to manage risks and contingencies will want information in the form of five or six bullet points, not a long, scholarly discourse. In many cases, he or she will listen for two minutes and no more. Distilling complex information into this sort of format is a difficult skill, and most certainly not all academics possess it. The first requisite is to be open-minded and cultivate a two way relationship. The second is to learn the art of transforming vital information into the right format.

The practitioner's view of resilience

In some respects, resilience is more of an art than a science. It involves bringing together many different sorts of personality in a common enterprise to manage business continuity in the face of both operational risks and enterprise risk. British Standard 65000:2014 defines organizational resilience as "the ability to anticipate, prepare for, respond and adapt to events," in the form of both sudden shocks and gradual change. Organisations need to be adaptable, competitive, agile and robust, and hence the advice they receive from academics and any research they commission, should help them to achieve these qualities. Hence, resilience is a very broad, multi-faceted issue that has many possible definitions and applications.

Most practitioners serve a long apprenticeship based on the experience of managing contingencies and events. In this, the learning process is incremental. However, it may engender a conservatism that ends in a reluctance to change practices, even when it is evident that they can be improved. In relation to academics, their viewpoint can be summarised as "I know what I'm doing but I don't quite know why." Thus, research can be used to analyse and distil practice. Given the prominence of the human factor, psychology, sociology and communication are vital parts of this endeavour. A well-formulated partnership may deliver metrics for assessing current practice and a repeatable methodology that can deliver resilience. Research may also help avoid the common pitfall of "reinventing the wheel". Blue-sky thinking may help practitioners react to new developments - and react more effectively to journalists who question what they are doing.

How to initiate a relationship with practitioners: the academic view

The academic who sets out with the objective of achieving a deep transition of his or her work to a state of immediate usefulness needs to start by learning the art of listening. There may be a common tendency to want to suggest PhD-level projects or protracted pieces of research right from the start, but it is usually a mistake to offer ready-made projects to practitioners at the first meeting, as these are not necessarily very relevant to their needs. Flexibility and open-mindedness are needed, and the first task is to build up a relationship of trust and mutual respect. Once the potential needs of the practitioners have been understood, short projects can be proposed. If the relationship is good, these may lead to one- or two-year post-doctoral projects and eventually the longer commitments associated with PhD positions or equivalent research projects. Hence, the agenda needs to be defined by a common effort by both parties, starting with an open framework that helps explore common interests. This may lead to the formulation of interesting projects and challenges. Open-mindedness will show that the need to solve practical problems is not necessarily opposed to basic research needs, but the two may instead be complementary.

Academics and practitioners need to have respect for each other's knowledge. There are many preconceptions, but research can identify them and they can then be challenged. This may be a painful process: some societal values cannot be questioned, it can be very challenging to establish priorities. In a synergistic manner, the process of establishing priorities for managing risks and events can be food for thought in the creation of a research agenda.

The potential of the academic contribution

The job of academics is to present a multi-faceted perspective and an analysis that offers different ways of viewing a problem. It is seldom necessary to make decisions for the stakeholder, but instead there is a need to provide the basis for improved decision making. By ensuring that *knowledge* of new developments is disseminated, the cycle of innovation can be speeded up.

The relationship between academics and practitioners is redolent with missed opportunities. For example, MSc and PhD dissertations may contain many useful observations and conclusions but these tend to disappear as the work is shelved, or whatever the digital equivalent of shelving is. More generally, we need to devise a better service of getting published work to user-practitioners.

Academics naturally concentrate on peer-reviewed research, yet the so-called 'grey literature' is not to be neglected. Field reports written by practitioners can be very interesting crucibles of ideas. To broaden their audience, they can be "academicised". Field experience can be written up in the form of academic papers, with practitioners as the lead authors and academics as subsidiary authors. In the humanitarian response field, this approach was pioneered in the 1970s by *Disasters* journal. It has the potential to be extended to many other areas in which it is not currently used. One additional detail of relevance is the increasing prevalence of open access to academic work, which means that anyone with an Internet connection can access the papers. Open access does not necessarily make the works intelligible, but it does make them accessible.

