



# A Glass Half-Full or Half-Empty?

A Dialogue on Progress in Disaster Risk Reduction

Ian R. Davis and David E. Alexander

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Prof. Ian R. Davis  
Adjunct Professor and Advisor to Amrita Vishwa Vidyapeetham University, Kerala,  
India  
82 Church Road  
Wheatley, Oxford OX33 1LZ, UK  
ian.robert.davis@gmail.com

Prof. David E. Alexander  
Institute for Risk and Disaster Reduction  
University College London  
Gower Street, London WC1E 6BT, UK  
david.alexander@ucl.ac.uk



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## **A Glass Half-Full or Half-Empty? – A Dialogue on Progress in Disaster Risk Reduction –**

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## Acronyms

ADPC	Asian Disaster Preparedness Centre ( <i>Thailand</i> )
AIDMI	All India Disaster Mitigation Institute ( <i>India</i> )
CBDRM	Community Based Disaster Risk Management
CBO	Community Based Organisation
CCA	Climate Change Adaptation
CAADP	Comprehensive Africa Agriculture Development Programme
COP	Convention of Parties
CRS	Catholic Relief Services
CSO	Civil Society Organisation
DFID	Department for International Development ( <i>UK</i> )
DRC	Disaster Research Center ( <i>Delaware, USA</i> )
DRC	Disaster Risk Creation
DRRM	Disaster Risk and Recovery Management
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
ERRA	Earthquake Reconstruction and Rehabilitation Authority ( <i>Pakistan</i> )
FEBA	Friends of Ecosystem based Adaptation
GFDRR	Global Facility for Disaster Reduction ( <i>USA</i> )
GHG	Green House Gasses
IIPA	Indian Institute of Public Administration ( <i>India</i> )
ICLEI	International Council for Local Environmental Initiatives
IDNDR	International Decade for Natural Disaster Reduction
IFRC	International Federation of Red Cross and Red Crescent Societies
IOM	Institute of Migration
IPCC	Inter-Governmental Panel on Climate Change
IRDR	Institute for Risk and Disaster Reduction ( <i>UK</i> )
IUCN	International Union for the Conservation of Nature
JICA	Japan International Cooperation Agency ( <i>Japan</i> )
MENA	Middle East and Northern Africa
NDRF	National Disaster Response Force ( <i>India</i> )
NRA	National Reconstruction Authority ( <i>Nepal</i> )
NREGA	National Rural Employment Guarantee Act ( <i>India</i> )
NSET	Nepal Society for Earthquake Technology ( <i>Nepal</i> )
OAS	Organization of American States
PAR	Pressure and Release Model
PEDRR	Partnership for Environment and Disaster Risk Reduction
SDRF	State Disaster Response Force ( <i>India</i> )
SEEDS	Sustainable Environment and Ecological Development Society ( <i>India</i> )
UCL	University College London ( <i>UK</i> )
UNDRR	United Nations Office for Disaster Risk Reduction
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	United Nations International Strategy for Disaster Reduction

***'An optimist will tell you the glass is half-full; the pessimist, half-empty;  
and the engineer will tell you the glass is twice the size it needs to be'***

attributed to Oscar Wilde  
(as well as to George Bernard Shaw)

***' Whether the glass is half empty or half full, I want to know who gets  
to drink from the glass and washes it up afterwards!'***

Maureen Fordham

***'For me the glass will always remain half empty – needing to be filled. We have learnt  
that the glass we thought needed filling was far too small and needed enlarging.  
Much of the water that filled that glass has evaporated and needs refilling,  
and the glass has expanded.'***

Babar Khan Mumtaz

***'...filling the other half of the glass must engage with more  
fundamental human values of fairness and empathy'***

Fred Krimgold

***'do we highlight the weaknesses in order to address them now, or in the future,  
or do we highlight the successes?'***

Maggie Stephenson

***'The half-full is the undeniable advance because we are not at zero....  
the half-empty is the cost of not doing what should be done.'***

Omar-Dario Cardona

***'Is our glass half -full or half- empty? The answer depends a lot on who and where'***

***..... We can ask "How full is our glass?", but we should also ask  
"What are we are filling it with and why?"***

David Etkin

***'...it is not only about 'where and who', but also 'if and how'...  
If the glass is half-full of something that evaporates very quickly  
if it is examined for effectiveness, it is not really full'***

Terry Cannon

***'More is needed on the contents of the glass'***

Steve Bender

***'It is not a glass, it is a barrel, or an oil tanker, or a bottomless pit'***

Ian Burton

***Disaster Risk Reduction - Glass half-full, or glass half-empty? Why are we faffing about  
with such bounded receptacles? There is a place before us, and between us, where there  
is an artesian reservoir of insight, wisdom - both conceptual and practical. If we can free  
up our hands from grabbing the glass there is hope we can apprehend that.***

Nick Isbister

***Certainly at 49,836 words your paper is more than half- full!'***

Edmund Penning-Rowsell



## Introduction: Disaster Risk Reduction - A Glass 'Half-Full' or 'Half-Empty'?

Observers of an identical situation will see it very differently. As the saying goes: *'Two men looked out from the prison bars, one saw mud while the other saw stars'*. Contrasting perceptions relate to our varied personalities, and they range across a broad spectrum from cheerful optimists, through hard-nosed realists, to disgruntled pessimists. Responses are also determined by where we are standing: our ages, backgrounds, occupations and experience (Delgado 2022). Throughout this paper the metaphor: *'half-full, half-empty glass'* will recur as contributors reflect on their unique experiences and perceptions of the plusses and minuses of disaster risk reduction.

At the outset of this dialogue some explanations are necessary:-

- how this discussion came about
- what is it about, and what is it not
- how the text has been organised
- what it hopes to achieve
- who is the intended audience.

The dialogue began when Ian wrote to some friends and colleagues who work in the disaster risk reduction field<sup>1</sup> to ask them for their impression of the overall level of progress in reducing disaster risk, with a request that they provide examples to support their view. Most of them responded generously. Then the results of the first set of responses were sent back to an expanding list of contributors. In some cases they reacted to the comments of others and many suggested the names of yet more people to be consulted. Some replied with relevant passages from their own writings. After a number of iterations, some interesting 'threads' began to develop around specific topics, in which a given response led to an alternative response, an objection, support for the argument advanced, or digression into another topic.

The result constituted a unique international dialogue of well-informed opinion, sometimes supported by evidence, that was submitted by 36 people of varied ages and occupational backgrounds, writing from 19 different countries. We hope that securing this diverse range of perceptions represents a rare contribution to the subject. Throughout the following text, we attempt to summarise the emerging ideas, points of view, unresolved issues and missing items.

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<sup>1</sup> Expert advice for this dialogue was provided by the following: Sudha Arlikatti (USA and India); Yasemin Aysan (Turkey); Sultan Barakat (Qatar); Steve Bender (USA); Mihir Bhatt (India); Ian Burton (Canada); Terry Cannon (UK); Omar-Dario Cardona (Colombia); Amod Mani Dixit (Nepal); David Etkin (Canada); Bill Flinn (UK); Maureen Fordham (UK); Bruno Haghebaert (Belgium); Nick Isbister (UK); Mikio Ishiwatari (Japan); Yasamin Izadkhah (Iran); Rumana Kabir (UK and Bangladesh); Ilan Kelman (UK and Norway); Fred Krimgold (USA); Titus Kuuyuor (Ghana and Zimbabwe); Allan Lavell (Costa Rica); Andrew Maskrey (Spain and Costa Rica); Vinod Menon (India); Babar Khan Mumtaz (Pakistan); David Peppiatt (UK); Anshu Sharma (India); Vinod Sharma (India); Rajib Shaw (Japan); Robin Spence (UK); Maggie Stephenson (Ireland); John Twigg (UK); Paul Venton (USA); Patrick Wakeley (UK); Gustavo Wilches-Chaux (Colombia); Zenaida Willison (Phillipines); and Ben Wisner (USA and UK). Their designations are provided in the Appendix.

The following dialogue makes no claim to providing clear or definitive answers to complex questions. Rather, it reveals 'work in progress' by drawing attention to the places where further work is needed. The frank, spontaneous and often provocative reflections and reactions of our correspondents, and their reactions to the views of their colleagues, provide a mixture of encouragement and discouragement. Their observations are certainly challenging, always interesting and in our view worthy of wider circulation.

The broad focus concerns the range of physical, social and economic measures that have been adopted in order to reduce the risk of disaster. Some measures are taken in anticipation of hazard impacts, some are related to the immediate impact of disasters, and some are part of recovery and reconstruction. Risk reduction is an all-pervasive process. It can range from fire-and-rescue staff checking that fire hydrants work to the creation of expensive systems of flood barriers. Various contributors emphasise that DRR is rarely an isolated act or a distinct set of actions. Rather, it is-- or should be--an integral and vital element of sustainable development, environmental management and good governance.

The dialogue reminded us of the sheer complexity of risk reduction, as multiple factors affect virtually every issue. Hence, in Section 2.2 our list of 16 themes could easily have been doubled. As we read the various contributions and attempted to place them into some form of order and summarise the comments, we came to realise that simplistic analysis of virtually any problem from a single sector, issue or viewpoint needs to be replaced with inter-disciplinary and multi-disciplinary education, research, practice and policy making.

It has not been our intention to treat the extensive dimensions of this field exhaustively or comment systematically on all the topics that are included in disaster risk reduction. There are many publications that seek to do this and any improvement on them would require an extensive and rigorous piece of work that is far beyond the scope of the present report. As the quotations have been divided up so that they fit into the structure of the report, we have selected some wise 'concluding words' at the end of the dialogue. We have given ten contributors the floor, with uninterrupted space to reflect on their main concerns about the current state of DRR (see page 106). Thus, the report is best described as a mosaic of ideas and opinions, some angry, some profound, others perhaps more trivial, as Nick Isbister describes on page 110 '*a bricolage<sup>2</sup> collated and compiled by Ian*' (and later by David). '*A protracted conversation with their many friends and colleagues.*'

To establish the context, the report begins in Part 1 with a brisk summary of the development of disaster risk reduction from 1917 until the present day. The aim of this section is to help newcomers to this subject to understand some of its deeper roots. This is followed in Part 2 with observations from the contributors on some of the strengths and weaknesses of DRR. Part 3, the final section, considers ways to assess the effectiveness of the various measures.

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<sup>2</sup> Bricolage: something constructed or created from a diverse range of available things, achieved by using whatever comes to hand.

Our hope is that this report will provoke further thought and questioning, which will be helpful in answering the question of how much we have achieved in reducing the disaster risks that are so depressingly familiar. We hope it will also highlight some of the principal lessons from treating the subject as a half-full or half-empty glass. We particularly hope that the ideas expressed will result in renewed confidence in the ability of those who make decisions to create safer living conditions and protect habitats and environments.

A broad audience of readers may find something in these pages that will assist them, provide encouragement and challenge thought and action: students, academics, practitioners in government, international agencies and NGOs, relevant professionals, and others.

It was never our intention to create a statistically accurate representation in the selection of contributors. Therefore, we recognise that the dialogue may contain biases. These may include the following.

- A strong emphasis upon the built environment and the urban context, reflecting Ian's own background and his strong interest in housing and shelter issues.
- As the majority of the contributors have been close friends and colleagues of Ian, who is now in his mid-80s, about half the reflections in this paper are drawn from this older generation who bring their lifetime experience to this text, but may not quite have the perspective of younger scholars and practitioners.
- We consulted far more academic contributors than active practitioners.
- We acknowledge a gender bias with comments from 29 men and only 7 women. However, this reflects a similar bias within the DRR community.

We express our gratitude to each of the contributors for sharing their insights on successive drafts of this dialogue, and we offer special thanks to Steve Bender for his wise contributions to the conclusions of each section. Extra thanks are also due to Terry Cannon, Bruno Haghebaert and Ben Wisner for their valued editorial support and to Edmund Penning-Rowsell and Ian Burton who gave us a valued critique and made constructive suggestions.

## Part 1. Patterns, 1917-2022

**Ian** began working in the Disaster Risk and Recovery Management in 1972, so tends to divide the subsequent decades up into convenient periods: the 1970s, 1980s, 1990s, the International Decade for Natural Disaster Reduction (IDNDR), and so on. **Ben Wisner** entered the field earlier and has added a summary of the 1960s. **David** began his involvement in 1980 with the Irpinia-Basilicata earthquake in Southern Italy. He has also studied the earlier history of the field.

The following summaries are impressions of general progress in reducing disaster risks during the past 100 years.

### 1.1 Origins and Where They Led Us

On 6th December 1917 two ships collided in Halifax, Nova Scotia. One, the *SS Mont-Blanc*, bore a cargo of munitions. A fire ignited them and the resulting blast totally destroyed all structures within a radius of 800 metres. It killed 1,963 people and injured 9,000, amounting to 22 per cent of the population of Halifax. It was the largest man-made explosion of pre-nuclear times.

Samuel Henry Prince (1886-1960) was a local Anglican priest who escaped injury in the blast and was thus able to assist the survivors. He had a strong sense of ministry, an academic bent (and an MA in psychology) as well as a maritime background (Scanlon 1988). In May 1919 he began a doctorate at Columbia University, which he completed and published in record time (Prince 1920). It deals with the first 30 months of the aftermath.

Several assessments of Prince's work have been published (Dynes and Quarantelli 1994, Scanlon 1988, 1997). One of these noted that "Systematic study of disaster was still three decades away" (Scanlon 1988, p. 216). However, it can be argued that Prince started the ball rolling. By a mixture of design and coincidence, his was the seminal study.

Major disasters had been systematically investigated before Prince came on the scene. The Royal Society report on the 1883 Krakatoa eruption (Symons 1888) is one contender; the 1783 Calabrian earthquakes are another, as the Royal Academy of Naples carried out a thorough study of this disaster (Vivenzio 1788). An even stronger contender might be the December 1857 Basilicata earthquake in the Kingdom of Naples. The Irish engineer Robert Mallet wrote a remarkable interdisciplinary report on it after a month of arduous fieldwork (Mallet 1862) and this has since been treated as a milestone in the history of science. However, none of these studies led to the development of disaster science. To an extent, Mallet is one of the fathers of seismology. His observations on disaster were part scientific treatise, part ethnography and part travelogue, but they had no immediate follow-up.

Prince was fortunate in that others were ready to take the field forward. Although the priest himself carried out no other studies of disaster and wrote no further treatises on it, other than a 1958 volume in which he repeated much of what he had written in 1920, momentum did not lapse. A bluff, broad-shouldered mid-westerner, Harlan Barrows,

who was Professor of Geography at Chicago University, took over the reins. In his 1923 presidential address to the Association of American Geographers he presented the field of human ecology (Barrows 1923). It ushered in the age of studies of how people and communities adapt to harsh environments and extreme events. Anthropologists such as Karl W Butzer (Butzer 2012) and Anthony Oliver-Smith (Oliver-Smith 1986) would take it forward, and so would Barrows's protégé, Gilbert Fowler White (White 1945, 1974, Hinshaw 2006).

The first generation of 'disasterologists' also included a remarkable man who managed to be both renegade and pillar of the establishment. Pitirim Alexandrovich Sorokin fled the Soviet Union in 1923. Before he left he founded the Sociology Department of St Petersburg University, and he did the same at Harvard University after he became a naturalised American. Sorokin was fascinated by the social properties of warfare, a field of study which gradually led him to write a more general treatise on disaster (Sorokin 1942). He appears to have had no legatees, although the founding in 1963 of the Disaster Research Centre at the University of Ohio (it moved to the University of Delaware in 1985) strongly promoted social studies of disaster and made the names of the sociologists Enrico L. ('Henry') Quarantelli and Russell R. Dynes revered by scholars and students worldwide. Moreover, the 'ethnographic' anthropology of Kai Erikson also left its mark (Erikson 1976).

Sadly, we cannot trace continuity or affinity in the psychological studies of disaster. In 1906 William James, the brother of Henry James, became a participant observer when he was lecturing at Stanford University and it fell apart in the San Francisco earthquake. Having survived - narrowly - he did not hesitate to put pen to paper (James 1911), but after that he did not follow up his reflections and neither did anyone else for a long a period of time.

Samuel Henry Prince forestalled Harlan Barrows by a few years but the establishment of social dynamics and human ecology (although not the conflation of these fields) was fortuitous, for it lent momentum to the study of disasters. Albeit with several different origins, a first generation of scholars had emerged. It led, perhaps erratically, to a second generation (White, Quarantelli, Dynes, etc.) and they took care systematically to nurture a third (e.g. Burton et al. 1993).

In 100 years the field has gone through several changes of name, or perhaps it has required time to acquire a coherent identity. Disaster risk reduction is a neologism, but it is intended to show that we embrace mitigation as well as response and recovery. 'Disaster science' is a good descriptor, but only provided we consider science to be a broad church that includes the social, economic, psychological and cultural aspects as well as the physical ones. We need Teilhard de Chardin's and Vernadsky's *noösphere* as well as the atmosphere, biosphere, hydrosphere and lithosphere (Levit 2000).

There may be new challenges in disaster science, but there is still much unfinished business. For example, we have failed to define what a scholar needs to have read in order to become a 'disasterologist'. Perhaps we should start by doing this. The list is not difficult to compile. Many of the earlier works are available in digital format and can be downloaded freely. Now, after a century of development, would be a good time to reread Prince and the other early luminaries.

Realistically, the beginnings of disaster science are diffuse enough that justifying the idea of a centenary is actually quite hard. However, there is something rather attractive about the idea that, like the Universe, it "all began with a big bang" (namely, the ship explosion). The second 'big bang' was undoubtedly 'nine-eleven', the terrorist attacks on the USA on 11th September 2001, in which civil defence underwent an abrupt return to favour as resources were poured into 'homeland security' (and thus out of natural hazards studies).

Disaster studies have grown at a fast and constantly accelerating pace. There are now more than 80 academic journals dedicated to aspects of risk, hazard and disaster, and more than 500 others that occasionally (or often) publish papers on these topics. Growth does not equal maturity. A centenary could be a good opportunity to force the pace regarding the latter, and to treat the occasion as a rather belated 'coming of age'.

## 1.2 The 1960s to the 2020s

### 1.2.1 The 1960s

**Ben Wisner** began his career during this decade:-

*'I saw the establishment of humanitarian institutions in the caldron of war that later became vehicles for reduction of disaster risk from natural hazards and currently climate change. Humanitarian assistance to famine-stricken civilians in Nigeria (Biafra war, 1967-1970) and those displaced by wars in Indochina (1965-1975) should not be artificially separated from humanitarian responses to natural hazard events and slow onset processes such as desertification.'*

Reconstruction following the 1963 Skopje earthquake in Yugoslavia incorporated a range of progressive architectural and planning mitigation measures.

### 1.2.2 The 1970s

The 1970s were a formative decade in the development of the subject and certainly in Ian's and David's perceptions. There was a gradual growth in the international awareness of disasters, their impact on communities and the need to mitigate the impact of hazard forces. By the end of the 1970s, disaster risk reduction was well established within the public health, agricultural, hydrological, sociological, geographical, architectural, planning and engineering professions, but it was still marginal in the policies of international NGOs and humanitarian agencies, which tended to focus on disaster response. Nobody ever referred to 'community-based disaster mitigation.'

Wisner noted that:

*'The Sahel famine, circa 1973, catalysed the institutionalization of food security in a number of African countries. This experience prepared donors and government for the later events such as Ethiopian drought. Five African countries that institutionalized disaster risk reduction between 1973-1985 all started with small units to coordinate receipt of donor food aid.'* (Van Neikerk and Wisner 2014)

This was the decade of the Bangladesh Bhola cyclone of November 1970 when over 300,000 died and the Guatemala earthquake of February 1976, in which 23,000 died.

### 1.2.3 The 1980s

**The 1980s** saw the gradual growth of UN involvement in promoting risk reduction. International agencies became aware of the need to reduce risks as well as to respond to disaster emergencies. In 1984, an international Conference was convened in Ocho Rios, Jamaica, on the implementation of disaster mitigation. This was the first international gathering to consider the topic. The event was initiated by **Fred Kringold** (page 118).

There was a growing academic commitment to international training courses, and there was an expansion of research programmes in the medical, engineering and food security fields. In relation to disaster preparedness, throughout the 1970s and 1980s, NGOs were largely regarded as marginal by governments and UN agencies. The Red Cross became increasingly effective in risk reduction initiatives. Around 1985 the world first became aware of changes in the global climate as a result of greenhouse gas emissions. In 1988, governments established the Intergovernmental Panel of Climate Change (IPCC).

The late 1970s and the 1980s were dominated with the Ethiopian droughts and famines. These occurred between 1983 and 1985 and they led to 1.2 million deaths. Some 2.5 million people were displaced and 400,000 became refugees.

### 1.2.4 The 1990s

The 1990s were a significant 'benchmark decade' in which the International Decade for Natural Disaster Reduction (IDNDR) highlighted opportunities to reduce risks. The inclination was certainly towards physical rather than social or economic mitigation measures. Despite this inherent weakness, the IDNDR became an essential stimulus that provoked countries throughout the world to look beyond their disaster response capabilities and start to promote prevention measures. In 1994 The first World Conference on Disaster Risk Reduction took place in Yokohama, Japan. It aimed to review the progress of the IDNDR and set the future course of risk reduction. During the 1990s, the DRR sector, including the IDNDR, paid only limited attention to climate change and the field that would later be forced to develop enormously: climate change adaptation (CCA).

The decade included some major disaster events, such as Hurricane Andrew, which devastated southern Florida in August 1992. In addition, the worst earthquake in India since independence occurred in 1993 at Kilara in the State of Maharashtra. Then, in January 1995, the Great Hanshin-Awaji Earthquake occurred in Kobe, Japan, killing 6,390 people and causing damage that amounted to more than US\$200 billion.

### 1.2.5 The years 2000-2022

These were years of major growth in concern and action as many academic institutions, professional bodies, international agencies and NGOs began to focus their attention on disaster risk reduction and climate change adaptation. The Inter-

Governmental Panel on Climate Change raised the international agenda with its successive, alarming scientific reports on the accelerating threats posed by extreme climate change and variability, as well as its projections of sea-level rise. These were decades in which there were many attempts to mainstream disaster risk reduction in all relevant sectors. The term 'resilience' started to replace 'mitigation', which had a different meaning within the climate change community, where it referred to the reduction of carbon emissions

The December 2004 Indian Ocean tsunami was a truly international disaster that affected countries throughout South Asia, India, Sri Lanka and Africa. It caused between 228,000 and 295,000 deaths. Four years later, Cyclone Nargis devastated Myanmar with 138,000 deaths reported. In terms of loss of life, the worst earthquake of these decades occurred in Haiti in 2010. Some estimates place the death toll as high as 240,000.



## Part 2. Perceived Strengths and Weaknesses in Disaster Risk Reduction

This section of the report considers perceived strengths and weaknesses as seen by the experienced contributors, grouped under broad headings with bridging text added as necessary.

### 2.1 Scope of Disaster Risk Reduction

**Ilan Kelman** initiated a lively discussion when he identified eight areas of significant progress, in DRR, that he termed 'acceptances'. His list embraced power, organisation and focus:-

*'Good news is increasing the acceptance of key issues, for example:*

- 1. Intersectionality.<sup>3</sup>*
- 2. Power rebalances.*
- 3. Decolonisation.*
- 4. Disasters not being so siloed.*
- 5. DRR melded into wider and deeper processes.*
- 6. Acceptance of complexity and non-linearity as the norm, not the exception.*
- 7. A far improved focus on people, e.g. mental health, involvement, and intangibles.*
- 8. Cross-scale links, including historical / deep time as well as individual to global.'*

**Ben Wisner** did not entirely agree, and he regarded Ilan's list as having negative rather than positive characteristics:-

*'I agree with Ilan Kelman's list of acceptances, but I consider them to be an example of a half-empty cup rather than half full. Items 5, 6 & 8 are hard to find reflected in budgets and daily practice at local scale around the world. Items 1-3 remain aspirational or, at best, points of contention and conflict. Item 7, if fully defined, would reveal some well-known traps such as the misuse of the language of "participation" and "inclusion" for purposes of controlling people.*

*'Not only, in my view, are the contents of this cup 'half-empty', but they could serve as a map of definitional trip-wires and political traps.'*

But, to what extent are we trapped by our terminology? **Steve Bender** reflected that:

*'...Ilan Kelman's list reflects solidification of post-colonial but squarely "development" and "under-development" nomenclature and thinking when it comes to even the most pointed risks.'*

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<sup>3</sup> **'Intersectionality'** is the acknowledgement that everyone has their own unique experiences of discrimination and oppression and we must consider everything and anything that can marginalise people – gender, race, class, sexual orientation, physical ability, etc.

A further concern was noted by **Maureen Fordham** who identified some of the problems and implications in using the term 'intersectionality':-

*'Ilan Kelman's list would certainly reflect a glass half- full if the rhetoric were translated into real change on the ground. However, to take intersectionality as a case in point, the use of the term 'intersectionality' is prone to the same misuse, misappropriation and necessary critique as we have heard before for resilience (amongst others).'*

She then gave this concept a human face:-

*'In my experience, intersectionality often translates into an additive checklist (e.g. include a different person to represent each characteristic of interest), whereas it should address multiplicative and synergistic conditions and processes (e.g. the impacts on, and opportunities available to, a woman who is elderly, widowed and of other marginalised social standing will be much greater than a woman of working age from an elite group).'*

**John Twigg** applauded Ilan's expansion of the scope of DRR:-

*'Good to see this broadening of DRR perspectives, (e.g. more interest in intersectionality, and social justice). But I've no wish to see yet another resilience framework! I fear we rather lost the plot with the resilience explosion since the mid-2000s: too much of this was abstract and pseudo-technical theory, while politics, power structures and struggles, rights and accountability were too often pushed aside (every student of DRR should read Naomi Klein's 'The Shock Doctrine', Klein (2007). But I wonder how many university reading lists it has appeared on?). Disasters and conflicts are often connected, or have an impact on one another, but operationally they are often treated as separate phenomena.'*

As the discussion moved into the area of conflict, **Maggie Stephenson** recognised the significant political and social implications:-

*'Regarding the conflict issue that John highlights, it is worth noting that the assessments, analysis and planning during or after conflict is always around the politics, institutions, economics and socio-cultural dimensions. Disasters tend to be dominated by engineers and scientists or their nationals. with little or no assessment or accounting for the politics, economics or social factors. However, these become all the main factors in tensions, delays, failures etc. or in successes.'*

Finally, in this discussion **Sultan Barakat** identified a yawning gap with respect to the question of how conflict can obstruct DRR:-

*'The Idea I wanted to see more elaborated in this paper is that of conflict and the interrelationship between it and disasters, including how conflict often holds back attempts for disaster reduction. I realize that the focus in*

*the paper was limited to DRR. But there are cases now, such as Afghanistan, Yemen, Syria, and the Middle East and Northern Africa (MENA) in general, where this trend has begun to appear, and I think that there is no objection to expanding this idea in research.*

*'The challenges in conflict-affected contexts will be amplified by conflict-related legacies, persistent problems associated with lack of security at the international, regional, and national levels and the rise of extremism and terrorism. There is a great challenge facing the world today, as most conflicts and disasters are complex and require an informed response to the potential impacts and risks. Nevertheless, despite these many challenges, I see that that a way forward can still be found to fill this gap.*

*'For more key points about conflict and disasters see my paper (Barakat and Zyck 2008).'*

### **2.1.1 Summary: The Scope of Disaster Risk Reduction**

Two experienced experts in DRR adopted opposing views on progress in the field. This is a reminder of the highly subjective nature of this subject, with differing perceptions that are probably based on different experiences. Consequently there is a need to find objective ways to measure progress.

A contributor questioned whether aspirations *actually* reflect progress when they are compared to progress observed on the ground.

Positive progress may be occurring inasmuch as the discourse on DRR is expanding into neglected and sensitive political and ethical areas such a power relationships.

Participants stressed how important it is that evaluation and assessment take account of politics, institutions, economics and socio-cultural dimensions, as well as physical elements.

Finally, there was a reminder that conflict can often hold back attempts to reduce disasters and disaster risk.

## **2.2 Terminology**

Two problems have repeatedly beset academic disaster studies and their applications in risk mitigation, emergency response and disaster recovery. The first concerns definitions of fundamental terminology and the second involves disciplinary boundaries. They are closely related, in that disciplines develop their own language, or their own interpretations of language that is employed in other walks of life. Anyone who has worked in the disasters field will be aware of the 'definitional minefield', which is symptomatic of the failure to agree on standardised definitions of basic terminology. Tables have been published that list dozens of definitions of terms such as 'disaster' (Mayner and Arbon 2015, p. 23), 'vulnerability' (Weichselgartner 2001, p. 88) and 'resilience' (O'Brien and O'Keefe 2013, pp. 130-1). With regard to the last of these, it is rumoured that more than 200 separate definitions can be found in the academic literature--but who would think it worthwhile to look for them all? Concomitantly, it is

now widely agreed that disciplinary boundaries are a hindrance to disaster research, which should be interdisciplinary, trans-disciplinary or multi-disciplinary - but which of these should it be, and how should it evolve?

Researchers have been confused and misled by problems of defining basic terminology, and these, along with issues about the role of disciplines, have fuelled endless and often inconclusive debates (Kelman 2018). Although they were initially illuminating and stimulating, the debates have become more of a hindrance than a help to the progress of research. Hence, the twin purpose of this paper is to clarify some of the issues about definitions and disciplines, and to suggest a *modus operandi* for disaster researchers. Conflicts over definitions and disciplines probably cannot be eliminated, but a better understanding of the theoretical issues might help us come to terms with them and avoid spinning our wheels in unproductive debates about meanings and territory.

According to the Oxford English Dictionary, 'definition' is "the action of defining, or stating exactly what a thing is, or what a word means." The statement of definition needs to be precise about the essential nature of what is being defined. There is also an element of formality in the way the meaning of a word or phrase is explained. The value of a definition is that it clarifies what a phenomenon is (in relational terms), how it performs and what is expected of it.

In disaster studies, we tend to suffer from the definitional disease, a tendency constantly to specify and respecify, requalify or redirect the description of terms. On the one hand, excessive focus on definitions reduces rather than expands the opportunities to use them, but on the other hand failure adequately to arrive at acceptable definitions leaves the exact meaning of the terms unresolved. This leads the researcher to a sort of 'cognitive dissonance'. On the one hand, how can we teach, share and employ a term if we do not have a clear idea of what it means, or to what it refers, or under what conditions it can be used? On the other, definitional debates are often recognised to be arid and to go round in circles. As Quarantelli (1998, p. iv) observed:-

*"If workers in the area do not even agree on whether a 'disaster' is fundamentally a social construction of a physical happening, clearly the field has intellectual problems."*

On the other hand, he also admitted that:

*"...to be concerned about what is meant by the term 'disaster' is not to engage in some useless or pointless academic exercise. It is instead to focus in a fundamental way on what should be considered important and significant..."* (Quarantelli 1995, p. 225).

Hence, even the great masters of the disasters field can be ambiguous about the need to define terms.

There are now more than 50 easily accessible glossaries of disaster terminology (for example, UNDRR 2917, 2020). A by-product of having a vigorous debate about definitions is the plethora of definitions that results from examining every angle under

which a phenomenon can be viewed (Kelman 2013). There are four possible solutions to this unhappy state of affairs, but they all have drawbacks.

- (a) *Do without definitions.* The result of following this strategy is that we may not be sure what we are talking about, leading to misestimation, misapprehension and failure to communicate because people are not "on the same wavelength", and possibly they cannot articulate why that is so.
- (b) *Impose definitions.* Unfortunately, people are bound to be dissatisfied with the result of this approach as it restricts the freedom of choice.
- (c) *Use working definitions.* For the sake of achieving a temporary consensus, debate is suspended and commonly agreed definitions are used for specific purposes. This presupposes that the users are able and willing to achieve a consensus with which all are adequately satisfied. In the spirit of "horses for courses" definitions are adopted for specific uses, but this tends to ensure that the uses cannot subsequently be broadened.
- (d) *Use more complex approaches, with negotiation and mediation.* This is a time-consuming strategy which will only work if agreement is reached. Again, it relies on the achievement of a temporary working consensus.

A further problem is that definitions which stem from particular disciplines tend to exclude others. For example, C.S. Holling wrote as follows:-

*"But there is another property, termed resilience, that is a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables."* (Holling, 1973, p. 14).

His insistence on homeostasis has been misused by generations of disaster researchers (e.g. Berkes 2007, Djalante et al. 2011), for what is good for closed ecological systems is not good for disasters with their dynamic states. The upshot of this is that definitions that do not survive the passage from one discipline to another impede cross-disciplinary collaboration.

When faced with a wide choice of definitions, the reader is urged not to add to the confusion by inventing another, and also not to 'cloud the waters' by tinkering with existing definitions. The better strategy is to use the most authoritative definitions, which are usually also the most accessible ones. It is also a good idea to accept that definitions are not inherently rich in hidden or implied meaning. Indeed, one of the problems of defining terms is the modern tendency towards microdefinition, which attributes too many powers and too much meaning to words. It overloads them with unnecessary scientific, cultural or ideological baggage. There are occasions when one wonders whether the authors of definitions would not prefer the terms to have almost magical powers. The connotations and implications become part of the definition and this is a mistake which is bound to lead to disillusionment due to the poor performance of the term as a source of explanation.

Accordingly, the criteria for choosing and adopting a definition should be as follows.

- (a) Terms must be defined to fit the needs which they are to serve and the context in which they will do so. This may mean that there are alternative, parallel or even conflicting definitions of an individual term. We must accept this problem as a fact of life.
- (b) Within the constraints of the previous point, the definition of a term should be as broad as possible and as neutral as possible with respect to different scientific or cultural ideologies.
- (c) A simple definition is better than a complex one. Through its symbolic value, terminology is a form of model, and a good model offers an elegant simplification of reality. The temptation to read too much into a definition has been the undoing of many a researcher.
- (d) All definitions are 'working definitions', in the sense that their use requires a consensus among the users, not only on the meaning of each term, but also on the fields of knowledge in which the attributed meaning is valid. Hence, consensus building is a vital part of the use of technology, as is the definition of the limits of validity.

