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THE CULTURAL DIMENSION OF DISASTER RISK REDUCTION

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Introduction

If those exposed to the risk of disaster lack awareness of the risk and how it affects them, it is hard to see how risk reduction can occur. Government needs to support education and awareness raising, but their expertise and power is not a substitute for community knowledge and action. The UNISDR (2011) defines public awareness as *"The process of informing the general population, increasing levels of consciousness about risks and how people can act to reduce their exposure to hazards".* While responsibility for implementing the HFA lies with national governments and regional and international organizations, it is often through the actions of informed and empowered citizens that disaster risk is reduced (Wisner, 2006). Empirical research has shown that local communities save the most lives following a disaster. Globally, generally, no more than 10 per cent of survival in emergencies can be attributed to external sources of relief aid (Gilbert, 1998; Bankoff et al., 2004).

This argues strongly for a community based approach to disaster risk reduction and disaster management. The importance of community awareness, knowledge and action is well stated in the Hyogo Framework for Action, and was a fundamental part of the 1990s International Decade for Natural Disaster Reduction and now the ISDR and its collaborating organisations. Recognizing its importance, those involved in the field have long worked to achieve local risk awareness and reduction. Despite this effort, progress is uncertain as one issue that characterizes the field is the difficulty in measuring success.

Increasing mobility, and the prospect of near universal connectivity between people and places, pose increasing challenges as people live, work and visit far from locations they are familiar with, and maintain strong and often day to day connections with those far away. However, the rise in global connectivity and the associated social media offer new and exciting opportunities for learning.

This paper provides an overview of the current state of public education at a global level, points to where it is heading and identifies opportunities for improvement. There are always incremental improvements to be made, but it is major change that offers the possibility of globally significant risk reduction.

Chapter brief and objectives

Informing the general population about disaster risk is addressed in Priority 3, Indicator 4 of the Hyogo Framework for Action:

3 (iv) Countrywide public awareness strategy exists to stimulate a culture of disaster resilience, with outreach to urban and rural communities

As specified by the HFA monitoring and review process (UNISDR, 2011) the key question for the above indicator is "Do public education campaigns for risk-prone communities and local authorities include disaster risk?" There are also three means of verification by which this

question is assessed: 1) Public education campaigns for enhanced awareness of risk; 2) Training of local government; 3) Availability of information on DRR practices at the community level.

With a focus on this indicator and the associated means of verification,this chapter seeks to fulfil the following four key objectives:

1. Identify what changes have been observed since the adoption of the HFA in 2005, and what has been the impact in terms of risk to society;
2. Establish the degree to which has this been facilitated by the HFA or other emerging issues in effective disaster risk management;
3. Determine if the change was adequately captured by the indicator in its current form and if not propose an alternative impact indicator;
4. Identify what elements will need to be developed for inclusion in the successor framework to the HFA:

Public education campaigns for enhanced awareness of risk

Globally, there are four major ways in which the public is being educating about disaster risk: 1) media campaigns; 2) participatory learning; 3) formal school-based interventions; and 4) informal education (IFRC, 2011). The following sections review the grey and white literature relating to each of these approaches and discuss the extent to which they have been employed in public awareness strategies at both national and local levels. Please note that formal school-based interventions are not analysed in detail here as are being addressed in detail in the background paper for Priority 4 *Indicator 3 (Promote the inclusion of disaster risk reduction knowledge in relevant sections of school curricula at all levels and the use of other formal and informal channels to reach youth and children with information" (UNISDR, 2005).*

Media campaigns

The focus of media campaigns is to provide uniform, large-scale impact with standard messages for risk reduction (IFRC, 2011). An analysis of the HFA National Progress Monitoring reports reveals that media campaigns are by far the most common approach to raising public awareness, at both the national and local level (PreventionWeb, 2014).

Traditional Media: Print, radio and television

The HFA progress monitoring reports indicate that the primary channel through which governments have sought to increase public knowledge and awareness of disaster risk is through the use traditional print and broadcast media, such as brochures, posters, newspaper supplements and public service announcements on radio and television (PreventionWeb, 2014). However, the effectiveness of this top-down approach to information dissemination has garnered very little empirical support (Solberg, 2010). In New Zealand, for example, an empirical evaluation conducted by the Earthquake Commission (2011) found that despite many media campaigns being run over the past decade, over half of the population have not done anything to prepare for earthquakes. Academic research confirms that while disseminating messages through traditional media channels may increase knowledge and awareness, the extent to which it leads to measurable changes in behaviour is limited (Becker et. al, 2013; Paton, 2003; Kim & Chang, 2010; Scolobig et al., 2012:

Solberg, 2010). In an early review of published research, Sims and Bauman (1983, p.184) concluded that "the available evidence is weak on the relationship between awareness or knowledge and the consequent adoption of damage mitigation measures". In a more recent review, focussed largely on seismic hazard research, Solberg and colleagues (2010, p.1668) came to a similar conclusion, stating that "It seems from existing studies that risk perception is only weakly related to seismic adjustment".

Most recently, in a major study of earthquake preparedness in New Zealand (Becker et al., 2013) found that messages disseminated through traditional media channels information raised awareness, but awareness alone was unlikely to motivate people into action, which was part of a much more complicated process involving a wide range of cognitive, behavioural, affective, and social processes. Through in-depth qualitative interviews, it was found that moving people from awareness to action required other forms of information delivery, specifically those that involved some kind of social interaction or experiential learning, a finding which fits with various models of behaviour change, including Lindell and Perry's (1992, 2000, 2011) Protective Action Decision Model, Paton's (2003) socio-cognitive model of disaster preparedness, and Bandura's (1986) social cognitive theory. Based on these findings, Becker et al. (2013) concluded that traditional media campaigns involving dissemination of information should be combined with other approaches that enable social interaction and experiential learning, such as community meetings, online forums or emergency preparedness drills.