The academic research literature can help make incremental improvements in the way things are done. In this sense it can augment tactically what practitioners do. Moreover, it can sometimes tell them whether they are doing things right in the first place. Here it is noteworthy that there are instances in which academic research provides the *only* information that is available. In any event, academics can ascertain what sources of knowledge practitioners are using, screen them and add the latest knowledge. Mentors are not lacking in the pantheon of academic authors, for example, Rhona Flynn on leadership and command and control, the late Barry Turner on risk management in the nuclear industry, and Brian Toft on active learning. There are many others.

A further quality of academic research is colloquially termed 'myth-busting'. Objective analysis of situations and tendencies can help dispel misconceptions about the world. In DRR, many of these concern human perception and behaviour, on which we have the benefit of almost a century of intensive research by social scientists.

Finally, through research, publication, white papers, and so on, academic work can inform policy and law. Conversely practitioners can inform research by identifying gaps which can become opportunities, thus enabling two-way dialogue and advancement, rather than repetition or retrenchment in unconnected, inward-looking disciplines or organisations.

Although the prognosis for collaboration is bright, there are some pitfalls that need to be avoided.

What if the academic product is not good enough?

Academic work can vary substantially in quality. In the face of increasing demand for inter-disciplinary work, academics tend to be stuck in their own disciplines. In fact, they are more and more driven by bibliometrics, which tend to reinforce the failure to adapt. In the field of DRR and resilience much of the theory we use is 30-40 years old and manifestly unsuited to modern conditions. One consequence of this is a difficulty in striking a comfortable balance between pure and applied research. Regarding the latter, it is important not to bury research proposals or findings in a welter of jargon, technical detail and incomprehensible acronyms. There is seldom any benefit in doing so.

There are dangers in over-promising and thus generating excessive expectations of research. Academics do not have all the answers—indeed, the answers may not exist. Instead they have their own development process, during which they may disagree amongst themselves. Although open debate is healthy, the sad reality, is that much academic work will not be of value, either practically or theoretically. Hence, it is necessary to sort out that which is useful and build upon it. To some extent, this is a natural procedure of selection, but it is not necessarily an efficient process.

Practitioners commonly show a predilection for the fruits of interdisciplinary research. Academics should be careful not to adopt multidisciplinary or interdisciplinary wording if that is not what they really do, as this is bound to end in the disillusionment of the user. In this context, much more work is needed on the creation of multi-disciplinary groups, especially in the light of the need to achieve multifaceted adaptations to climate change.

Genuine interdisciplinary work in DRR and resilience would see far more integration of academic areas that are now largely outside this field. These include, for example, archaeology and artificial intelligence. Even the study of management systems and leadership needs firmer connections with our field. In this way, academic study can seek to be transformational, to lead change, not reproduce and support the status quo.

Timeliness is important, but it should not eclipse quality. It is easy to be short-changed by poor research that is ill-conceived and hastily conducted. Hence, when practitioners commission or use academic research, quality control is essential.

On the divide between academics and practitioners

Although the previous considerations may have given the impression that there are two very diverse camps, in reality there are no sharp distinctions between academics and practitioners. One reason for this is that there are different kinds of practitioner and therefore there is no single gap that needs to be bridged. Another reason is that there can be transitions between the two worlds, as practitioners take educational courses or become academics, and academics move into professional practice. Moreover, rather than a divergence of objectives, there is much ground for synergy. If mutual incomprehension exists, networking is the solution. In this respect, there is a need to build bridges more widely than merely in bilateral form: academics, public sector workers, the private sector and NGOs all need more mutual sources of communication.

Some would argue that academics need to be trained to communicate with practitioners, although possible the reverse is true as well. Hence, there have been failings and opportunities on both sides. Here, the role of the intermediary can be very helpful. There may also be a role for adapters of research, who are able to translate the work into the basis of answers to practical problems, as well as an agenda for training. Finally, in one sense, students are pracademics, as many of them will be looking for real-life involvement and opportunities to apply the skills they learn in courses.