Academics are territorial animals, and like other species they defend their territories. One way in which this is done is by the deployment of jargon. Hence, rather than people who discuss problems, we have 'actors' who engage in 'discourse', and perhaps the problems are 'wicked', although how they can acquire a personality remains a mystery. The difference between terminology and jargon is that the former is a necessary way of imparting meaning to phenomena and the latter is a way of obfuscating the meaning. There are limits of acceptability. Overenthusiastic use of what the writer or speaker regards as terminology simply obscures meaning. The only antidote is to use the 'distiller' model, in which statements laden with jargon are boiled down to see what they mean. In most cases the answer is likely to be nothing unusual or original.

A word like 'governance' has acquired a glorious sense of ambiguity. For more than six centuries it was nothing more than a synonym for 'government', but recently it has come to imply transparency, democracy and participatory forms of public affairs. In so doing it has begun to lose its neutrality. This may not be a bad thing, for who would complain about a reasonable plea for government to be sensitive to the needs of the governed?

**Yasemin Aysan** commented as follows:-

*'The understanding and refinement of DRR language, of its components and the various models have expanded significantly over the years. This creates interesting debate and advances among the academics and research community on the subject, and a profound understanding of risks. However, communication of these concepts to authorities at the national and local level who are civil servants, who work and think in multiple languages is not easy.'*

*'During our Disaster Management Centre training of national staff in Oxford Polytechnic in the 1980s, getting across the concept of hazard was relatively easy but vulnerability did not translate easily conceptually and language wise. Gustavo Wilches-Chaux's simple but powerful presentation on the sources of vulnerability, accompanied by amusing photos from everyday examples saved the course. While the glass is half-full in conceptual refinements of DRR related concepts and language, its communication to the non-academic audience is where the glass is half-empty.'*

**Omar-Dario Cardona** gave the following assessment:-

*'From the Hyogo Framework onwards, the systematic elimination of the word 'vulnerability' was encouraged; conceptually key when it comes to inequality. Every time it is used less and the use of the word 'resilience' has been promoted, due to its conveniently positive connotation in political terms for institutionality. Resilience ended up being associated again with the capacity of response and reaction and not with the capacity to anticipate; reducing vulnerability and risk from a development perspective. The Sendai Framework has not associated resilience with the effectiveness of comprehensive risk management performance and is ambiguous in not stimulating the answer to the question of how much resilience is enough resilience?'*

**Terry Cannon** agreed:-

*'Completely agree – those who have power (Omar's term is 'institutionality') prefer language that diverts attention away from the causes.'*

**Steve Bender** added:-

*'Much more can and should be said about the (continual) use of the word "disaster" from varying points of view and its impact on mis-framing, defaming, and demonstrably inhibiting progress on addressing an understanding of hazard, exposure, vulnerability, risk, loss and event.'*

And **Ilan Kelman**:-

*'Increased dominance of complicated, unhelpful jargon and debunked ideas over baseline common sense notions, for example:-*

*Disaster Lexicon*

*<http://www.ilankelman.org/miscellany/DisasterLexicon.doc>*

*compared to Disaster Anti- Lexicon*

*<http://www.ilankelman.org/miscellany/DisasterAntiLexicon.doc> '*

### **2.2.1 Summary: Terminology**

Disaster risk reduction has its characteristic terms, such as 'exposure', 'vulnerability' and 'resilience', but their exact meaning is often disputed.

Because there are many points of view about the meaning of terms, and therefore many potential definitions, all attempts to define terminology are provisional. We are constrained to treat the results as ‘working definitions’ rather than anything more conclusive.

Definitions are linked to the interpretation of terms and phenomena, including the manner in which sources of information describe disasters. This can lead to substantial distortions of the reality on the ground, for example, by treating natural hazards as ‘natural disasters’, implying that they are caused by nature. In reality, the hazard may be natural but its disaster potential is decidedly the result of human action. Even the word ‘disaster’ is open to debatable interpretations, as it is based on assumptions about what causes such events and what makes them destructive.

### 2.3 Manipulation of Information

*‘if it bleeds, it leads. The media likes gory, scary stories, which is all well and good, up to a point, because most of us find them interesting. But it’s also really rather misleading. This occurred to me while reading about frankly heroic performance of the global supply chains during the pandemic, which received precious little thanks. The truth is that we in the media are not good at covering stories about normality reasserting itself, about systems righting themselves. “It was actually fine, in the end” they may be called. Consider, for instance, a few of the headlines you didn’t read this year. “Petrol stations restore normal service, and no one has to queue any more.” Or “Brexit- related Channel lorry tailbacks prove not that bad.” “M20 not turned into a vast lorry park.” “PPE/ toilet paper/ Christmas gift supplies plentiful.” “Container ships pass at normal speed through unblocked Suez canal.” “Surge in lorry licences eases truck driver shortage.” It’s something to bear in mind as we move into 2022 when, with luck, the gradual reassertion of normality will be the big story - no doubt largely ignored by the Fourth Estate, which will by then have found new things to worry and complain about.’ (Tait, 2021, p. 8)*

As they will probably have never heard about all the various media scare stories in 2021 that actually came to nothing, readers from outside the UK may be perplexed with the above press report. But all readers of the press and TV watchers will be aware of dramatic reports of disaster impact (a *glass half-empty*) and also be aware that there are rarely, if ever, reports about successful recovery or risks being reduced (a *glass half-full*) in the popular press. Thus, the example of recovery and risks being reduced after earthquakes in Nepal on pages 35-38 may come as a surprise to some readers. When the academic press covers disasters it does cover the full range from emergency to recovery, from risks to protection, but the public at large, as well as the political leaders, are most unlikely to read academic journals.

When Ian was on the board of a British based NGO in the 1970s, like all disaster related NGOs this body had a very active fundraising department. When major disasters occurred, dramatic press reports and appeals that emphasised urgent needs would be circulated to the agency's supporters. This was how the agency gathered support for its operations. However, reports were certainly *not* sent out about resilient



local capacities to manage the crisis or longer-term achievements in successful recovery. Encouraging such stories would not unlock purses, and in any event coverage of such matters was not part of the mandate of the fund-raising department.

When Ian travelled to his first field visit to a major disaster, the earthquake that devastated Managua, Nicaragua, in 1972, he visited Professor Henry Quarantelli, probably the world's leading sociologist with expertise in disaster research, who was based at the Disaster Research Centre (DRC), then located in Columbus Ohio. As they stood at the departure gate in Columbus Airport, he generously briefed Ian on what to expect when he reached the disaster area. Henry's words remain etched in Ian's memory and have proved accurate over the subsequent decades in visits to numerous disasters. "*May I offer you some advice as to what to expect when you get to Managua?*" My affirmative prompted his response: "*I expect you will encounter a massive overestimate of damage and dislocation, and a massive underestimate of local resources to tackle the situation.*"

Thus, the mass media, (which want to sell newspapers or attract television viewers) operate in unofficial alliances with humanitarian agencies (which depend on donations to survive). Inevitably, they 'play up' any disaster situation, emphasising stories of chaos, dislocation, corruption and helplessness, and largely ignoring accounts of courage and resourcefulness in local communities. As there is very rarely any appetite in the media or agencies to celebrate locally achieved success, there is rarely, if ever, any reporting of efforts to reduce risks. As both international reporters and most aid agencies depart from the scene a few weeks after impact, progress of recovery is also normally well outside the scope of media reporting. Thus, there is continual distortion of any news of positive progress. This remains a critical and unresolved issue which persistently has a significant impact on policies and public attitudes.

Ian's evidence is drawn from virtually every presentation he has made to agency supporters or lay audiences such as church groups and women's institutes. The questions that are raised in such gatherings tend to be broadly based on a confident assumption that there is an acute need and that international agency X or Y is well placed to meet that need if they secure the necessary financial support. What is regularly missing from the perceptions of an average British lay-audience is an awareness of the local capacity of the surviving community or local government, local institutions, or local NGOs to manage their own trauma effectively. The concept that disaster survivors may need additional help but crucially it must *never* duplicate local resources is never expressed. The most probable reason that they know nothing about local capacity is that it is never discussed in the mass media. NGOs and donor governments have not informed them about indigenous coping strategies.

There are exceptions to every rule and it is worth noting that in certain situations, for reasons of political or economic expediency, governments play down the impact of disasters, or manipulate downwards the number of casualties. A good example of this (perhaps best described as 'official confusion') occurred in Jamaica in 1988 when Hurricane Gilbert caused acute devastation, particularly to the popular hotel resorts on the north coast of the country. This disaster coincided with an election campaign and the Prime Minister, seeking re-election, went on various international television news channels to show the extent of the hurricane damage and make an international appeal for recovery funds. The result was a massive influx of money and support in kind from

the Jamaican diaspora in Canada and the USA. However, the television coverage of the devastation also led to mass cancellations of hotel bookings by North American tourists. As a result, the large international hotel chains contacted the Prime Minister's office to insist that he immediately return to the television networks with the good news that the hotels were actually in good shape, despite the hurricane, and that it was 'business as usual' with them. So, within hours of announcing devastation, the Prime minister reappeared to express an opposite message announcing normality, noting that all was well after all and international tourists were welcome and would be accommodated.

When earthquakes coincide with preparations for massive international sporting events, governments have been known to play down their impact for fear of the cancellation or postponement of the event by the international organisers. This occurred after the 1985 Mexico City earthquake that occurred in the same city as the forthcoming 1986 football World Cup. It also happened following the Sichuan Earthquake in China, which occurred on 12<sup>th</sup> May 2008, just three months prior to the Beijing Olympic Games, due to start on 24<sup>th</sup> August.

The artist dissident **AI Weiwei** described the moment when he began his resistance to the ruling Chinese Communist Party as the authorities suppressed information on the numbers of children and young people who had died in the collapse of schools and universities which were shoddily built as a result of widespread corruption:-

*'When I started to research the students who had died in the Sichuan Earthquake in 2008, right before the Olympics opened (the Chinese government censored and controlled all information about the earthquake). Piece by piece, we found them -the names, the schools and universities of 5,219 students. I felt desperate at that time. I felt I could collapse at any moment and I knew the authorities could make me disappear easily.'* Weiwei (2022)

These words were written before the Russian invasion of Ukraine in March 2022. In the British media, there has been extensive coverage of the fighting, with reports from journalists in Ukraine, as well as many appeals for funds by relief agencies. These reports have given extensive emphasis to local capacities to cope and resist the invading forces which contradicts the evidence given above about how local resources are played down. So perhaps we are witnessing a positive change towards more accurate reporting.

### **2.3.1 Summary: Manipulation of Information**

A claim was made that distorted information prevails in the reporting of disaster impact. For example, national governments in countries that experience disasters are prone to distort impact assessment information in order to maximise international support, or in rare cases to minimize the impact for some specific political reason.

NGOs in donor countries that provide disaster assistance are also apt to exaggerate disaster impact data concerning damage, disruption and casualties in order to attract financial help from their supporters.

The media in both the affected and donor countries tend to exaggerate disaster impact in order to create dramatic newsworthy stories that sell newspapers and attract television viewers. However, in contrast, news coverage of the war in Ukraine has given extensive coverage to how communities have coped with the national crisis.

As media staff soon depart from the scene to cover new stories in different places, successful long-term disaster recovery and reconstruction are rarely covered in media reporting. As a result, the strength of survivors' actions and the efforts of their own governments in striving to recover have often been played down or ignored. The effect of these distortions is that myths are perpetuated, with the negative consequence of an ill-informed public who may be responding to exaggerated or distorted appeals. Their lack of awareness of local capacities provides a false impression of dazed, helpless victims in sharp contrast to the reality of active survivors and responsible local officials.

The examples provided in this section relate to post-disaster impact. However, the extent to which information concerning risk reduction is *also* subject to manipulation by governments deserved further attention. It was only touched on here in the quotation about China.

## 2.4 Warnings and Evacuations

*'On 19<sup>th</sup> September 2021, after 50 years of magmatic quiescence, the Cumbre Vieja volcano on the Spanish island of La Palma roared back into life, ash speckled the sky, and molten rock cooking at 1,075C oozed from several fresh fissures and cascaded down the volcanos western flanks ...ploughing through houses and farms with insouciance. Fortunately, thanks to the work of local scientists and emergency services, thousands of people were evacuated ahead of time, and no deaths have been reported.'* (Andrews 2021)

Several contributors highlighted the success of cyclone shelters and evacuation planning in saving lives:-

**Anshu Sharma** noted that *'Cyclone deaths have come down drastically (in India), with very clearly visible improvements in early warning and evacuation systems.'*

**Terry Cannon** agreed: *'Perhaps the most impressive progress is to be found in cyclone warnings and evacuations (and lives saved) in Orissa in recent events.'*

**Mikio Ishiwatari** noted that effective warning and evacuation systems also applied to other hazard threats -

*'The development of accurate forecasts and warnings, with consequent evacuations of communities at risk has had a decisive effect in reducing casualties from volcanic, cyclone, tsunami and flood impact.'*

**David Etkin** also recognised the value of the Cyclone Shelters in Bangladesh. However, **Terry Cannon** remained unconvinced, identifying some of the problems:-

*‘.....the shelters are a minor part of lives saved – there are not enough, many are out of use because of poor condition, and they are unpopular. Most people find other safe places than the shelters – but they are a visible symbol of Government and NGO Red Crescent supposedly doing the right thing.’*

Responding to these observations, **Rumana Kabir**, originally from Bangladesh, shared her experiences:-

*‘I have seen the impacts of having or not having cyclone or flood shelters, from examples of Bangladesh, India, Thailand and Myanmar. India and Bangladesh are way ahead and learnt a lot from this. There is not enough land out there to build the cyclone shelters as the coastal landscapes are changing. Even these projects are called ‘resilient infrastructure’ by some of providers of these mega structures! Finally, the so called providers realised that it is not what people want, the people actually want ‘resilient housing’. As Thailand and Myanmar are starting to be prepared, they are copying the models from these countries, but none of us are learning from what doesn’t work.’*

#### **2.4.1 Summary: Warnings and Evacuations**

Contributors were unanimous in recognising that forecasts and warnings of impending volcanic, cyclone, flood and tsunami hazards, and the evacuations that followed, were highly effective in saving lives. However, there was some debate about the effective role of cyclone shelters. Some typical problem areas were noted: some low rates of usage, poor quality and general unpopularity. There was a report of the experience of families who expressed a preference for safe houses over using cyclone shelters

#### **2.5 Who Sets the Agenda for Disaster Risk Reduction?**

An Indian perspective was provided by **Vinod Sharma**, who noted the massive progress made in recent years:

*‘The IDNDR (1990-1999) made notable differences in the Disaster Management system in India and the Government started thinking of Disaster Preparedness and Mitigation. The National Centre for Disaster Management was created in the Indian Institute of Public Administration (IIPA) for capacity building of Government officers and other stakeholders.*

*‘After the Tsunami in 2004, where India was also badly affected, the Government enacted the Disaster Management Act in 2005 and the National Disaster Management Authority was created at all levels of public administration from the Centre to District level. Today India has a National Disaster Management Plan, all states have State Disaster Management Plans, and all the Districts of the country have District Disaster Management Plans.*

*'After the Sendai Framework in 2015, the National, State and District level plans were revised on the basis of priorities and goals of the Sendai Framework. I could see a sea change in the Government's perception about Disaster Risk Reduction and support to DRR activities at different levels. But still I feel the glass is only half full. I wish that communities should be strengthened and their capacity building in disaster preparedness, mitigation as well as in response.'*

Sharma recognised that effective DRR requires action at all levels, not just government:-

*In India we have to strengthen the local communities and invest more in man and machine to reduce the impact of disasters. With climate change as a big threat, disaster preparedness and appropriate mitigation measures are required at every level. The 15th Finance Commission of India has recommended that Disaster Mitigation be located at both National and State levels. This will certainly change the focus from relief towards mitigation and preparedness.'*

However, **Vinod Menon** observed a general lack of governmental direction in India-

*'In the final analysis, I feel that governance institutions mandated to save lives and protect livelihoods failed the common people. The 2004 Tsunami raised the bar by mobilizing resources, preparing legislations, setting up institutions & showing hope towards radical shifts in thinking, the pandemic period in 2020 and 2021 has shown leading institutions going back & forth without clear direction. So I feel that we have to make the half empty glass fill up as much as we can, through our sincere efforts.'*

**Zenaida Willison** reflected that until about 2010 the focus in the Philippines had been on

*'...relief, emergency management and limited preparedness. This resulted in a top-down approach in DRR and development planning and the priority and focus on emergency management over prevention and mitigation.*

*'But from 2010 it has consistently used disaster risk reduction, with broader application contained in its DRRM framework of four DRR pillars: prevention and mitigation, Preparedness, Response and early recovery and Rehabilitation and Recovery. The Philippine Disaster Risk Reduction and Management Act (RA 10121) enacted in 2010 shifted the focus from emergency relief and response to risk reduction. The implementing guidelines include the setting up of structure at the lowest political level, Thus, now all the barangays (local communities) have a Barangay Disaster Risk Reduction and Management Council/Office.*

*'However, currently in the present administration (2021) while there is already a well- established law supporting disaster risk reduction (RA 10121) the current government attempts to revert back to emergency*

*management with the proposed creation of the Department of Disaster Resilience. The NGOs and CSOs, though getting tired, continue to persist of defending the gains.'*

A number of concerns were expressed in the dialogue on the overall performance of governments and international agencies. **Maggie Stephenson** came to their defence:-

*'There are numerous criticisms by the contributors to this paper of governments, UN, multilateral agencies etc. apparently regarding them as talking shops, or as ineffective people who don't care and don't get things done. But it sounds like the expectations that high levels will fix things are unrealistic and at the same time not supported.'*

*'Having spent time within governments and UN, I think there is less expectation from the inside and far more acknowledgement of the limitations of their capacity and power. There is more power and resources in the City of London than in Westminster. The budgets of hedge funds invested in real estate is shaping cities with multiple times the budget governments or development banks. People are more informed by YouTube and Facebook posts than by politicians or policies.'*

*'Should governments and multi-laterals not have talking shops and launch eloquent documents and try show leadership and facilitate and contribute to public discourse and hopefully legislation. I think they should. They have a role in setting agendas for their respective constituencies and societies. And they are responding to what societies and constituencies identify as important.'*

*'Do I expect that its enough? No. But that doesn't mean they shouldn't try to set direction. If in fact politicians set direction or propose policies, in reality, they respond to public opinion and formalise it into policies. If we didn't all watch David Attenborough would we agree to limiting plastics'*

*'The UN system is close to financially bankrupt and needs serious overhaul, for many reasons. But what do you do in the meantime? What do we want as a global system, and how are we going to make it? Where is the momentum to reform or create political structures?'*

*'Isn't it depressing to know that at G7 meetings, instead of dealing with global challenges, world leaders are negotiating nuclear submarine contracts.'*

Concluding these observations on the respective roles of decision makers, **David Etkin** posed a radical question:-

*'A question interesting to me is "Should politicians be in charge of managing disasters?" We must have accountability, but they so often respond to political considerations more so than the public good, that I think we need to rethink that power and decision-making structure.'*

### 2.5.1 Summary: Who Sets the Agenda for Disaster Risk Reduction?

Gradually, despite some policy reversals, the Governments of India and the Philippines have expanded their focus from emergency response to risk reduction. However, there is all too often a lack of clear direction by governments.

The catalysts for the expansion of actions from response to prevention came from the International Decade for Natural Disaster Reduction in the 1990s, as well as major disasters such as the 2004 South Asian tsunami.

One indicator of progress came from a broadly accepted recognition that DRR is the responsibility of all levels of society.

There are often unrealistic expectations of governmental capacity, with a reminder that government resources can be dwarfed by those of private sector financial bodies. Moreover, social media communication channels may far outstrip those of any government.

Finally, as their political bias may be in conflict with the public good, a provocative challenge was made to the assumption that political leaders should set agendas for DRR.

## 2.6 Building for Safety

### 2.6.1 Building for Safety Programmes 1976-2022

A key element in the life of any community is the level of safety to be found in human settlements. This is particularly the case in relation to earthquake risk, as an estimated 98% of all deaths from earthquake impact result from building failure. Therefore, the design, construction, siting, shape, level of maintenance, choice of building materials and compliance with building regulations are key determinants of safety. As we reviewed progress in securing safety, a lively exchange of opinion and information between some of the leaders in this field followed. Inevitably, the discussion digressed in various directions.

‘Housing has become a political priority’ suggested **Maggie Stephenson**, noting that this reality applied

*‘....across many countries and income levels. The term ‘Housing Crisis’ is commonplace. Housing supply and affordability is critically low. Housing policy and public discourse is thin on ideas or understanding. Add to that a disaster and we should not be surprised when housing reconstruction is in difficulty, in policy or implementation. We are also in an age of urbanization that is also thin on ideas.’*

A structural engineer with a lifetime of experience of housing to resist hazards. **Robin Spence**, described the context of safe housing in many low-income countries where there are

*'...dedicated earthquake engineering professionals, and important work has been done in developing codes and guidelines, not only for formal sector construction, but also for non-engineered construction, and in demonstrating better building techniques through artisan training programmes. The popularity of these programmes proves their value, but to date these efforts have only reached a small fraction of the populations at risk.*

*'Countries such as Japan, New Zealand, the USA (certainly California) and Chile have made impressive progress towards earthquake safety, and many other countries are making some progress.*

*'In several countries, there have been important campaigns for the improvement of safety in schools and hospitals (for example in Colombia and Nepal), and these have been demonstrated to be effective.'*

He then drew attention to his recent book *'Why Do Buildings Collapse in Earthquakes?'*, co-authored with **Emily So** (Spence and So 2021), in which they

*'....undertook a survey of professionals to identify successes and failures, including responses from individuals in about 30 earthquake-prone countries (a recap of the survey I did for my 2007 Mallet-Milne lecture). Our comments are drawn from the concluding paragraphs of that Chapter, which summarises the position for the largest part of the earthquake risk population (including Colombia and Ecuador, Indonesia, India, Pakistan most Caribbean countries). Our comments reinforce the glass half empty viewpoint, at least for earthquake risk facing middle and low-income families.*

*'Even though many of the countries with continuing and growing risks have experienced devastating earthquakes in recent years, all of them are middle or low-income countries with substantial rural populations, and construction of most dwellings continues to be highly vulnerable to earthquakes.*

*'Even though construction in many of these countries is nominally governed by earthquake codes, these codes only apply to the formal construction of urban areas, and even there, code enforcement is frequently inadequate or non-existent, and most construction does not meet adequate safety levels. In the rural areas, (where a substantial part of the population lives) most construction uses various forms of masonry, normally without any consideration of earthquake safety.*

*'But as a result of low family incomes, the homes of the majority of the population are still being built using conventional methods and available local materials, and even when aware of the earthquake risk, any resources homeowners can find to build better tend to be used to create more living space or other improvements.'* (Spence and So 2021, pp. 235-236)



**Maggie Stephenson** commented on the income dimension and the expectations of the occupants of houses and agreed

*'...with much of this extract from Robin Spence and Emily So's book, however, in my experience, families with increasing incomes do not only use it to create more living space, or other improvements (though piles of external decorative finishes are a sign of new money). I also see families deciding they are building more seriously, hiring engineers and architects, and securing their assets, by getting the due paperwork including following building regulations. I also see families who have lost loved ones taking extra precautions for themselves and their descendants, they see it as a personal moment of responsibility they have for their children and grandchildren to come, not to condemn them to the same trauma they experienced. I even see people with moderate increases in income move from having lived in unreinforced masonry to constructing reinforced framed buildings. People invest with blind faith in new steel and concrete.*

*'Due to the pressures on land in urban areas in particular, reconstruction is often more dense and higher rise, so people tend to invest a great deal in reinforced concrete frames to go higher, sometimes without enough capacity but equally sometimes with plenty of redundancy due to inefficient engineering advice. Whether they are safer or not, is not only due to household investment decisions, it is also down to the knowledge level and/or honesty of the designers and contractors.*

*'I don't want to suggest that everyone is building better, there is certainly an emphasis on other criteria, like bigger and fancier, but I do think where the crisis has caused serious trauma, where people can afford to build safer, they seem to be doing so, or trying to do so.*

*'Lastly, in many places efforts to strengthen compliance after disasters seem to have some lasting impact, particularly in urban areas, with increased awareness of codes, capacity to prepare drawings, engineering skills in earthquake design, contractor capacity to detail correctly, and institutional capacity to inspect and enforce. Not enough of course, but not nothing.' Ideas?'*

*'Three stories about owner-driven housing reconstruction are worth mentioning together, (between the Bhuj, Gujarat, Kashmir and Gorkha, Nepal earthquakes). India, Pakistan and Nepal have led the development and implementation of owner-driven housing reconstruction and rehabilitation, with over 1.5 million new houses reconstructed and several hundred thousand repaired and retrofitted. They have advanced enabling approaches over direct construction, changed the roles of governments and NGOs, promoted coordinated and equitable rather than projectized assistance, increased transparency, and achieved mass awareness and participation in training. They also built one on the other, in regional exchange and discussion, moving the sector forward.*

*'This was supported by the World Bank, JICA, the Asian Development Bank, European Union, Swiss Cooperation, DFID, UN Habitat, UNDP, IOM, and many NGOs national and international, notably NSET and CRS in Nepal, but the primary credit needs to go to the country and local governments themselves and the affected communities who managed so well and proved the validity of the principles involved.'*

A decisive impact has been created by the growth of the 'building for safety' movement involving the training of local builders and crafts persons in creating safe low-cost dwellings, schools and other buildings in local traditions. This movement began in 1976 following the Guatemala earthquake, with an innovative Oxfam and World Neighbours village reconstruction project when a few hundred earthquake resistant houses were built. But by 2007, following the Kashmir earthquake of 2005, over 650,000 earthquake-resistant rural dwellings were created by the Pakistan Government's 'Earthquake Reconstruction and Rehabilitation Authority' (ERRA) in collaboration with UN Habitat. This total is even greater when urban houses are added.

This owner-driven housing reconstruction programme, and others like it in Haiti, India and Nepal, have the potential to yield four vital dividends: they train builders in safe construction, seek to use locally available materials, create livelihood recovery, produce safe dwellings, and raise the awareness of building occupants concerning earthquake safety factors (see Table 1).

<b>Elements in reconstruction strategy</b>	<b>Contractor-based housing reconstruction</b>	<b>'Building for safety' housing reconstruction</b>
<i>Training of local builders and crafts persons in safe construction</i>	Not present	A key element in programme design
<i>Supply of building materials</i>	Varied sources	Locally sourced, including recycled debris from housing damage, thus generating work in disaster affected area
<i>Livelihood creation through reconstruction</i>	Varied sources of labour, but mainly the use of contractors own workforce	Generation of work for disaster survivors to aid their own recovery and reconstruction
<i>Safe construction</i>	Compliance with building codes and planning requirements Technical support is required in safe siting and construction	Compliance with building codes and planning requirements Community-based safety programmes create mass-awareness of hazard safety measures Technical support is required in safe siting and construction

**Table 1.** A comparison between contractor-based housing and building-for-safety programmes.

**Sultan Barakat** had insights from work undertaken in Lebanon on owner-driven housing:-

*'I argued before that owner-driven approach in housing reconstruction has pros and cons. But there is a big chance of a more holistic approaches to guarantee the effectiveness of risk reduction in both conflict and disasters contexts.*

*'My paper addresses the previously unexamined nature of this process. "(In the aftermath of the 2006 'July War' housing reconstruction in southern Lebanon proceeded along an owner-driven model funded primarily by Middle Eastern donors), including the actors involved, amounts provided and the results achieved, before examining the ways in which implementation affected economic development, poverty alleviation, gender equity, disaster preparedness, cultural heritage and state building. As consistently identified within the literature, housing reconstruction following conflict and other crises has implications beyond the provision of permanent shelter, such as for health and psychosocial well-being. Emerging (or re-emerging) owner-driven approaches as applied in southern Lebanon, while possessing theoretical benefits, were found to have varied effects upon populations at differing socio-economic statuses. Mixed or hybrid approaches combining owner-driven and contractor-driven models may help to capitalise upon the strengths of each, such as local ownership and structural integrity, while ensuring a greater degree of flexibility than either is able to provide independently." (Barakat and Zyck 2008, 2011)*

*I concluded that "A mixed approach, with the poorest receiving participatory contractor-driven reconstruction and owner-driven approaches for the relatively better off", may result in the greatest benefits, although households must retain the right to select the model to which they are subject. A third option may also be considered, whereby, rather than a mixed approach, a hybrid contractor and-owner-driven model is pursued. Such a model would include the construction of a solid foundation and frame by professional contractors and the provision of grants to enable owners to finalise the home by designing the layout and including culturally relevant aesthetic touches according to their own specifications.*

*'This three-tier system of reconstruction, including owner-driven, contractor-driven and hybrid approaches, would help to ensure that the model of housing reconstruction pursued is not based on hypothetically universal advantages of any one approach but on the specific needs and stated aspirations of each household. Such an approach would also encapsulate the widely stated but rarely implemented mantra that reconstruction must be done with rather than for its intended beneficiaries.'*

Significant progress has been achieved in the past decades through the introduction of cash support rather than the allocation of building materials or dwellings. **Yasemin Aysan** recognised the value of this approach, which offers an increased degree of freedom to beneficiaries:-

*'The role of 'cash support to home owners' rather than supporting the 'construction of model houses approach' to reconstruction is worth mentioning. However, success depends on many factors, above all, the management of a programme. A cash-based World Bank Programme in Sri Lanka was implemented by 2 different agencies in the same area with very diverse results. Quality of the local authority and agency's support determined the outcome. Freedom to choose how to spend came with the cash approach that needs to be supported without dictating designs, but by gradually injecting basic principles into the process. Many national and international agencies are not experienced enough for successful results. Though flexible, like many other safe housing programmes this approach also did not influence wider construction practices. Availability of cash for safety measures before major disaster hits is unlikely. Unlike the general negative assumption about contractor-built houses, in the same area people who lived in them preferred their houses to be contractor built model houses to labour-intensive approaches, particularly for the elderly and single women.'*

**Andrew Maskrey** provided a useful insight with a depressing description of the harsh reality about the drivers of urban risk, which may be shaped by speculative gain. This supports the discussion about root causes in the pressure-and-release model (pages 87-90):-

*'Building for safety programmes often introduced in the context of post-disaster recovery have often been successful in strengthening housing resilience (as described by other contributors.) Likewise, I agree that as countries develop (ie. GDP and HDI indicators improve) so do overall building and infrastructure standards and governance, including hazard resilience.*

*'However, what this piece is missing is the fact that urban growth in most cities in low and lower-middle income countries (as well as some from upper- middle and high-income countries) continues to be shaped by markets and capital rather than by the needs of low-income households and communities, including their need for safety. Urban planning is generally absent as well as consistent government support to upgrading and strengthening the resilience of low-income areas.*

*'Examples of this are rife. In Dhaka, the infilling of ponds and water retention areas for speculative high-rise buildings increases flood risk for low-income areas of the city. Informal settlements continue to be either relocated or bulldozed to make way for speculative commercial or residential developments in all cities or for new infrastructure to service those developments (Nairobi comes to mind). Bangkok and Jakarta are sinking due to uncontrolled ground water extraction, increasing flood risk for their residents. While most countries have urban planning legislation and well qualified planners, architects and engineers, planning has never become a practice. Urban development, therefore, can be considered a form of risk transfer, in which risks are transferred socially and territorially, from the sectors that gain from speculative development to those that lose*

*out. In this reality, Building for Safety Programmes are like a grain of sand in the desert. Nice for journal articles but not game changers.'*

**Babar Mumtaz** shared Andrew Maskrey's scepticism about the effectiveness of building-for-safety projects:-

*'... in my experience post-disaster reconstruction remains sandboxed and rarely have any impact on safety in buildings in general. In countries like Pakistan, where 70 to 80% of the housing is built without the need for any formal planning or construction approval, safety is a rather hit-or-miss matter. While there is a considerable body of accumulated knowledge and time-tested notions of the strength and performance of traditional materials and technologies, this is less the case with newer technologies or when faced with rare or unexpected events and forces such as those that lead to most disasters. In a major departure from previous responses, the 2005 earthquake and the 2010 floods involved and engaged communities and local, small-scale builders who were introduced to safer building measures.*

*'However, despite the scale and impact of these events, few of the everyday government departments and officials were involved, little of this learning has survived and even less has crossed over into everyday practice. The irony is that it would take very little to engage with and incorporate the building for safety practices and learning into the everyday.'*

Andrew's metaphor of building-for-safety programmes being 'grains of sand in the desert' and Babar's negative experiences of safety programmes demand further comment. Such programmes are indeed rare and isolated when set alongside traditional housing reconstruction approaches, but that does not diminish their importance. Following any disaster that destroys dwellings, some form of housing reconstruction will inevitably take place. The normal pattern comprises a mix of self-build dwellings constructed by surviving families, contractor-based government sponsored housing, private-sector provision and a few isolated NGO initiatives (NGOs, however, tend not to build houses). Table 1 seeks to compare the value of contractor-based housing with the products of building-for-safety programmes.

Contributors actively involved in reducing seismic risks to dwelling construction in Nepal, namely **Amod Mani Dixit** and **Maggie Stephenson**, and with risk management in Turkey, **Yasemin Aysan**, shared their experiences in the following examples that vividly convey the challenges involved in creating safe living conditions.

## **2.6.2 Nepali Experience of Earthquake Reconstruction 2015-2022**

The Nepal Society for Earthquake Technology (NSET) has developed innovative, effective basic demonstration tools to test half-scale earthquake resistant dwellings. It uses basic shake-tables and nudging to simulate ground shaking, with the aid of tractors and mechanical diggers.