Traditional media campaigns have other limitations. They are often characterised by top-down approaches to DRR with messages being designed to appeal to the broadest possible segment of the population. When combined with the need to keep messages simple and straightforward, this limits the extent to which information and advice can be tailored to meet the needs specific audiences and, as a result, messages may be misunderstood or ignored by particular segments of the population (Paton, 2003, 2008, 2010). Another limitation of traditional media campaigns relates to the tendency to focus on hazard characteristics and preparedness. A core recommendation emerging from the GNDR's (2013) participatory monitoring of the implementation of the Hyogo framework was that media campaigns should also include information rights and entitlements, duties and responsibilities, and policies and practices of state and non-state actors. By applying a rights-based approach, people can be empowered to think more critically about the information and advice they receive, particularly in terms of the structural inequalities and power imbalances between social, economic and demographic groups that underpin differential vulnerability (Cutter, 2012; Birkmann et al., 2013).

While, the dissemination of risk messages though traditional media has its limitations, it is worth emphasising the important role of community radio in increasing awareness. Community radio offers some key benefits over other media, particularly in rural areas in many parts of Africa and Asia (Myers, 2008; Harvey, 2011). Radio is communicated orally, using local language, and at relatively low cost – meaning that it is accessible to people who cannot access other media (Myers, 2008). Radio is frequently paired with other communication tools such as mobile phones for call-in shows, or face to face listening groups which enhance uptake of the information being shared, and creates a platform for two-way exchanges and informal learning between a wide range of actors (Myers, 2008; Harvey,

2011). Use of radio for dialogue need not be restricted to the community level as it can be used to share knowledge between communities and link with national broadcasters to engage stakeholders country-wide (Myers, 2008; Harvey, 2011).

New media: Internet and mobile technology

In both rich and poor countries, people are connecting through technology at an accelerating pace (UNOCHA, 2013). In 2011, more than 2.3 billion people were using the Internet: 70% of those were living in developed countries; 24% were living in developing countries; and 6% were living in least developed countries (UNOCHA, 2013). However, all the signs are that as costs fall and coverage increases, usage will increase rapidly in rural areas and among poorer people (Meier, 2013; UNOCHA, 2013; Hardman, 2013. It is predicted that by 2015, the number of users in developing and least developed countries is expected to rise to 50% and 15% respectively (UNOCHA, 2013). Mobile phones ownership and usage is also rapidly increasing. In 2011, in 105 countries, there were more mobile phone subscriptions than people and the number of total subscriptions was reaching almost 6 billion (about 86% of the world's population) (UNOCHA, 2013). As costs fall and coverage increases, all indicators suggest that usage will continue to increase rapidly in rural areas and among poorer people. Africa is a region of major growth: there are now 735 Million mobile phone subscriptions, which is roughly equal to 70% of the population (UNOCHA, 2013).

While the adoption, use and choice of technology depends on many factors - including affordability, availability, literacy, gender, age, status, physical abilities, cultural preferences, political environment, and the media/IT/telecoms network and infrastructure - mobile and internet devices and platforms technology are transforming the way that data is generated, collected and shared (UN-OCHA, 2013; Hardman, 2013; Meier, 2013). There has been a rapid expansion of digital social networks, especially in middle-income countries: the Philippines has over 14 million active social network users, Malaysia has 11 million and China over 150 million (Duggan & Smith, 2014). Facebook is by far the most popular social media site over 800 million users worldwide and Twitter is the second largest with over 220 million users worldwide, then LinkedIn (100 million) and MySpace (80 million) (eMarketer, 2013; see Dufty input paper). Through social media, people are able to connect with each other faster and more easily than ever before and this is changing the balance of power, participation and accountability in social, political and economic systems (Hardman, 2013).

This rapid rise in mobile and internet usage has resulted in increased usage of digital communications across the disaster cycle. National emergency management agencies have developed web-sites, set up social media accounts (e.g. Twitter, Facebook) and are using these as platforms to disseminate warnings and communicate with the public on broader issues of disaster preparedness and response (e.g. FEMA). Some agencies are also leveraging features of mobile network systems to broadcast early warning alerts (EWA) to all mobile phone users within affected areas (Olaffson, 2013; Handmer & Ratajczak-Juszko, 2011). The FEMA (FEMA) Integrated Public Warning and Alert System (IPAWS) program sends EWAs for all extreme weather events, as well as other threatening emergencies (FEMA, 2013). The Australian Government Emergency Alert system sends voice messages to landlines and text messages to mobile phones within a defined area about likely or actual emergencies (Australian Government, 2013). A systematic review of the Australian system

(Handmer & Ratajczak-Juszko, 2011) found strong public support for the use of mobile phones as a delivery mode and the great majority of those surveyed said that the system fully met or exceeded their expectations.

NGOs have also been developing EWA systems in lower income countries. The IFRC has partnered with Trilogy International Partners to develop the Trilogy Emergency Relief Application (TERA) which has been used to send emergency alerts to mobile phones in Haiti and Sierra Leone (Olaffson, 2013). The TERA system provides emergency alerts as well as simple, practical information on disaster preparedness, response and recovery. In evaluations of the TERA system in Haiti (Chazaly, 2011), more than 60 per cent of respondents reported that they had received an SMS from the Red Cross Red Crescent. Of these, 86 per cent said the information was useful, 72 per cent said they shared SMS with others and 56 per cent reported taking action after receiving an SMS. Respondents also provided positive feedback on the timeliness, simplicity and practicality of messages. Critical to the effectiveness of the TERA system, in both Haiti and Sierra Leone are the partnerships with mobile operators who provide the platform free of charge, which ensures that the delivery of messages is not impeded by budget constraints (Meier, 2013).

In the realm of preparedness, internet and mobile technology has been utilised as an additional channel through which to disseminate brochures, publications and audio visual material, particularly in higher income countries where internet access and usage has proliferated. For example, the United States Federal Emergency Management Agency's (FEMA) web-based Ready campaign (FEMA, 2014) provides extensive advice on how to plan and prepare for various hazards, including wildfire, tornado, heat wave, and volcanic eruption. Similarly, Canada's "72 hours: Is your family prepared" provides information on how to make an emergency plan and prepare an emergency kit (Government of Canada, 2014). Other examples of National level web-based campaigns include the American Red Cross 'Be Red Cross Ready' Campaign (ARC, 2009), Surf Life Saving Australia's 'Tsunami: The Ultimate Guide' (Australian Tsunami Advisory Group, 2014) and the United States Centre for Disease Control and Prevention's 'Emergency Preparedness and Response' website (CDC, 2014). It is important to note, however, that because these web-based campaigns adopt the same top-down approach as the more traditional media campaigns, they tend to be subject to same limitations (see Dufty input paper).