One potential barrier to communication and collaboration is the issue of how to deal with uncertainty.

On uncertainty

We live in a volatile, uncertain, complex working environment. According to the standard view, practitioners want answers to concrete problems, while academics tend to emphasise uncertainty, but how will the former react to problems that have no immediate answer? The difficulty of communicating uncertainty calls into question what academics are trying to put across in terms of what they *are able to* communicate. Uncertainty has its costs, but this is not always a bad thing. An important goal is to pursue new knowledge in order to reduce levels of uncertainty. This is a process that has a distinct benefit-cost ratio, in which research needs to find the point of diminishing returns. In the meantime, uncertainty is an everyday reality with which both academics and practitioners need to engage. The mutual exploration of uncertainty requires mutual levels of perceptiveness and trust. The pay-back will come in the form of risk information that contributes to innovative change. On both sides, an honest approach recognises uncertainty and does not attempt to minimise or discount it. Hence, a convergent viewpoint can be achieved. It requires clarity on the part of academics and honesty in the face of challenges on the part of practitioners. It is a pleasure for academics to hear practitioners say "we want to be challenged" and to admit that they do not have all the information needed to manage situations.

Teaching, training and education for practitioners

In academic terms, the growth of education has been very different from the growth of research. Although it is frequently, and very rightly, said that research should inform teaching (and vice versa) in DRR and resilience the two tend to be treated separately.

Several questions present themselves. Is education delivering what it needs to provide? Are we teaching the right or the wrong things? What are the elements of good training programmes for different kinds of professional worker? We need to come up with more evidence of what works, and why and how it does. In other words, before embarking on any programme of teaching, we need to conduct a training needs analysis, something that is all too seldom done. It is not the number of hours of training that counts, but the impact. Hence, needs assessment should be conducted with the impact, rather than output, in mind. A typical question to answer would be "in what should an operational commander be trained?" In addition, one of the most important functions of training is, not merely to extend the trainees' competencies, but to challenge preconceived notions about how things need to be done.

An element of DRR should be taught at the undergraduate level to geographers, architects, engineers, and so on, as an attempt to motivate students to take this field seriously in their later professional life. Short courses and MOOCs (massive on-line open access courses) can also help get people interested in this field. However, the skills that academics need when they are invited to train practitioners may be rather different to those that they normally use in university teaching. DRR and resilience are, if not unique, then at least distinctive in that the test of theory is its immediate applicability to practical problems.

Detachment is a feature of the academic approach. It is part of a quest for objectivity, but it can very easily lead to a sense of artificiality. Although the 'big picture' is always useful, practitioners would counter by arguing that it is very difficult to focus on the objective of draining the swamp when one is up to one's ears in alligators: this underlines the importance of teaching practical solutions to problems, or at least the skills needed to create such solutions. We need to teach agility and the ability to apply lessons. Many of these are inherent in the research of academics who have observed DRR practice and made deductions from it. However, academics involved in training need to establish credibility with the practitioners, which may involve going out into the mud and toil of real or simulated emergencies, moreover carrying the need to communicate with people who do not speak academic jargon.

In addition, teaching must impart challenges. For example, in the present day the world's humanitarian system is being severely tested. This fact must come across in teaching: it must form the basis of a critical analysis that is designed to generate insight. Moreover, the fact that nations which suffer disaster are becoming less willing to accept international aid can be regarded as a key performance indicator and a warning which should help frame study, research and practice at the strategic and tactical levels.

Even a well-trained, experienced organisation can benefit from academic input. The organisation's strengths and weaknesses can be evaluated, and so can its support functions. Training simulation can create scenarios that are useful to trainees. Note, however, that in free discussion ideas aired at the beginning will have to be re-entrenched at the end. As Howard Aiken, principal designer of the IBM Mark 1 computer, once said "Don't worry about people stealing your ideas. If your ideas are any good, you'll have to ram them down people's throats."

Here are some more common challenges.