**Maggie Stephenson** noted that NSET has lasted for more than 30 years so far and has become a regional resource that has expanded and contracted according to needs and opportunities. It has added to the training of thousands of Nepali engineers and championed the role of expert local NGOs, in part by working through the Asian Disaster Reduction and Response Network (ADRRN).

**Amod Mani Dixit**, the Director of NSET, wrote as follows:-

*'My glass is overflowing, we in Nepal have achieved much more than what we could even imagine when we started DRR in the early 1990s together with the advent of IDNDR. Although the devastation by the 1988 M6.6 Udaypur Earthquake stirred the minds and hearts of quite a few Nepalese professionals, returnee graduates from European universities could not answer simple questions from illiterate Nepalese - "what is the use of your knowledge when I lost my child and home and you had better stop continue talking your scientific nonsense".*

*'Today, Nepal is reporting that more than 95% of the Gorkha earthquake-damaged houses had been rebuilt back better. More than 90% of new building constructions, of which 80% are non-engineered. 50 of the largest municipalities outside of Kathmandu valley now comply fully to the stipulations of the National Building Code Disaster awareness has been achieved to the extent that improved legislation has mandated obligatory compliance to the national building code and local planning bylaws in all the 753 urban and rural municipalities. And local governments have been given the tasks of gradually developing the required DRR capacities and capabilities! Such achievements have happened in a land-locked country that spent the entire three past decades in exogenic Maoist insurgencies, political turmoils and economic stagnation!*

*'I, therefore, see for sure that the DRR glass is over-spilling, - (never mind that my DRR glass is way smaller than any of your glasses in Europe and Americas!) I am also happy because in the past three decades Nepal saved more lives per dollar spent in DRR than perhaps in other economically rich countries.'*

**Maggie Stephenson**, adviser on reconstruction to the Government of Nepal, commented:-

*'Amod Mani Dixit understandably needs to highlight the successes. And for a country as poor and fragile as Nepal, managing the largest ever owner-driven housing reconstruction programme, it has to be a success first and foremost, and NSET played a key part in that at policy and implementation levels.*

*'I think the major success in Nepal was financial assistance by the Government (National Reconstruction Authority NRA) to over 800,000 households under a single programme. This is particularly significant*

*considering the poverty level of most of the families affected, and the amount of money provided.*

*'This was unprecedented in Nepal, but it does raise serious issues for the government in relation to households regularly affected by flooding, and whether they will receive similar levels or types of assistance. Of course, flood risk mitigation needs infrastructure, settlement or natural resource management measures, not just individual house measures, so there are differences in the rationale for assistance, but it is a question for the Government of Nepal and for Amod to not only talk about earthquake risk reduction, but other risks too.*

*'While the houses built under the NRA assistance and inspection were largely compliant, it is not necessarily the case that subsequent construction is as compliant in rural areas.*

*'One of the major flaws in the Nepal programme was the strong emphasis on engineering compliance along with very short deadlines for inspection and release of the cash tranches, and low economic capacity of households. The three factors combined to cause many households to build one room or very small houses, compliant with the engineering standards, just to get the grants. Plenty of these are now just used as kitchens, or storage. These are tiny houses, not easy to extend, and not meeting the space needs of large extended families who previously had storage for crops, accommodation for animals and many family members in multi storey large houses.*

*'Unlike Gujarat, where core houses were easy to extend in a single storey courtyard typology, or Pakistan where households were able to mobilise contributions from diaspora relatives and the ERRA funds leveraged compliance of the overall investment, (or there were more low cost construction techniques approved which met the needs of the poorest households), in Nepal, there is a mismatch between the tiny engineered new house and housing needs. (DFID said Nepal will be known as the 'tiny houses programme'). There are other issues such as the high levels of debt incurred by households in Nepal, related to their reconstruction costs, and despite the massive investment by the Government. Lastly, there was a widescale loss of rural built heritage as the engineered boxes replaced a range of local complex typologies.*

*'I think some of NSET staff are focused on the compliance outcome, more than the housing outcomes. They have been more involved previously and currently in urban construction and building code compliance, which is going very well. So I think they deserve a lot of credit for it. The quotes on compliance maybe refer more to the relatively high rates in formal and urban construction, than rural.*

*'NSET and the Government have also been working on urban and rural schools, in a range of technologies, which have also been going well. But I think private housing needs more than engineering indicators and there*

*were weaknesses in the Nepal EQ programme, rural and urban heritage settlements that are already flagged and will be criticised in time.*

*'However, do we highlight the weaknesses in order to address them now or in future, or do we highlight the successes?'*

### **2.6.3 Turkish Experience of Earthquake Risk Management 1970-2022**

**Yasemin Aysan** sent in this commentary:-

*'In the '70s and '80s earthquake risks were concentrated in the rural areas of Turkey, mostly damaging the small unreinforced masonry or earth houses in Eastern Turkey. Even a 4.3 earthquake would result in significant losses. Knowledge to strengthen them was available in the country. The Martin Centre in Cambridge University (Robin Spence and Andrew Coburn) also undertook some valuable research regarding how to strengthen masonry in a timber-poor region. In recent years, these same areas were hit by similar scale earthquakes. After 40 years, damage was limited. It is difficult to attribute this progress to training, safe housing reconstruction programme at the time, or improved building codes which were not applicable in the villages. One factor was the gradual, widespread accessibility (availability and income) to non-traditional construction materials. Their ease of maintenance relative to the traditional was a bonus.*

*'In those 40-50 years, high-earthquake risks in Turkey shifted from the rural areas to the rapidly urbanising cities with limited long-term urban planning. While some historical evidence and technical knowledge existed on disaster risks of many cities, they were seldom considered in planning decisions. Building codes improved, though not always systematically enforced. Simultaneously, risk is rebuilt at an escalating pace in some unmaintained historical building areas occupied by refugees and the poor; low quality multi story blocks of flats, old and in new development areas; pressures of expensive urban land allowed developers build on unsafe land. Each economic and political development brought new risks and exposed different groups to the changing patterns of risk. Initially, change was from rural to urban squatters, migrants in cities, who built illegally on unsafe land. Gradually such land is legalised for political reasons and some squatters developed their land. Others were cleared and replaced by high rise blocks of flats by the authorities. Today, the high-risk groups are the new poor and the refugees in old historical areas; low income and lower middle to middle income group occupy poor quality blocks of flats. There are recent urban transformation programmes to renew high earthquake risk buildings that 'marry' owners of flats with developers, each take a percentage of the new building. This was a short-lived scheme after the Mexico City earthquake. However, this programme is criticised for starting in higher income areas, now expanding to lower income neighbourhoods and completing a transaction is a slow process.*



*'The pandemic started to reverse the trend of movement this time from urban to rural. Many old people returned to their villages, middle income groups, especially the young, also moved out of cities. Now these booming towns are becoming densely populated, shifting the risks and problems of unplanned urban growth to these small towns. In this process, urban and rural floods, extensive forest fires also became frequent threats.*

*'Many lower income countries exemplified in this paper are likely to go through similar paths, in their own, unique ways. Long-term analysis and learning from different situations should replace 'pilot projects and 'snap shot' overviews. Then, a half full and a half empty glass might frequently change places several times over time.'*

#### **2.6.4 Managing Urban Risks**

**Andrew Maskrey** discussed the challenge of disaster risk and urban development:-

*'The form of urban development predominant throughout Africa, much of Asia and Latin America, shaped by opportunities for speculative gain, at the best ignores and at the worst represses the needs of the urban poor. In Lima (a city I have been working and living in and observing for over 40 years now), urban expansion through squatting is still accepted as a normal way of urban development to resolve the housing needs of low-income families despite 60 or more years of literature and practice showing how the State can support the process through planned development, technical assistance, and approaches such as sites-and-services.*

*'In conclusion, therefore, I subscribe to the vision that badly planned and managed urban development, that ignores the needs of low-income households and communities, often accompanied by environmental degradation or unsustainable use of land and water is a major driver of risk, over which the DRR community has had little or no influence, except in the case of specific demonstration projects.'*

**Robin Spence** related the urban context to earthquake risk:-

*'Urbanisation is occurring rapidly in many of these countries, but moving to urban areas generally means finding space in highly vulnerable informal settlements, or building in a similar way to the construction of rural areas. Buildings in modern materials, if not built to earthquake codes, are not necessarily any less vulnerable.*

*'Thus for the large and often rapidly-growing populations of these countries, the earthquake risk today is increasing rather than diminishing, and is creating the context for large earthquake disasters in the future.'*

**David Etkin** commented on the proposed relocation of Jakarta:-

*'In terms of exposure, the concentration of populations in urban areas and along coastal areas seems to be continuing, so I don't see much positive*

*news there in terms of disaster risk. However, we are seeing the first major relocation of a coastal megacity with what is happening at Jakarta. But will all be relocated? I expect there will be major social justice issues emerging from this event. The numbers of refugees (climate and otherwise) are probably going to increase in the future, and this may well lead to a hardening of borders and more social unrest.'*

### 2.6.5 Social Capital and Housing

The complex social dynamics of house occupancy were noted by **Sudha Arlikatti**, based on her research in Tamil Nadu, South India:-

*'Beneficiaries of in situ (owner driven) housing programs generally reported a higher self-assessment of recovery compared to the resettlement (donor assisted) housing programs as they could continue to cohabit with their extended families, who were their support systems, unlike those in resettled homes which were much smaller and designed for nuclear families.'*

- *Social capital continues to be very important to DRR efforts.*
- *Shelter and housing reconstruction must be culturally sensitive and understand varying family types and structures within a community. This is still lacking in "re-building safer" programs by government/ INGOs.*
- *DRR requires an equal focus of structural/ housing recovery, economic/ livelihood recovery and psychological recovery.*

*'The Government of Tamil Nadu mandated the provision of Tsunami insurance for all new home owners. However, homeowners did not understand that it was for rebuilding if a tsunami struck again. They assumed it was to cover repairs such as leaky roofs and were complaining that government officials were ignoring their requests.'*

*'Tsunami insurance is a great strategy, but risk area residents must be told what it is for and how it works.'*

*'Most of coastal India is completely built out and it is impossible to ask coastal residents and those living in floodplains to relocate, as a mitigation strategy.'*

### 2.6.6 Mental Health and Housing

**Bill Flinn** described the collaboration between CARE and Oxford Brookes University (with additional partners) in conducting applied research:-

*'.....into the connections between post-disaster housing and both physical and mental health and well-being. There is now a shelter and health page on the cluster website and you can see two recent reports there – one on health generally and one specifically on mental health and well-being.'*

<https://www.sheltercluster.org/resources/shelter-and-health>

*'Here are a few of our recent publications:*

*Towards Healthier Homes. Report from a Shelter and Health Workshop (shelter, mental health and wellbeing pending publication)*

*<https://insights.careinternational.org.uk/publications/towards-healthier-homes-in-humanitarian-settings>*

*Mindful Sheltering*

*[https://sheltercluster.s3.eu-central-](https://sheltercluster.s3.eu-central-1.amazonaws.com/public/Mindful%20Sheltering_0.pdf)*

*[1.amazonaws.com/public/Mindful%20Sheltering\\_0.pdf](https://sheltercluster.s3.eu-central-1.amazonaws.com/public/Mindful%20Sheltering_0.pdf)*

*'Another interesting recent development is the 'Roadmap for Research', that you can download here:'*

*<https://www.interaction.org/blog/roadmap-for-research/>*

*Roadmap for Research; Chapters 8 and 12*

*[https://www.interaction.org/wp-content/uploads/2021/06/Roadmap-for-Research\\_96ppi.pdf](https://www.interaction.org/wp-content/uploads/2021/06/Roadmap-for-Research_96ppi.pdf)*

**Suda Arlikatti** shared some of the research findings that relate stress symptoms to shelter and housing-

*'Following the 2004 Indian Ocean Tsunami disaster, we conducted a study of 531 households from seven coastal settlements in Nagapattinam in 2005, 2008 and 2012 (Andrew and Arlikatti 2012, 2014, Andrew et al. 2013, Arlikatti and Andrew 2012 and 2017, Andrew et al. 2014).*

*'We collected shelter data (i.e. the type of temporary shelter taken, duration of stay in a temporary shelter, number of times relocated), number of deaths or injuries in the family, and aid received for repairs and rebuilding, to characterize short-term recovery. In 2008, to characterize long term recovery, we collected data from 531 of the same households from seven coastal settlements in Nagapattiam, to understand whether they perceived their household and community had recovered, if they had experienced stress symptoms and had sought formal or informal treatments, or no treatment, and their satisfaction with the types of aid received.*

*'These were some interesting findings:-*

*'Contrary to expectations those who sheltered in temples, mosques, churches and marriage or community halls closer to their villages had higher stress symptoms than those in government designated shelters.*

- *Government/NGO designated shelters are very important, they are clearly doing something right!*
- *Work on identifying and planning for and siting of these shelters and their adherence to building codes is an urgent need*

*Four years after the tsunami, about 63% households said they had not recovered and this was directly related to their inability to pursue their familial livelihoods.*

- *Need for longitudinal studies to monitor cultural and livelihood changes that affect DRR.*
- *Stocktaking after 20 years of the 2004 tsunami in the 13 affected countries will be important.*

*'Less than a quarter of households sought assistance from a mental health professional (formal or informal) and those that did perceived higher levels of household and community recovery.*

- *Despite acknowledging the benefits of mental health professionals, it is difficult to advocate for them, due to the stigma attached to seeking their help in rural India.*
- *NGOs and local self-government agencies may be able to educate their constituencies*

*'Immediately after the disaster (in 2005) psychological stress symptoms were negligible for households involved in fishing activities. However, about four years later the ratings were the highest for those involved in fishing, from among all other livelihood groups. This was likely because of the outpouring of relief aid money in the initial months. But in the long-term, once they were relocated or resettled many kilometres inland, they could not earn through their fishing activities due to distance from the sea.*

- *Alternative livelihood support planning must go hand in hand with housing recovery programs to ensure mental health of disaster survivors and enhance DRR.'*

### **2.6.7 Creating Livelihoods through Housing Construction**

An emphasis on livelihood creation and protection in disaster recovery has been a key element in the user-build recovery and reconstruction operations following the 2004 Indian Ocean tsunami, the Pakistan earthquake of 2007; the Haiti earthquake of 2010 and the Nepal earthquake of 2019, see Sanderson (2011). But can builders, masons and carpenters apply their newly acquired skills to strengthen their livelihoods? **Babar Khan Mumtaz** expanded the question:-

*'While post-disaster housing construction does provide employment generation opportunities, these are short-lived. Talking to some of the builders working on housing after the Kashmir earthquake, many of whom had come from outside the region in response to the demand, they expressed concern for their future and whether they will be able to use their newly improved and acquired skills. However, more than the employment generated in construction, there is the greater and longer-lasting employment and economic development potential generated after housing construction as a direct result. When asked what the households will spend their compensation payments on, most women said, "washing machine - we have running water now and won't be living our old life." This and other examples point to the*

*multiplier impact of improved housing on generating long term demand in the economy.'*

### 2.6.8 Building Regulation

The Global Facility for Disaster Reduction (GFDRR) of the World Bank has supported an important initiative in Jamaica to update national building regulations and devise relevant methods to improve safety of low-income families. GFDRR (2016)

### 2.6.9 Economic and Social Infrastructure

**Steve Bender** highlighted a neglected aspect of urban vulnerability:-

*'The most demanding challenge of DRR of the built environment in both qualitative and quantitative terms is dealing with the vulnerability of existing economic and social infrastructure. .... Few people know much and most people know little or nothing about the vulnerability of their home, water and sewerage system, schools, medical facilities, transportation corridors, energy and telecommunications networks, and their places of employment.'*

### 2.6.10 The Role of Insurance for low-income families

**Suda Arlikatti** described Indian experience of insurance for home owners:-

*'The Government of Tamil Nadu mandated the provision of Tsunami insurance for all new home owners. However, homeowners did not understand that it was for rebuilding if a tsunami struck again. They assumed it was to cover repairs such as leaky roofs and were complaining that government officials were ignoring their requests.'*

- *Tsunami insurance is a great strategy but risk area residents must be told what it is for and how it works.*
- *Most of coastal India is completely built out and it is impossible to ask coastal residents and those living in floodplains to relocate, as a mitigation strategy. Where would they go? These are paid up homes on ancestral properties. Moreover, the government does not have funds to buy them out, as is the practice in developed nations. But they can also not provide funds to keep rebuilding flooded and destroyed properties. Homeowners need to take individual responsibility and may receive subsidies from the government depending on their economic situation, to build stronger and safer. But the conversation to possibly create a National/ State level hazard (e.g. flood/ tsunami/ earthquake/landslide) insurance program is a necessity in all the States of India.'*

### 2.6.11 Educating Young Architects and Engineers in Low-Cost Building Safety

In the final discussion concerning safe construction, **Maggie Stephenson** described the dilemmas about the career prospects of young professionals:-

*'Young engineers and architects from the global south who have personally experienced disasters and worked with me in historic reconstruction programmes, have tried to study further and sought opportunities to learn in order to work more effectively in reducing vulnerability, in informal settlements and non-engineered construction. Inevitably, they are steered by universities instead towards topics like remote sensing, or new materials or technologies or new data tools, on the basis that this is the valid space for professional development. There is little work being done on concrete blocks which are the global vernacular for example, but improving their production, use and performance could yield multiple benefits, apart from building safety, such as durability, cost, thermal etc.'*

**Babar Khan Mumtaz** responded:-

*'Maggie Stephenson makes a very valid point, but it is not just "the universities" that steer them to high-tech techniques rather than allowing them to address the needs of the everyday. The students see no point in addressing compressed block construction. They see that their future lies in the high-tech gloss which is in demand not just by the local elites but more importantly is an exportable commodity that can get them employment abroad. How many architectural magazines feature the works of Hasan Fathy compared to that of Dame Zaha Hadid?'*

### 2.6.12 Costs and Benefits of Building Safety

Agencies that promote DRR measures are always interested in whether their investments were worth it. What level of safety was secured at what cost? However, they also need to evaluate the human costs associated with the measures they are advocating. For example, Ian was once taken to an earthquake safety project in a village in Maharashtra in India. Teams of young earthquake engineers who had been trained in the Indian Institute of Technology, Roorkee, had visited the village and convinced the residents that their homes were very dangerous because the heavy earth roofs could fall on families during a future earthquake. The proposed 'solution' was to substitute sloping lightweight corrugated steel sheeting for the heavy earth roof resting on heavy timber beams.

This change enraged the house occupants. Their new 'safe' roofs generated a tremendous noise akin to a drum beat when monsoon rains fell that kept them awake at night. In the heat of summer, the roofs acted like a radiator, making the inside of the dwellings intolerably hot. Even worse, their original heavy earthen flat roofs had an important social function for these rural communities that was neglected by the earthquake engineers: they were used by the occupants for a variety of household purposes, such as sleeping outdoors in hot weather, drying fruit and preparing vegetables in a protected zone that was inaccessible to foraging animals.

Assessments of effectiveness always need to balance the *need* for safety with the human *costs* of safety. There is little point in being safe in the long-term if it results in daily misery in the short-term. Life is about *living* not merely *protecting*.

### 2.6.13 Summary: Building for Safety

As the vast majority of earthquake deaths relate to building failure, seismic safety in building construction remains a critical need in both urban and rural areas.

For the dwellings of low-income families, there is a persistent need for appropriate building regulations and their effective enforcement.

More work is needed on the safety of concrete block construction, which in some parts of the world is the new vernacular building tradition.

Significant progress has been made in the construction of owner-driven housing. In contrast to contractor-based programmes, it must incorporate the training of builders and crafts-persons in safe construction processes. However, such programmes are exceedingly rare events at present.

Badly planned and managed urban development that ignores the needs of low-income households and communities has become a major driver of risk. The DRR community has had little or no influence over it.

Holistic approaches are needed in the design of housing projects. Mental health, social, livelihood and environmental factors need to be incorporated, along with technical safety factors.

Unfortunately, young professional architects and engineers rarely see their future in working in the low-income housing sector.

## 2.7 Food Insecurity

More than two-thirds of Africans depend on agriculture for their income and their basic food needs. Africa tackles food insecurity, nutrition and incomes across the continent through various initiatives including the Comprehensive Africa Agriculture Development Programme (CAADP). In drought-prone countries there is growth in food security measures, with the development of food buffer stockpiles, innovative agricultural practices to protect soils, and physical, social and economic early warning systems designed to predict impending droughts and take corrective action.

**Ben Wisner** noted the ‘...*need to acknowledge that in 2021 and projected into 2022, the number of people living with food insecurity is growing and the situation is critical.*’

**Terry Cannon** added:-

*‘The main intervention in the last 20 years in India is income support for landless people (to guarantee 100 days of paid work when local*

*employment is inadequate) through the National Rural Employment Guarantee Act (NREGA) The problem never diminishes because the causes of the poverty and lack of employment are embedded in the systems of power and inequality.’ (Misra 2022)*

**Maggie Stephenson** suggested the need to

*‘...look at the work of the World Bank and plenty of national governments and others in developing social safety nets that have been facilitated and accelerated by digital and information technologies and changes in financial service technologies. The number of people in social welfare support programmes now runs to billions. This has been ramped up even wider and faster due to COVID, with cash payments becoming palatable among donor countries.’*

Finally on this topic, **Steve Bender** believed that *‘The above comments about Flood Protection and Food Security are wholeheartedly mistaking market adaptation for progress.’*

### 2.7.1 Summary: Food Insecurity

Food insecurity is growing and is closely related to the lack of employment opportunities, poverty and insecurity. In response social safety nets have evolved with changes in financial services including greater use of cash donations by donors. But such relief measures do not constitute long-term progress.

## 2.8 Climate Change and Adaptation Processes

### 2.8.1 The Global Agenda to Tackle Climate Change

**David Etkin** made the following points:-

*‘Climate and weather- related hazards are getting worse, especially for heat waves, droughts, forest fires and possibly Atlantic hurricanes. This summer interior British Columbia experienced a record high temperature one day of 50 degrees C (I rounded up from 49.6). As a meteorologist, I find this to be an astonishing record. I doubt we could even calculate a meaningful return period for that high a temperature. I think the likelihood of us reaching a climate tipping point this century is being increasingly accepted – if we reach such a critical threshold we are in deep trouble. This issue is really part of a larger one, related to the destruction and simplification of global ecosystems. It is very, very worrisome.’*

**Ben Wisner** added:-

*‘With this growing consensus as noted above, I think this section of the document should acknowledge the growing demands, especially by organized young people, for RAPID de-carbonization and MASSIVE “new green deals”. See Naomi Klein’s book: On Fire: The Burning Case for a New Green Deal (2019) and Michael Mann’s review of it (Mann 2019).*



**John Twigg's** viewpoint is as follows:-

*'The Anthropocene (the current geological age, viewed as the period during which human activity has been the dominant influence on climate and the environment.) underpins everything. This is the elephant in the room where DRR is concerned. Lots of talk about climate change as a phenomenon, and loads of suggestions about what treaties, laws and measures to introduce; but not nearly enough on the human decisions and activities that are changing the planet's environmental systems drastically and probably irreversibly. Will it take mass extinction to bring humanity to its senses? A cynic might argue that reducing the human population would be a good thing as it would reduce our environmental footprint on the planet.'*

**Ilan Kelman** added:-

*'Climate change is taking over agendas, dominating discussions, and generating confusing vocabulary.'*

**Terry Cannon** responded:-

*'Part of Ilan Kelman's point would also be that severe recent events are blamed on Climate Change when they may actually not be exceptional in terms of long-term climate data. Bangladesh has not had any worse floods or cyclones in recent years – climate change takes over the agenda with a kind of moral signalling and many people go with it without checking the data. The problems faced by poor people in Bangladesh are more related to inadequate / missing government policies than they are to climate change. But it is convenient to blame climate change to get off the hook.'*

## **2.8.2 Disasters and Climate Change: A Common Concern?**

**Ian Burton** argued as follows:-

*'Let me repeat one observation that I have been making. Sendai still refers to disasters as "a common concern". That means it is a humanitarian problem which is addressed as a matter of goodwill and generosity I.e. not an obligation. Whereas the United Nations Framework Convention on Climate Change (UNFCCC) agree that climate change is a "common responsibility". The text qualifies this and the exact phrase is "common but differentiated responsibility".*

*'In other words, some countries bear a larger responsibility than others. The distinction is important. And it rests on the assumption that climate impacts are a global problem with global causes and consequences. The disaster community still seems to be locked into the idea that disasters are unique and isolated and place-based events. This perhaps was a correct view in the past but it is increasingly evident that there are common underlying and connected causes - not of the hazard events necessarily,*

*but in the vulnerability and exposure that exists and is being increased by human choices and decisions, sometimes unknowingly and sometimes known but denied or concealed.'*

**Rumana Kabir** added these reflections:-

*'Being a dual citizen from both Bangladesh and the UK I have two perspectives that link together. While working in international development mainly voicing communities and local views, as well as within a UK's public policy context, I feel the problems are the same everywhere. Our so-called community-led housing or disaster risk reduction projects glorified as, 'people being resilient of living with disasters' cannot reverse climate change impacts. The problem is elsewhere. It is us, who need to adapt our mindset, let alone our leaders. People can't live with disasters forever.*

*'Here in the industrialised world, the glass is too full! We are contributing to global warming ourselves. Climate Change Adaptation has its limit. People in flood prone UK, Germany and Bangladesh cannot keep on adapting. The privileged ones like us, whether we live in the East or West, can't carry on flying and consuming. We need to think how to mitigate our own impacts to global warming and act to Refuse, Reduce, Reflect, not just go on with the mantra of 'reduce, reuse and recycle', which obviously is not enough. Now, it is not only Bangladesh that is sinking, it is Europe and the US who are sinking too.'*

### **2.8.3 Adaptation to Climate Change**

During the COP26 summit in Glasgow in October 2021 the UN Secretary-General António Guterres stated that four billion people had suffered climate-related disasters in the past decade. Thus, one of the COP26 conference days was devoted to adaptation, a long-overlooked issue, with the international dominant focus being primarily focussed on reducing greenhouse gas emissions.

*' Adaptation can take the form of seawalls, flood barriers, storm drains and shelters for displaced people, but there is also scope for 'nature-based solutions' such as tree-planting to prevent landslips, restoring wetlands to act as sponges for heavy rainfall and planting crop varieties that are more resilient to higher temperatures and water shortages. All require investment, however, and most poor countries cannot raise the necessary finances.'* (Harvey 2021)

**Ben Wisner** commented:-

*'It was good, of course, that time was allocated in COP 26 to consider adaptation measures to combat Climate Change, however, we should remember that the money pledged by rich countries to poor ones for implementing adaptation has not been provided in full and is insufficient.'*

**Omar-Dario Cardona** reflected as follows:-

*'The half-full or the half-empty is a virtual reality, real virtuality, like risk 'is'... possibility and reality at the same time; it's not only about the future... it's about the present.*

*'Despite the argument that the climate disaster is already happening due to the events currently taking place, by multiple actors, ranging from environmental and political activists, the media, multilateral entities, to press for the measures of Green House Gas (GHG) Reduction in the shortest time possible, adaptation is not indeed on the agenda of decisions, priorities, and investments.*

*'Faced with this pressure to be politically correct with the slogan: 'business as usual' in the framework of a new large speculative and financial business, the governments of the least developed and vulnerable countries, with new demagogic discourses, soon plan to be carbon neutral. This prize would be an achievement that would require innovation and technology. That is costly, not very feasible and if it is not achieved by most developing countries, it would not have a greater direct benefit for them to reduce their own disasters. This is because its contribution to the global emissions problem is negligible, leaving no space to prioritize the reduction of its 'vulnerability', which is already an existing risk problem.*

*'The visions of the catastrophists, neo-Malthusians, have as their main objective to press for action, leaving aside adaptation. Its relevance is not perceived and is presented by some promoters of GHG reduction, in a biased way, such as a slow action in the face of "urgency" and as a synonym of inability, failure, and resignation... There is no reflection that there have always been and always will be hydro-meteorological events and that the potential for an increase in damage is mainly due to increased exposure and 'vulnerability'. Nor is there any recognition that if the desirable condition of carbon-neutrality were achieved, the intense events that characterise climate variability would not cease. Thus, an adaptation and transformation strategy must be in place, often termed: 'integrated disaster risk management.'*

#### **2.8.4 Nature Based Solutions to Disaster Risk Reduction and Adaptation to Climate Change**

The International Union for Conservation of Nature (IUCN) has developed a set of internationally accepted guidelines for nature-based solutions (IUCN 2020).

Working with the Global Facility for Disaster Risk Reduction of the World Bank, an international consortium of agencies has been cooperating on exploring the potential to reduce flood run-off by natural means. Guidelines have now been produced (GFDRR 2017).

**Paul Venton** commented thus:-

*'Nature-based solutions? This is such a growing (no pun intended!) field, (again no pun intended!) How on earth have we managed to label disasters as "natural" for so long (especially outside of professional disaster and development arenas). Clearly, we understand that so much is un-natural, and by contrast nature provides such a vitally important contribution to resilience (and reduction in people's vulnerability) as well as so many other deep, deep benefits (benefits seems far too cold a word - like some sort of economic analysis - what I'm talking about is life!). Besides, if we strip away anymore of the earth's biological diversity, we are doomed on a global disaster scale, including because of climate related implications.*

*'Since the mid 2000s I have become passionate in my work about our relationship with nature, and the implications with respect to disasters and climate impacts. Time and again we witness how exploitation and degradation of wetlands, coasts, coral reefs, forests and other ecosystems are among the major causes of disaster, whereas when healthy these same ecosystems provide us with protection from flood, drought, storm, soil erosion, landslide, while providing all manner of other benefits including carbon sequestration, enhanced air quality, food and clean water for good health, livelihoods – and, yes, peace and joy too.*

*'Local communities are the stewards of the environment. This is, in my view, also a deep spiritual calling as we are tasked to care for the Garden of Eden (Earth). It is a necessity for survival, but it is also a requirement in our inheritance as caretakers of the gift of Earth's abundance and beauty. When all seems lost and hopeless, this invitation to keep leaning in and participating in conservation and restoration remains a personal steadfast motivation for action, even if this appears terribly small and insufficient and too often undermined by contradictory actions. Another powerful motivation is a desire to help our children reverse their sense of loss and anxiety over their future. Very happily, the fields of ecosystem-based disaster risk reduction and ecosystem-based climate change adaptation are maturing very rapidly and being taken increasingly seriously – such as at COP26. The Partnership for Environment and Disaster Risk Reduction and Friends of Ecosystem-Based Adaptation Networks are full of impressive institutions and individuals that are forging forwards. Also of significance is the improving recognition in local communities and indigenous people's pivotal role as true leaders and stewards.'*

*'These two networks provide useful information on nature- based solutions: 'Partnership for Environment and Disaster Risk Reduction' (PEDRR) <https://pedrr.org/> and 'Friends of Ecosystem based Adaptation' (FEBA) <https://friendsofeba.com>.*

**Terry Cannon** added:-

*'Nature-based solutions' fits into the idea of a 'cure-to-damage ratio' that I like to use. Far more is invested in corporate activities (trillions of dollars worth), that damage 'nature based' prevention. See for example Greenfield and Weston (2020).*

### 2.8.5 Flood Protection

According to **Mikio Ishiwatari**:-

*'Japan is recently suffering from severe flood disasters almost every year. The 2018 flood killed over 200 people, which is the first time in 30 years. Typhoon Hagibis in 2019 damaged some 17 billion USD, which is a record high.'*

*Some countries, in particular China, India, and the Philippines, are drastically increasing investment in flood protection. I understand England is also doubling the budget for flood protection. The Japanese Government predicts that flood risks would double by 2040 because of climate change. See National Land Development Council (2020).'*

**Bruno Haghebaert** added:-

*'An interesting initiative on Flood Risk Reduction is the 'Zurich Flood Resilience Alliance', <https://www.zurich.com/en/sustainability/people-and-society/zurich-flood-resilience-alliance>.*

### 2.8.6 The Impact of Climate Change on Low-Income Housing

The following is an extract from a book by **Pat Wakely**:-

*'The early decades of the 21<sup>st</sup> century have seen the dramatic and tragic impacts of global climate change, particularly on low-income group settlements. Whilst strategies to minimise the severity of the world's climates, notably global warming through the emission of 'greenhouse' gasses, have been addressed politically by international bodies and agreements, with varying degrees of success.*

*'However, it seems extremely unlikely that any international political or technical innovations will reduce the vulnerability of urban settlements to the impacts of global climate change before the end of the 21<sup>st</sup> century, but they can be mitigated by informed planning for enhanced resilience to hazards, thereby reducing risks of disaster from extreme climatic conditions such as flooding and drought, storms and high winds, and geophysical hazards such as earthquakes, tsunamis and landslides*

*'The impact of climate change hazards, such as seasonal rains that have occasional unpredictable extremes, should be mitigated by judicious planning and infrastructure engineering that take into account seasonal*

*occurrences and the possibility of unexpected peaks, without radically increasing the capital cost or maintenance expenditure in use. Long-term environmental changes, such as sea level rise, or extended periods of drought and/or extreme air temperature increases (heat waves) can be addressed by informed good planning and design practice. In many cities long-term climate change can have significant effects at a regional level that impact directly upon urban low-income housing. For instance, sustained periods of drought or extensive flooding can disrupt agricultural production in rural areas, occasioning increased migration to towns and cities by ex-farmers seeking shelter and employment in urban low-income group (informal) settlements.'* (Wakely 2018, p. 93)

### **2.8.7 Summary: Climate Change and Adaptation Processes**

The need for responses to climate change (as a global threat) should be regarded as a *common but differentiated concern* in all countries.

The importance of developing nature-based solutions as adaptations to climate change is growing.