> Using social media for public awareness: In late 2012, the Philippines government launched ICOMMIT, a social media campaign aimed at encouraging the public to help in reducing the risks posed by disasters. The campaign seeks to raise awareness and encourage action through sharing of views on how people can build safer communities. Partners in the campaign include Oxfam, Action Against Hunger, CARE Nederland, Plan International, Christian Aid, Handicap International, Coalition of Services of the Elderly and the European Commission. Internet users can support the campaign by stating what they intend to do to reduce disaster risks and promote awareness in high risk communities. Using social media platforms like Facebook, Twitter, Youtube, Instagram or Tumblr, users can make a commitment by writing: 'I commit to…' and then stating their pledge. The campaign also advocates the participation of persons with disabilities and other vulnerable sectors in the crafting of policies. (Source: Romero, 2012).

Mobile and internet technology has also provided increased opportunities for citizens to engage with others on the topic of DRR. In addition to providing information about how to plan and prepare for various hazards, FEMA's (US Federal Emergency Management Agency) Ready website provides access to the National Preparedness Community where citizens can interact with each other and emergency service personnel (FEMA, 2014). Citizens can join communities of practice to connect with peers to share best practices, develop preparedness plans, and help each other prepare more efficiently and effectively. Theoretically, by providing a space within which community members can share knowledge, experiences and resources, the National Preparedness Community increases opportunities for social interaction and experiential learning, thereby increasing the likelihood that people will be motivated to act (Becker et al., 2013; Lindell & Perry, 2012; Paton, 2003, 2008, 2010). Although the impact of interactive components for web-based campaigns has yet to be formally evaluated, membership of the National Preparedness Community has increased from 9,000 in 2011 to just over 42,000 in 2014 suggesting that large numbers of people are seeking to proactively engage in online discussions (FEMA, 2014).

Perhaps the most exciting use of mobile and internet technology has been the innovation of 'crowdsourcing'. Crowdsourcing is the process of "obtaining needed services, ideas, or content (e.g. data) by soliciting contributions from a large group of people, and especially from an online community, rather than from traditional employees or suppliers" (Vinck, 2013). Crowdsourcing originated in the aftermath of Kenya's disputed 2007 presidential election when, a non-profit software company, *Ushahidi*, created a website that collected eyewitness reports of violence reported by email and text message and placed them on a Google Map (Ushahidi, 2014). It was first applied to the disaster context in the immediate aftermath of the Haiti earthquake in 2010 (Meier, 2013). Despite extensive damage and destruction to the built environment, most cell-towers remained intact, so *Mission 4636* set up an initiative that allowed anyone within Haiti to send a free text message about their situation on the ground to the number '4636' (Munro, 2012). The messages were then translated, categorized and mapped by Krey`ol and French-speaking volunteers worldwide via online crowdsourcing platforms (Munro, 2012). 80,000 messages were processed and 45,000 relevant unique structured reports were streamed back to responders on the ground (Munro, 2012). In parallel, volunteers from Tufts University launched a live 'crisis map' that they populated with information from social media, mainstream media and text messages (Meier, 2013); and volunteers from the Humanitarian OpenStreetMap community used satellite imagery to create the most detailed street map of Haiti ever made (Meier, 20013). The administrator of FEMA described these efforts as producing the most comprehensive and up-to-date maps available to the humanitarian community (Meier, 2013).

Since the Haiti earthquake, large-scale crowdsourcing has been deployed with increasing frequency: *Pakreport* was established by Pakistani citizens following the floods in 2010 that left millions homeless: *Sinsai* was established by Japanese citizens after the earthquake and subsequent tsunami and nuclear reactor crises: *Christchurch Recovery Map* was established by New Zealand citizens following the earthquake in Christchurch: *Alabama Recovery Map* and *Oil Spill Crisis Map* were established by citizens from the United States following the tornadoes and BP oil-spill: *Libya Crisis Map* was established by UNOCHA during the civil unrest in the country; *Crisis Map for Hurricane Sandy* was established by Google and at the request of FEMA, OpenStreetMap added a crowdsourced layer (Munro, 2012). Essential to all of these mapping projects has been the contribution of 'digital humanitarians' - volunteers who offer their services in response to crisis to gather and analyse crisis data from all sources and present it in usable format (Hardman, 2013).

Crowdsourcing is also being used to gather baseline risk data. For communities in disaster-prone low- and middle-income countries gathering baseline data is often very difficult because human resources and budgets often don't allow for in-depth data collection at the local level. In an attempt to overcome these constraints, Humanitarian OpenStreetMap, has been training Indonesian students and volunteers to use digital technology to capture and share information about buildings and building types in earthquake-prone areas (IRIN, 2013); see Dufty input paper). In partnership with the Indonesia-Australia Facility for Disaster Reduction, the Global Facility for Disaster Reduction and Recovery, the Australian Community Development and Civil Society Strengthening Scheme and Indonesia's National Agency for Disaster Management, students and volunteers have been trained to map individual buildings with specific attributes and these data are then made publicly available online to help decision-makers and the public to better understand the impact a strong earthquake can have on the built environment (Olaffson, 2013). Sharing the data and creating open systems also promotes transparency and accountability, and ensures a wide range of actors are able to participate in the challenge of disaster risk reduction (Olaffson, 2013).

While mobile and internet technology is transforming the way Governments, NGOs and the public share information before during and after disasters, experts warn that it should be used alongside rather than replace traditional media (IFRC, 2013). The digital divide means that many members of the public do not have access to mobile and internet technology: computer literacy and general literacy issues may further restrict users' ability to read text messages or on-screen instructions; in the event of a disaster, mobile infrastructure is often damaged or networks become overloaded, leaving people unconnected for extended periods of time; and while user driven data can be highly informative and relevant, there is always the potential for rumours to spread through social media networks and too much information to create confusion (IFRC, 2013). When designing public information programmes, it is critical that governments and NGOs carefully consider the needs of the community in question and ensure that all community members have access to information in a form that is accessible and meaningful to them.