The challenges we face

Academic work is often abstract. It tends to confront the broad picture and focus on the generation or verification of theory. A challenge therefore exists in striking a balance between concentrating on short-term, closely defined issues and the need to look at the long term. In no field is that challenge more imperative than in climate change adaptation especially given its links with DRR and resilience. Academic work may be about things that do not pay off in the short term: so be it, but the challenge here is to convince practitioners that there is value in looking beyond the short term. The key question is whether risk assessment should be based on the situation today or that which will confront the next generation.

As academics receive very little feedback, it is a struggle to find information on how and where academic research in DRR and resilience is being used. Two-way communication is needed in order to explain what does and does not work for the practitioners. The reverse flow of information can help academics test their theories with practical knowledge. However, it is difficult even to know where to seek feedback, as there are so many organisations, institutions and agendas. Nevertheless, in our work, it is best not to shy away from economics and politics. Both have a profound influence on what we can do and whether it is deemed useful. In this context, rather than being a hindrance, budgetary pressures should be considered opportunities to be grasped.

Research is not the exclusive preserve of universities. It also happens in many other forms of agency and organisation. Barriers need to be dismantled. Universities remain good collectors, reviewers and evaluators of research information—but are they good collaborators with other kinds of research institution? The answer is "sometimes". In general, not enough learning is being shared across borders.

Institutions are all designed for upward, not downward, accountability. Some of what is commonly taught in DRR refers to institutional architecture that no longer has relevance. One of the great challenges here is to understand the meaning of the term 'community' and use it productively in teaching and research. In this context, researching and teaching big events that have not yet occurred may be very difficult, and hypothetical realities may not be appreciated by hard-headed practitioners. Nevertheless, to some extent we are all prisoners of history, as our ancestors made decisions on the basis of the information that was available to them at the time and we have to live with the consequences. Hence, research and teaching must focus on the historical context, the present situation and the future potential. Moreover, it must do so in a context in which there is (at least in the United Kingdom) no official definition of 'mitigation' and there are many problems in defining the term 'community', socially, functionally, geographically and economically. Hence, we must all orientate ourselves to an environment in which there are no central drivers of risk.

There is a sense of imperative in this. We now have the opportunity to help drive productive, positive change. The alternative is not to take the initiative and, through failure to innovate, gradually to become part of the problem rather than the solution.

Good practice and examples

The credibility of academics among practitioners is sometimes hard-won and never instantaneous or automatic. One can take heart from the example of the Peace Studies Department at the University of Bradford. When it was founded, as a centre for conflict resolution, it was regarded as rather subversive, but in 30-40 years it gradually achieved legitimacy and an enviable reputation.

The emergency planning and coordination authority for the UK capital city, London Resilience, has seen fit to create an Academic Partnership which promotes cooperation between academics working in DRR and resilience and practitioners in London. Since the 2012 Olympics, London has seen two or three generations of senior Fire and Police officers, so there is a need for the continuous application of expertise.

Moreover, the transformation of London into a sort of 'city-state' has created a demand for resilience and a new view of the risks and opportunities associated with business. Adaptation to events such as crises and shocks is firmly part of the business approach in London. Events are taking on a much greater strategic significance than ever before, and the new complex reality demands the kind of analysis and critical thinking that academics can provide.

Other partnerships have shown different innovative pathways to collaboration. For instance, Tulane University has had a "revolving door" policy, in which academics went to work in NGOs and NGO personnel came to work in the university. In Britain, the resilience of communities to flood risk has been tackled by an alliance between an insurance company, two academic institutions and two practitioner organisations. All of them come to the problem from different perspectives and contribute in their own ways to the search for a methodology to measure resilience.

These are only a few of many interesting examples of good practice in collaboration and partnership. The challenge is to disseminate, interpret and utilise them in order to demonstrate the range of opportunities for academics to work with practitioners.

The penultimate section of this report outlines a new initiative to facilitate collaboration both between academics and with practitioners.