## **2.9 The Covid-19 Pandemic**

### **2.9.1 Denials and Fault Lines**

**Vinod Menon** commented as follows:-

*'The hard-won gains of the countries to work on the 17 Sendai Development Goals from 2015 onwards were put back several years behind the 2015 baseline figures due to the devastating impact of Covid-19 in most countries.*

*'While the 2004 Indian Ocean Tsunami became a clarion call for a paradigm shift from a humanitarian aid system characterised by reactive post disaster relief & response practices to a robust system of improved pre-disaster multi hazard preparedness, risk reduction and emergency response capacities, the experience of the 221 countries impacted by Covid-19 in preparing for, responding to and recovering from Covid-19 shows that the pandemic has exposed the fault lines.*

*'During the Covid-19 months, several Disaster Management practitioners became the spokespersons of the establishment spreading misinformation and disinformation.'*

**Bruno Haghebaert** added:-

*'Maybe this needs further explanation, as it can be interpreted in several ways. Not only the establishment is guilty of misinformation.'*

**Maggie Stephenson** followed up:-

*'But as well as exposing fault lines, as noted by Vinod Menon, Covid also demonstrated some collective action, ability to exchange information, to act with urgency etc.'*

According to **Ben Wisner**:-

*'A major fault line exposed is between "the West and the Rest"... two years into the pandemic there is still a lack of adequate vaccines in poor countries despite the efforts of Covax.'*

**David Etkin** opined:-

*'Very worrisome to me is how so many people are politicizing Covid management issues – it is really bad in the U.S. but we are seeing it here in Canada as well. The denial of pandemic realities is costing many, many lives and prolonging the disaster. If we cannot base disaster management policies on science and data as well as ideologies, then we are in bad shape.'*

**Omar-Dario Cardona** reflected as follows:-

*'Who gives the character of unpredictability? Not believing that something can happen does not mean that it is unpredictable, no matter how much it is warned. Was a global pandemic not foreseeable or was it not believed that it could be real? It was certainly not a surprise for the specialists. Despite previous scientific evidence and warnings, health systems were not prepared. In addition, it is not only blindness in the face of the threat, because political ineptitude and the lack of coordinated, timely, and effective action must be added.'*

*'Governments had other priorities. Allowing the death of a few thousand people as if it were just another year in which several planes go down every day for months... has been amazing. 'Socio-economic vulnerability proved to be a determinant of the degree of affectation as well as the capacity for recovery'. Governments knew that a pandemic was feasible and it was underestimated; even when it had already spread, and the public also did not grasp the implications. Misinformation, improvisation, lack of leadership, anticipation, and preparation proved fatal and science was shown to be essential.'*

*'But can health be regarded as an everyday risk? At a global scale, during the COVID pandemics of 2019-21, the public health risks, health deaths and economic consequences far eclipsed the worst impact of natural disasters in recent decades.'*

**Mihir Bhatt** added the following:-

*'The DRR community was not aware of the pandemic coming, the authorities and corporates had no investments made to retard or prevent it, authorities had no idea how to handle it; and yet, so far, there are no preparedness measures. The neo-liberal economics is leading to more risk and this can only be addressed if we think of "economics of risk reduction and resilience economics".'*

## 2.9.2 Summary: Covid-19

The mixed responses to Covid-19 have shown the best and worst in our countries. A lack of preparedness to widespread misinformation on social media have contrasted with some effective international cooperation, and with the sharing of vital data. We can only hope that as the pandemic continues to generate effective vaccine protection that it will soon extend to the most vulnerable citizens and nations.

## 2.10 Community Actions to Reduce Risks

Perhaps the most important area of progress in the past two decades has been the expansion in community actions to reduce risks and adapt to climate change. There is extensive literature on this subject (Lassa 2018, Shaw 2016).

The significant progress in community-based disaster risk management (CBDRM) was echoed by **Steve Bender**:-

*'Your comment and Lassa's work are certainly worthy of recognition - as perhaps the closest thing to discussion of 'community to development based risk management' present in this look at measuring progress.'*

**David Peppiatt**, shared his perspective from his work with the Red Cross, confirming the value of CBDRM programmes:-

*'There is much ambiguity and complexity when one reflects on progress in the world of disaster risks, vulnerabilities and resilience. As David Etkin says, (pages 39-40) so much depends on who you are and where you live in this world as to how you will perceive or indeed experience progress. I am loath to generalise but would like to offer one rather basic reflection from the past 25 years of my life working with the International Red Cross & Red Crescent Movement.'*

*'When I joined the Red Cross I discovered an extraordinary global network of National Societies, branches and first responder volunteers, many of whom lived in and came from some of the most at risk parts of the world. I quickly learned these first responders were the greatest asset of the RC Movement, present before, during and after disasters and accepted, trusted and valued by the communities they serve.'*

*'What has struck me most as I have visited many Red Cross and Red Crescent National Societies over the years has been the genuine culture'*



*shift in the RC from response to preparedness and the strong focus on resilience among our network of volunteers. From Bangladesh RC cyclone preparedness to Jamaica RC "Better be Ready" hurricane preparedness programme, and from the Philippines RC Development Programme to Kenya RC DRR programmes I have witnessed disaster mitigation, preparedness, risk reduction, resilience (or whatever term you choose to adopt!) become an important and integral part of the RC work at the local level, often resulting in very practical and simple measures and with high levels of community engagement. I could cite numerous examples from every region of the world.'*

However, a past colleague of David, **Bruno Haghebaert**, was not so convinced:-

*'But... based on my three decades of experience with community-based disaster risk reduction, I also see a number of inherent weaknesses and challenges related to community-based DRR actions. They relate to:*

- *Scale: how many or how few people are actually being reached compared to the total population? What about the neighbouring village, which may equally be at risk? Is there a snowball effect of the interventions to other locations?*
- *Connections and partnerships: does the civil society organisation (CSO) or community-based organisation (CBO) make sufficient use of the added value and capacity of other actors or is there competition between them? And is local government fully engaged and committed?*
- *Sustainability over time: once the external support comes to an end how long does the support / capacity building that is being provided last?*

*'These challenges can be addressed but there are definitely interrelated spatial, temporal and connectivity issues associated with community level DRR action.'*

This perception was shared by **Ben Wisner**:-

*'Not meaning to 'elder-splain' my friend Bruno, but merely to echo and to agree completely with his observations, my own 5 plus decades of work on local knowledge and communities confirms what Bruno describes.'*

Three contributors described their experiences of community action. **Yasamin Izadkhah** noted progress in Iran:-

*'The growth of public awareness and education concerning disaster risk and the awareness of vulnerable groups concerning disasters.'*

Then **Zenaida Willison** from the Philippines noted the polarity in perceptions:-

*'...until the early 1990s, but more prominently in the 70's and 80s, development NGO's were perceived by the government as "rebels", "revolutionaries". On the other hand, the NGOs thought that all*

*government offices are corrupt. Both were wrong, but there is some truth in those perceptions.*

*'Through advocacy and lobbying, the government (during the previous administration) accommodated the NGOs to be part of the system. Civil Society Organisations (CSOs) and NGOs are members of the government councils at all levels. The NGOs/CSOs are highly instrumental in the passing of The Philippine Disaster Risk Reduction and Management Act in 2010.'*

Working in Bangladesh following a cyclone, **Yasemin Aysan** discovered that community preferences were *not* for DRR:-

*'...I was trying to help the local organisation to set up a community based DRR. After an extensive survey, against our expectations clean water and not DRR was the top priority. Explanation was that dirty water made them sick which meant they could not work to earn an income. One was a daily risk the other risk was when it was flooded.'*

The key role of young people was emphasised by **Rajib Shaw**:-

*'Young people and youth groups are taking keen interest, not just as youth advocate or activist, but young professional and entrepreneur. At least in Asia, I see increasing number of young people are taking DRR as their career option, which is again a great positive change'*

**Vinod Menon** agreed, with Indian experience of *'...self-organised mobilisation of students and youth to establish advocacy groups and platforms for climate action and Disaster Risk Reduction'*.

This assessment was shared by **Vinod Sharma**:-

*'Children are way more aware about disaster risk and risk reduction approaches than before.'*

### **2.10.1 Summary: Community Actions to Reduce Risks**

The positive progress of risk reduction by communities reported by contributors in India, the Philippines, Iran and Kenya etc. needs to continue and to expand.

Young people can play vital roles in community-based disaster risk management. However, some persistent concerns were noted in the dialogue:

- the limited scale of such programmes in relation to communities which are *not* offered such opportunities
- many community programmes suffer from isolation from other groups, including
- local government
- many community programmes are 'one-off' unsustainable efforts

## 2.11 Education, Knowledge and Awareness

### 2.11.1 Expansion in Knowledge, Education and Training

Knowledge-sharing has occurred in India and Japan where major efforts have been made to transfer disaster risk management experience from those with experience of earthquake and cyclone recovery and risk reduction to those who need such knowledge. This was achieved by transferring officials. The experience of stone-masons in safe housing reconstruction from Nepal was transferred to the reconstruction programme in Gujarat, India and Kashmir in Pakistan by bringing skilled masons to the areas being reconstructed where these craftsmen functioned effectively despite language barriers.

David notes that the amount of knowledge available is so very much greater than it was 40 years ago. In 1980 there was only one significant academic journal for the provision of useful information to the practitioners. It was, of course, *Disasters*. Now there are at least 85, and this signifies that the number of people who are researching disasters, hazards, resilience, and so on, has gone up enormously. The growth in knowledge feeds the growth in education.

But what is the impact of academic publications on practitioners? **Maggie Stephenson** was not convinced '*...that most practitioners are informed by academic publications, and they rarely ignite public imagination.*'

A number of contributors noted the expansion within the educational sector. **John Twigg** described this as an 'explosion':-

*'Realistically, we're looking at generational changes, or certainly over several decades, to understand long-range trends, enabling environments, etc. Historical perspectives of change are useful counterweights to here-and-now analyses. I think the explosion of disaster education and training in the past 25 years or so is a particularly significant, positive feature in ensuring DRR's continuity and growth (though I'm not sure it can be measured or proved).'*

Various colleagues in Japan, India and Iran shared John's assessment. **Rajib Shaw** from Japan described how:-

*'DRR has made significant progress as an academic discipline, in some countries as a stand-alone discipline, in some other countries through integrating with other disciplines. This is very important trend at least in the last seven to eight years.'*

**Anshu Sharma** echoed this from India:-

*'Disaster risk reduction has a formal space in curricula in India.'*

An Iranian expert, **Yasamin Izadkhah**, had also witnessed this growth, but noted the struggle to keep training alive, given the frequent long-return periods of earthquakes:-

*'I recognise the significant progress that has been achieved in Asia and Middle Eastern countries for public education of various groups particularly those vulnerable in disasters. At the same time, I see many developments that have arisen from a strong practical and pragmatic momentum for tangible actions, such as preparedness / response. In Iran there has been considerable progress in developing disaster courses for engineers and architects. However, knowledge is often forgotten, perhaps due to the long-return period of certain hazards.*

*'But from the year 2000 to the present there has regrettably been much talking and writing and many cosmetic responses with less tangible imperatives and initiatives on the ground where it counts most. Nevertheless, I recognise the need for realism and cynicism to be balanced with optimism where there this can be genuinely justified. So I give thanks for achievements that have been secured so far, but I think we still need to be doing a great deal better!'*

Yasamin then discussed the overall aim of disaster education:-

*'...in Disaster Risk Reduction, the aim should be to build a 'Safety Culture' through education which is a long process requiring the commitment and coordination of various groups of the society to be successful. Disaster reduction at the community level promotes improved self-reliance. Understanding the 'community needs' and 'long-term planning' are the key factors for sustainable disaster reduction. There is also a need for the partnership of different organizations involved combined with placing 'good governance' at the heart of disaster management and risk reduction'*

From Canada, **David Etkin** described the positive results of academic programmes:-

*'One very positive aspect is the emergence of college and university programs in emergency and disaster management (in Canada at least). We are creating an educated cadre of professionals that did not exist before, and an academic pool of expertise that continues to grow.'*

However, **Terry Cannon's** experience was not so positive:-

*'... in contrast to David Etkin's positive Canadian assessment, my experience of teaching disaster courses in King's College London, Copenhagen, Lund and Brussels is that almost all the students see the subject as being about response and they still have very little understanding (or job opportunities) in prevention or preparedness. '*

**Maggie Stephenson** responded with a concern about access to education:-

*'Well Terry's latter concern depends on who they are? Many engineers for example work in infrastructure which is far more likely to be about adaptation, mitigation and prevention. Likewise, for agriculturalists and food supply people.*

*'DRR education is needed in the places of greater risk of disasters, and to become more accessible at different levels, for different locations. And at low or no cost. Disaster education is currently dominated by the global north and its academic institutions, with notable exceptions of course. But like education on sustainable urbanization, it needs to take place in the places that would benefit most and inform it most.'*

**Ben Wisner** proposed that the entire educational system of countries:-

*'...should include age-appropriate exploration of hazards, risks and capacities to reduce risk. At the national scale, there should be degree courses in DRR. A good example of how education can help to reduce disaster risk is to be found in Cuba (Castellanos and Wisner 2018).'*

The results of a statistical survey of the sustainability of various training programmes in Nepal, supported by an international donor were referred to by **Yasemin Aysan**:-

- *Trained builders in rural areas claimed the demand for earthquake safety measures was low among the house owners.*
- *Many of the relevant municipality staff trained on new laws and rules changed jobs or responsibilities.*
- *Medical staff trained at hospitals were largely retained in the system and the knowledge was retained as it is similar to their preparedness for health emergencies. However, changes to be made in the hospitals for evacuation, storage of dangerous materials etc. were less sustained.*
- *Change of jobs and positions were also high among the police. But, army created its own continuous training and a search and rescue exercise capability.*
- *Where it matters the most in the rural population and the local municipalities, limited learning has survived and even less is likely to be transferred to other area or scaled up. As hazards are just one of the many concerns and responsibilities authorities and high-risk communities may have to manage they often have to make choices in everyday life.'*

### 2.11.2 Educational Challenges

**Bruno Haghebaert** wrote about the tendency in our present age to *'... disregard knowledge, learning from the past being seen as outdated and irrelevant, especially if it is not available online, so a lot of reinventing is happening. That's why, with the support of the United Nations Disaster Risk Reduction a list is being developed in 2022 of 'DRR Classics''*

An example was cited by **Ben Wisner**:-

*'Routledge has published a four volume set that reprints "classics" of the kind to which I think Bruno is referring. See Wisner et al. (2015).<sup>4</sup> The Table of Contents is available at: <https://www.routledge.com/Disaster-Risk/Wisner-Gaillard-Kelman/p/book/9780415624206>.'*

One characteristic of current education is the creation of a body of students who are taught to challenge and question. Thus, **Maggie Stephenson**:-

*'... has found that many DRR and development studies students feel immobilised. Are they learning critique and criticism and judgement so much that they fear taking a step, or are they setting the bar so high in terms of what they aspire to achieve that they don't want to settle for compromises or less? Either way, they seem to retreat to the safer space of academic research, teaching or small-scale ideal 'pilot projects' that never scale-up, but get documented as best practice.*

*'It is interesting that an architectural education is always about making a proposition. Whatever the constraints of site, brief, time, (if not budget), we are used to proposing, testing and then adjusting, and proposing again. Later we learn to work with clients and in teams to get buildings made. We are not afraid of the process. We have to jump at the end of the diving board.*

*'Maybe we don't research and analyse enough, cutting straight to the proposal, but on the other hand many other disciplines only learn the processes of research, analysis and critique and not the processes and repercussions of proposing and making.*

*'This seems a valuable lesson for educating professionals in other aspects of the built environment including those in disaster risk reduction. We know how hard it is to get anything built at all, and what is involved in getting something done well.'*

**Ilan Kelman** noted the:-

*'Loss of long-term knowledge and, even worse, loss of interest in long-term knowledge, for example: climate change action failing to draw on prior development and sustainability lessons and disaster response interests failing to apply decades of previous work.'*

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<sup>4</sup> **Cost of publication.** While there is an admirable intention by the authors to bring 'classic writing' to the attention of a new generation, the cost of this (and many other text books) remains prohibitive and out of reach. The book cited by Ben Wisner retails at £1,019.06 in hardback (Amazon price, January 2022). Such inflated costs for important textbooks limit purchase by many academic libraries and individual readers, given their budgetary constraints.

### 2.11.3 Measuring Academic Impact

A pair of interesting observations about academic effectiveness were shared. **Maggie Stephenson** noted that:-

*'Many of your contributors talk about effectiveness of DRR policies, programmes and interventions, which made me wonder. Most of the contributors are academics, (am I right?), although they have also played advisory roles, or have had some experience in various organisations, but they are primarily educators, researchers, writers, advocates. That being the case, I wonder how effective they think they have been themselves?*

- *Was academia the most effective route to take?*
- *How effective are the courses they run?*
- *How effective are the students they teach?. What follow up is there to how the students use the learning? Or don't?*
- *Are the courses adjusted accordingly? If not why not?*
- *What constraints do they face?*
- *How have the various academics mainstreamed DRR in or otherwise contributed to wider development education? Or built environment education? Or other domains within their respective educational institutions?*
- *To what end?*

**Sudha Arlikatti** responded, citing experiences from the United Arab Emirates and India:-

*'In response to Maggie Stephenson's query, I want to note two examples, new in this arena but doing remarkable work.*

*Rabdan Academy in Abu Dhabi, UAE. Started in 2013 it offers unique bachelor's degrees in Business Continuity Management and Integrated Emergency Management, to first responders from the UAE Military, Police, and the Ministry of Interior. The intent is to round off their training and education with an understanding of the importance of social and cultural aspects of effecting disaster risk reduction, before they become commissioned officers. Training first responders to not only focus on response but widen their horizons to the value of prevention and mitigation is key and the UAE government understands this. This Academy and the degrees offered are first their kind in the Arab World (<https://ra.ac.ae/%d9%90about-rabdan/>).*

*Amrita Vishwa Vidyapeetham University's School for Sustainable Development started in 2020, requires all their doctoral students to select a village (one of 100 that the University is working with) and conduct immersive work on a thematic area, following UN-SDGs including, environment and climate change, risk reduction, gender equality, education etc. of their choice. The objective is that the dissertation work, knowledge gleaned and solution/s offered will integrate community inputs and help make the village self-reliant and reduce threats. Other students*

*can also choose the same village but help solve another societal problem or extend/ expand the work of others before them. In this way academia has a direct impact on the community and it is measurable. Other academic institutions can follow such a vision for effecting experiential learning that ensures societal benefits and broader impacts on a continuum. This is one way of measuring the effectiveness of DRR efforts through academic work (<https://amrita.edu/school/sustainable-development/>).'*

#### 2.11.4 Summary: Education, Knowledge and Awareness

In recent decades there has been a massive expansion in the creation and sharing of knowledge of DRR experiences. Despite this growth, past knowledge is often lost or disregarded.

Two particularly important issues surfaced in this discussion:-

- How to ensure *access* to education for those needing it, but with limited resources.
- How to ensure the *relevance* of the educational curriculum to the needs of the subject.

### 2.12 Building Capacity

#### 2.12.1 Building Capacity through Multiple Players

##### 2.12.1.1 Global Leaders

Two contrasting models of leadership seem to apply to DRR:

- the traditional pyramid model, with one person or entity at the apex of cultural influence guiding an ever-widening community
- a non-hierarchical model of inter-connected leadership, (both formal and informal) in the shape of a lattice, or perhaps wire netting, with multiple leadership hubs in specific aspects of DRR and climate change

During the Glasgow COP 26 Conference on Climate Change **Greta Thunberg** wrote:-

*'The truth is there are no climate leaders. Not yet. At least not among high-income nations. The level of public awareness and the unprecedented pressure from the media that would be required for any real leadership to appear is still basically non-existent.*

*Hope is all around us. Because all it would really take is one world leader or one high-income nation to decide to be honest, to truly treat the climate crisis that it is. One leader who counts all the numbers – and then takes brave action to reduce emissions at the pace and scale the science demands. Then everything could be set in motion towards action, hope, purpose and meaning.*



*The clock is ticking. Summits keep happening. Emissions keep growing. Who will that leader be?’ (Thunberg 2021, p. 4)*

The emergence of long-awaited leadership/activists in the climate change field has occurred with David Attenborough (aged 95) and Greta Thunberg (aged 19). However, in the field of DRR, internationally prominent leaders have yet to emerge to capture the public imagination, although prominent leaders exist within the academic and scientific communities.

**Maggie Stephenson** responded as follows:-

*‘Yes Ian, but you managed to lead generations of shelter people without your own television series.’*

**Ilan Kelman** challenged the suggestion that Greta Thunberg was exercising responsible leadership:-

*‘I am puzzled at the inclusion of Thunberg as an activist with no scientific credentials who promotes plenty of misconceptions about the science? If non-scientific activists are to be used to promote the material here, then Malala has far more to offer DRR. Thunberg’s statement that there are no climate leaders is incorrect. Watt-Cloutier, Hansen, McKibben, and Klein have long been global climate change leaders/activists among many others (Unigwe 2019).’*

**Ben Wisner**, commenting on the above quote from Thunberg suggested that she was: *‘... referring to national governments that actually take significant concrete steps to limit warming: national models, hence leadership in that sense.’*

### 2.12.1.2 Governments

With respect to knowledge, consultants, academic research, leadership and regional cooperation, in recent decades there has been a rapid growth of national capacity, particularly in India, Latin America, Indonesia, and the People’s Republic of China. There has also been a significantly expanded community of concerned and active individuals, academic bodies, international agencies and journals. There has been a dramatic growth of International NGOs and their field partners, with a specific focus on aspects of disaster risk management. They include Care International, Tearfund, Practical Action, the Asian Disaster Preparedness Centre (ADPC), the All-India Disaster Mitigation Institute (AIDMI). SEEDS and the Centre for Disaster Preparedness Foundation in the Philippines (CDP).

Despite these developments, in terms of progress, **Terry Cannon’s** glass was only half-full:-

*‘In contrast to your positive assessment, my experience in Vietnam, China and Bangladesh is that a lot of the academic and consultant advice and knowledge is ignored. China claimed to be supporting ‘community based DRR’, while Chinese authorities were bullying parents who protested*

*about their children's deaths in 2008 and locking up their lawyers. In Bangladesh cyclone prevention is almost entirely building expensive embankments that have been criticized for years.'*

**Maggie Stephenson** responded:-

*'Perhaps the situation that Terry Cannon describes, where advice and knowledge are ignored, tells you something about how to communicate and work with countries apart from what to communicate. This takes us back to John Twigg's question (page 16) about understanding the power structures which are not confined to government. 'Yes, but lots of capacity gets developed but is not used or is only used once and then sidelined. And plenty more potential capacity never gets a chance.'*

Positive examples of capacity building were noted, **Mikio Ishiwatari** described how:-

*'Some countries have developed DRM systems at the national and local levels following the Indian Ocean Tsunami in 2004. Indonesia and Sri Lanka have strengthened national DRM agencies and established local DRM offices almost from scratch.'*

**Maggie Stephenson** agreed:-

*'Many countries have learned from Japan, and Japan is constantly learning and should be acknowledged for this role.'*

**David Etkin** reflected on progress in Canada with:-

*'...Resilience becoming mainstream thinking within governments, and we are seeing the creation of city resilience officers, such as in Vancouver.'*

**Maggie Stephenson** responded with a warning:-

*'Yes David, but beware of the parallels with having 'gender officers', who then claim the space and let others off the hook , or imply it is a domain of knowledge beyond others.'*

**Vinod Menon** was concerned that:-

*'Most disaster management practitioners are not studying the critiques by the conscientious thought leaders any more.'*

### **2.12.1.3 Professionals**

**Vinod Menon** described:-

*'Efforts by professional institutions of doctors, engineers, architects, planners, social workers, data scientists, psychologists and academia to contribute their skill sets to improve multi hazard preparedness, risk reduction, response and recovery.'*

**Maggie Stephenson** agreed:-

*'Yes, but some professional networks are better than others if you want to find north-south solidarity and support. Built environment tends to be transactional or commercial, maybe because there are contracts at stake.'*

**Steve Bender** noted some limitations:-

*'Within professional bodies generally there has been an (absolute) absence of consideration of the concept, practice, role, financing of and evaluation of development as the driving constructor of risk.'*

#### 2.12.1.4 Entrepreneurs

**Vinod Menon** could see a positive role for the *'... spontaneous efforts of start-up entrepreneurs to identify critical gaps in preparedness, response, risk reduction and recovery and find innovative solutions through disruptive design thinking.'*

**Rajib Shaw** recognised the role of the private sector:-

*'Innovation and role of private sectors is another dimension where we are seeing steady growth. Twenty years back, as private sectors in DRR, we used to think of insurance and reinsurance companies. Nowadays, non-conventional private sectors are developing new products in the field of DRR, and see this as a business opportunity, very similar to the environment field. This is again a positive change.'*

**Terry Cannon** had no idea what Rajib Shaw's observation meant in reality, He cited an example:-

*'...about ten years ago there was a for-profit company operating in India, I think US based, it was linked to a mobile phone company that wanted to charge people for a subscription to obtain cyclone warnings. I hope that was effectively made redundant by the Indian Government's own efforts in Orissa.'*

**Steve Bender** expanded on Terry's concern:-

*'Cannon only cracks open the discussion of the job creation, marketing, earnings, and profiteering in the "disaster" industry, particularly when and where such (academic) discussions begin with and continue with disaster, and disaster response.'*

#### 2.12.1.5 Embedding Experts in National Governments

The placement or embedding of experts within the heart of governments recovering from disasters has been an important step forward in a number of countries, such as Nepal, Pakistan, Lebanon, Haiti and Sri Lanka. This transfer of knowledge of recovery

strategies and DRR from context A to context B points to a way to transfer vital knowledge and experience in the future.

**Maggie Stephenson** described the challenges she had experienced when of working within governments:-

*'Perhaps the larger point is about embedding expertise, experience or additional capacity inside and under the direction of local long term bodies: national governments, technical departments, reconstruction authorities, municipalities, and/ or within civil society organisations, local NGOs, universities, local media etc.*

*'This requires a different way of working, where you are not in charge, not dictating terms or timeframes, where assistance is not about visibility, outputs or outcomes may not be quantified in advance for donors. It is not effectively done by short consultancy, it requires investing time in building relationships and trust, investing in understanding and adapting to institutional contexts, challenges and opportunities. It requires a flexibility and a willingness to work in partnership, which is rarer than you think.*

*'Embedding people is to increase capacity and help with accessing experience from elsewhere. 'Embedded' means over a longer time, and under the direction of national and local authorities. This has been described as an 'accompaniment approach' – progressing at their speed, and until the end.'*

### **2.12.1.6 Emergency Managers**

**David Alexander** is convinced that:-

*'Emergency response needs to be an order of magnitude more powerful than it is now, thanks to things like pandemics, wide-area prolonged electrical power failure and intensified effects of climate change.'* (See further comment on this subject by David on page 117.)

### **2.12.2 Building Capacity through Information Technology**

Any official, teacher, academic or consultant who was operating in the 1970s and 1980s will be well aware of the contrast in their working patterns and relationships following the arrival of mobile phones, the Internet, fax machines, Google search engines, etc., from the early 1990s onwards. The information technology revolution has provided immediate cheap or free access to knowledge, information and communications. It has transformed patterns of work. It is estimated that by 2010, the date of the tragic earthquake, over 95% of the population of Haiti, the poorest country in the western hemisphere had access to mobile phones. The development of IT may well be the most significant area of progress in the humanitarian sector in the past half-century, a fact which was noted by Henry Quarantelli in the early days of the revolution (Quarantelli 1997).

However, David believes that despite the increasing reliance on technology, it is *always* fallible. **Terry Cannon** went further:-

*'It is more than that. Those who have power prefer technical 'solutions' because they look like something is being done, when the problem is caused by economic and political factors that cannot be fixed only with technical solutions, only by changes to the politics and economics that cause risk.'* (Back to disaster risk creation, see page 84.)

**Maggie Stephenson** reminded us about indirect influence and possible progress in DRR:-

*'Some progress in risk reduction occurs outside of disaster risk reduction activities but directly affects them. For example: Internet and digital access to information, mobile phones, from weather forecasts to open source research , contact between peers and family members.'*

### 2.12.3 Building Capacity in India

**Vinod Sharma** summarised Indian progress in DRR over the first two decades of the 21st century:-

*'The year 1999 was a turning point in India, when the Odisha Super Cyclone happened, after that, in 2001, there was the earthquake in Gujarat and the 2004 Tsunami which forced the country to undertake some radical and effective measures in Disaster Risk Management. In 2005, India enacted the Disaster Management Act and made institutional arrangements at National, State and District levels. These measures comprised the creation of a National Disaster Response Force (NDRF) at the National level and State Disaster Response Force (SDRF) at the State level. During the last 15 years the positive impact of these investments is clearly visible as we have saved lives substantially in last few devastating cyclones and floods.'*

*'Although the real measurement of the effectiveness of DRR is not possible in India. nevertheless, there can be a few parameters, and based on those overall success can be roughly evaluated.'*

*'I can see the following visible changes in DRR which has reduced the mortality and morbidity in natural disasters in India:-'*

- 1. There is gradual improvement in the early warning system of cyclones and floods. The use of social media and IT has made it possible for early warning dissemination to occur up to community level.*
- 2. The use of Science and Technology in early warnings and the creation of good databases at different levels has made a substantial difference.*
- 3. The National Disaster Response Force (NDRF) and the State Disaster Response Force (SDRF) are dedicated forces for disaster*

*rescue and relief only. They could save lives in all the Indian natural disasters in the past 15 years.*

4. *Disaster education from school level to University level has created a strong awareness about natural disasters and the do's and don'ts of disasters before and after they occur. Today 26 universities are giving higher degrees in disaster management in India.*
5. *There is now (2021) a political will for climate change adaptation (CA) and DRR at the national level. In the Asian Ministerial Conference in 2016, the Hon'ble Prime Minister gave a 10 point agenda, which shows the national commitment to these agendas at the highest level.*
6. *In India, DRR has become a state subject and we can clearly see that states are taking a keen interest as they invest in DRR, with a consequent reduction in life and economic losses.'*

**Anshu Sharma** also noted this rapid progress:-

*'In India national and provincial disaster management plans are in place. Local disaster management plans (city and village level) have been made in a number of cases and the concerned authorities in other places know about them.'*

However, **Terry Cannon** remained unconvinced:-

*'But are these Indian elements noted above really examples of 'half-full', or mostly 'tick-box' bureaucratic fulfilment of top-down edicts? Is there any evidence that these plans have actually affected preparedness very much?'*

## 2.12.4 The Absence of Accountability

**Maggie Stephenson** queried whether much is achieved by *'... parachuting academics or consultants into situations if they don't do the time and build meaningful relationships. You might as well try to learn to play the cello for 5 minutes every 6 months.'*

Maggie's concern rang uncomfortably true in Ian's experience, as for many years he was frequently 'parachuted in' as an academic or consultant where he often felt 'guilty as charged'. He can recall many one-off consultancies where he was hired to undertake a study of national capacity that were doomed from the outset on account of their inherent problems:-

- totally inadequate time to undertake a ridiculously complex task
- his lack of local language skills
- his lack of understanding of the local culture
- being asked to address issues, all too often framed by the sponsoring donor agency rather than the national government
- lack of evaluation or follow-up
- lack of experienced local counterparts to undertake the work jointly

- the problem of salary differentials as local counterpart workers became aware of inflated consultancy rates being paid (often to my university, not me!) in sharp contrast to their low governmental salaries
- his lack of accountability to the object of concern: a person or family who were 'at-risk' or recovering from a disaster impact.

Ian was often aware of such shortcomings when the invitations arrived, but when working in a consultancy organisation or academic institution relentless pressure is exerted to bring in consultancy income.

Ian writes:-

*'This issue is all about the absence of effective accountability and it reminds me of an angry paper I wrote 45 years ago in 1977 about those who seek to provide assistance in disaster situations (Davis 1977). To describe what I regarded as an accurate description of assisting groups, including ourselves as 'foreign experts', I disrespectfully called the piece 'The Intervenor'. That provocative title resulted in some very angry letters from the heads of agencies for whom I had been working! With the help of colleagues (Fred Cuny, Frederick Krimgold and Everett Ressler) we developed an eight-column matrix called 'The Outsider at a Disaster'. in which we explored the issue of accountability and the range of actors who work in the disaster sector.'*

I reproduce just one of the lines that described our accountability as foreign experts.

The outsider at a disaster					To whom are such people accountable?		
The Intervenor	Official reasons for their presence	Self interest in the disaster	Underlying beliefs which will govern their efforts	Activity within the disaster area	Officially	In practice	To the disaster victim?
Foreign experts in various subjects	To use their expertise	To use their superior knowledge  Rivalry with others who have similar skills  To impress these rivals	Inadequacy of local people  Their help is wanted  Their skills cannot be found locally  Their skills are relevant	Provide appropriate advice  Work with foreign organisations who are providing help	Possibly to their superiors in home university or agency  To those who have sponsored their work	Hardly anyone	No accountability

**Table 2.** The outsider at a disaster.

### 2.12.5 Building Quality and Quantity in DRM

Ilan Kelman observed positive progress in reducing risks from varied hazards:-

*'Good news appears in increasing examples (and understanding of the importance of these examples) of long-term success (thus far). For example:-*

- *Floods <https://www.psychologytoday.com/gb/blog/disaster-choice/202105/torontos-actions-after-hurricane-hazel-still-reap-rewards>.*
- *Cyclones <https://news.trust.org/item/20161013115243-3s6eq>*
- *Earthquakes <https://www.psychologytoday.com/gb/blog/disaster-choice/202105/how-seattle-withstood-68-earthquake-without-disaster>*
- *Volcanoes <https://www.youtube.com/watch?v=vqtsmN7Zsi0>*

*Nothing precludes an overnight change into catastrophe.'*

In the final exchange on capacity building, **Gustavo Wilches-Chaux** lamented:-

*'The apparent (or evident?) failure in introducing effective risk management principles in decision making processes and in the minds of key decision makers.'*

And **Steve Bender** emphasised the need for quality *and* quantity in capacity building:-

*'The evolving discussion brings to bear a depth to the imagery of the 'half-full, half-empty' argument. The subject is societal action on disaster risk reduction, and almost by definition, the thought is on quantitative aspects of that action. But just as important are the qualitative actions that give space for broadening the understanding of which societal actions, why, and how they come about.'*

### **2.12.6 Summary: Building Capacity**

To guide and inspire progress, two models of leadership were proposed: the hierarchical pyramid and the interconnected lattice. Hence, leadership can be hierarchical or it can be achieved by coordination and networking.