Participatory approaches

The key participatory approach to public education for enhanced awareness of risk falls under the banner of community-based disaster risk reduction which can be broadly defined as

> *"a process of disaster risk management in which at risk communities are actively engaged in the identification, analysis, treatment, monitoring and evaluation of disaster risks in order to reduce their vulnerabilities and enhance their capacities." (Abarquez & Murshed, 2004, p.9).*

Underpinning CBDRR is the well-accepted notion that hazards and disasters are constructed in the patterns and structures of everyday life and therefore the theory and practice of DRR must be informed by the local knowledge and lived experience of local people (Abarquez & Murshed, 2004; Hewitt, 1997; Maskrey, 1989; Wisner et al., 2004; Twigg, 2004). More specifically, patterns of vulnerability and capacity are context specific and local in character, which privileges the knowledge and experience of local people (Chambers, 2008; Haghebaert, 2007; Twigg, 2004; Maskrey, 1989; Abarquez & Murshed, 2004).

Since emerging as key approach to increasing public awareness and action in the late 1980's, CBDRR has predominantly been facilitated at the community level by NGOs and UN agencies (van Alst, Cannon & Burton, 2008). More recently, however, efforts have been undertaken to mobilise government support for the integration of CBDRR into National level policy, planning and programming (Kafle & Murshed, 2006; Zwi et al., 2013; RCC, 2010; Shaw, 2012). The impetus for this increased focus on CBDRR in National policies and plans can very likely be attributed to the Hyogo Framework which states: "Both communities and local authorities should be empowered to manage and reduce disaster risk by having access to the necessary information, resources and authority to implement actions for disaster risk reduction' (UNISDR, 2005).

> In Bangladesh, the National Plan for Disaster Management (2007-2015) developed by the Ministry of Food and Disaster Management recognizes community empowerment, which is operationalized by CBDRR, as one of the six key result areas with the following elements: capacity building of local disaster management committees; development of community based early warning system; community risk assessment at union level; development of risk reduction action plan at union level; development of contingency plan at union level; bottom up mainstreaming of risk reduction action plans into local development plans; and local DRR funding mechanism for implementation of community risk reduction actions (RCC, 2010).

More recently, the UN General Assembly explicitly endorsed CBDRR when it stressed the need "to build and strengthen coping capacities through…the promotion of community participation and ownership through community-based disaster risk management approaches" (UN, 2009). The value of CBDRR was also highlighted in discussions at the 2013 UNISDR Global Platform Consultations where participants continually emphasized the central

importance of focusing on local communities and of involving them in disaster risk reduction planning and implementation. (UNISDR, 2013). The Global Network of Civil Society Organisations for Disaster Reduction which conducts a participatory monitoring system for implementation of the HFA at the local level has also made explicit recommendations for increased public participation in DRM a core recommendation for the post-2015 DRR framework (GNDR, 2015). Taken together, these high profile policy positions and recommendations have raised the profile of CBDRR and opened space for views and data generated through participatory approaches to feed into national policy (Pelling, 2007).

The value of CBDRR for building resilience has also been firmly established by research. Studies have highlighted its value for increasing risk awareness and mobilising local people to become actively involved in the planning and implementation of solutions (Tran et al., 2009; Cadag & Gaillard, 2012; Mercer et al., 2010; Delica-Wilson, 2004; Maceda et al, 2009; Shaw, 2012). The participatory assessment methodologies inherent to CBDRR have been found to yield reliable primary data for understanding the risk profile of communities (Holloway et al., 2008; Pelling & Wisner, 2007; Wisner, 2006). Moreover, risk reduction measures implemented as a result of CBDRR are often more sustainable than those resulting from top-down directives (Zwi et al., 2013; Shaw, 2012). CBRR is also able to reach the most vulnerable groups in a community and ensure that their needs are met in the planning and implementation of risk reduction strategies (Shaw, 2012). Perhaps most importantly, however, CBDRR often more effectively addresses underlying risk factors and drivers of disaster vulnerability (Zwi et al., 2013; Shaw, 2012).

While there is strong support for CBDRR's effectiveness and it is being incorporated into National policies and plans, implementing it on a broad scale will present numerous challenges. First it is resource intensive: as it is currently practised, it requires outside facilitators who spend considerable time with the community. Reaching a sizeable number of communities, particularly those in remote or rural areas, is a human resources challenge (van Alst, Cannon & Burton, 2008). Second, with large scale implementation the practice of CBDRR will move away from its empowerment origins with participation being interpreted in instrumental terms as a mechanism for reducing financial costs or prolonging the sustainability of projects (Pelling, 2007; Haijmans, 2009). The challenge going forward is to systematise approaches, design for scale and implement in a manner in which quality can be balanced with cost effectiveness: however, few mechanisms for up-scaling have been proposed.

The key to leveraging the substantial benefits of CBCRR requires that the international community work together to develop and validate frameworks that can be readily implemented at the grassroots, particularly in communities where existing resources are limited. The UNDP's Community-Based Adaptation Programme (UNDP, 2014) provides a useful framework through which this could be achieved. The programme draws on several key capacity building mechanisms including public private partnerships between local government, the private sector, civil society groups, community-based organisations and NGOs; volunteerism, social protection programmes and small grant schemes; peer-learning and train-the trainer-initiatives; and the development of flexible tools and guidelines for technical assistance; and alignment with other issues such as climate change adaptation and sustainable development (Onestini, 2013).

Informal education

Social learning

Drawing on a variety of social learning literature, Schusler et al. (2003, p. 311) define social learning as "learning that occurs when people engage one another, sharing diverse perspectives and experiences to develop a common framework of understanding and basis for joint action". It has also been defined as "as a change in understanding that goes beyond the individual and spreads throughout communities or groups through social interactions between people (Reed et al., 2010). At its best, it can create a deep change in understanding with people taking greater responsibility for their own development and altering their assumptions about what can be achieved (Cundill et al., 2014). This change in understanding can then drive a broader agenda toward social change that is acceptable to, and valued by the community (Cundill et al., 2014). As Reich (1985) explains social learning "allows people to discover latent public values that they have in common with others, and in the process to create new public values. Together, citizens begin to define targets of voluntary action, to identify what they value most about the community, and to uncover goals and commitments that transcend their narrower self-interests." Importantly, social learning also "improves the quality and wisdom of decisions we take when faced with complexity, uncertainty, conflict and paradox" (Roling & Wagemakers 1998, p.4).