The Network for Disaster Risk and Resilience - ndrr.info

The first two Academic Summits at UCL (in June 2013 and June 2014) established that there is a demand for a network designed to facilitate information exchange between academics and also with practitioners. Interdisciplinary communication is needed, but it has problems derived from the structure of institutions. Hence, we have set up a website to promote the sharing of information on research, courses, expertise, jobs, publications, institutional news, projects and other elements of what academics do in the fields of DRR and resilience. This initiative is restricted, for the time being, to Europe and is designed to help academics and practitioners understand what knowledge, expertise and opportunities are available in our field. We hope that in time the initiative will also give academics more of a collective voice. As time progresses, we will be developing the website as a common resource, and we hope that academics and institutions will participate and become partners. We would like this site to be common property and at the service of all its users. The success of this initiative is therefore dependent on the willingness of users to participate and uphold it by sending in current information to be displayed and disseminated. We anticipate that the main development of this nascent site will take place in the autumn of 2015.

We hope to be able to link the NDRR website closely to a parallel initiative, to which we would like it to be complementary. London First has recently inaugurated a **Security and Resilience Network** (<http://londonfirst.co.uk/networks/security-and-resilience-network/>) in which the emphasis is serving the needs of practitioners in business and commerce. We hope that the academic offerings on ndrr-info will be of interest to users of London First's network and that the two initiatives can grow in synergy.

Conclusion

This report has emphasised that many practitioners require academics to provide, not long and thoughtful abstract discourses, but short, sharp practical answers. Accordingly, I end by summarising the reflections given above in the classic "six bullet points." Readers who feel that even this is too copious, and five would be better, can ignore one at random!

Conclusions:-

- The work of practitioners, together with applied academic work on their behalf, is the crucible of ideas for academic research and the teaching that it informs.
- Open minded, exploratory relationships between academics and practitioners can help facilitate needs assessments and projects that are mutually beneficial.
- Practitioners tend to learn incrementally through an "apprenticeship" based on accumulated experience. This can be augmented by academic knowledge, which can help dispel misconceptions and introduce broad issues.
- There is no simple barrier to overcome between academics and practitioners, as there are many kinds of the latter and many agendas. In any bilateral relationship, learning needs to be a two-way process.
- Practitioners would rather that academics provided interdisciplinary research and training. Academics need to resist the pressures against this sort of work and ensure that promises of interdisciplinary contributions can be fulfilled.
- Academics need to seek and practitioners need to supply feedback about what is beneficial, so that the right teaching, research and service will be conducted.

Appendix

Disaster Risk Reduction and Resilience Strengthening the Links between Academics and Practitioners

Position Paper

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The object of this brief essay is to outline some of the issues and challenges that academics and practitioners in the field of disaster risk reduction (DRR) and resilience face in communicating with one another and working together. My aim is to offer a preliminary contribution to discussions that will take place at the UCL Academic Summit on 24th June 2015.

With respect to risks, crises, emergencies and disasters, in their various phases, the function of academics is, broadly, to observe and deduce. This is part of a constant search for enlightenment, in which what events in the field form the raw material of research, teaching and advice. A body of existing knowledge is brought to bear on new developments. By synergy, it is augmented during that process.

Academics are the chief producers and utilisers of theory. If it is any good, theory explains, connects, validates, qualifies and makes practical action more efficient. As the eminent sociologist of disasters, Tom Drabek, noted, it is the road map of disaster reduction and relief because it clarifies issues and fundamental relationships. Leaving aside bad, irrelevant or misconceived theory, which clarifies nothing, DRR and resilience are distinctive, if not unique, in that the test of good theory is its immediate applicability to practical problems. There is much less emphasis on storing up theory for use at some undefined time in the future, although, of course, this can be useful as well.

Theory needs to be formulated and validated by measuring it against the evidence. The first of these steps involves creating models that, as elegantly as possible, simplify reality to its most important elements and filter out extraneous detail (to use an electrical metaphor, the model extracts the 'signal' from the 'noise'). The models are made by observation of reality "in the field", employment of existing methodology and building upon previous formulations. The evidence must be collected in the field and from statistical sources, as appropriate.