Major issues such as climate change management may go ahead with no identifiable major leaders. The world of DRR has yet to find and recognise leaders in the public realm (such as Attenborough and Thunberg) to challenge and inspire all ages and cultures.

DRR also needs well-connected leaders in all sectors and locations to motivate more localised and focused responses.

It is essential to regard disaster risk management *not* as a sector alongside development and other economic and social sectors, but rather as a defined situation for which society has undertaken and will continue to undertake measures to secure the health, safety and welfare of its populations.



There is minimal value in importing foreign 'experts' to provide advice unless this is in close working partnership with local staff and is conducted with full accountability.

Donor-driven projects rarely achieve locally sustainable results.

The following factors combine to emphasise the need to build national capacity:

- cut-backs in aid programmes within donor countries
- the desire for self-sufficiency in countries that used to be beneficiaries of aid
- the inability or unwillingness of global and regional governmental institutions to meet training and funding needs of aid recipients
- the need for local solutions to local problems by local personnel

It is vital to recognize that, as hazards ignore national boundaries and the global nature of the threats posed by climate change, there will *always* be a need for international support. There will be a corresponding need for international actions to reduce trans-boundary impacts.

National leaders may or may not take into account scientific advice about the management of hazards. Despite the efforts of professionals to devote their skills to disaster risk reduction, there has been a failure to consider the role of development in *increasing* disaster risk. Nevertheless, there are various ways in which professionals can be embedded in management systems. The development of technology has been one of the drivers of the growth of expertise in disaster risk reduction and it is destined to continue in this role.

Since the tropical cyclone of 1999, India has made significant improvements in emergency planning, education, warning and evacuation procedures. However, there are still questions of accountability and assessing whether progress is real or largely illusory.

## **2.13 Integration of DRR into Systems, Structures, Policies, Plans, Cultures, Power, Life and Faith**

### **2.13.1 Integration with Sustainable Development**

**Babar Khan Mumtaz** creatively likened the relationship between disasters and development to an interlocking DNA spiral:-

*'For me the glass will always remain half empty, needing to be filled. While we have made considerable progress and gained many insights since the Ocho Rios conference on the Implementation of Disaster Mitigation in 1984, much more remains to be done. We have learnt that the glass we thought needed filling was far 'too small and needed enlarging. Much of the water that filled that glass has evaporated and needs refilling, and the glass has expanded. I see disasters and development as two sides of the same coin each linked to the other in a helical dance reminiscent of the DNA.'*

**Gustavo Wilches-Chaux** chose another unusual metaphor: an air-bag:-

*'Every day I see how disaster risk management is taken as the airbag that is located in the steering wheel or in the dashboard to prevent injuries in case of an accident, while the normal development budgets are invested in firewater for the driver.'*

*'In practice, the indivisible continuum environmental management – disaster risk management - climate management is still not fully at the heart of development, despite it being formally described as “sustainable”. But at the same time, when in situations where a disaster could have happened and yet did not occur, this was possible because the continuum environmental management – disaster risk management - climate management was effectively applied in the territory and/or process decisions.'*

The response from **Ilan Kelman** noted the constant need to achieve balance :-

*'As always, it is a balance with intertwined, multi-scalar influences and with those having the most influence not necessarily having the most to provide. The real concern might be trying to systemise the answers to the question of the half-full or the half-empty glass, especially to articulate the fundamentals-as Gustavo Wilches-Chaux so eloquently and inspiringly achieves.'*

We offer ways forward, especially integrating scales, in theory:-

- <https://doi.org/10.1108/DPM-02-2017-0043>
- <https://doi.org/10.1007/s13753-015-0038-5>
- <https://doi.org/10.1007/s11069-016-2294-0>

and practice:-

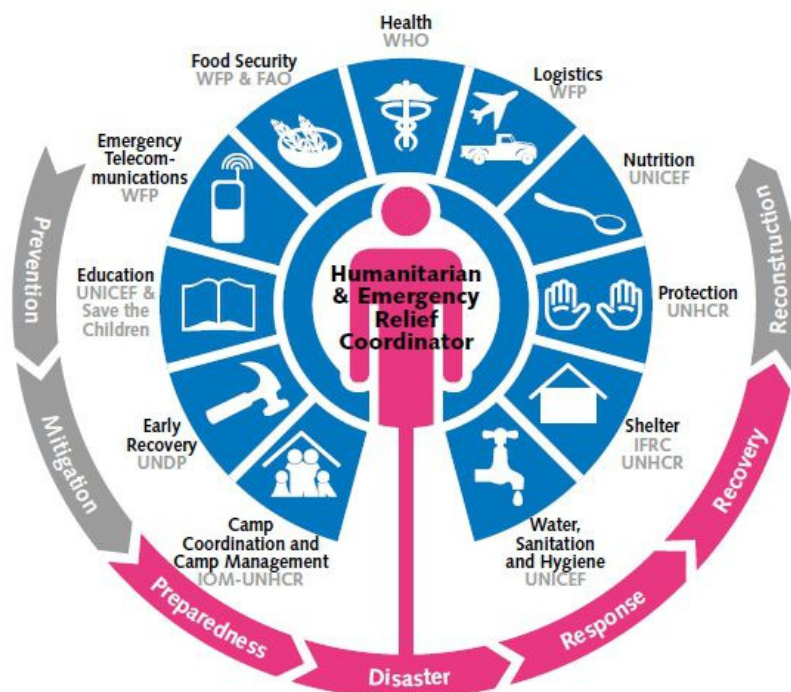
- <https://doi.org/10.1007/s13753-015-0046-5>
- <https://www.routledge.com/The-Routledge-Handbook-of-Disaster-Risk-Reduction-Including-Climate-Change/Kelman-Mercer-Gaillard/p/book/9781138924567>
- <http://doi.org/10.17645/pag.v4i4.729>

**John Twigg** then discussed where change is most likely to occur:-

*'Positive change in DRR and resilience is likely to be faster and more effective at sub-national levels. International treaties, instruments and the institutional architecture of aid have their uses but they are blunt instruments and move things too slowly. There is arguably more dynamism and progress at local levels, particularly towns and cities (see for example the work of C40 Cities, Resilient Cities Network, ICLEI). But avoid projectisation of DRR - it must be integrated with broader developmental processes' (Wilkinson et al. 2017)*

### 2.13.2 Integration Through the UN Cluster System

The 'cluster approach', introduced by the UN in 2005 and administered by UNOCHA, is the most visible and possibly most ambitious aspect of the humanitarian reform agenda. It aims to make humanitarian response more predictable by introducing a system for organising sectoral coordination among key humanitarian actors. Clusters that have played a vital part in promoting risk reduction are Food Security, Shelter, Water, Sanitation and Hygiene, Early Recovery and Education.



**Figure 1.** The UK cluster approach. (Source: UN documents.)

**Maggie Stephenson** described the relative success or limitations of varied clusters:-

*'Whilst the emergency humanitarian actors are more coordinated and predictable thanks to the cluster system, the same cannot be said of the stakeholders within subsequent recovery or reconstruction phases or activities. Or between the emergency and recovery stakeholders. This is not too bad in education and health where there is some continuity of actors, but in shelter, housing and other sectors it is a serious shortcoming.'*

### 2.13.3 Integration Within the UN System

**Steve Bender** reflected on the 'ups and downs' of the UN in relation to risk reduction:-

*'Throughout recent decades "UN involvement in DRR" can be seen to in various ways: hallmark, high-water mark, low-water mark, and black mark of institutions in their various forms having benchmarked and still*

*persisting to silo, place in parallel, and contradict the very existence of (if you must) DRR as a sector alongside their other program sectors. To continue, the IDNDR only cemented in presentation and in practice the "disaster" sector approach for economic and social sectors.'*

**Vinod Menon** saw the need for:-

*'Increasing awareness on the need for convergent & coherent thinking to strengthen multi hazard preparedness, risk reduction & emergency response capacities of stakeholder groups.'*

#### **2.13.4 Integration into Everyday Life**

**John Twigg** described how disasters are still too often separated from everyday or extensive risks:-

*'... more localised investigations and interventions could help to integrate planning and practice relating to development, extensive risks and major events. This would also open up opportunities for community-based action, mutual aid, emergence, etc, which came to life during Covid-19. I got into DRR through working in the NGO sector and I still believe in the value of independent voluntary action, community and individual, and the value of NGOs and voluntary organisations that support and facilitate this.'*

When reading UN inspired documents, such as the Sendai Framework and its targets, the Global Assessment Reports and the IPCC Reports, and while attending large international gatherings, we have often pondered on the mysteries of institutional arrogance. There seems to be an inherent tendency for these UN and international bodies, and some international NGOs, to regard themselves as the custodians of DRR or climate change adaptation.

However, it is important to remember that the day-to-day business of reducing risks progresses as the *normal* function of a wide number of professional figures in various fields, who embrace safety as a regular part of their job in managing new developments or maintaining the existing environment. This work is undertaken by architects, engineers, builders, planners, insurers, hydrologists, agriculturalists, geologists, meteorologists, health professionals, teachers, regulatory officials, police forces, and emergency services in local or municipal governments.

There has been much criticism of how officials put their work into silos, isolating it from other endeavours. However, from Ian's experience as an architect, and from teaching architectural students, the true nature of the work is integration. In every design, one depends on the decisions and functions of other people. Thus, isolation is a practical impossibility, and yet it is treated as if it were almost a goal.

In river catchments within the UK, the control or management of floods is not an isolated DRR task. Rather it is integrated into the overall management of the river catchments, along with a host of other related functions: land drainage, irrigation, fisheries protection, pollution control, water supply, river transportation, sewage

disposal, and so on. Nobody needs to exhort these officials to mainstream their work, for this has always been their working pattern.

**Mihir Bhatt** agreed with the first paragraph in this section, noting that:-

*'... institutional humility will help. We need to know more about the limits of institutions and what they cannot do and when they become counter – productive in reducing risk, I find. When we focus on the work/task of recovering from risk, isolation disappears. When we focus on institutions, I find that limitations can take over.'*

**Steve Bender** focused on the second paragraph:-

*'Your point is well taken and the "etc., etc." could go on and on as in the totality of the development process not just "new developments," no matter when, no matter where, no matter the size and involvement of population groups. The business of reducing risks should be the work of development in toto in a thoroughly integrated fashion as noted.*

*'I hold a view that officials in international bodies, as well as national governments, the private sector and NGOs, are rather well versed in the ways governments function with regard to risk management and management of the natural and built environment. This is manifest certainly in the sectors just mentioned as they readily isolate or "silo" DRR as a separate, specific program sector to address risk in one or more economic or social sectors (including housing). In fact, in many instances the same entity that carries out development processes concurrently carries out DRR processes, often in an uncoordinated approach, and with differing individual sets of goals and objectives. In essence, development is development and DRR is disaster risk reduction.*

*'How to get coordination, collaboration, cooperation and integration in this ever increasing individualistic, competitive world? In essence, we need integration but we reward monopolies and fight for uncontrolled independence.'*

**Ilan Kelman** believed that:-

*'Increased uncritical uptake that top-down, international, siloed processes will achieve the needed results.'*

### **2.13.5 Integration with Faith**

Ilan's Christian faith was the original motivation for becoming involved in the disaster field, through his work in 1968 with the Christian-based international NGO Tearfund, at roughly the same time as the organisation was created. In the subsequent years *all* his work (teaching, research, writing, consultancy, painting, architecture, advocacy,

and so on) has been undertaken *through the lens*<sup>5</sup> of his Christian faith. Therefore, Ian cannot leave this discussion about integration without considering the spiritual or faith dimension, the bedrock of all he does or creates and how this is built into his life, work, experience and hope.

Ian adds that his experience is shared by other Christians, some of whom are contributors to this dialogue. Other friends who have contributed to this paper hold different religious beliefs while nonetheless acknowledging the vital faith dimension in their work experience. And others, who do not subscribe to any religious belief, are motivated by a 'spiritual or ethical concern' to reduce risks to people and our fragile planet.

Integration of faith with work in DRR and climate change adaptation is expressed in three ways.

*Consistency between life and faith.* The need, or continual battle, is to be a consistent Christian (or member of another faith), attempting to avoid hypocrisy<sup>6</sup>, where faith and trust in God is the foundation block and the motivating force of our lives, not merely some warm feelings. Ian would seek and hope to express his own faith in his values, attitudes, work and relationships. A verse from the book of James in the Bible (Chapter 2, Verse 14) is frequently quoted and sums this up powerfully: '*What good is it, my brothers, if a man claims to have faith, but has no deeds?... faith without works is dead.*'

*Absolute confidence in the power of prayer and in God's providence.* During the COP 26 Glasgow Climate Change Conference there were numerous examples of people expressing their deepest fears that our fragile global situation is already in irreversible dire straits. From 2010 to 2012 Ian was part of the two-year IPPC SREX project and even at that time, ten years back, some of the climate scientists involved with this project were already highly sceptical about whether carbon emissions could be reduced in time to avert global catastrophe.

We, the authors and editors of this report, want to work as hard as anyone to avert the negative impacts of climate change through any support that can be offered to encourage positive policy options at the macro-scale of governments and by adapting our own lifestyles to reduce the risks at the micro-scale. But in addition to such public and personal actions, we believe there is another dimension to the crisis and that can be summarized in the word '*faith*'. Here we can have total confidence in our loving God, who created and sustains our wonderful planet to hear our faithful prayers as well as to guide all who seek to be faithful stewards, protecting and nourishing every vulnerable citizen as well as our natural environment of seas, land and air.

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<sup>5</sup> **BEN WISNER:** '*Lens*' is such a powerful metaphor. A lens bends light from a source outside the lens. So, how does this Christian lens bend or interpret the reality of suffering due to disaster, etc.? ....The reader would welcome an explanation of what "colours" (wave lengths) of existence: (Suffering? Greed? Hatred? Delusion?) your "lens" separates – just as a real prism separates white incoming light into colours.

<sup>6</sup> **BEN WISNER:** I think all of us are to some degree hypocritical in that we fly here and there, eat highly processed foods, consume plastics. I am the worst offender, and if I were writing something along these lines, I'd probably put '*attempting to minimize hypocrisy*' Saying that you 'trust in God' but not really trusting? What would that be like? Is it hypocritical to think, '*I trust in God*' and then to look both ways before crossing a road?

(See also **Paul Venton** on 'stewards of the environment' in the section on 'Nature-Based Solutions', page 50)

In Matthew's Gospel, Chapter 17, Verse 20, Christ's disciples faltered on account of *'their little faith'*. There then followed a remarkable promise by Jesus Christ: *'...I tell you the truth, if you have faith as small as a mustard seed, you can say to this mountain, 'Move from here to there' and it will move. Nothing will be impossible for you.'* Obviously, this was figurative language, but the power of intercessory prayer by the Christian Church worldwide, while not being documented in any UN resolution, is nevertheless a potent force, officially neglected and greatly undervalued, the *spiritual dimension* of risk reduction.

In 2015 Pope Francis raised two massive questions about climate change:-

*How do we love our neighbours in need by sharing wealth and at the same time love our Earth by promoting sustainability?*

*How do we promote economic growth and respect the common good?*

(Pope Francis 2012)

Almost a decade later, on 2nd November 2021, Pope Francis made a plea to world leaders at the COP 26 Global Climate Conference in Glasgow:-

*"We need both hope and courage. Humanity possesses the wherewithal to effect this change, which calls for a genuine conversion, individual as well as communitarian, and a decisive will to set out on this path. It will entail the transition towards a more integral and integrating model of development, based on solidarity and on responsibility."* (address by Pope Francis to COP 26)

Ian believes that the greatest challenge in his 85 years is for him, as a Christian, and for all people of faith, religious organisations and faith-based NGOs to retain our confidence in our Creator. We certainly need Divine guidance concerning how to deploy our skills and energy by taking practical and positive actions (at both macro- and micro-scales). The task is to address DRR opportunities and the threats posed by climate change with assurance and trust, to always keep hope alive in the darkest of times with a willingness to effect change and to act with bold courage.

**Ben Wisner** supported Ian's statement on the faith dimension in his life and work:-

*'I welcome this because there are too few instances of skilled intellectual workers admitting the importance in their work of emotion and intangible elements of their world view. Few admit that the head and the heart need and complement each other.'*

*'I support his statement because since 1966, over the course of 56 years of practical and intellectual work on development, health, environment and disaster, I have witnessed the role of faith. Ian uses the word "hope" at the beginning of his first paragraph and as the last word of his summary. What I have seen many times is that the poor, the marginalized, the bearers of risk organize themselves, help each other and demand changes to the root'*

*causes that make them poor, marginal and put them at risk. They persevere. They hope. That human trait of hopefulness is born of people's faith that meaning can be made of seeming chaotic events. All formalized religions on the planet have rituals of renewal as well as acceptance of the reality of suffering. The ethical teachings of these religions on suffering provides guidance and motivation to help and to share, to speak truth to power. Buddhism teaches that suffering results from delusion, grasping and aversion. That is only one example of a way of thinking with great potential for understanding and reducing disaster risk, as Ian Davis has done since 1968.'*

**Steve Bender** noted that faith traditions lead us to community:-

*'...loving our neighbour, and working for the common good, which can include development with betterment for all. As individuals and as community, we will never be tested beyond our ability to meet challenges. Through the grace of God we have the ability to explore and understand; equally we each have the free will to choose how as to act on our beliefs and values. Do we not know now much about the construction of risk and the reduction of vulnerability, particularly of the poor, as well as how to respond to catastrophic events? Are we not called to make development something more than survival for ourselves and our neighbour?'*

**Mihir Bhatt** noted that:-

*'Christ's 'Sermon on the Mount' translated into my mother tongue Gujarati has always inspired me in reaching out to the last humanitarian victim and in keeping up my humanitarian efforts when facing opposition from the authorities or brut force. Always.*

*'Almost always Mahatma Gandhi's ideas of 'Truth and Non-Violence' is useful in my work on humanitarian accountability and social protection for humanitarian victims.'*

**Zenaida Willison** noted that:-

*'Ian has reminded us of James' exclamation: 'faith without work is dead'. However, James is not suggesting that we work to be saved. On the contrary, the faith that is alive is demonstrated in the way we relate with and care for our environment.*

*'When I was a consultant to the Philippine Government's Climate Change Commission, we had our yearly national Climate Conference, where we showcase model local government units on how they integrate disaster risk reduction (DRR) with 'Climate Change Adaptation and mitigation' (CCAM) at the community levels. Interestingly, those who were chosen to present their cases attributed their success in the field of harmonizing DRR and CCAM to the belief that God guides their actions. Strong faith in someone bigger, proved to be a formidable force that motivates people to carry on.'*



Why are probabilities what they are? Is the risk there, or do we believe it is there? These enigmatic questions were raised by **Omar-Dario Cardona**, who realised that:-

*'Facing risks requires cooperation. To secure effectiveness, it is not so much about understanding how cooperation evolves, it is more about how to organise cooperation on an unprecedented scale, and that is not possible without a 'religious' attitude that ultimately rests on 'faith'. It is necessary to have emotions such as hope - an aspiration not built on nothing, but rather requires reasons to support it.*

*'Even scientific and mathematical reasons are essentially accepted as matters of faith. The analysis and explanation of what happens are much more than an intellectual act, it is a 'security' mechanism, although what happens cannot be controlled. People share a fundamental religious impulse –even agnostics– which manifests itself in 'emotions', such as hope, and in deep 'ethical and moral convictions'... convictions why humans face risk.'*

**Sudha Arlikatti** retained a strong confidence in search-and-find solutions:-

*'For me the "glass is half full" and never "half empty" because I am a diehard optimist who believes in the capacity of humans to constantly innovate in finding solutions to mitigate against emerging threats or tragedies. Like an Akshaya Patra or an inexhaustible vessel of food that provides constant sustenance and never becomes empty (Sanskrit words referred to in the Hindu epic the Mahabharata), I am assured that our perennial efforts at DRR will help ensure a safer world.'*

*'Percy Ross, American multi-millionaire and philanthropist who started the column Thanks a Million used to say, "many drops make a bucket, many buckets make a pond, many ponds make a lake, and many lakes make an ocean". Let us stop our self-assessments of the value of our own efforts which often lead to feelings of guilt for not doing enough; stop the name calling "good, bad or indifferent intervener or commentator", and simply believe that no matter where we are working from, the Global North or South, as an academic or practitioner, for a non-profit or for-profit organization, working on a small or big project, our work and contributions are collectively leading to making our DRR efforts stronger and more effective. It is all worth it and we must plough along.'*

In the final contribution to this discussion on the integration of faith dimension **Nick Isbister** explained that he had not had:-

*'... any direct practical experience of working in Disaster Relief or in Disaster Risk Reduction work. I am sad that I have not been able to work in this field. I have though worked as an executive coach with many people who have worked in this broad field. I have coached leaders from Tearfund, World Vision, Care International, Médecins Sans Frontières, Oxfam (GB and International). Remarkable people, courageous, passionate, gifted, people who have made a real difference to the world -*

*some with a deep faith commitment, some with none, but all I would number in the company of saints. Many of those I have worked with bore scars from their experience and part of my role was to 'hold' and help restore these courageous people back to some sense of well-being and health.*

*'The late Rabbi Jonathan Sachs talks of the calling all Jewish people have - he would add all people with any sense of responsibility to others - in the words of the title of his book 'to heal a fractured world'. He tells us there: "To live the life of faith is to hear the cry of the afflicted, the lonely and marginal, the poor, the sick and disempowered, and to respond. For the world is not yet mended, there is work still to do, and God has empowered us to do it - with him, for him and for his faith in us." (Sacks 2005, p. 82)*

*'Is faith necessary for this great work? Of course not. But many of the people who move into this work are committed to what I can only call transcendent values – 'beliefs that hold hope for a better world.'*

### **2.13.6 Summary: Integration**

The familiar slogans 'living with disaster risks' and 'living with and adapting to climate change' highlight the need to build resilient societies that come to terms with disaster risks and find ways to manage them as an integral part of everyday experience, beginning with what each societal unit defines as 'development'. And we need faith, courage and hope...

### **2.14 Ethics, Equity and Human Rights**

**David Etkin** wrote:-

*'Out of curiosity, I did a search for the words "ethical" and "moral" in this dialogue "Ethical" did not appear and "moral" appeared twice, on page 47 in a comment by Terry Cannon and when referring to moral hazard in a comment by Allan Lavell on page 85.*

*'To my mind, it seems that DRR should occur within a well-established ethical framework, and yet robust ethical analyses are generally notable by their absence. One example of this is a study I did looking at risk analyses by emergency management organizations Etkin (2019) not only were there no ethical analyses, there was no acknowledgement that the metrics chosen or methodologies used were underlain by value judgements that largely determine how risks are ranked. One obvious example of this is that total economic damages are invariably chosen as a metric as opposed to damages normalized by wealth or GDP. The former privileges the elite and wealthy while the latter privileges the poor and vulnerable. We certainly give a lot of lip service within the field of emergency management to the importance of vulnerability issues, but I wonder how that plays out in practice?'*

*'We can ask "How full is our glass?", but we should also ask "What are we are filling it with and why?" The latter question requires both normative and descriptive ethical elements: (a) what "should" we be pouring into our glass, and (b) a description of what "is" being poured into our glass (in addition, there are many different glasses). How do those two compare? DRR is devoted to the moral value of reducing suffering, and these questions should be addressed within a robust ethical framework.'*

Responding to David's concerns, **Ilan Kelman** listed some of his publications on disaster-related ethics (Kelman 2005, 2015, 2021, Kelman and Dodds 2009, Kelman and Harris 2021).

**Vinod Menon** expressed his concern over inequalities, a key element in vulnerability:-

*'Most disaster management practitioners have chosen the easy comfort zone of remaining silent, getting co-opted & becoming accomplices in impoverishing excluded and marginalized people, thus contributing to the rich becoming richer and widening income inequalities.'*

**David Etkin** agreed that: *The gap in wealth between the rich and poor is widening, which is not a good sign.*

**Ben Wisner** described how power relations affect risk reduction:

*'Riding my hobby horse again, I have to add "power" to the above title. In daily life people and groups have different degrees of ability to influence or constrain the behaviour of others. Intimate and proximal human actors with power include partners/ husbands/ wives; landlords; merchants; employers, local government officials, police, etc. Whether and how I perceive and mitigate risk may be affected by the power wielded by such people.'*

**Terry Cannon** agreed:-

*In responding to the comment from Ian Davis (page 63) that there has been a "dramatic growth in international NGOs and their field partners in disaster risk management", I would like to draw attention to the following extract from Chapter 7 of the 2014 Red Cross World Disaster Report that I edited with Lisa Schipper. The report's editors asked DRR colleagues and friends why it is so difficult and rare for DRR organizations to acknowledge the key power relations that affect the localities where they want to work. The response here from a very well-informed Bangladeshi who has worked in both DRR and adaptation activities for a major international nongovernmental organization (NGO) was typical:-*

[extract from a book by **Terry Cannon** and **Lisa Schipper**]

*"I think there is an unwritten consensus between [international] NGO and their local partner not to talk about it. You have seen that most of the NGO led adaptation projects are only for three to five years. Within this limited time frame, it is quite impossible to address power relations. I feel that they want to address it; they have to spend a substantial time building rapport with the community. But in reality, they do not have that much of time in*

*their project. They select a local partner and the funding agency asks them to begin the implementation, which means spend money.*

*"The donor wants visibility and needs to burn money. They are not interested who is getting what and how. If they have good visibility for their work and high burn-rate [i.e., they spend the whole budget in time], this can ensure their next projects; power relations are not required. This is another type of power relation at macro-level between donor and recipient of the funding.*

*"Another Bangladeshi NGO worker confirmed this: "I used to work with a major [international] NGO for two years. I also found projects are mostly about some short-term solutions or spending money in a way where there can be lots of visibility. It does not address power issues and go in depth of the problem. It is very outcome-driven practice." (Cannon and Schipper 2014)*

In the above quotation from the book the co-authored, Terry and Lisa report their negative experiences that NGOs or other project managers are *only* concerned about 'securing visibility' or 'burning money' and they are 'not interested who is getting what and how'. We have both also observed some projects, with self-interest to the fore, but in our experience the vast majority of projects by NGOs, governments and international agencies have been conducted with good intentions, and have been undertaken in good faith. Moreover, it is not very clear how INGOs can influence local power relations without being accused of meddling, and perhaps being drummed out of the country on the grounds that they are subversive.

A further comment on differential power relations was made by **Maureen Fordham**:-

*"Diversity' and 'inclusion' are two more dense concepts which are much misused. However, exposing differential power relations is much more revealing (as Terry Cannon and Lisa Schipper have mentioned. Consultative and participatory DRR interventions may be diverse and inclusive of several subordinated social groups (using a checklist approach) but we must consider the power or capacity of each to go beyond just having 'a seat at the table' (and we have got much better at this) to having a respected voice and the power to effect change in those contexts.'*

**David Etkin** noted that in an age of globalisation there is a pressing need for communitarian and egalitarian values, as opposed to ones rooted in nationalism and individualism:-

*'... In many ways the "distant other" is now our neighbour. It doesn't seem to me that, on balance, that shift is happening (but perhaps I am being too influenced by U.S. media, though I make a real effort to watch BBC news). According to a recent BBC story, the U.S. spent about \$825 billion in Afghanistan. On a war that left things no better off, in the end. Maybe worse. What if that money had been spent on peace building, protecting ecosystems, and sustainable futures? Still, according to Forbes "Between*

*the years 2013 and 2018, nearly \$300 billion in U.S. taxpayer money flowed as “aid” to countries outside the United States”, so there is certainly a lot of resources going in that direction (though I am not sure what is included in those statistics – tied aid, and aid as a force multiplier may be included).'*

**Zenaida Willison** described violations of human rights in the Philippines:-

*'In the Philippines during the period of martial rule 1974-1986, human rights abuses were rampant all over the country. This is on record with extensive documentation. 10,000 victims of human rights filed a case against the Marcos dictatorship. Their case won in the international tribunal in mid-1990s, but nothing happened. It was only in 2013 or so, that the government compensated the victims of human rights abuses, belatedly recognizing that there were more than abuses, that the government of Marcos committed.*

*'However, currently in 2021 human rights are being consistently violated. In response advocacy and environmental defenders continue to explore all avenues to ventilate their cause –even up to the regional and global level.'*

The issue of justice and equity has pervaded Ian's career. He can vividly recall a galvanising moment in a Tearfund conference in 1974 when the issue of justice surfaced. Various speakers described their rather paternalistic intentions to provide British technical assistance to improve farming practice in certain drought-prone African countries. Their comments were met by an irate response from **Dr Darling**, Head of Wye Agricultural College, who had spent most of his career in Central Africa:-

*'Scripture in James 1-5 cries out, not for charity but for justice for agricultural producers. Any system we encourage must end up with the farmer getting a fair price for what he gives. Senior Nigerian and Sudanese people have said to me “Give us a fair price for our primary products and take your technical assistance and do what you like with it. We don't want to be obliged to you. You pay us what we've earned and we'll hire the people we want to come and give us the assistance we need.”*

*'We must aim for that. Justice not charity is the prime object, but God forbid that we should withhold charity when it is needed and we have the power to give.'* (Davis 1978a)

### **2.14.1 Summary: Ethics, Equity and Human Rights**

It is essential for both DRR and CCA to occur within a well-established ethical framework, and yet this is generally absent. This ethical framework needs to define and address:-

- the drivers of risk
- power relationships
- defining those who are likely to gain or lose in DRR projects

- effective accountability of decision makers to both those they represent and the beneficiaries of projects
- the protection of human rights

## 2.15 The Creation of Risk

**David Etkin** suggested the following:-<sup>7</sup>

*'There are problems, and there are solutions; maybe sometimes there are not solutions. How does the Ingenuity Gap and the Risk Society relate to these issues? Ian Burton has been talking for some years about how the disaster problem is rooted in Disaster Risk Creation (DRC), not DRR, and that the resources devoted to DRC actions far outweigh those of DRR. Has this been changing? I doubt it, but am not seeing a lot of data or analyses on this issue.'*

**Maggie Stephenson** added:-

*'But would more data or research make much difference?'*

According to **Ian Burton**:-

*'I think we need to give a lot more thought and time to Disaster Risk Creation (DRC). My effort to get Forensic investigations underway largely failed. Does DRC really outweigh DRR? I think we cannot be sure about the answer. So this brings me to ... Uncertainty. When we have to admit that we don't really know, what do we do? Nothing? No we have to make our best judgement based on the knowledge we have. It is better to take action while admitting that we may be wrong and have to change our minds than to do nothing or fail to innovate for fear of being proved wrong. So my judgement is that we must look hard at DRC as well as DRR. If we neglect DRC there could be huge adverse consequences.'*

**Mihir Bhatt** added:-

*'The DRR as it is has made progress at many levels, in many sectors, in many communities and at many locations. This progress must be celebrated. And yet DRR is going to fumble in the end as the rate at which we produce disaster risks is faster than the rate at which we reduce the risks. The gap is expanding rapidly with each new economic development advance as well as each new disaster. At some point DRR will become marginal and a limited cause. We saw such marginalization in the pandemic (health risk).'*

This was **Steve Bender's** contribution to the debate:-

*"The construction of risk of the built environment must be understood first and foremost on its own terms which include the role of human behaviour*

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<sup>7</sup> For those of you who are interested, there are interviews with Ian Davis and Ian Burton (and others) at <https://www.youtube.com/channel/UckXEDt3BclbWzGF39YjurxQ/videos>.

*as well as risk assessments and development processes... More is needed on the contents of the glass. And more research is needed on the underlying causes of 'constructed risk' created from the influence of human behaviours, and the human behaviours that are demanding responsibility and accountability. Reconstruction can also be seen as part of the construction of risk and deconstruction'<sup>8</sup>*

**Allan Lavell** added:-

*'When dealing with the risk construction all creation issue, which is of course critical if we get on top of risk, it is as I have emphasized fundamental to be able to understand risk from different perspectives, human, economic, social, cultural etc. Understanding risk is not monitoring all or calculating etc. although these are critical. It means significance, role, use, gain from creating risk by some and others then suffering its consequences in loss and damage when risk is materialized.*

*'Moral hazard issues like those on the financial crisis, or in Fukushima and Thai floods. Acceptable risk is not just something confined to considerations of direct risk aspects. Thus, for poor populations living in hazard prone areas is maybe the only way to get land and habitat, nearness to work, income etc. so the idea of acceptable risk is not just hazard orientated or decided but needs holistic analysis and discussion - coproduction of knowledge that guides action.*

*'And on the other side of the equation for large transnational company's location in hazard prone areas like during the Thai flooding of 2011 is not just about hazard proneness but also about opportunity, location, tax reductions, etc .etc. And living on the slopes of volcano leads to great economic benefit over many years but loss when the thing blows its top.'*

**Ilan Kelman** noted the following:-

*'Seemingly increasing prospects for huge disasters, despite some metrics allegedly indicating a decline in disasters and disaster impacts (although most of the metrics are artificial, so they prove or disprove little, instead leading to few convincing conclusions.)'*

**Andrew Maskrey** observed:-

*'I make the rather unimaginative observation that the same people who have died in the Covid pandemic are the same people who are affected by disaster or the same people who suffer from gang violence, conflict or repression by their governments. The process of risk construction described throughout this section of the paper is systemic. This is a different way of thinking about systemic risk (which is all the rage right now*

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<sup>8</sup> Steve Bender has discussed a range of issues concerning progress in DRR and the Construction of Disaster Risk in his book: Bender, S. (2021). *Constructing Risk, Disaster, Development, and the Built Environment*. Berghahn Books, New York.