Given its propensity for building shared understanding, creating knowledge that drives social change and improving decision-making for issues characterised by complexity and uncertainty, social learning provides an important vehicle for DRR policy and planning. To date, however, the use of social learning for DRR has been limited by governments and NGOs alike (UNISDR, 2011; Gupta & Lung, 2011). Yet, extensive research on social learning for natural resource management and climate change adaptation provides a strong evidence base for its application to the DRR context (Berkes, 2009; Bouwen & Taillieu, 2004; Brown et al., 2008, Fernandez-Giminez et al., 2008; Keen et al., 2005; Kuper et al., 2009; Muro & Jeffrey, 2009; Schusler et al., 2009; Wals, 2007). In particular, social learning provides a valuable framework for the planning stage of CBDRR, in which community members come together with scientists and public officials to identify effective and sustainable solutions for DRR (Aburquez & Murshed, 2004; Maskrey, 1989; Twigg, 2004).

Cultural and performing arts

Performance and the arts provide a variety of creative opportunities to communicate important and serious messages about DRR in an entertaining and engaging way (IFRC, 2011). In the aftermath of the Haiti earthquake, UNOPS used music, songs and comic theatre to educate internally displaced people on DRR and the prevention and treatment of water-borne diseases. More than 65 theatre presentations took place in around 25 camps, with each show drawing audiences of around 100 to 125 people (UNOPS, 2011). The Armenian National Survey for Seismic Protection working with the Armenian Ministry of Science and Education has developed a programme in which children learn the basics of seismic behaviour and protection techniques through interactive education-play and then perform a play titled "Terra-non-firma" for their parents and friends (Asian Disaster Risk Reduction Centre, 2008). In South-Africa, the Cape Town City Council has engaged the services of The Jungle Theatre Company to develop a play that engages communities in

informal settlements in an interactive and hands-on learning experience (City of Cape Town, 2014).

A particularly effective way of engaging women in both Latin Amercia and Asia has been though DRR themed audio soap operas or 'radio novellas'. 'Better to Prevent than Lament' (in Spanish) has two 25-episode series. 'The Rough Season' (in English) covers recurrent natural hazards in the Caribbean in a 15 episode series (IFRC, 2011).

Several organisations have also facilitated local people to craft their own DRR focussed performances and productions. In Chang Rai, Thailand, Plan Thailand in collaboration with Wandering Moon trained children in the production of puppet shadow theatre which the children then used as a vehicle for communicating information about disaster risk and disaster risk reduction to the wider community. Plan has employed youth-centred participatory video for the same purpose (Haynes et al., 2013). Producing these videos enabled children and young people to research, document and raise awareness of disaster risk, and use screening events to mobilise and advocate for risk reduction measures in their communities which was found to be an effective tool for empowering young people to raise important issues with decision-makers and advocate on behalf of their communities (Haynes, 2013). The participation of local people in the scripting and staging of productions means they are more believable, culturally sensitive and are more likely to incorporate local knowledge and perspectives.

However, the true value of cultural and performing arts in raising awareness and prompting action has not been investigated in a systematic way and research is this area is needed. While there is substantial anecdotal evidence that these approaches engage community and enhance knowledge and awareness, the specific mechanisms through which this occurs have not been empirically tested and the extent to which knowledge gained influences changes in behaviour is often assumed rather than systematically investigated. That said, it has been firmly established that performing and cultural arts provide a powerful mechanism for creating social networks and building a sense of community, both of which are key driving factors in the adoption of individual and collective actions for risk reduction.

Disaster drills and exercises

Drills and simulation exercises are highly effective ways of increasing public and organisational preparedness for emergencies and are being conducted in many cities and schools on a regular basis: the municipality of Quito in Ecuador carries out drills and simulations at the institutional level as well as in communities and schools; in Bhubaneswar, India, drills are held at the city, ward, and community levels and in schools and colleges; and in Cape Town evacuation drills are monitored and supported by the city's disaster risk management staff (Blackburn & Johnson, 2012).

In Save the Children's school safety programmes, children are encouraged to form student disaster management committees who work alongside teachers and local government officials to develop emergency management plans and teach other students about emergency management procedures. While solid evaluation data of these programmes is lacking, there is strong preliminary evidence that involving children as participants in drills and other emergency management planning enhances their learning, increases their self-confidence and provides additional capacity for the emergency response

While drill exercises often terminate at the end of the drill itself, learning can be significantly enhanced by conducting an After-Action-Review (AAR). AARs have their origins n the operational procedures of the U.S. Army (1993) where they are described as "a discussion of an event, focused on performance standards, that enables individuals to discover for themselves what happened, why it happened, and how to sustain strengths and improve on weaknesses". Undertaken correctly, AARs can provide emergency managers with opportunities to gain maximum benefit from every program, activity, or task by providing candid insights into specific strengths and weaknesses from various perspectives (USAID, 2006). Additionally, because AAR participants actively discover what happened and why, they can learn and remember more than they would from more formal critiques or evaluations (USAID, 2006). AARs also allow groups, teams and organisations to build a shared understanding of how a particular action unfolded, peoples' respective roles and responsibilities, and the nature of the constraints and complexities faced, both individually and collectively (Sexton & McConnon, 2003).

The disaster management community regularly uses AARs to evaluate their own performance in the field after a major event (US AID, 2006). However, the application of AARs to the context of community level or school drills has not been explored by empirical research. However, a recent evaluation of a Save the Children DRR programme in the Philippines (Petal & Towers, forthcoming) suggests that child-centred AARs could both help to improve school emergency management plans as well as enhance children's learning of DRR. For example, in one school, it was observed that when children were encouraged to actively critique an earthquake drill that had just been conducted, they identified several problems that they were able to solve through collaborative discussions with other and their teacher. Thus, AARs may provide a valuable mechanism for both social learning and improved emergency management plans. They may also provide pathway to increasing community ownership of risk, which is not only due to personal acceptance of the risk and community cohesion, but also facilitated by a need and desire to improve on a situation [see Barnard input paper]. Also fundamental to increasing community ownership of risk is a commitment from governing bodies to relinquish some control to cohesive communities [see Barnard input paper]. By creating a context whereby community members, children and emergency planners can work collaboratively to identify and solve problems responsible, AARs can further facilitate risk ownership.