Caveat emptor: in academic research, much is made of the concept of an evidence base, as DRR and resilience are considered to be fields in which there has been something of a failure systematically to amass evidence. Although there is much truth in this observation, care needs to be taken over what is evidence and how it can be used. Evidence can be misleading, inconsistent, indeterminate or selective. It can defy interpretation, or it can be manipulated. Indeed, all use of evidence is selective, whether in pursuit of objectivity or not. Hence, any emphasis on collecting and using evidence throws up a series of questions. To what extent is evidence a surrogate for experience? Is evidence composed of "objective data", or is it mere perception of how

the world functions? What is the connection, if any, between evidence and wisdom? How much evidence is enough? Finally, can we do without evidence and would explanation be more efficient if this were the case? These are all open questions, for which the answers require deep thought and much debate.

According to some commentators, there is a distinction between academics and practitioners, in that the latter inhabit "the real world". It is perhaps worth noting that there is nothing less real about the academic world. Indeed, in some cases it may well be more "real", in that academic work permits one to develop overviews and explicitly to measure situations against knowledge of how the world functions in ways that practitioners can seldom do.

Nevertheless, there is certainly a high degree of separation between the world of the academics and that of the practitioners, from policy formulators to front-line operatives. To make decisions about expenditure on risk reduction or humanitarian intervention; to run a business in the face of a risk that it may be interrupted or destroyed by disaster; to save lives after natural hazard impact; to make calculations about structural resilience; to provide shelter; these are examples of the work of practitioners and every one of them would benefit from a measure of sound academic work in both research and training, or education.

The simplest way for academics to be appreciated by practitioners is to produce something that makes the work of the latter simpler or easier. At their best, academics can generate insight, correct impressions, solve problems, provide learned commentary, invent new routines or instruments and connect up the pieces of a problem in ways that are creative and revelatory. At worst, they fall foul of the phenomena that obstruct common endeavour.

There are several barriers to communication and collaboration between academics and practitioners. The first is language. Many academics have a tendency to write in long, intricate sentences that present abstruse concepts by way of impenetrable jargon. There may be fields in which this is justified, but they do not include DRR and resilience. Granted, one cannot avoid much of the technical language of physical and construction sciences, but in the social sciences obfuscation is greatly overused. Complexity is particularly attractive to the neophyte. It conveys an aura of wizardry (hey presto! this is research!), and it is seen as endowing a work with legitimacy. Lovers of complexity would do well to read J.B. Priestley's essay "Making writing simple", in which he looked back wryly on his own youthful pretentiousness and in his maturity offered common sense and sagacity.

The second barrier is divergence of objectives. Not all scholarship needs to be immediately applicable to practical problems. Indeed, it is one of the great tragedies of modern research policy in DRR and resilience that the emphasis falls so heavily on applications that basic research is being given short shrift. However, it is often possible to fulfil theoretical and practical objectives at the same time, as the latter become a spin-off of the former. Thus, research for the sake of research may still result in practical applications, as well as storing up knowledge for use in future practice.

The third barrier is mutual incomprehension. Both sides need to make the effort to appreciate the perspective of the other without denigrating it. Synergy or symbiosis, or

in other words, added value, can only be created if there is genuine input on both sides.

The fourth barrier is indeterminacy. Understandably, practitioners want answers. Academic culture induces us to hedge our statements with qualifiers. The response is often "Yes, I understand that, but is it going to happen or not?", and the academic replies, "Well it might do, under certain circumstances", which leaves the practitioner distinctly unenthused. The misperception that science has all the answers is widespread. We live in a world dominated by indeterminacy and unsolved problems. More than ever, the emphasis in science has shifted from providing the answers to constraining uncertainty as far as is possible with current knowledge and techniques. Neither side wants to admit that the answer could be "there is no answer", but that is often the case. For example, regarding earthquake prediction, we know the location of broad areas of seismicity. We know much about the recurrence intervals of events of certain sizes, and we can amass information on the effects of earthquakes by studying local vulnerability. However, broad-term magnitude-frequency predictions remain controversial as a result of the duality between probabilistic and deterministic methods, while short-term prediction may be an unattainable goal. In many areas, the way that the interaction of faults changes the stress field in the Earth's crust is complex enough roundly to defy exact prediction of when and where the next seismic event will occur, and what will be its magnitude. Paradoxically, human reactions may be more predictable than that, if we only learn to observe the signs.