*as you probably know) which is normally considered to be the impact of risk in systems.*

*'In the village where we live in Costa Rica I observe that poor people don't complain about being poor. They complain about being abused: by employers that don't pay their wages or benefits or the government that does not protect their rights. Ultimately the day a poor community in Peru can win a court case against a rich mining corporation that is polluting their land and water I will start to believe that we can avoid the construction of disaster risk. Meanwhile I see things in the countries I live in pretty much the same or worse as they were 40 years ago, when I first started working in this field.'*

I want to include an extract from a book I wrote with Garima Jain and Alan Lavell in 2021. An appropriate title would be: *'When the veneer of DRR starts to fade...'*

Extract from a book by Andrew Maskrey, Garima Jain and Alan Lavell:-

*'The operation of the underlying risk drivers (badly planned and managed urban development, environmental degradation, weak governance, climate change etc.) reflects the logic, dynamics and values that characterize the political economy at different scales. In all political economies, there is always a trade-off and tension between the privatization of benefits and the socialization of risks. How these trade-offs are managed is the fundamental underpinning of the social construction of risk.*

*'The concept of moral hazard is intimately related to this trade-off and is used to describe situations where excessive risk taking is encouraged because the risk-taker who privatizes the gains avoids the resulting socialized risks, by having access to government incentives and/or protection or insurance, amongst other things. This was a root cause of the 2007-2011 financial crisis, where essentially banks underwrote loans with the expectation that another party would likely bear the risk of default, creating a moral hazard and eventually contributing to the sub-prime mortgage crisis. Moral hazard, therefore, can be used to describe "any situation in which one person makes the decision about how much risk to take, while someone else bears the cost if things go badly."*

*'The social expropriation and concentration of the benefits of economic growth and the social transfer, in time or geography, of the risks that accompany that growth to other sectors is an expression of moral hazard and underpins the social construction of risk.'* (Maskrey et al. 2021)

**Ben Wisner** commented:-

*'All good comments and questions in this section; however, what's missing is discussion of how DRR can inadvertently create new risks (DRC). Dams or levy systems constructed to reduce risk may also displace people. The*



*livelihoods of these people and their social networks are thereby disturbed. If formally “resettled” they may face new risks. Judging by a large literature on resettlement and settlement schemes.’ (see Scudder 2019)*

Finally, **Omar-Dario Cardona** noted that

*‘Problems grow faster than the velocity of the solutions: this is the main failure of our social commitment as academics and professionals.’*

### 2.15.1 Summary: Creation of Risk

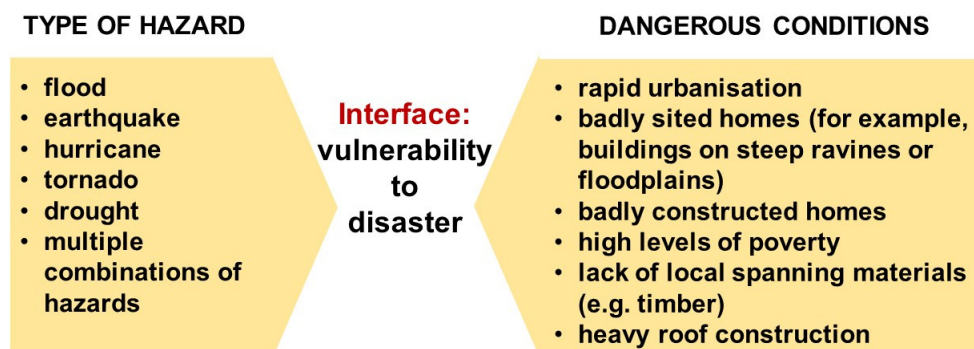
Our societies have spent many decades seeking to reduce risks, but have seriously neglected to address the ways risks (many of which are unknown or unrecognized) are continually being generated. Thus, we urgently need a holistic understanding of the complex processes that create risks at every level, in every sector and in varied locations. From such knowledge it will be possible to highlight structures, practices and policies that need to change in order to avert future devastating impacts.

This is a moral and ethical issue, as well as a social, political, environmental, economic and technical challenge. In each of its facets this challenge has purpose-driven objectives and beneficiaries.

### 2.16 Cause and Effect

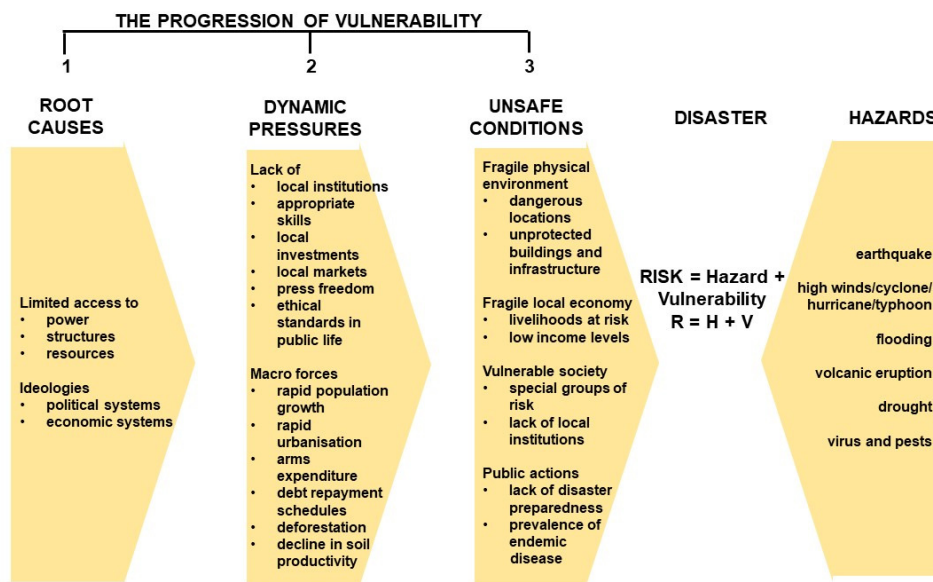
We conclude the discussion of the strengths and weaknesses of DRR by returning to the model of disaster vulnerability that Ian has been exploring and modifying throughout the past 43 years: the ‘pressure and release (PAR) model’, which is more often called the ‘crunch model’.

Ian first developed this model in the mid- to late-1970s and reproduced it in a rather rudimentary version in his first book, ‘Shelter after Disaster’ (Davis 1978b). The diagram was specifically related to a central theme of the book: the vulnerability of human settlements and dwellings. Therefore, the diagram was confined to *dangerous conditions*, with no consideration of the forces that create and maintain high levels of vulnerability (Davis 1978b, p. 3).



**Figure 2.** First appearance of the 'crunch model' in *Shelter after Disaster* (1978) [redrawn for this report].

Later, co-authors Piers Blaikie, Terry Cannon and Ben Wisner expanded it into various forms in relation to key hazards, see the second edition of *At Risk, Natural Hazards, People's Vulnerability and Disasters* (Wisner et al. 2004, pp. 49-60). In the introductory diagram (reproduced below) we attempted to describe a complex dynamic process we called a 'progression of vulnerability', originating in *root causes* through *dynamic pressures* resulting in *unsafe conditions*. The point of the diagram was that when these unsafe conditions were exposed to the severe forces of natural hazards a disaster or *crunch* could result from this collision.



**Figure 3.** First appearance in print of the developed model incorporating a three-stage progression of vulnerability (Blaikie et al. 1994) [redrawn for this report].

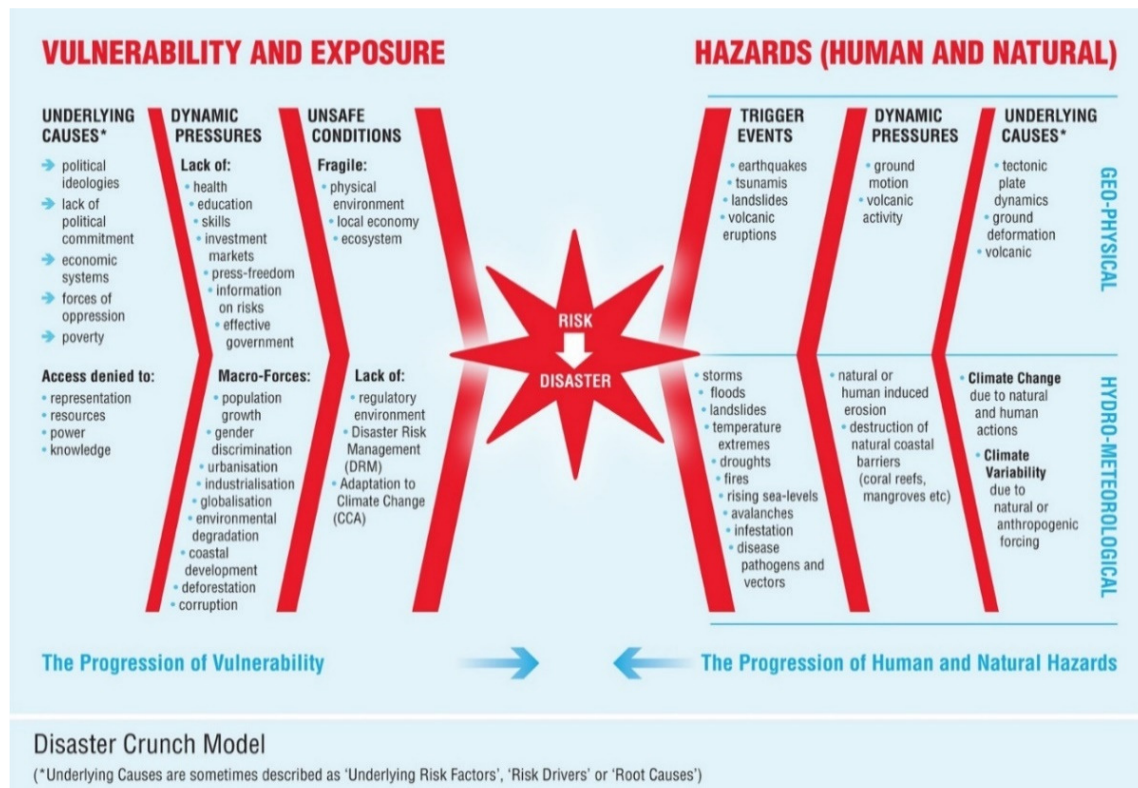
The next development in the model was a response to the gathering momentum of climate change over the period 2000-2021. The model in Figure 3 shows human factors causing vulnerability on the left-hand side of the 'crunch', thus provoking disasters, while on the right-hand side, under 'hazards', the extreme forces were natural. This tidy situation in the model had to change because of the mounting evidence of the role of human (anthropogenic) factors in causing extreme hazards, climate variability and climate changes on account of the emission of greenhouse gasses that have affected the global atmosphere with dire consequences. Therefore, the current revised version of the model, indicated below, now shows the *progression of vulnerability* on the left-hand side and the *progression of human and natural hazards* on the right-hand side.

**Bruno Haghebaert** observed:-

*'It appears that the different models explained in this section, especially the unsafe conditions model, are not directly useful to measure and monitor the effectiveness of DRR measures, as these would need to be further specified and contextualized. But this would be an interesting exercise.'*

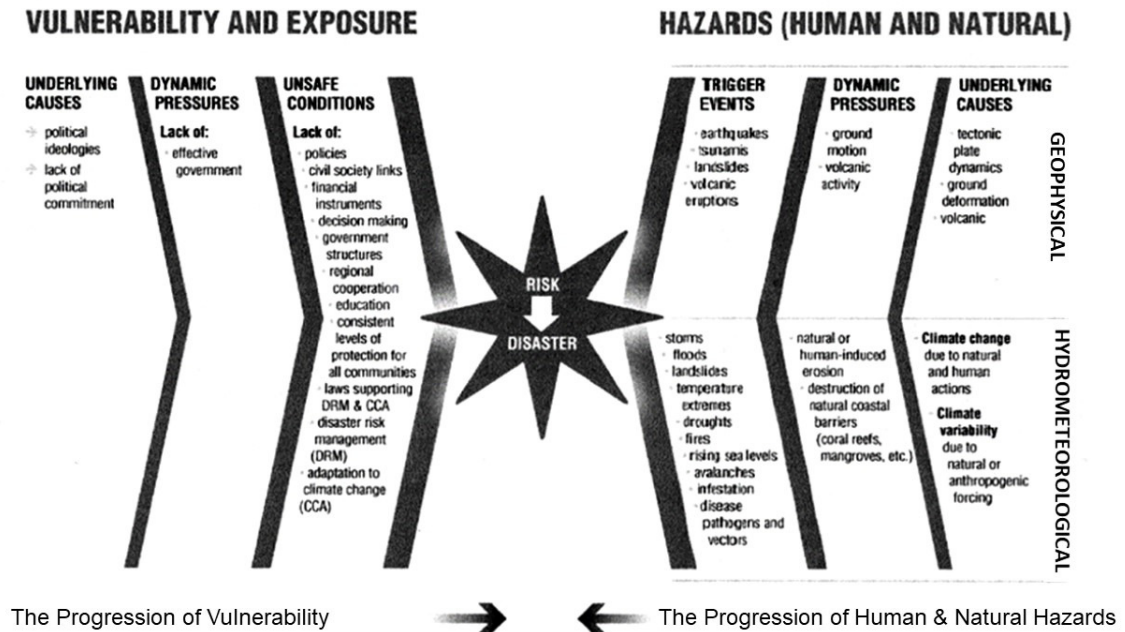
Ben Wisner added:-

*‘The revised and expanded pressure and release model (PAR) used in the second edition of At Risk suggested that various feedback loops existed, including the human acceleration of geophysical and hydrological processes. Also, further elaboration and creation of a suite of supplementary diagrams was achieved by Ben Wisner, Ilan Kelman and JC Gaillard in Chapter 3 and elsewhere in a book they jointed edited, The Routledge Handbook of Hazards and Disaster Risk Reduction (Wisner et al. 2012).’*



**Figure 4.** The current model including human actions as a source of vulnerability from both sides of the ‘disaster crunch’, namely, vulnerability and hazard (Davis 2015).

This model can be applied to all categories of disaster: technological, health, natural hazards, and so on. An example follows concerning vulnerability in government.



**Figure 5.** Application of the current model to *patterns of vulnerability in government, in Disaster Risk Management in Asia and the Pacific* (Davis 2015).

As an underlying cause, lack of political commitment has been well described by **James Lewis** and **Ilan Kelman** (2012):-

*‘First, short-term political dynamics political dynamics and expediency, motivated by political self-interest, compared to a long-term concern for the ‘public-good’.*

*Secondly, a lack of political consensus that can exist cross-party divisions concerning risk reduction priorities and policies.*

*Thirdly, short sightedness of politicians in failing to tackle ‘low-probability’, yet ‘high- consequence’ disaster events.’*

The above model and the two worked-example diagrams can form the basis of observations that seek to answer three questions:

1. Is this a diagrammatic representation of a cup that is half-empty or one that is half-full?
2. Are the underlying causes (as suggested in the model above) the same pressures described above in Section 2.17, Creation of Risk (see page 84)?
3. Given the vast scope and scale of these entrenched underlying causes, and that they appear on both sides of the model, are there any grounds for hope of positive actions to address, reduce or eliminate these root causes?

**First question.** Is this a diagrammatic representation of a cup that is half-empty or one that is half-full?

As they simplify complexity in order to form useful diagrams, all models have limitations and this one is certainly no exception. However, from the comments we have received, this model has assisted people at a variety of levels, from village training workshops in India to higher education studies and government officials who seek to gain a better understanding of the dynamic nature of risk. However, in 2013 **Ian Burton** noted a 'half-empty' limitation in the 'crunch' model:-

*'I am struck by the not infrequent occurrence of situations in which decision-makers have all the knowledge and information and understanding that they could possibly need to make what external experts and observers would universally consider to be sound risk management and reduction decisions and do not do so.*

*'The crunch model does not provide space for or draw attention to the circumstances in which decision-makers often find themselves faced with pressures not to act or to delay decisions, perhaps indefinitely. There is often a power structure and a set of political interests to which decision makers respond or with which they comply. Thus they fail to act in the best interests of the community as a whole in terms of risk and damage reduction. This power structures and political interests can be local, national or international (global) and there can also be expressions of private sector interests' (Burton 2013).*

**Bruno Haghebaert** added:-

*'Ian Burton's comment quoted above: 'do not do so', raised the question whether risk creation is intentional or structural? (or both). It would be powerful if risk creation could be integrated into the above crunch models, introducing an element of trade-off in the choices made by decision makers but also by at-risk populations, as described by Alan Lavell on page 85. As hazards are just one of the many concerns people may have, this introduces a more actor-orientated approach, which is predominant in the pressure and release (PAR) model.'*

**Ben Wisner** commented:-

*'I agree with Ian Burton, Bruno Haghebaert and Allan Lavell. However, one has to think more deeply about what "actor" means. 'decision makers' signifies a bureaucracy and institution and not specific human individuals. Likewise, who is, or might be, said to represent the 'at risk population'?'*

**Second question.** Are the 'underlying causes' (suggested in the 'crunch' model) the same pressures described above in Section 2.17 on the 'Creation of Risk?' (page 84).

Various epithets have been used to describe the 'originators of vulnerability'. They include 'root causes', 'risk drivers' and 'underlying risk factors'. Each term is important in conveying the potent power and essence of these forces:-

*Root* captures the notion of these forces being deeply embedded with the capacity to grow.

*Driver* pictures the dynamic nature of risk generation.

*Underlying* aptly expresses the concealed nature of the causal factors.

The 'underlying causes' in the 2016 version are noted in the model as follows:-

- political ideologies
- lack of political commitment
- economic systems
- forces of oppression
- poverty
- *access denied* to representation, resources, power and knowledge.

These are ethical, political, economic, ideological concerns. They can comprise aspects of a society with enduring cultural and historical roots.

In the discussion in Section 2.17 about Disaster Risk Creation (page 84) certain ideas were expressed about the cause and effect process that are *not* covered in the crunch model. For example, the model seems to suggest that vulnerable families living in unsafe conditions are exposed to danger against their will. This may be the case in some instances, but in others they are managing 'trade-offs' that balance intrinsic benefits against threats.

**Allan Lavell** suggested that:-

*'Acceptable risk is not just something confined to considerations of direct risk aspects. Thus, for poor populations living in hazard prone areas is maybe the only way to get land and habitat, nearness to work, income etc. so the idea of acceptable risk is not just hazard orientated or decided but needs holistic analysis and discussion... living on the slopes of volcano leads to great economic benefit over many years but loss when the thing blows its top.'*

**Ben Wisner** noted the following:-

*'The formulation "against their will" written above is too simple. A full understanding of the political ecology and geography of residential space reveals that people locate their dwellings or homes because of a wide variety of factors, only some of which are conscious or "willed". Proximity to a good school or to work may be a conscious, willed desideratum. Rent will be another. But proximity to amenity green space for recreation may never cross a person's mind and likewise, hazards such as an unstable slope or nearby tectonic fault may not be consciously avoided.'*

**Third question.** Given the vast scope and scale of these entrenched underlying causes, that appear on both sides of the model, are there any grounds for hope regarding positive actions to address, reduce or eliminate these root causes?

Once again, there are different answers from a 'half-empty' or a 'half-full' position.

**Half-empty.** Many underlying causes, such as gender discrimination or the absence of political freedoms, are 'mega-issues' that form the political ideology of entire nations, or belief systems. Therefore, what actions to reduce risks are advocated in countries

such as Iran, the People's Republic of China, Russia, and Saudi Arabia, where prevailing political ideologies or cultural traditions are likely to generate, maintain and expand severe risks?

The pressure groups pushing for radical action to reduce risks often find themselves opposed by powerful interest groups who stand to gain from the status-quo or the continuity of risks. All democratic societies decide to limit the duration of their governments and hold new elections. Thus, even far-sighted, responsible political leaders are much more influenced by short-term electoral expediency than by the need to address costly, long-term issues such as tackling potent risk drivers, especially when they are sitting in the driving-seat!

**David Etkin** asked the radical question about whether we can trust our political leaders to make decisions on risk reduction?

*'A question interesting to me is "Should politicians be in charge of managing disasters?" We must have accountability, but they so often respond to political considerations more so than the public good, that I think we need to rethink that power and decision-making structure.'*

**Ben Wisner** opined:-

*'Perhaps politicians should not be in charge; rather, an independent technical commission should monitor, warn and require action. Such a division of powers is common in democracies where, for example, the judicial and executive systems are separate.'*

**Bruno Haghebaert** chipped in:-

*'Regarding David Etkin's query concerning the role of politicians, a related question could be, as illustrated in the current pandemic, are autocratic systems better equipped to be able to address large scale emergencies and crises than democratic systems?'*

**Ben Wisner** responded:-

*'Bruno's question is important. There are multiple answers. For now the PRC testing regime seems to be controlling Covid with Draconian shut downs affecting millions of people. But is that sustainable? Another possibility is that autocratic systems can more easily suppress evidence and data, as has been alleged concerning Tanzania'. (See Knowles 2021)*

**Babar Khan Mumtaz** added:-

*'I find it rather disturbing at what seems to me to be an underlying bias or prejudice in the wording and the selection of examples, in both the half-empty and the half-full sections of this paper.'*

Perhaps in the light of the near disasters seen in the USA and UK in particular, and most of the "West" in general regarding Covid-19 and the vaccination fiasco, we should

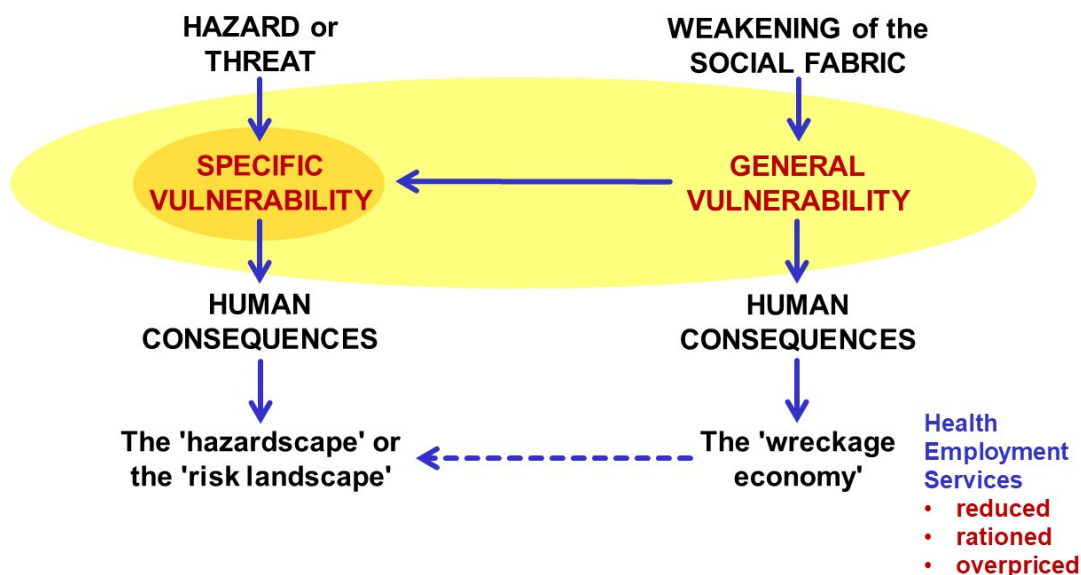
not be so sure that unfettered political freedoms are much better than the limiting of political freedoms. More so, in the list of countries, perhaps we should include Israel, where prevailing political ideologies or cultural traditions are likely to generate, maintain and expand severe risks?

**Half-full.** In countries such as the USA and Australia, the impact of hurricanes, tornadoes and wildfires has not lessened. Or maybe these should be added to the half-empty view?’

Despite the challenges noted above and the nature of the progression of vulnerability, this paper contains a wealth of evidence that significant risks *are* being reduced: in Nepal against earthquakes (page 35); in many countries on account of improved flood and cyclone warning systems and evacuation planning (page 25); and at community level, against varied hazard categories throughout the world (*passim*).

### 2.16.1 Beyond the ‘Pressure-and-Release’ Model

Is it perhaps time for a review of the ‘pressure-and-release’ model in the light of the momentous changes that the world is undergoing? To begin with, it is possible that the causes of disaster cannot be understood without understanding the context in which they develop. By context, we mean factors that are not directly related to disaster itself, but which cause people to live in a general state of vulnerability that reduces their ability to resist the impact of disasters. Poor health, unemployment, inadequate shelter and lack of peace and stability all play a role in generating vulnerability, but not necessarily through a direct relationship with disasters. The relationship between specific and general vulnerability is shown in Figure 6.

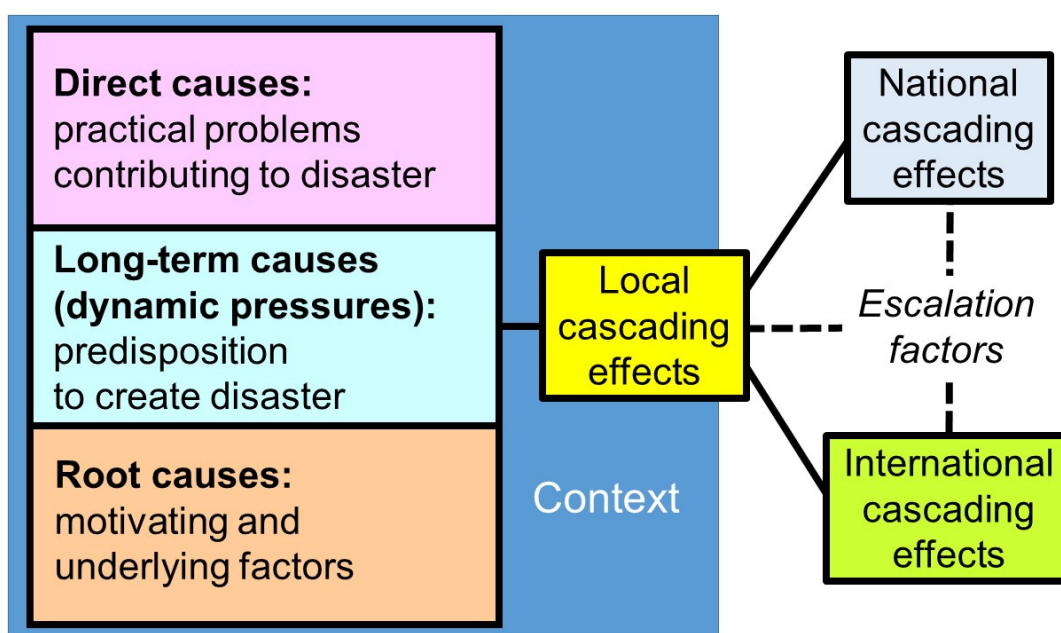


**Figure 6.** Specific vulnerability (to particular hazards and threats) as a component of general vulnerability (to life’s adversities). Source: David Alexander

In both rich and poor countries, populations increasingly live in networked societies. We depend on networks for commerce, information, safety and security, and most



forms of social interchange. Hence, most disasters are cascading events. The simplest form of cascade is illustrated by the ‘toppling dominoes’ metaphor, in which there is an impact followed by a linear chain of consequences. However, in reality effects tend to spread through the network at different scales. Escalation points occur at which different kinds of vulnerability interact with each other to cause enhancement of the impact (Alexander and Pescaroli 2019). When, for example, social and economic vulnerabilities interact, the escalation point can sometimes produce a worse impact than that of the initial trigger event. As shown in Figure 7, cascades can occur at a series of different scales, as the consequences of an impact can spread out in different ways. For example, the fire at Grenfell Tower in London in June 2017 was a high-rise disaster that killed 72 residents. It affected housing in London and throughout the United Kingdom, as more and more examples of unsafe tall residential buildings were found. It also connected with high-rise disasters in other parts of the world, revealing an international ‘risk-scape’ (Alexander 2021).



**Figure 7.** Causes of disaster, encapsulated in the general context (see Figure 5) and leading to distributed, cascading consequences. Source: David Alexander

### 2.16.2 Summary: Cause and Effect

The 'crunch' model graphically indicates the dynamic and complex nature in which disaster risks are generated and sustained through *underlying causes* exerting *dynamic pressures* resulting in *unsafe conditions*.

The model has its limitations in not indicating the failure of decision makers to take demanding decisions for the public good, as well not describing some of the positive reasons why families decide to take risks to achieve economic benefits. However, despite the presence of powerful underlying causes, significant progress has been achieved in reducing risks--as indicated in this paper.

### Part 3. Ways to Measure the Effectiveness of Risk Reduction Measures

The following observations summarise issues that relate to the measurement of effectiveness. The question is simple, the answer complex. Obviously, the acid test is whether the range of measures discussed throughout this paper actually reduces risks. From post-disaster assessments and damage surveys, can we tell how societies, their buildings, infrastructure and economies benefited with increased safety from measures put in place *before* the onslaught of extreme hazards? The second question, much more difficult, concerns how the effectiveness of risk reduction measures can be tested in the *absence* of a disaster.

#### 3.1 General Concerns

In her research, **Yasamin Izadkhah** noticed '*... a lack of evidence of the effectiveness of disaster risk reduction activities.*' This remains a persistent challenge, and various contributors shared their reflections on the complexity of accurate and effective measurement.

**Mikio Ishiwatari** suggested that:-

*'The effectiveness of investments should be covered from the policymakers' perspective. Explaining the DRR measures' contribution to country growth is a challenge. Without evidence of the effectiveness of DRR investment, policymakers could not increase investment in DRR, while the Sendai Framework for DRR stresses investment as a key priority action.'*

*'At the project scale, we can present benefits by using cost-benefit analysis. For example, government agencies are conducting projects of flood protection based on economic analysis. However, it is unclear at the national scale since the contribution requires huge DRR investment. Japan and China are investing over 10 billion USD for flood protection annually, but there are no clear figures of the returns or benefits from their investments.'*

*'Developing countries have to allocate their financial resources to DRR from their limited national resources. The science and engineering community is expected to support policymakers in developing countries to decide on increasing investment in DRR.'*

**Omar-Dario Cardona** expressed his concern over:-

*'...the 'effectiveness' of DRR and DRM, and adaptation. My comments are, after all, a criticism of ourselves. For example, although the discussion on "natural disasters" is relevant from the conceptual framework and the epistemological point of view (due to the understanding of the problem) I think that it is not the type of concern that we should mainly take into*

*account. When we see these problems and not the effectiveness of risk reduction, we are seeing the finger and not where the finger is pointing.'*

*'The primary focus of academia and interdisciplinary scientific efforts in "Integrated Disaster Risk Research" must be "how to achieve effectiveness" of risk reduction and adaptation. This should be the main objective of a new integrated and interdisciplinary scientific agenda.*

*'The half-full is the undeniable advance because we are not at zero, -but for me and many-, clearly insufficient taking into account the challenge that the risk currently is growing faster than the speed of the solutions.*

*'The half-empty is the cost of not doing what should be done, and the loss of the opportunity to transform the present based on the prediction of the future; despite the relevance of risk as a common denominator of all sorts of strategic planning.*

*'Measure the verisimilitude of the future... that "becoming-real", i.e. risk, is the opportunity to do something, not about the future but the present. In fact, It is not deal with the "unforeseeable" but the "invisible" for most governors and policymakers that do not want to see. To govern is to anticipate, we can't prevent tomorrow's disasters unless we imagine them today. More "what if?" for less "and now what?"*

*'The glass is the safety or the resilience and the question of whether it is half-empty or half-fill is the same as the questions on how much safety and resilience is good-enough safety and resilience? That means measuring the unmeasurable" Does anyone have a sound proposal?'*

**Maggie Stephenson** put her finger on one of the greatest difficulties in the assessment of effective actions:-

*'... there are so many variables, or factors to consider that it becomes very difficult to attribute cause and effect to any one DRR intervention. That's a lesson for all involved who regularly overstate the significance of their policy/ projects/ research etc.'*

**Babar Khan Mumtaz** provided an example:-

*'I am reminded here of the story of the man on the Intercity train to Edinburgh who took sheets of blank paper from his briefcase and tore them in half and then in quarters and halved and quartered them again till he had a bunch of 2" x 2" squares. He opened the window and let them fly out. He then repeated the same exercise time and again until one of the horrified fellow travellers asked him why he was doing it. To this the man replied: "I am keeping the tigers away". "But" said someone, "There aren't any tigers!" To which he got the logical reply, "You see? It is effective!"*

Or, as **Maggie Stephenson** put it in her quotation, *'...there are so many variables...'*

**Omar-Dario Cardona** described how he is able to read advances in DRR, and see interesting 'visions' but his concern is centred on the:-

*'... "effectiveness" of DRR and DRM, and/or adaptation ... My comments are, after all, a criticism of ourselves.... When we see these problems and not the effectiveness of risk reduction we are seeing the finger and not what the finger is pointing.... Let's talk about what is not talked about! It is now imperative to speak of many gaps regarding the "effectiveness" of risk modelling approaches and methods, of integrated and proactive prevention, of corrective and prospective risk reduction. Currently, the primary focus of academia and interdisciplinary scientific efforts in "Integrated Disaster Risk Research" must be "how to achieve effectiveness" of risk reduction and adaptation. This should be the main objective of a new integrated and interdisciplinary scientific agenda.'*

**Steve Bender** discussed how choice affects measurement:-

*'Measurement, particularly and most easily understood in the area of the built environment with its vulnerability and risk, exists already in quality and quantity sufficient to make important changes in the reduction of disastrous events to populations. How is it that I state this? It is because all development processes are full of choosing between this and that level of risk for each component of economic and social infrastructure. Those choices are based on many, many factors including tradition, custom, graft, corruption, ignorance, greed, known skills, cost to implement, and who are the beneficiaries and who pays (to name a few). It is not measuring the unmeasurable; it is bringing to light (admittedly to the limits of every expanding knowledge) what is acceptable risk, who decides, who pays, and who benefits (and how - remember that natural disaster risk management through insurance and CAT bonds is a multi-billion dollar industry, as is post-disaster reconstruction).'*

### **3.2 Flood Protection Measures**

Where river or coastal flooding is a regular seasonal event, it is possible to monitor closely the effectiveness of specific structural and environmental measures in order to refine them in subsequent DRR actions.