A major draw-back of community level drills is that public participation is often low. A major international initiative, originating in California, to increase participation in drills is the "Great Shakeout" campaign for earthquake safety. Drills take place on a particular date every year and provide people living in earthquake prone areas with the opportunity to practice how to be safer during earthquakes: namely, to "Drop, Cover and Hold On." This Shake-out campaign is an excellent example of how simple but lifesaving consensus-based key messages can be disseminated on a broad-scale. Rates of participation are increasing every year and 6.4 million people have registered to participate in the October 2014 drill. Importantly, many of these participants have registered as member of a larger group contingent from government, civil society groups, NGOs, the private sector and schools, which demonstrates the value of engaging with community members through stakeholder groups.

Training of local government

The role of local government in building disaster resilience is hard to overestimate. Local governments are not only first responders to crises and emergencies; they are also responsible for local development plans, building regulations and basic services (Blackburn & Johnson, 2012). Effective disaster risk reduction at the local level demands that local government has the technical capacity and competency to assess risk and implement effective and sustainable solutions ((Blackburn & Johnson, 2012). Education and training for local government is an essential part of ensuring that the requisite capacities and competencies exist. Educating elected officials, local administrators and municipal workers also helps to build political will, local-level leadership and a culture of commitment (Blackburn & Johnson, 2012). Establishing a sustainable and permanent training programme is therefore a vital ingredient in building resilience (Blackburn & Johnson, 2012).

The Hyogo Monitor National Progress reports indicate that 80 out of 100 reporting countries are training local government in DRR: however, the specific mechanisms by which training is being delivered is remains unclear. While several higher income countries have dedicated institutes with a mandate to deliver training to government, most countries lack an institutional basis for training at the local level and it may be that this is constraining capacity for effective risk reduction at the local level. In some countries, the lack of an institutionalised basis might be attributed to a lack of financial and human resources (PreventionWeb, 2014; Blackburn & Johnson, 2012), while in others a centralised government structure might undermine a commitment to capacity building at the local level. Regardless of the underlying reason, if local governments are to facilitate disaster resilience within their communities, some kind a formalised mechanism for ongoing training is required.

The literature provides several mechanisms through which ongoing training of local government could be achieved,of which have already been already been applied in the DRR sector: peer-assists (Serrat, 2010; USAID, 2006; Bennet & Jessani, 2011) have enabled local authorities to learn from their counterparts in other jurisdictions who have faced the same issues (Blackburn & Johnson, 2012); communities of practice (Wenger et al. 2002) have brought together local pockets of expertise and isolated professionals to provide a forum for leveraging, standardising, and institutionalising good practice models (FEMA, 2014); online repositories, portals and databases have been used to disseminate publications, tool kits, manuals, and other documents (GDN, 2014; PreventionWeb, 2014); conferences have acted as important mechanisms for establishing and maintaining personal networks within and between organisations; and trainings have been delivered both online and face-to-face for build technical knowledge in a wide variety of areas (e.g. the World Bank e-institute, FEMA training academyImportantly, many of these mechanisms can be implemented or accessed at a relatively low cost which makes them valuable options for lower income countries where specific funding mechanisms for DRR training at the local level are limited.

> In India, the National Institute of Disaster Management (NIDM), constituted under the Disaster Management Act 2005, has national responsibility for human resource development, capacity building, training, and policy advocacy in the field of disaster risk management. Under this mandate the Institute is delivering Online Courses on a variety of disaster management (NIDM, 2014). Developed in collaboration with the World Bank in Washington, courses include a basic course comprehensive disaster risk management, as well as specialised courses on CBDRR, climate change and disaster risk, earthquake risk management, safer cities, and gendered aspects of disaster recovery and reconstruction. It has also has published a numerous training manuals that are available online, including a step-by-step guide to the development of village disaster management plans (Walia & Guleria, 2012), a Training of Trainers (ToT) module on flood risk mitigation and management (Kaushik, 2012); urban risk mitigation (NIDM, 2013); and a ToT manual on psychosocial care in disasters (Satapathy, 2009).

Availability of information on DRR at the community level

If communities are to effectively participate in local-level decision making and planning, they must have access to information that is customized to the unique goals and needs of the community. However, as indicated by HFA Monitor National Progress Reports for 2013 this indicator is lagging and as a result communities either lack access to locally relevant information risk or it is not available in a form that is meaningful to them (PreventionWeb, 2014). According to HFA monitor reports, one of the main reasons for the lack of information at the local level is a lack of funding for DRR at the local government level. It has been

suggested that a decentralised government structure is more conducive to the funding of local level awareness initiatives and DRR activity more broadly (Blackburn & Johnson, 2012). Thus, legislating for local control of DRR budgets may provide a solution to this problem.

Another way of securing the necessary resources for local level awareness raising is through the development of partnerships. In the United States, for example, San Francisco's Neighborhood Empowerment Network (NEN) has developed the Empowered Communities Program (ECP), which brings together government, nonprofit, academic and private sector organisations to collaborate with neighbourhood stakeholders to strengthen their community's resilience to disasters. The program seeks to: create a community wide vision of resilience that is customized to the unique goals and needs of the community; advance of a culture of trust, ownership and cooperation within a community; introduce capacity building organizations that are not identified as tradition disaster preparedness agencies (i.e. Universities); and add value to the current capacity building efforts of traditional emergency preparedness organizations by facilitating the development of a neighborhood action plan with broad stakeholder participation. Initially piloted in one neighbourhood in 2012, the ECP has now been converted into a scalable framework and is being deployed in four other high risk communities across the City.

In the Cebu province of the Phillipines, the municipality of San Francisco has adopted a community-centred engagement approach, which integrates DRR into environmental and social development programmes (Blackburn & Johnson, 2012). Within each Purok (the community group structure below the village-level Barangays consisting of between 40 and 100 households), an elected President who leads a monthly community meeting. The regularity of these meetings ensures on-going community consultation and continuous education about local risks and community activities. The system undergoes regular evaluation to ensure continuous improvement, using indicators developed to measure success. The Purok system has been important in mobilizing and empowering communities by connecting them into a wider model of participatory governance. Another example is provided by the City of Cape Town's upgrading programme which, in line with national policy, seeks to reduce critical risks to infrastructure, particularly in informal settlements (Blacburn & Johnson, 2012). The project involves local government partnering with communities who establish steering committees to identify community assets and challenges. These committees survey an average of 10 per cent of the community and the results feed into a Community Action Plan to improve basic infrastructure, expand roadways to allow access for emergency vehicles, and improve access to water and sanitation. What these examples demonstrate is that the availability of information at the local level has more to do with governance structures and political will than financial and human resources (Blackburn & Johnson, 2012). They also illustrate the value of cross-sector and cross-scale partnerships in building resilience.