The final barrier to collaboration lies in divergent imperatives. The politician, business manager or field operative is under pressure to produce results. In the academic world there may be intense pressure to publish or teach. Assessment can limit the opportunity to work on problems that are outside the parameters set by the assessors. Nowadays, research funding programmes often include a vaguely-defined criterion called 'impact'. However, in DRR and resilience, there is still a big gap between the academic research agenda and the fundamental needs of society. Great efforts have been made to close it, but institutional, employment and funding pressures continue to dictate the agenda independently of other issues.

One other issue is important. In the present day, much is made of trans-, inter- and multi-disciplinary work. There is a widespread understanding that the boundaries between disciplines need to be crossed, because practical problems have multiple facets and can be appreciated and analysed in different ways. A holistic approach to DRR and resilience is better than one that attempts to solve only part of the problem because it stems from the perspective of only one discipline. This is entirely justifiable, as problems associated with disasters tend to be complex, and more than 40 disciplines are professions are engaged in trying to solve them.

I advocate two criteria for strengthening this approach. The first is to abandon the concept of disciplines as far as is possible. Those, such as engineering, that involve liability cannot entirely be forsaken. However, it is axiomatic that the demands of the problem should determine the solution, not those of the discipline through which it is viewed. Half of the battle to reduce risks and disasters lies in appreciating the potential of disciplines and professions that are not one's own. Secondly, one should try to avoid the natural human tendency to assume that there is only one reality and each of us is a party to it. The best way to appreciate human motivations and objectives is to see

problems in the light of different views of reality dictated by different life experiences, cultures, and forms of education and training. Broad-mindedness is the basis of collaboration, along with a willingness to accommodate new perspectives.

In the light of these considerations, several themes emerge for debate. The first is *how to make research more useful*. This obliges one to define 'useful' and to think about what academic research can contribute to the solution of urgent practical problems in our field. It may also require some consideration about what is *not* being done and should form part of the agenda. For instance, how should we appreciate the opportunities and limitations that go with working to reduce disasters in the light of any particular human culture?

The second issue is *how to improve communication across the boundaries between disciplines and professions*. In our academic or professional training, we are taught to reason in particular ways, yet the distinctive feature of disasters and crises is that they create an imperative need for answers to problems that may transcend the barriers. Despite all the talk of interdisciplinary work, there are still very strong pressures to identify with disciplines and professions, to protect their territory in the field of learning, and to conform to their norms. Yet, given the urgency of the need to protect the world's populations against disaster, loss of identity and loss of credibility may be the least important of our worries.

Thirdly, we need to address *how to improve teaching and training so that they better suit the needs of the trainees*. Courses are beset by the problems of fragmentation among the disciplines that contribute to DRR and resilience. Do we fully appreciate the need to produce 'educated generalists', who understand the multi-faceted nature of disasters? Before launching our courses, did we conduct a needs assessment, and afterwards have we measured the effectiveness of the training or education provided? What should be the content of the core curriculum, and what are the best methods of putting it across?

Finally, it is imperative to find out *how to avoid the isolation brought by monodisciplinary approaches*. Are there antidotes to the pressures to conform in disciplinary circles? Can we press for better recognition of genuinely interdisciplinary work? Despite the rhetoric, there remain many more opportunities for interdisciplinary (or indeed *non-disciplinary*) work than examples of it in practice.

In conclusion, the debate needs adaptability, receptiveness and a desire to avoid the 'dialogue of the deaf'. Academics can help practitioners find answers to the problems that beset them, and to find their way around the maze of existing knowledge. That process cannot take place without mutual understanding and a genuine desire to adapt to the perspectives, exigencies and cultures of the other side in this debate.