### **3.3 Warning Systems**

Progress in the effectiveness of warning systems and public evacuations can be measured by remote sensing, and by monitoring mobile phone data and attendance data from evacuation shelters and data on vehicle movements in response to the issue of a warning.

### **3.4 Hazard Resistant Building**

Well established construction practices, building materials, applied using relevant building codes when applied to the dwellings of middle or high income families can be measured on scientifically proven assessment techniques using shaking tables, wind

tunnels and other such equipment. A variety of more basic and less costly assessment tools have been developed to test the hazard resistant building techniques for the dwellings of low-income families.

### 3.5 The Long-Term Safety of Communities and Reconstruction Programmes

Over-time communities change and some adapt their buildings with no knowledge of building safety measures. Thus, a settlement of safe buildings constructed after a disaster can become highly unsafe within a few years due to public ignorance of constructional safety measures as well as the absence of building maintenance. The only way to measure safety is by longitudinal, long-term evaluation, preferably by the original architects, engineers and builders to enable them to learn about the effectiveness of their past design decisions.

Initiation of longitudinal studies of disaster recovery and risk reduction to review long-term progress or failures (Schilderman and Parker 2014, Davis and Alexander 2015).

Who is the measurement for? **Paul Venton** raised the basic question:-

*'As for measuring effectiveness. Not easy! The only point that springs to mind is on the issue of who is measuring effectiveness for whom? I do appreciate the idea of participatory monitoring - and that will only happen if people recognise the benefits and are invested in making adjustments so as to adapt to changes and make improvements. And that of course only really comes about when decisions are made with the full engagement of the right people!'*

**Steve Bender** outlined the need to look at measurement through the lens of 'development':-

*'... this makes clearer the decisions taken as to the intended effectiveness of DRR measures for whom, by whom, where, when, how, and who pays and who benefits.'*

**Yasamin Izadkhah** raised a key issue concerning the role of knowledge in influencing behaviour:-

*'An important missing issue is to assess whether the 'head knowledge' concerning disaster risk reduction issues results in any change in the behaviour of the target group. This has been a gap for many years and has to be considered seriously since it is such a difficult task to accomplish.'*

For strategic planning of DRR activities a thorough SWOT analysis (strengths, weaknesses, opportunities and threats) is needed to discover the potential of communities.

The development of information and communications technology (ICT) as an integral part of disaster management continues to increase. There are social as well as technical aspects of ICT in disaster management and risk reduction. The impact and

effectiveness are still yet to be observed despite the availability of extensive information. This concerns disaster risk reduction, preventive safety measures, disaster preparedness, response and recovery techniques, as well as the structural advice and guidelines can be found for the public to use through communication with mobile instruments and many tools such as systematic access to the Internet.

### 3.6 Insurance and Re-Insurance Data

The insurance industry holds data that can be used in assessing the effectiveness of risk reduction measures, but much of this information is commercially sensitive and is thus not placed in the public domain. In addition, insurance cover is not generally applicable to poor communities. Nevertheless, microinsurance holds promise as an outgrowth of microfinance for poor communities (Hochrainer-Stigler et al. 2012). However, the insurance industry could do far more to influence the trends in the effectiveness of mitigation that their experience indicates.

### 3.7 Public Awareness

Using social surveys, it is possible to verify whether the public understand or register the actions they need to take through a public information programme. However, the result may be very different from understanding how the same people would act in an actual disaster situation.

**Bruno Haghebaert** agreed:-

*'...the participation of people in a drill may not be a good indicator of the actual response to a warning, when they will have to leave their houses and belongings behind for an indefinite period.'*

### 3.8 Higher Education

The performance of students attending a masters course in some aspect of DRR is assessed through the normal academic processes of examination and assessment of course work. However, neither process measures their direct experience or competency as they apply their knowledge in real situations.

### 3.9 Outlining an Approach to Assessment

**Titus Kuuyuur** shared his UNDP experiences in assessing DRR:-

*'In general, the effectiveness of DRR measures can only be tested by the next disaster in terms of damage, live losses, and the timeframe for the affected communities to bounce back and move forward to become much more resilient to the next disaster. It is a complex field since both systems and people reactions need to be tested in several uncertainties where the frequency and magnitude of the impact of the disaster is a measure of the effectiveness of DRR measures being put into use. Nonetheless, for my years of experience in the field in many countries in Asia and Africa, one can follow through the effectiveness of DRR measures in the following outline steps:-*

- *Identify clear SMART indicators (at output, outcome and impact level) for monitoring results on the DRR measures implemented. This should be aligned to the objectives.*
- *Establish baseline values for the indicators and based on the context and historical data set milestones or targets for use in checking progress and effectiveness.*
- *Follow through the indicators through routine or regular studies such as outcome monitoring and impact studies.*
- *Include qualitative and subjective measures to capture and explain the dynamics, patterns, and non-numerical results from the DRR measures*

*'Qualitative approaches using participatory methods:-*

- *Evaluation survey to capture qualitative impact (e.g., outcome and impact levels)*
- *Evaluation matrix developed from theory of change/logical framework might be helpful focusing on effectiveness, efficiency, relevance and sustainability.*

*'Qualitative data to be complimented by:-*

- *Systematic triangulation*
- *Quantitative data (i.e., Number of DRM plans developed and being implemented by the communities against target).'*

### **3.10 Disaster Plans**

Emergency Service staff are routinely trained through simulation exercises or disaster drills. However, disaster plans are inevitably related to an anticipated scenario that will rarely simulate a disaster event accurately. Also, as noted above, there are always difficulties in relating the experience of a training simulation to the stress and chaos associated with reality of an actual disaster event.

Dwight Eisenhower, the Supreme Commander of the Allied Forces in WW2 famously stated that 'Plans are useless, but planning is indispensable'. Therefore, when considering effectiveness, it is the process of planning that needs to be evaluated rather than the product, such as the accuracy or detailed content of disaster plans.

### **3.11 Scope of the Assessment of Effectiveness**

When considering the effectiveness of DRR at the community scale an immediate problem arises concerning the scope of the evaluation. Should the assessment be determined by the community in question, or according to an external decision?

Ian's own experience in leading teams conducting such assessments in India, Pakistan, South Pacific Countries and the Caribbean is that if the community decide to participate fully in the assessment it is likely that the scope of scrutiny will primarily focus on their *everyday* safety concerns (those that affect their families) rather than long-term (or long-return) threats such as earthquakes, volcanic eruptions or cyclones.

If the assessment is being made soon after a major disaster, then the collective memory of that event will loom large and will also be a matter of deep concern, but if the last disaster to hit the region was decades ago, even if it is potentially a high consequence event, then it will be unlikely to be of great concern to the community in comparison with their everyday fears. These immediate worries often include health concerns, road safety, their children's access to education, crime, protection of their livelihoods, risks of eviction, and fire risks to their homes.

In 2021 the insurer AXA issued a report entitled '*Future Risks*' (Axa 2021), in which experts and the British public were surveyed about the threats that they think will have the greatest global impact in the next 5-10 years. The results highlight public concerns that range from personal to global threats. The results of the survey in priority order were as follows:-

1. Climate Change, 59%
2. Pandemics and infectious diseases, 57%
3. New security threats and terrorism, 39%
4. Cyber security risks, 39%
5. Pollution, 38%
6. Natural resources and biodiversity, 30%
7. Chronic illness, 26%
8. Geopolitical instability, 23%
9. Social discontent and local conflicts, 24%
10. Financial and stability risks, 21%

The scope of the threats raises three concerns. First, the range, scale and complexity of the varied environmental, political, health, economic risks etc. facing society in 2022 indicate the level of anxiety facing the general public and a consequent fear that they are well beyond the scope of existing governance.

Secondly, should assessment of the effectiveness of risk reduction be confined to major hazards and threats or should it embrace the pressing everyday safety concerns of the community as a collective, fully integrated risk assessment?

Thirdly, who should decide on the scope of an evaluation of DRR: an external body (or bodies) who want to gauge the effectiveness of their respective DRR programme, or the community in question, or both?

**Sultan Barakat** responded to this third point concerning who decides and who assesses:-

*'...and whose standards of assessment to adopt? Such questions indicate the need to think 'outside the box' when it comes to DRR.*

*First, the lack of ownership in crises response misses the opportunity to work alongside society structures such as religious leaders, youth, women, and other marginalized and weak groups. At the same time, "localisation should not be seen as axiomatically peace promoting". Rather, the current wave of interest in the issue is an opportunity to "get the local right" in terms of its incorporation with national, regional, and international conflict and disaster responses.' (Barakat and Milton 2020)*



*Secondly, we have to keep in mind that, although the assessment of “success” and “failure” for a number of housing reconstruction projects, including the contribution of such projects in DRR, were identified after their completion, these assessments are based on third-party standards, not those of national stakeholders.’ (Barakat 2003)*

In this section **Yasamin Izadkhah**, from Iran, and **Omar-Dario Cardona**, from Colombia, both expressed their concern over the lack of evidence on the effectiveness of disaster risk reduction measures. The reason for this gap may lie in the reality that the essential tools and techniques for disaster risk reduction, and adaptation to climate change, are a complex, mixed bag of social, environmental, educational, economic, administrative and technical approaches. While the effectiveness of some approaches can be measured with some precision, others have proved much more difficult to evaluate. **Yasemin Aysan** noted the critical and challenging need to transfer knowledge of what works well to new locations (see page 38)

It is also clear that while the effectiveness of certain individual measures can be measured, (as noted below) it does not appear possible to measure the *composite effectiveness* of the overall protection of a town or city that may include an array of building safety measures, land-use controls, regulatory environment, warning systems, emergency services, disaster plans and public awareness of the risks. As **Maggie Stephenson** noted, the variables in overall protection are massive and the interactions between the varied elements are highly significant. One hazard will rarely resemble another in its location or impact characteristics.

### 3.12 Assessing our Own Contribution to Disaster Risk Reduction

At the outset of this report (page 8) we raised the question of how we each measure the impact of our *own* contributions to disaster risk reduction or adaptation to climate change? We asked how each of us assess the value of our own efforts. Can we recognise any evidence of effectiveness? If so, does this come from external evaluations, long-term assessment, self-assessment, comment from our peers or carefully observed changes?

Such inner reflection is essential before offering any further suggestions to others concerning measurement of *their own* actions: *medice cura te ipsum* (physician heal thyself).

There is a large literature on self-assessment. However, as the issue here is our own personal assessment of our contributions, Ian has reflected on his teaching, architecture, writing, painting, teamwork, consultancies and advocacy and has concluded that the following are vital personal assessment processes.

(a) Assessing the value of one's efforts: to reflect, not only on whether the primary aims of each work activity were achieved (both qualitative and quantitative), but for whom?

(b) Recognising evidence of effectiveness: to identify productive and unproductive work patterns.

(c) To know whether one's actions have changed any lives, strengthened any communities, made any places safer or improved any working practices.

(d) To rank oneself in relation to various work tasks, seeking to move away from low-ranking tasks and strengthen more successful work areas.

(e) To pay close attention to external evaluations of one's work, noting any prevailing patterns that require one to make changes.

(f) Long-term assessment: to revisit places where one has worked in the past, where one offered advice or made important decisions, and to observe and ask questions and learn from those experiences. One needs to be prepared to visit places where one suspects that all did not go as planned, as well as revisiting anticipated success stories:-

*'The most significant learning experience in my career has been to revisit a village in Maharashtra India 15 years after it was reconstructed after an earthquake, Since the organisation I led, advised on reconstruction policy and I led the evaluation team that had visited the site when the project was completed.'* (Davis and Alexander 2015, pp. 1-11)

(g) Comment from peers: to seek feedback on one's performance from colleagues and clients (including anyone involved in a given task at any level).

(h) Observation of change: to look for evidence of past successes and failures and to learn from them, not only about the effectiveness of the effort, but also about the costs and benefits.

(i) In the case of disaster risk reduction or climate change adaptation, to know whether any of one's past work has been tested in subsequent disaster forces. If so, what were the consequences?

Bibliometry is commonly used to assess academic work, with especial emphasis on papers published in respected journals and the number of times they have been cited. Up to a point, the popularity of a work is a measure of its success, but the drawbacks of bibliometry have been known for a long time (Phelan 1999). An article may be cited frequently because it is notoriously wrong. It may be cited because the topic is popular, but not necessarily because a popular topic is an important one. The frequency of citations does not emphasise the importance of an idea, especially if the idea in question lays dormant for a long time before it enters the mainstream of scientific thinking.

Creativity is the key to one's contribution to knowledge. So is lateral thinking, the creative, constructive association of ideas that are not obviously related to one another. In disaster risk reduction, learning is achieved by a mixture of academic study and the study of practical experience obtained in the field. DRR is exceptional in that, while theory is the roadmap that brings order to chaotic situations, it only functions if it can be put to use in a practical manner with more or less immediate effect. Thus, one can judge one's contribution by the way in which one learns from experience and

transforms that learning into a lesson for others, usually by generalising it. This means that particular experiences, such as living through a disaster, can be observed, thought about, 'decoded' and translated into generalisations that will help other people in similar situations in the future. Disaster reveals the inner workings of society: that is its fascination as well as its tragedy. It is nevertheless something we need to capitalise on and to exploit in a benign, creative and positive way for the good of human safety. The measure of such an activity, if there is a measure, is the extent to which others are inspired by what they hear and read and see demonstrated before them.

### 3.13 Conclusions and Broad Findings

This report contains a range of diverse opinions about success or failure in the complex world of disaster risk management and identifies some questions and proposals concerning the assessment of the success of DRR within community settings. The results highlight some unresolved issues and contain a mixture of encouragement and concern. They do not provide any grounds for self-congratulation or complacency.

We close this report in two ways: first, by stating broad findings from the discourse, and secondly by inviting some friends to have the last words in this dialogue, words of criticism, encouragement, warning and suggestions for future action.

1. This international dialogue has revealed significant progress in DRR and CCA:-

- extensive community-based disaster risk reduction activities
- effective building for safety programmes in Nepal, Pakistan and other countries
- governmental legislating to build risk reduction into national disaster plans
- highly effective warning systems and evacuation planning against floods, tsunamis, landslides and volcanic eruptions
- advances in higher education with courses incorporating DRR and CCA
- the positive impact of IT systems throughout the entire field
- effective international sharing of scientific data during the Covid pandemic
- a growing political commitment to adapt to climate change (expressed in COP26)
- progress in coordination through the UN cluster system.

2. Despite such examples of progress, it is clear that there are:-

- escalating disaster threats, with the added challenge of the creation of new risks
- the long-term global impact of Covid-19, added to the consequences of climate change
- all of this occurs within a deteriorating context of international security
- hazards and threats are far outstripping the scale, form and location of existing counter-measures.

3. On the basis of these considerations, a quantum leap in response is needed in all sectors, by all players, for example:-

- assessment of existing and newly created risks
- devising more effective tools to assess effectiveness more accurately
- relevant and accessible education and training

- the transfer of existing knowledge and experience to those needing it where it is of proven effectiveness
- identification of the entrenched 'drivers of risk' and defining creative ways to address them through concerted action
- adopting 'natural solutions' to protect the fragile natural environment.

4. All DRR and CCA measures need to be assessed to determine their effectiveness, and appropriate modifications need to be made in the light of measured experience. This requires two processes:-

- post-disaster assessment of impact and damage to determine the effectiveness of any DRR measures that are in place
- pre-disaster assessment of the effectiveness of DRR by a range of measures, some of which are identified in Part 3 of this paper.

### 3.14 Ten Last Words

**Yasemin Aysan**, a Turkish architect and an independent consultant in disaster risk reduction and development. She was formerly Senior Advisor to UNDP's Bureau for Crisis Prevention and Reduction and Undersecretary-General for Disaster Response and Recovery, IFRC.

*'In an everchanging world of multiple risks, what we may consider as half-full today may quickly turn into half-empty, depending on where, what, defined by whom. Clear from the diversity of views on similar issues in this interesting discussion paper, neither 'achievements' nor 'the gaps' are easy to generalise. They are context and time specific.*

*'Longitudinal overview of experiences, of changing risks, adaptations (or their absence) to reduce risks are limited in numbers. Most assessments for evidence are undertaken as part of an accountability to the donors and to 'close books' of the implementing agencies after programmes. Yet, effectiveness of DRR measures, their sustainability over time, transfer of learning and experiences to other places and situations that are likely to be the next hot spot, require sustained commitment to long-term knowledge and its transfer to where the needs might be.'*

*'Most progress is in the disaster response and management aspect of DRR, as well as in the refinement of the concepts, though the conceptual richness is hard to engage in a practical way for the non-academic DRR/DRM practitioners in many countries. Sustained progress that reduced risks for the wider population are in a few aspects and locations. In places where DRR progress is needed the most; old and newly emerging risks are rebuilt faster than what is reduced.*

*'I am not that positive on DRR progress given how much money is spent on international institutions to promote it with the governments or the public. Academic work has progressed but it is not a game changer for the governments.'*

**Steve Bender** is an urban planner and international consultant on disaster risk management. He is the retired division chief in the Organization of American States (OAS).

*'In reflecting on this dialogue I wish to emphasise the following points:*

*1. Discussion at present of culture, tradition, political, legal, social economic or faith-spawned behaviour and community capacity for, and taking action to, reduce risk to catastrophic events, particularly those prompted by atmospheric, hydrologic and geologic events makes little distinction between the vulnerability of human populations and the vulnerability of the built environment.*

*2. With the exception of climate change, there is little discussion of human beings knowingly promulgating ever more far reaching development endeavours that create by choice risk, and the human actions associated with the choice of acceptable levels of risk.*

*3. At present as practiced, systemic risk assessment policy and practice notes little differentiation in approach or analysis when addressing the present versus the future need for disaster risk reduction as if little is known about risk.*

*4. Disaster risk reduction policy and practice does not often distinguish between placing a priority on existing vulnerable infrastructure components and associated populations while still addressing risk reduction challenges associated with post-disaster recovery and reconstruction, and with new development initiatives (Tafti and Tomlinson 2015).*

*5. There are significant mismatches between understandings of:*

- climate change effects on people in informal settlements and elsewhere*
- vulnerability of populations and the economic and social infrastructure components on which they depend and prosper*
- vulnerabilities recognized at varying geographic, social, and economic levels*
- effective risk management before and after a disastrous event occurs, beginning with life safety.*

*6. Discussion of risk and DRR continue to place "disasters" alongside "development" as two distinct human occurrences, neglecting to identify risk construction as the evidence of development as the crucible in which disasters occur. This is manifest in the visual if not mental imagery of the disaster-development cycle. This is reinforced by discussion of "development" and "underdevelopment" in the absence of identifying risk creation. This is echoed in references to "disaster by design," "disaster capitalism" and the "industrial-disaster complex".*

*7. There is little concern at present to discuss the role of dependency and inter-dependency, isolation and community, dominance and redundancy in and among settlements, cities, nations and regions.'*

**Mihir Bhatt**, an urban planner and is currently Director of the All-India Disaster Mitigation Institute (AIDMI) in Ahmedabad. He discusses progress in DRR.

*'...at many levels, in many sectors, in many communities and at many locations. This progress must be celebrated. And yet DRR is going to fumble in the end as the rate at which we produce disaster risks is faster than the rate at which we reduce the risks. The gap is expanding rapidly with each new economic development advance as well as each new disaster. At some point DRR will become marginal and a limited cause. We saw such marginalization in the pandemic (health risk). The DRR community was not aware of the pandemic coming, the authorities and corporates had no investments made to retard or prevent it, authorities had no idea how to handle it; and yet, so far, there are no preparedness measures. The neo-liberal economics is leading to more risk and this can only be addressed if we think of "economics of risk reduction and resilience economics.'*

**Ian Burton**, an English geographer who has spent his academic career in Canada, is a pioneer in DRR and climate change, having worked in the disasters and hazards field since the 1960s. In the late 1970s, he co-authored one of the classic books, namely *The Environment as Hazard* (Burton et al. 1978). While most experts in this field work in either the DRR or climate change camps, since the early 1980s Ian has managed to straddle both. He has played key roles in the work of UNISDR and the IPCC, and has also been an advocate for small island countries in many of the COP inter-governmental conventions.

*'Perhaps the metaphor of the half full and half empty glass in the title is confusing, or just downright wrong! It is too simplistic. It implies that there is a fixed and needed volume of knowledge, (research) and its application, that is needed to achieve the goals of disaster risk reduction. If I go down that metaphor track, I would say that the problem is not to be simply understood as a single fixed container that has to be filled! The glass (i.e. the understanding and magnitude of the problem) is itself changing. As fast as we attempt to fill the glass the nature of the problem is changing. Somehow we need a metaphor (or title) which reflects the changing nature of the problems of disasters.*

*'If there is any message that this text conveys to me it is that disaster research is a bit of a disaster itself! Perhaps the glass is entirely empty! It is good to lay out the confusion and the progress and regress that has been made, but surely there needs to be at least a little more by way of integration or synthesis?*

*'I think that more could be done to address the present situation and especially the future. Let us not just reinforce the old debates and confusions! As you well know disasters were once upon a time attributed*

*to nature as in “natural disasters”. (They still are in many places and among many groups). Then we moved to the idea that the disasters were in large part attributed to human choices that led to growth in exposure and vulnerability to “natural” hazards. We are now at a new stage in which human activities are understood to be shaping the geophysical and biological extreme events themselves, as well as the exposure and vulnerability to the events. This is most dramatically exemplified by climate change (global heating, weather chaos), So this is one way in which the shape and size of the glass is changing. Another change is that we are coming to understand that all disasters involve both “nature” and human activities, policies and choices. This includes pandemics, (Covid) epidemics (HIV), and a whole range of disasters that have been referred to as “man-made”, or industrial, or transport, or technological. (Bhopal, Bangladesh textile factories, etc.).*

*‘So, I think we need some discussion of the wider view of disasters. This is also linked to the growing understanding that disasters are not simply local, or place-based events but also have cascading effects. And to go further there is also growing interest in root causes that are common. The fatalities and damage and losses caused by wildfires, heat waves, floods, nuclear accidents, pandemics and on and on, are coming to be seen as having some commonalities in their causation. Perhaps this leads to the direction of future research and there is not much to report on at present. But surely it would be important to flag these ideas? It might even be appropriate to include the current concerns about systemic processes, the 109nthropocene, and the apocalyptic, and existential.’*

**Bruno Haghebaert** is a specialist consultant in disaster risk reduction and climate change adaptation. Formerly, he was the lead in the IFRC in DRR and vulnerability. In 2022 he is coordinating a 'DRR Early Days' initiative on behalf of the United Nations Office for Disaster Risk Reduction (UNDRR).

*‘Using the analogy of the half full/half empty glass, I would like to share with you some additional thoughts.*

*‘DRR is a broad concept straddling the humanitarian and development field. It has different elements (glasses) which each have their own rationale and indicators of effectiveness. Although there is no consensus on how to subdivide the concept, DRR could in my view be broken down into the following components:-*

- disaster preparedness*
- early warning*
- disaster mitigation (project-based)*
- prevention (as part of sustainable development)*
- avoidance of risk creation (as a newcomer).*

*‘While disaster preparedness’s aim is to enhance the effectiveness and timeliness of response (and thus to save lives following the impact), early warning’s aim is to proactively move people out of harm’s way, mitigation has as additional value the reduction of damage to structures and*

*belongings (and thus livelihoods), while prevention and avoidance of risk creation aim at the outright elimination of risk. For all these elements different indicators of effectiveness can be developed.*

*'I see these different elements as communicating vessels/glasses. Once a society has reached a certain level of preparedness (and the glass is more than half full and could start to spill over), resources may be used to enhance early warning capacity etc... Next, investing in response and early warning capacity only may be considered to be not sufficient, when houses, belongings, livelihoods are not adequately being protected. Once the effectiveness of the humanitarian system is considered to be high enough, more developmental long-term interventions will be considered etc... In the specific case of risk creation the aim will be to reduce the content of the glass as much as possible (not to further fill it up). It would be nice to be able to put this into a drawing.*

*'Of course, in reality this is not such a straightforward mechanical process but my experience has shown that this is often the sequence, which is taking place...*

*'My second reflection is that DRR enhancement is not necessarily a linear process: DRR glasses may temporarily fill up but over time the content may also decrease again, as a consequence of external factors, such as waning donor or government interest in the topic. Then the impact of a major disaster or global or regional conferences/commitments may be needed to raise concern and fill the glasses again.*

*'Finally, I have a reflection on the DRR/CCA nexus: the current growing interest in hydro-meteorological hazards, as a result of a changing climate, may lead over time to a lack of interest and investment in reducing the risk of geological hazards, until the next big one. So different hazards may require a different size of glasses to be filled.'*

**Nick Isbister:** a psychologist who advises managers in varied aspects of public life including the humanitarian sector, shares some thoughts on how we can be more reflective and effective in our work.

*'One of the most remarkable things about Ian Davis is his perpetual, and, indeed habitual openness to learning. Ian is an indefatigable learner. This article is testimony to that. This article is testimony too, of another inveterate trait of his, to involve, to capture the attention of people and draw them into conversation and dialogue.*

*'This article is a good example of that, a set of ideas and opinions, sought, elicited and now themed and codified - a bricolage collated and compiled by Ian. A protracted conversation with his many friends and colleagues now frozen, set in concrete, transformed into a record of insights, learnings, missed opportunities, regrets and hopes.*



*'David Farrier, in his wonderful book: Footprints: In Search of Future Fossils (Farrier 2020) asks what is the legacy we the progenitors (some might say perpetrators) of the Anthropocene age will leave far distant generations of our descendants? The people beyond us, 'people separated from us by hundreds, even thousands of generations', will, says Farrier, 'live in a world still warped by our decisions'.*

*He begins his exploration of the records we will leave future generations with a meditation on the discovery of a set of fossilised, early-hominid footprints - trace fossils:*

*'Ancient footprints, like burrows, tracks and tooth marks...Unlike fossilised remains...speak of life rather than death. Though bodiless, they bear witness to...stories about how ancient lives were lived' (Farrier 2020, p. 4).*

*This article is one of those 'trace fossils' - it 'speaks of life rather than death', it bears witness to how a diverse and disparate group of pioneers, innovators, accidental and intentional heroes created a new discipline, applied their deep expertise to some of the world's most repetitive and intractable problems - disasters.*

*'Speaking of life' this article is a trace fossil of a nascent profession, the precious witness of how lives were lived not 850,000 years ago but a mere 50 or 60 years ago. The paper shows us the tracks of these fascinating people. Maggie Stephenson writes above about this group:*

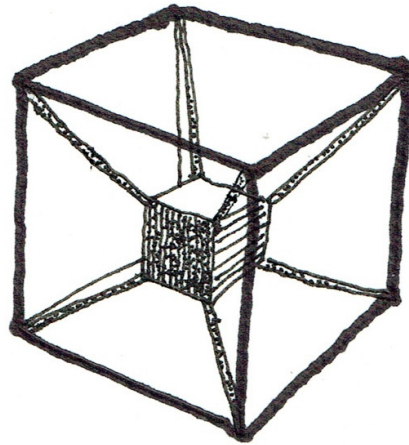
*'Many of your contributors talk about the effectiveness of DRR policies, programmes and interventions, which made me wonder. Most of the contributors are academics, (am I right?), although they have also played advisory roles, or have had some experience in various organisations, but they are primarily educators, researchers, writers, advocates.' (Farrier 2020, p. 30)*

*'Elsewhere in the text, people talk about the potential of 'activists', engineers, officials, residents, 'house-occupiers', entrepreneurs, rebels, revolutionaries, climate change influencers etc.*

*'Way back at the beginning of his career, around the time he was making the transition from being an Architect to being a Disaster Housing specialist, Ian wrote what he called earlier an 'angry paper ... 45 years ago in 1977', a piece in the New Internationalist called (as he now says, 'disrespectfully') 'The Intervenors'. (page 69) The paper highlighted the lack of accountability 'outsiders' have to those who are affected by the disaster, the local populations, the 'victims'. Indeed, Ian's point was all 'outsiders' have little real accountability to anyone.*

*'A little after he wrote 'The Intervenors' I remember working with Ian where he had made a physical model of his 'accountability matrix'. With wood, and cardboard and glue he illustrated his point about the inter-*

*connectedness of everyone, and, our mutual accountability - a box, tenuously held in place by rubber bands. Heath Robinson would have been proud of him. Push the box one way, and the other bands had to take the strain.*



*'Ian's model was, I guess an attempt to make real the seemingly abstract concept of multiple 'stakeholders' - all of whom have 'interests'. In the disorder and the confusion of the aftermath of a disaster it is 'easy' for some groups' interests to be central, whilst others' interests are ignored, denied, suppressed and ridden roughshod over. Sadly, in the 'order' and the ease of the planning and the mitigation phase, this partiality abounds there too.*

*'Whether we be academics or activists, engineers or educators, planners or consultants, writers or practitioners we are all, variously 'intervenor's. Good, bad or indifferent intervenors ply their trade and make their living. Some, sadly, not all do great work. Such 'intervenor's move and serve with wisdom and compassion and consistently add value to whomever they are with, and whomever they are there to help. Such 'special' people always bring a sense of additionality to the context and to the 'intervention'. These people often become cherished, and indeed, trusted advisors.*

*'Harvard professor, David Maister, admittedly, working with groups more often composed of lawyers and accountants, says of such people that they all share a number of key characteristics. In particular they have what he calls 'a predilection to focus on the client, rather than themselves'. Further, Maister suggests such people have:-*

- *enough self-confidence to listen without pre-judging*
- *enough curiosity to inquire without supposing an answer*
- *willingness to see the client as co-equal in a joint journey*
- *enough ego-strength to subordinate their own ego.*

*Trusted advisors listen, trusted advisors are curious, trusted advisors 'co-create' and above all, they are not 'big egotists' (Maister et al. 2000).*

*'Intervenors' may not all become 'trusted advisors', but they are all 'practitioners' - their contributions come in a variety of forms. The best most assuredly are 'reflective practitioners'. John Dewey, the father, with Donald Schon of the discipline of 'reflective practice' talks of great practitioners who have:-*

*'[An] active desire to listen to more sides than one; to give heed to facts from whatever source they come; to give full attention to alternative possibilities; to recognise the possibility of error even in the beliefs that are dearest to us.'* (Dewey 1933, p. 29)

*'Intervenors' people making 'interventions' in disasters themselves and in the potential value of mitigation strategies, and post-event reviews. We live with our heritage as intervenors, the fruit of our labour often sits writ-large for all to see:-Did our intervention work?*

- *Did we listen well enough?*
- *Who did we listen to then, and whose voice did we miss, not hear, avoid, ignore?*
- *Does what we thought was so apt and right for then stand the test of time?*
- *What was the lasting impact of what we suggested, or recommended?*
- *Would we be welcomed back to this community now?*
- *Who benefitted the most from the intervention?*
- *Did the lives of those we thought might be the beneficiaries of our interventions actually improve?*
- *How has what we put in place then, evolved, stood the test of time?*
- *Given what we know now, how might our intervention have been different?*
- *Can we look those who were there then in the eye and say "I got it wrong?"*

*'The best 'intervenors' ask themselves these questions often. The best intervenors ask themselves these questions repeatedly, often 'in the moment' as the intervention is taking place, and certainly, as here in this publication in the aftermath.*

*'Following John Dewey, Donald Schon's suggested that there were two types of reflection: reflection-in-action and reflection-on-action (Schön 1983):-*

*'Reflection-in-action is always in the heat of the moment, always in the midst of the activity, always as things are swirling around our heads. Reflection-in-action are those moments when an 'intervenor' catches themselves caught up in the whirlwind, being sucked into the maelstrom, and they take a moment to stop and access another facet of who they are. Ronald Heifetz calls it getting out of the dance and onto the balcony - others call it 'perspective-building', even story-making.*

*'Reflection-on-action is always after the fact, always as and when the storm has calmed, always once there is time to breathe, and think, and reconnect with feelings ignored in the fray, feelings held at bay as the urgency of the most pressing concerns are addressed and resolved (or not). Reflection-on-action can be personal, even private, but is often most powerful when done collectively. Most powerful when shared with other practitioners, most powerful when done in dialogue. Reflection-on-action is at its best when it embodies what Mikhail Bakhtin says: 'Truth is not to be found inside the head of an individual person, it is born between people collectively searching for truth, in the process of their dialogic interaction' (Bakhtin 1984, p. 110).*

*'This does not need to be 'formal', though having a process to do it helps, having a facilitator helps, preserving time to do it regularly helps - most importantly this is no luxury, this is essential to good practice and good well-being.*

*'For Farrier, our footprints, our trace-fossils will show future generations who we are. And for him, time will tell what they say. He concludes his meditation with this thought:-*

*'In the rush of everyday life, we miss the subtle shift; through habit, we see the present by the light of the past. The challenge is to learn instead to examine our present, and ourselves, by the eerie light cast by the onrushing future.'*

*'Disaster Risk Reduction - Glass half-full, or glass half-empty? Why are we faffing about with such bounded receptacles? There is a place before us, and between us where there is an artesian reservoir of insight, wisdom - both conceptual and practical. If we can free up our hands from grabbing the glass, there is hope we can apprehend that.'*

**Fred Krimgold** a pioneer in this field, is the author in 1974 of the first PhD dissertation to focus on reducing disaster risk as an integral element in development planning: *Pre-Disaster Planning. The Role of International Aid for Pre-Disaster Planning in Developing Countries* (Krimgold 1974). He reflects on a significant gap in our institutions and governance - the reality that for all our technical and operational progress we often fail to engage with fundamental human values, a recurring theme throughout this dialogue.