It must be acknowledge that the availability of information is often constrained by a lack of technical baseline data on hazards, vulnerabilities and capacities. However, partnerships can build capacity in this area too. As mentioned in the earlier discussion of crowdsourcing, a partnership between the Indonesian Government and OpenStreetMap is building capacity for capturing baseline data by training university students to map to individual buildings with specific attributes relating to seismic risk (Meier, 2013). Several other governments are also

forming partnerships to build capacity for local level risk assessment. In Bhubaneswar in India, where community risk assessment is institutionalised at the ward level, NGO volunteers are being trained in mapping exercises and engineers, architects, planners and masons are being trained to use 'Rapid Visual Screening' to assess seismic risk in the built environment (Blackburn & Johnson, 2012). The key message here is that when governments are under resourced, partnerships, decentralised governance systems and public participation can strengthen capacities to ensure that citizens have access to local-level information about disaster risk and DRR.

One major vehicle through which governments can make information available at the community level is through partnerships with faith-based organisations [see Komino input paper]. A comprehensive demographic study of more than 230 countries and territories conducted by the Pew Research Center's Forum on Religion & Public Life estimates that there are 5.8 billion religiously affiliated adults and children around the globe, representing 84% of the 2010 world population of 6.9 billion (Pew Research, 2012). The importance of faith is also recognized by various UN agencies. As noted by the UNHCR "stitched into the fabric of local communities and well-versed in the nuances of local culture and politics, national FBOs are present before, during and after disasters and conflicts; have the trust of local communities, and operate in areas where governments and humanitarians have little presence or authority" (UNHCR, 2011). Furthermore, UNFPA identifies faith based leaders as "cultural agents of change" indicating that the social and moral capital held by religious leaders and faith-based organizations places them alongside other actors at the local level to implement the standards in international frameworks (UNFPA, 2009).

> In Uganda, the Joint Christian Council drew on decades on community involvement to identify key actors within communities and trained them in DRR awareness raising. The actors then returned to their communities and conducted various awareness activities at the local level. Diakonia in Thailand observes the big role of churches in creating communities' awareness on DRR, because such institutions offer place to gather for vulnerable and poor community members who are often hard to reach by even the local authorities. INHAT, NCA's partner in Thailand, also recognizes that trainings for disaster preparedness and response for young Muslim Association conducted for Muslim youth after Asian Tsunami in 2004 was possible due to its outreach and the acceptance already obtained by the local communities. Source: Komino input paper.

Komino (see input paper) identifies several ways in which FBOs are specially placed to engage in awareness raising at the local level. First, they provide open accessible spaces for community members, including those who are often the most vulnerable to the impacts of disasters. Second, because they operate at the grassroots they have privileged knowledge of

the local conditions and are therefore able to provide information that is both relevant to the needs of the local community and is culturally sensitive. Third, within the communities in which they operate FBOs are often highly respected and trusted as reliable sources of information and knowledge. However, as Komino also notes, it must be recognised FBO are spiritual and religious institutions and cannot be expected to possess the same amount of knowledge or expertise on DRR as specialist NGOs or local government. Thus, to fully capitalize on the unique position that FBOs occupy in their communities, training in the concepts and practice of DRR are essential.

Cross-cutting issues

The literature review identified a wide range of cross-cutting issues that have relevance for both the key question and the three means of verification.

Social inclusion

Within a community, disasters typically magnify inequalities, exacerbating prior social problems (Wisner et al., 2004). Minority groups, the poor and socially marginalised, women, children, elderly, people who are unwell and those with disabilities, are often at higher risk of adverse physical, social and economic impacts during, and following, disaster events (Zwi 2013). Despite this, there is general agreement that nationally formulated DRR policies are not engaging vulnerable and marginalised people as vital and active partners in building disaster-resilient communities (GNDR, 2009; 2011; 2015).

Gender

Women and girls, who account for over half of the 200 million people affected annually by natural disasters, are typically at greater risk from natural hazards than men, particularly in low-income countries (Fothergill & Peek, 2004). Women and girls are disproportionately affected by disasters because of structural inequalities in terms of decision-making authority and leadership opportunities within households and communities (Enarson & Chakrabarti, 2009). For this reason, the HFA explicitly identifies gender as important for each priority action: "A gender perspective should be integrated into all [disaster risk management] policies, plans and decision-making processes, including those related to risk assessment, early warning, information management, and education and training" (UNISDR, 2005).

At the national level, however, there is a clear lack of attention on gender in DRR. Only six out of 62 government statements to the Global Platform for Disaster Reduction explicitly mention the need to be more inclusive of women and out of 40 HFA National Progress Reports for 2013, only 11 countries have conducted gender-disaggregated vulnerability and capacity assessments (Le Masson and Langston, 2014). The *Women's Views from the Frontline* survey (Huairou Commission, 2010) reported that the majority of women are excluded from preparedness and response programmes, have very little knowledge of their rights and entitlements, and feel marginalised from decision-making processes. There is also very little evidence that gender is being incorporated into public awareness strategies. In an another in-depth analysis, Fordham (2012) concludes that far from considering the specific needs and vulnerabilities of women, both government authorities and NGOs focus on gender neutral hazard impacts, assume male headed households, underestimate or overlook men's

and women's different skills, knowledge and capacities, and do not include the perspectives of men *or* women in the design of DRR measures. Thus, a significant gap exists between what is stipulated in the HFA and what is happening on the ground.