*'As specialists dealing with building safety, we have tried to influence the location and construction of settlements to reduce disaster risk in many parts of the world. Many efforts have been successful. However, the threats to the built environment and its occupants have mutated and expanded beyond resistance to the structural loads of natural hazards.*

*'We have discovered the roots of disaster vulnerability in the broader societal issues of poverty, ignorance and inequality. We have been able to add to the contents of the glass of disaster risk reduction with specific*

*technical and operational contributions but ultimately come to the realization that the filling the other half of the glass must engage with more fundamental human values of fairness and empathy'.*

As Director of Humanitarian Assistance in the British Red Cross and formerly the Director of the ProVention Consortium, **David Peppiatt** reflects on a vital change in organisational culture that he has observed as it moves towards preventive action from its traditional response role:-

*'What has struck me most as I have visited many National Societies over the years has been the genuine culture shift in the Red Cross/ Red Crescent from response to preparedness and the strong focus on resilience among our network of volunteers.*

*'Of course, the critical question of positive progress is whether this culture shift in humanitarian action has resulted in saving lives, protecting livelihoods and making these communities safer places to live. This brings us back to where and who you are. But has there been some progress? I most definitely think so.'*

**Maggie Stephenson**, an Irish architect has played key advisory roles in many recent reconstruction projects following major earthquakes in Pakistan, Haiti and Nepal. She challenges those of us who are academics to reflect on how we regard ourselves and our role? Are we active or passive? Do we see ourselves as implementors or commentators?

*'It is all fine and well to criticise governments, UN, development banks etc. But do the academics see the glasshouse? Some of your contributors seem to question not only the activities but also the motivations behind them. Since I think your primary audience is also academic, I am asking them to start with making their own house more fit for purpose. It seems a practical as well as ethical place to start. Understanding our constraints, in our own social and institutional systems also tends to be helpful to recognise the constraints others face and theirs and how to go forward.*

*'Your original question was 'are we getting anywhere?'. Like others around the we and communities of practice. Your contributors represent decades, if not centuries, of distinguished academic thinking and learning in DRR. I am curious to hear how they analyse and critique their own domain of education, research and publication?*

*'What do they think has been most effective in DRR academia? What challenges or shortcomings might they diagnose? What suggestions do there have to address these challenges? Many cite more courses and more publications as progress, but is there analysis of access, application or impact?*

*'Academic activities are presented very positively in this paper in comparison to the world and stakeholders outside of academia. However, I wonder if the structural constraints that your contributors identify in*

*government and UN systems, for example, (implied as they rather than we within this report) are mirrored in academic institutional systems and what are the implications?*

*'How has the digital revolution affected data, learning and communication of what is the potential?*

*'Might discussions around how knowledge is produced and shared warrant more reflection and explanation by the academic community on their experience and maybe proposals or commitments to meet ambitions around effectiveness?*

*'I am not a disaster risk reduction expert in any shape or form. I recognise that this has been the central preoccupation for your contributors who have thought deeply and seriously on the topic and have worked long and hard towards making the world safer. We owe them a debt of gratitude. I have not earned a place in the conversation.*

*'Perhaps in answering your question of glass half- full or half- empty, the contributors reveal what stake they have in the answer as a comment on their life's work?*

*'Have they been mainly implementors or commentators?*

*Implementors (who have been responsible for the decisions, budgets, resources) may know what was achieved despite the soul crushing obstacles, they know what they tried to do and compromised back to, how lonely and difficult it was, what sacrifices they made to get something done. They have to report progress, a glass half-full.*

*Commentators on the other hand can discuss how they articulated ways forward, how they said what should be done find themselves unheeded, or that progress was not far enough or not good enough, or failed by political structures, institutions, people. A glass half- empty.*

*Commentators or critics may say it should have been more. Implementors may say sure, but 'should' and 'could' are different questions.'*

**Paul Venton** works as an independent consultant in the disaster and development sectors and places our optimism, realism and pessimism into a wider perspective:-

*'I believe that the question – 'is the glass-half full or half-empty ?' has something to do with human nature. We are always balancing hope and despair. The despair drives action that provides hope. So it is not at all surprising that the 'glass half-full or half- empty' saying is banded about and always provides equal measure of optimists and pessimists (and I reckon that we are all a mix of both from time to time). Right now, I'm an optimist - because there are far too many problems to be pessimistic!'*

### 3.14.1 Last of the Last Words

To conclude, David reflects on his research, teaching and consultancy advice that covers both disaster response as well as protection:

*'When considering the plus and minus levels of progress in reducing disaster risks we need to take into account the likelihood that the world is at a turning point at which it is more imperative than ever to 'get serious' about disasters.*

*'I am concerned that there is too much reliance on the assumption that what has happened in the past will be a reliable guide to what happens in the future. I don't believe that will be the case. Nonetheless, too much effort and strategy seems to be based on 'planning for past events, not future ones'*

*'I am sorry to sound negative, but I am worried about whether it is actually possible to judge how much water there is in the glass. In the 21st century, we need to upgrade the pressure-and-release model: henceforth, disasters will be hostage to context. Momentous changes have happened recently, and much more momentous changes are poised to happen:-*

- *huge increases in the magnitude and frequency of natural hazards*
- *proliferating critical infrastructure failure (including space weather incident)*
- *unplanned mass migration (the cat is well and truly out of the bag)*
- *potential collapse of carrying capacity for areas of the world*
- *possibility of existential events (VEI7 eruption, M9 quake, meteor, etc.)*
- *above all, the coincidence of more than one of these contingencies*

Context:-

- *a retreat from democracy (it is well documented) leading to repression and the curtailment of human rights*
- *polarisation at the national and international levels*
- *diverging enrichment and impoverishment leading to levels of wealth differential that have not seen before in the modern world*
- *control of world resources by a tiny minority of the world population*
- *technology has created a degree of separation between reality and what people - often erroneously - think is reality.*

'The first imperative is to try to understand what the effect of context is upon disaster vulnerability. This is not clear because the world situation is changing so dynamically. What we can say is that institutions tend to be way behind in adapting to the changes.

'The second imperative is to understand what all this means socially. Much faith is placed in the concept of community, but what is community? It has no characteristic spatial scale and no immutable function. It may be supportive and therapeutic or oppressive and dysfunctional. It may be

*inclusive or exclusive. I am not advocating a Thatcherite view (“there is no such thing as society”), but I am asking for a re-evaluation of what we understand as the way people collectively react to disaster risk.*

*'The third imperative is to change priorities. Although it is sensible and morally right to shift the emphasis from responding to mitigating, preventing and preparing, we all know that response cannot be avoided or neglected. It will have to be an order of magnitude better than it is now. Not only is this because of a greater disaster risk, it is also because responders will have to work much harder at damage limitation and containment. Ordinary people in all sorts of settings, rich and poor, will have to learn to be more resilient on a personal level. Fatalism will have to be combatted.'*



## References

- Alexander, D.E. 2021. Understanding and characterising cascading disasters. In S. Eslamian (ed.) *UN Handbook of Disaster Risk Reduction for Resilience (HD3R-2021) Cascading Disasters: Multiple Risk Reduction and Resilience. Book 1: New Frameworks for Building Resilience to Disaster*. Springer, Berlin (Chapter 18). doi: 10.1007/978-3-030-61278-8
- Alexander, D. and G. Pescaroli 2019. What are cascading disasters? *UCL Open: Environment* 2019;(1):03: 1-7. DOI: 10.14324/111.444/000011
- Andrews, R. 2021. Volcanoes aren't like bombs... *The Observer* 3rd October 2021, p. 12.
- Arlikatti, S. and S.A. Andrew 2017. Disaster housing recovery in rural India: lessons from 12 years of post-tsunami housing efforts. In A. Sapat and A-M. Esnard (eds) *Coming Home after Disaster: Multiple Dimensions of Housing Recovery*. CRC Press, Boca Raton, Florida: 175-190.
- Andrew, S.A. and S. Arlikatti 2014. Public, private and non-profit partnerships in disaster housing recovery: an examination of housing development approaches in India. In N. Kapucu and K.T. Liou (eds) *Disasters and Development: Global Issues and Cases*. Springer International, Gland, Switzerland: 351-370.
- Arlikatti, S., S. Andrew, J. Kendra and C.S. Prater 2014. Temporary sheltering, psychological stress symptoms and perceptions of recovery. *Natural Hazards Review* 16(3): 1-11. DOI: 10.1061/(ASCE)NH.1527-6996.0000166
- Andrew, S., S. Arlikatti, L. Long and J. Kendra 2013. The effect of housing assistance arrangements on household recovery: an empirical test of donor-assisted and owner-driven approaches. *Journal of Housing and the Built Environment* 28(1): 17-34. DOI: 10.1007/s10901-012-9266-9.
- Arlikatti, S. and S. Andrew 2012. Housing design and long-term recovery processes in the aftermath of the 2004 Indian Ocean tsunami. *Natural Hazards Review* 13(1): 34-44. DOI: 10.1061/(ASCE)NH.1527-6996.0000062.
- AXA 2021. *Future Risks Report 2021*. AXA, London, 38 pp.
- Bakhtin, M. 1984. *Problems of Dostoevsky's Poetics*, (C. Emerson, ed. and trans.). University of Minnesota Press, Minneapolis, Minnesota, 384 pp.
- Barakat, S. 2003. *Housing Reconstruction After Conflict and Disaster*. Humanitarian Policy Network, Paper no. 43. Overseas Development Institute, London, 43 pp.
- Barakat, S. and S. Zyck 2008. *Housing Compensation and Emergency Preparedness in the Aftermath of the July 2006 War in Southern Lebanon*. Norwegian Refugee Council, Oslo, 102 pp.

Barakat, S. and S. Zyck 2011. Housing reconstruction as socio-economic recovery and state building: evidence from Southern Lebanon. *Housing Studies* 26(1): 133-154. DOI: 10.1080/02673037.2010.512750

Barakat, S. and S. Milton 2020. Localisation across the humanitarian-development-peace nexus. *Journal of Peacebuilding & Development* 15(2): 147-163. DOI: 10.1177/1542316620922805

Barrows, H.H. 1923. Geography as human ecology. *Annals of the Association of American Geographers* 13(1): 1-14.

Bender, S. 2021. *Constructing Risk, Disaster, Development, and the Built Environment*. Berghahn Books, New York, 282 pp.

Berkes, F. 2007. Understanding uncertainty and reducing vulnerability: lessons from resilience thinking. *Natural Hazards* 41(2): 283-295. DOI: 10.1007/s11069-006-9036-7

Blaikie, P., T. Cannon, I. Davis and B. Wisner 1994. *At Risk: Natural Hazards, People's Vulnerability and Disasters* (1st edition). Routledge, London, 320 pp.

Burton, I. 2013. Private communication with Ian Davis, August 2013, quoted in Davis, I. (ed.) 2015. *Disaster Risk Management in Asia and the Pacific*. Routledge, Abingdon, UK, p. 83.

Burton, I., R.W. Kates and G.F. White 1978. *The Environment as Hazard*. Oxford University Press, New York, 240 pp. (2nd edn 1993, Guilford Press, New York, 304 pp.)

Butzer, K.W. 2012. Collapse, environment, and society. *Proceedings of the National Academy of Sciences* 109(10): 3632-3639. DOI: 10.1073/pnas.1114845109

Cannon, T. and L. Schipper (eds) 2014. *World Disasters Report: Focus on Culture and Risk*. International Federation of Red Cross and Red Crescent Societies, Geneva, 288 pp.

Castellanos Abella, E.A. and B. Wisner 2018. Natural hazard governance in Cuba. In *Oxford Research Encyclopedia of Natural Hazard Science*. Oxford University Press, New York. DOI: 10.1093/acrefore/9780199389407.013.238

Davis, I. 1977. The Intervenors. *New Internationalist* 58 (July 1977): 21-23.

Davis, I. 1978a. Rich world, poor world. *Third Way* (December 1978): 12.

Davis, I. 1978b. *Shelter after Disaster*. Oxford Polytechnic Press, Oxford, 127 pp.

Davis, I. (ed.) 2015. *Disaster Risk Management in Asia and the Pacific*. Asian Development Bank Institute. Routledge, Abingdon, UK, 360 pp.

Davis, I. and D. Alexander 2015. *Recovery from Disaster*. Routledge, Abingdon, UK, 392 pp.

Delgado, K. 2022. How to become more optimistic in tough times. *The I Newspaper* (11th March 2022): 15.

Dewey, J. 1933. *How We Think*. J.E. Heath, Boston, Mass., 240 pp.

Djalante, R., C. Holley and F. Thomalla 2011. Adaptive governance and managing resilience to natural hazards. *International Journal of Disaster Risk Science* 2(4): 1-14. DOI:10.1007/s13753-011-0015-6

Dynes, R.R. and E.L. Quarantelli 1994. The place of the explosion in the history of disaster research: the work of Samuel H. Prince. In A. Ruffman and C. Howell (eds) *Ground Zero: A Reassessment of the 1917 Explosion in Halifax Harbour*. Nimbus Publishing Limited, Halifax, Nova Scotia: 55-68, 431-432.

Erikson, K.T. 1976. *Everything in its Path: Destruction of Community in the Buffalo Creek Flood*. Simon and Schuster, New York, 284 pp.

Etkin, D. 2019. How risk assessments by emergency management organisations fall prey to narrow framing. *International Journal of Emergency Management* 15(1): 81-97.

Farrier, D 2020. *Footprints: In Search of Future Fossils*. Fourth Estate, London, 320 pp.

GFDRR 2016. *Building Regulation for Resilience: Managing Risks for Safer Cities*. Global Facility for Disaster Risk Reduction, World Bank, Washington DC, 132 pp.

GFDRR 2017. *International Guidelines on Natural and Nature Based Solutions for Flood Risk Management*. World Bank Washington DC, 989 pp.

Greenfield, P. and P. Weston 2020. Banks lent \$2.6 tn linked to ecosystem and wildlife destruction in 2019: report. *The Guardian* (28th October 2020).

Harvey, F. 2021. Do we need to adapt to the changing climate? Just ask a poor country. *The Observer* (7th November 2021): 9.

Hinshaw, R.E. 2006. *Living with Nature's Extremes: the Life of Gilbert Fowler White*. Johnson Books, Boulder, Colorado, 339 pp.

Hochrainer-Stigler, S., R.B. Sharma and R. Mechler 2012. Disaster microinsurance for pro-poor risk management: evidence from South Asia. *Journal of Integrated Disaster Risk Management* 2(2): 1-19.

Holling, C.S 1973. Resilience and stability of ecological systems. *Annual Reviews of Ecological Systems* 4:1-23.

IUCN 2020. *Global Standard for Nature-based Solutions*. International Union for Conservation of Nature, Gland, Switzerland, 30 pp.

James, W. 1911. On some mental effects of the earthquake. In *Memories and Studies*. Longman, Green, and Co., New York (reprinted in 2015 by CreateSpace Independent Publishing Platform).

Kelman, I. 2005. Operational ethics for disaster research. *International Journal of Mass Emergencies and Disasters* 23(3): 141-158.

Kelman, I. 2013. Negotiating disasters: politics, representation, meanings. *Disaster Prevention and Management* 22(4): 378-380.

Kelman, I. 2015. Ethics of disaster research. In M. Wyss and S. Peppoloni (eds) *Geoethics: Ethical Challenges and Case Studies in Earth Sciences*. Elsevier, Amsterdam: 37-47.

Kelman, I. 2018. Lost for words amongst disaster risk science vocabulary? *International Journal of Disaster Risk Science* 9(3): 281-291. DOI: 10.1007/s13753-018-0188-3

Kelman, I. 2021. Ethically researching local impacts of environmental change without travel. *Geosciences* 11(8): 1-5. DOI: 10.3390/geosciences11080316

Kelman, I. and R. Dodds 2009. Developing a code of ethics for disaster tourism. *International Journal of Mass Emergencies and Disasters* 27(3): 272-296.

Kelman, I. and M. Harris 2021. Linking disaster risk reduction and healthcare in locations with limited accessibility: challenges and opportunities of participatory research. *International Journal of Environmental Research and Public Health* 18(1): 1-21. DOI: 10.3390/ijerph18010248

Klein, N. 2007. *The Shock Doctrine*. Knopf, Toronto, 672 pp.

Klein, N. 2019. *On Fire: The Burning Case for a Green New Deal*. Simon and Schuster, New York, 320 pp.

Knowles, S.G. 2021. Pandemic data collection in authoritarian regimes. *American Scientist* 109(6): 331. DOI: 10.1511/2021.109.6.331

Krimgold, F. 1974. *Pre-Disaster Planning. The Role of International Aid for Pre-Disaster Planning in Developing Countries*. Avhandling for Teknisk Doktorsexamen vid Institutionen for Arkitektur, Stockholm.

Lassa, J. 2018. *Roles of non-government organizations in disaster risk reduction*. Oxford Research Encyclopaedia of Natural Hazard Science. Oxford University Press, New York. DOI: 10.1093/acrefore/9780199389407.013.45

Levit, G.S. 2000. The biosphere and the noösphere: theories of V. I. Vernadsky and P. Teilhard de Chardin. A methodological essay. *International Archives on the History of Science* 50(144): 160-176.

Lewis, J. and I. Kelman 2012. The good, the bad and the ugly: disaster risk reduction (DRR) versus disaster risk creation (DRC). *PLoS Currents Disasters* 21 June 2012. DOI: 10.1371/4f8d4eaec6af8

Maister, D.H., C.H. Green and R.H. Galford 2000. *The Trusted Advisor*. Free Press, New York, 336 pp.

Mallet, R. 1862. *Great Neapolitan Earthquake of 1857: The First Principles of Observational Seismology..* Chapman and Hall for the Royal Society, London, 2 vols.

Mann, M. 2019. Radical reform and the green new deal (book review). *Nature* 573: 340-341.

Maskrey, A., G. Jain and A. Lavell 2021. *The Social Construction of Systemic Risk: Towards an Actionable Framework for Risk Governance*. UNDP, New York, 60 pp.

Mayner, L. and P. Arbon 2015. Defining disaster: the need for harmonisation of terminology. *Australasian Journal of Disaster and Trauma Studies* 19(special issue): 21-26.

Misra, N. 2022. National Rural Employment Guarantee Act (NREGA) of India. <https://www.yourarticlelibrary.com/india-2/nrega/national-rural-employment-guarantee-act-nrega-of-india>

National Land Development Council 2020. *Water-Related Disaster Risk Reduction Considering Climate Change: Transition to River Basin Disaster Resilience and Sustainability by All*. Council Report, National Land Development Council, Tokyo, 74 pp.

O'Brien, G. and P. O'Keefe 2013. *Managing Adaptation to Climate Risk: Beyond Fragmented Responses*. Routledge, London, 217 pp.

Oliver-Smith, A. 1986. *The Martyred City: Death and Rebirth in the Andes*. University of New Mexico Press, Albuquerque, New Mexico, 280 pp.

Phelan, T.J. 1999. A compendium of issues for citation analysis. *Scientometrics* 45(1): 117-136. DOI: 10.1007/BF02458472

Pope Francis 2012. *Laudato Si: On Care for Our Common Home*. Vatican Documents, Vatican City, 184 pp.

Prince, S. 1920. *Catastrophe and Social Change: Based Upon a Sociological Study of the Halifax Disaster*. Studies in History, Economics and Public Law no. 94. Columbia University Press, New York, 151 pp.

Quarantelli, E.L. 1997. Problematical aspects of the information/communication revolution for disaster planning and research: ten non-technical issues and questions. *Disaster Prevention and Management* 6(2): 94-106. DOI: 10.1108/09653569710164053

Quarantelli, E.L. 1995. What is a disaster? *International Journal of Mass Emergencies and Disasters* 13(3): 221-229.

Quarantelli, E.L. (ed.) 1998. *What is a Disaster? Perspectives on the Question*. Routledge, London, 312 pp.

Sacks, J. 2005. *To Heal a Fractured World: The Ethics of Responsibility*. Continuum, New York, 288 pp.

Sanderson, D. 2011. Livelihood protection and support for disaster. In B. Wisner, J-C. Gaillard and I. Kelman (eds) *Handbook of Hazards, Disaster Risk Reduction and Management*. Routledge, Abingdon, UK 655-668.

Scanlon, T.J. 1988. Disaster's little known pioneer: Canada's Samuel Henry Prince. *International Journal of Mass Emergencies and Disasters* 6: 213-232.

Scanlon, T.J. 1997. Rewriting a living legend: researching the 1917 Halifax explosion. *International Journal of Mass Emergencies and Disasters* 15(1): 147-178.

Schilderman, T. and E. Parker (eds.) 2014. *Still Standing? Looking Back at Reconstruction and Disaster Risk Reduction in Housing*. Practical Action, Rugby, 282 pp.

Schön, D.A. 1983. *The Reflective Practitioner: How Professionals Think in Action*. Basic Books, New York, 384 pp.

Scudder, T. 2019. *Large Dams: Long Term Impacts on Riverine Communities and Free Flowing Rivers*. Springer Nature, Singapore, 312 pp.

Shaw, R. 2016. *Community-Based Disaster Risk Reduction*. Community, Environment and Disaster Risk Management, no. 10. Emerald Publishing, Bingley, UK, 300 pp.

Sorokin, P.A. 1942. *Man and Society in Calamity: the Effects of War, Revolution, Famine, Pestilence Upon Human Mind, Behaviour, Social Organization and Cultural Life*. Greenwood Press, Westport, Connecticut, 353 pp.

Spence, R. and E. So 2021. *Why Do Buildings Collapse in Earthquakes?* Wiley, Chichester, UK, 304 pp.

Symons, G.J. (ed.) 1888. *The Eruption of Krakatoa and Subsequent Phenomena*. Report of the Krakatoa Committee of the Royal Society, Harrison and Sons, London, 494 pp.

Tafti, M.T. and R. Tomlinson 2015. Best practice post-disaster housing and livelihood recovery interventions: winners and losers. *International Development Planning Review* 37(2): 165-185. DOI: 10.3828/idpr.2015.14

Tait, T. 2021. Editorial comment. *The Week* (25th December 2021): 8.

Thunberg G. 2021. There are still no real climate leaders. Not yet. *The Guardian* (21st October 2021).

UNDRR 2017. *Terminology*. United Nations Office for Disaster Risk Reduction, Geneva, <https://www.undrr.org/terminology>

UNDRR 2020. *Hazard Definition and Classification Review: Technical Report*. United Nations Office for Disaster Risk Reduction, Geneva, 87 pp.

Unigwe, C. 2019. It's not just Greta Thunberg: why are we ignoring the developing world's inspiring activists? *The Guardian* (5th October 2019).

Van Niekerk, D. and B. Wisner 2014. Experiences from Sub-Saharan Africa. In A. Lopez-Carresi, M. Fordham, B. Wisner, I. Kelman and J-C. Gaillard (eds.) *Disaster Management: International Lessons in Risk Reduction, Response and Recovery*. Earthscan, London: 213-228.

Vivenzio, G. 1788. *Istoria de' tremuoti avvenuti nella Provincia della Calabria Ulteriore e nella città di Messina nell'anno 1783* (2nd edn). Reale Accademia delle Scienze e Belle Lettere, Stamperia Reale, Naples, 2 vols.

Wakely, P. 2018. *Housing in Developing Cities, Experience and Lessons*. Routledge, Abingdon, UK, 160 pp.

Weichselgartner, J. 2001. Disaster mitigation: the concept of vulnerability revisited. *Disaster Prevention and Management* 10(2): 85-94. DOI: 10.1108/09653560110388609

Weiwei, A. 2022. Interview with the artist Ai Weiwei. *The Observer* (6th February 2022): 7.

White, G.F. 1945. *Human Adjustment to Floods: A Geographical Approach to the Flood Problem in the United States*. Research Paper no. 29. Department of Geography, University of Chicago, 225 pp.

White, G.F. (ed.) 1974. *Natural Hazards: Local, National, Global*. Oxford University Press, New York, 288 pp.

Wilkinson, E., E. Lovell, S. Patel, J. Twigg, A. Kirbyshire, K. Peters, L. Weingärtner and V. Le Masson 2017. *Delivering Disaster Risk Reduction by 2030: Pathways to Progress*. Overseas Development Institute, London, 41 pp.

Wisner, B., P. Blaikie, T. Cannon and I. Davis 2004. *At Risk, Natural Hazards. People's Vulnerability and Disasters* (2nd edition). Routledge, Abingdon, UK, 496 pp.

Wisner, B., I. Kelman and J-C. Gaillard (eds) 2012. *The Routledge Handbook of Hazards and Disaster Risk Reduction*. Routledge, Abingdon, UK, 876 pp.

Wisner, B., J-C. Gaillard and I. Kelman(eds) 2015. *Disaster Risk. Critical Concepts in the Environment*. Routledge, Abingdon, UK, 1778 pp.



## Contributors

**Professor David Alexander** *(Italy and UK)*

Institute for Risk and Disaster Reduction  
University College London  
Vice-President of the Institute of Civil Protection and Emergency Management  
London, UK

**Professor Sudha Arlikatti** *(USA and India)*

Professor, Amrita School for Sustainable Development  
Amritapuri Campus, Kollam, Kerala State, India  
Architectural and planning consultant in India and Oman for 14 years before moving into academia

**Dr Yasemin Aysan** *(Turkey)*

Independent Consultant  
Istanbul, Turkey  
Formerly Senior Advisor, UNDP Bureau for Crisis Prevention and Reduction  
and Undersecretary-General for Disaster Response and Recovery, IFRC

**Professor Sultan Baraket** *(Qatar)*

Founder and Director: Centre for Conflict and Humanitarian Studies (CHS), Doha  
Professor at the Doha Institute for Graduate Studies, Doha  
Honorary Professor at the University of York, UK where he was the Founder and Director of the Post-war Reconstruction and Development Unit (PRDU).

**Steve Bender** *(USA)*

Tilghman's Island, Maryland, USA  
Retired Division Chief, Organization of American States (OAS)  
International Consultant on Disaster Risk Management

**Dr Mihir Bhatt** *(India)*

Director, All India Disaster Mitigation Institute (AIDMI).  
Ahmedabad, India

**Professor Emeritus Ian Burton** *(Canada)*

Department of Geography  
University of Toronto  
Toronto, Canada

*(Laureate, jointly with Neil Adger and Karen O'Brian, 2021 'Frontiers of Knowledge Award' from the Banco Bilbao Vizcaya (Fundación BBVA) for their 'Contribution to Social Adaptation to Climate Change')*

**Terry Cannon** *(UK)*

Development Studies specialist  
Institute of Development Studies  
University of Sussex, Brighton, UK

**Professor Omar-Dario Cardona** *(Colombia)*

Institute of Environment Studies  
National University of Colombia (Manizales) and  
CEO of INGENIAR: Risk Intelligence Ltd. (Bogota).  
Bogota, Colombia  
*(Laureate: 2004 UN Sasakawa Award)*

**Professor Ian Davis** *(UK)*

Adjunct Professor and Advisor to Amrita Vishwa Vidyapeetham University, Kerala,  
India  
Visiting Professor: Kyoto, Lund, Oxford Brookes Universities and  
Honorary Visiting Professor, Royal Melbourne Institute of Technology (RMIT) in  
Europe  
Oxford, UK  
*(Laureate: 1996 UN Sasakawa Award)*

**Professor Amod Mani Dixit** *(Nepal)*

Chair, College Management Committee  
Universal Engineering and Science College (UESC)  
President, National Society for Earthquake Technology - Nepal (NSET)  
Kathmandu, Nepal

**Professor David Etkin** *(Canada)*

School of Administrative Studies  
York University  
Toronto, Canada

**Bill Flinn** *(UK)*

Senior Shelter Advisor  
CARE International, UK  
London, UK

**Dr Maureen Fordham** *(UK)*

Professor of Gender and Disaster Resilience  
Director, IRDR Centre for Gender and Disaster  
University College London  
London, UK

**Dr Bruno Haghebaert** *(Belgium)*

Disaster Risk Reduction and Climate Change Adaptation Specialist  
Formerly Lead in IFRC in DRR and Vulnerability  
Ghent, Belgium

**Dr Nick Isbister** *(UK)*

Executive Coach  
The Listening Partnership  
Oxford, UK

**Dr Mikio Ishiwatari** (*Japan*)

Visiting Professor, The University of Tokyo  
Senior Advisor in Disaster Management and Water Resources Management  
Japan International Cooperation Agency (JICA)  
Tokyo, Japan

**Professor Yasamin O. Izadkhah** (*Iran*)

Associate Professor, Risk Management Research Center  
International Institute of Earthquake Engineering and Seismology (IIEES)  
Director of Public and International Relations Office  
Tehran, Iran

**Rumana Kabir** (*UK and Bangladesh*)

Civil Servant, UK Government  
Specialist in Public Policy, Housing and Disaster Risk Management  
Guest lecturer at various universities (UK, Spain, Bangladesh).  
Bracknell, UK

**Professor Ilan Kelman** (*UK and Norway*)

Institute for Risk and Disaster Reduction and Institute for Global Health  
University College London, UK  
University of Agder, Norway

**Dr Fred Krimgold** (*USA*)

President Health and Safety Initiative  
Washington, DC, USA

**Dr Titus Kuuyuor** (*Ghana*)

Programme Manager  
Zimbabwe Resilience Building Fund  
United Nations Development Programme, Zimbabwe  
Harare, Zimbabwe

**Dr Allan Lavell** (*Costa Rica*)

Founding member, Social Studies Network in Disaster Prevention in Latin America  
Coordinator, Research Program on Risk and Disasters  
General Secretariat, Latin American Faculty of Social Sciences (FLACSO)  
San José, Costa Rica  
(*Laureate: 2015 UN Sasakawa Award*)

**Andrew Maskrey** (*Costa Rica and Spain*)

Coalition for Disaster Resilient Infrastructure (CDRI)  
Formerly Coordinator of the Global Assessment Report on Disaster Risk Reduction (GAR) at UNDRR and Chief of the Disaster Reduction and Recovery Unit at UNDP  
Founder, Centre for Disaster Prevention and Studies (PREDES), Peru and the Network for Social Studies on Disaster Prevention in Latin America (La Red).  
San Pedro de Turrubares, Costa Rica and Malaga, Spain

**Vinod Menon** *(India)*

Founder Member, National Disaster Management Authority  
Government of India with the status of a Union Minister of State  
in the Government of India from 2005 to 2010  
Delhi, India

**Babar Khan Mumtaz** *(Pakistan)*

Housing and Urban Development Planner  
Former Director of the Development Planning Unit (DPU)  
University College London (UCL)  
Lahore, Pakistan

**David Peppiatt** *(UK)*

Director of Humanitarian Assistance  
British Red Cross  
Formerly Director ProVention Consortium  
London, UK  
*(Awarded the 'Order of the British Empire' (OBE) in 2022 for his 25 years of service to the Red Cross)*

**Dr Anshu Sharma** *(India)*

Co-Founder of Sustainable Environment and Ecological Development Society  
Consultant in Urban Planning and Disaster Risk and Recovery Management  
Delhi, India

**Professor Vinod Sharma** *(India)*

Senior Professor, Disaster Management  
Indian Institute of Public Administration  
Vice Chairman, Sikkim State Disaster Management Authority  
Delhi, India  
*(Awarded the 2022 'Subhas Chandra Bose Aapda Prabandham Paraskar' for his services to Disaster Management in the State of Sikkim and India)*

**Professor Rajib Shaw** *(Japan)*

Graduate School of Media and Governance in Keio University, Japan  
Senior Fellow of Institute of Global Environmental Strategies (IGES), Japan  
Chairperson of SEEDS Asia and CWS Japan  
Yokohama, Japan

**Robin Spence** *(UK)*

Emeritus Professor of Architectural Engineering  
Department of Architecture  
University of Cambridge  
Director and Past Chairman of Cambridge Architectural Research Ltd  
Cambridge, UK

**Maggie Stephenson** *(Ireland)*

Former Recovery Technical Advisor for UN HABITAT  
Dublin, Ireland

**Dr John Twigg** *(UK)*

Senior Research Associate  
University College London  
London, UK

**Dr Paul Venton** *(USA)*

International Development Consultant  
Disasters, Climate Change and Environment  
Dover, Mass., USA

**Professor Patrick Wakely** *(UK)*

Professor Emeritus of Urban Development  
University of London  
Former Director Development Planning Unit (DPU)  
University College London (UCL)  
London, UK

**Gustavo Wilches Chaux** *(Colombia)*

International Disaster Risk Management Consultant  
Professor Universidad Externado de Colombia  
Bogota, Colombia

**Zenaida Willison** *(Philippines)*

Independent Consultant  
Adviser, Centre for Disaster Preparedness, Philippines  
Vice Chair, Global Network of Civil Society Organization for Disaster Reduction  
Board Member, Adventist Development and Relief Agency- International and Asia  
Batangas, Philippines

**Professor Ben Wisner** *(USA and UK)*

Honorary Visiting Professor, Institute for Risk and Disaster Reduction  
University College London, (UCL)  
Affiliate Scholar, Environmental Studies Program, Oberlin College  
Oberlin, Ohio, USA

Web: [www.ucl.ac.uk/risk-disaster-reduction/](http://www.ucl.ac.uk/risk-disaster-reduction/)

Phone: +44 (0)20 3108 1101

Email: [irdr\\_enquiries@ucl.ac.uk](mailto:irdr_enquiries@ucl.ac.uk)

## IRDR Report 2022-1

UCL Institute for Risk and Disaster Reduction  
University College London  
Gower Street, London WC1E 6BT  
United kingdom

Location: Bloomsbury Campus, South Wing (2nd floor)



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