In attempt to address this gap, the 'National HFA Monitor Process for 2013–2015' asks government to explicitly report on whether gender concerns inform policy and programme conceptualisation and implementation in a meaningful and appropriate way (UNISDR, 2013). In addition, the 'Local HFA Monitor Process' encourages local governments to assess how much has been done to support the most vulnerable people (particularly women, the elderly, and children) to actively participate in DRR decision-making and planning processes (Le Masson & Langston, 2014; UNISDR, 2013). It further refers to gender in relation to the provision of education programmes and DRR training in schools and communities (Le Masson & Langston, 2014; UNISDR, 2013). Finally, the UNISDR has explicitly identified the promotion of gender sensitive DRR as a strategic focus for its 2014–2015 work programme when it will UNISDR will work with women parliamentarians and grassroots women's organizations to provide guidance on how to integrate gender equality in disaster risk reduction programmes to effectively implement in the HFA and its successor (UNISDR, 2013). The outcomes of these initiatives must flow through the design of gender sensitive public awareness campaigns that specifically address the needs, vulnerabilities and capacities of women, girls, men and boys (GNDR, 2015).

Children and young people

Over two decades, an expanding literature has increasingly clearly demonstrated that children are disproportionately affected by both the physical and psycho-social impacts of disasters (Kar et al, 2009). More recently, however, an increasing number of anecdotal field reports are providing powerful evidence that when children have the requisite knowledge and understanding, they can make a valuable contribution to activities across the DRR spectrum from preparedness and response, through to mitigation and prevention (Benson & Bugge, 2007; Mitchell et al., 2008, 2009; Nikku et al., 2006; Vanaspong et al., 2007) and action research studies (Haynes, Lassa, & Towers, 2010) There is some preliminary evidence that children have a unique capacity for communicating risk within the household (Ronan et al., 2001; 2003; 2008; 2009).

A key approach to leveraging children's agency is child-centred DRR. Emerging as a distinct approach to DRR over the last decade, the primary objective of CC-DRR is to "strengthen children's skills so that they understand the risk of disasters in their communities and are enabled to take a lead role in reducing the risks and impacts of potential disasters" (Benson & Bugge, 2007, p.9). CC-DRR has its origins in the community development initiatives of Plan International and Save the Children. Underpinned by a child-rights approach to community development, both of these organisations seek to address the causes of poverty and its consequences for children's lives through participatory approaches that foster empowerment and this has strongly influenced the conceptual basis and practical application of CC-DRR (Mitchell et al., 2009; Plan International 2010; 2010b; Bensen & Bugge, 2007).

In practice CC-DRR, involves a wide range of child-centred activities aimed at increasing children's knowledge and skills for risk reduction, including workshops that enhance their familiarity with the concepts and terminology of DRR and the roles that children can play in the

DRR process; lessons in how to complete vulnerability and capacity assessments for various types of hazards; training in the development of hazard awareness raising campaigns using a variety of media; practical skill building activities aimed at improving children's chances of survival before, during, and after a disaster (Bensen & Bugge, 2007; Mitchell et al., 2008; Haynes et al., 2010a; Haynes et al., 2010b; Haynes, 2013; Mitchell et al., 2009; Nikku et al., 2007). While rigorous academic research on how these activities impact on the development of children's knowledge and skills, several major research initiatives are now under way (e.g. Ronan et al., 2014).

Over the last five years, several major international developments have increased the profile of children and young people in DRR. Under the banner of the 'Children in a Changing Climate Coalition', UNICEF, Save the Children, World Vision, and Plan International have developed the 'Children's Charter for Disaster Risk Reduction' (Children in a Changing Climate Coalition, 2011). Developed through consultations with more than 600 children in 21 countries in Asia, Africa, and Latin America, the aim of the charter is to raise awareness of the need for a child-centred approach to DRR and for stronger commitments from governments, donors and agencies to take appropriate steps to protect children and support their participation in disaster risk reduction and climate change adaptation. The charter contains five resolutions: 1) Schools must be safe and education must not be interrupted: 2) Child protection must be a priority before, during and after disaster; 3) Children have a right to participate and to access the information they need; 4) Community infrastructure must be safe, and relief and reconstruction work must help reduce future risk; and 5) Disaster Risk Reduction must reach the most vulnerable.

Another major global initiative in this arena is the Comprehensive School Safety Framework (UNICEF et al., 2013). Developed through a partnership between UNICEF, UNESCO, INEE, IFRC, World Vision, ADPC, Childfund and SEAMEO, the framework is underpinned by the recognition of children's rights to survival and protection as well as to education and participation. As outlined in the framework, the four main goals of school safety are: 1) to protect learners and education workers from death, injury, and harm in schools; 2) to plan for educational continuity in the face of expected hazards; to safeguard education sector investments; and 4) to strengthen climate-smart disaster resilience through education. The framework seeks to achieve these goals by aligning educational policies and practices with disaster management at national, regional, district and local levels and rests on three pillars: 1) Safe Learning Facilities: 2) School Disaster Management; an 3) Risk Reduction and Resilience Education. As can be seen in Figure 1, a key feature of the framework is the linkage between and schools, households which creates significant opportunities for building a culture of resilience in the wider community.

INSERT FIGURE

The framework provides an important mechanism for building disaster resilience on a broad scale. However, as identified through various research and advocacy activities, there is a need to build capacity for implementation across each of the three pillars (UNICEF, 2013). For example, effective disaster resilience education requires the development of a model for comprehensive "scope and sequence" for knowledge, skills and competencies in disaster risk reduction. There is also a need to develop consensus-based and actionable key messages

and adapt them to national and local contexts. Addressing these needs will require identifying and coordinating visible leadership for each of the three and aligning comprehensive school safety with post-2010 Millennium Development Goals, the Sustainable Development Goals and the Hyogo Framework for Action 2. It will also require the establishment of research priorities and research-practice linkages.

Low-income populations

Low-income populations around the world suffer the greatest disaster losses and have the most limited access to public and private recovery assets, both in developing countries and wealthy industrialized nations (Fothergill & Peek, 2004; Wisner et al., 2004). Firstly, they are more likely to inhabit the most exposed areas because these are deemed undesirable by the rest of the community (Hewitt, 1997). Meanwhile, unstable livelihoods, poor health, hygiene, nutrition, poorly constructed housing creates very high levels of vulnerability and a lack of knowledge about disaster risk undermines capacity (Cutter, 2012). Some have suggested that this lack of knowledge is because many low-income populations are more distrustful of government agencies and those who typically communicate risk messages (Rowel et al., 2009). Others have suggested that information is deliberately withheld from low-income groups because they lack political power and are not seen as a priority by those in government (Wisner et al., 2004). Finally, when information is made available, it is often disseminated in ways that people cannot access or understand.

There is little published research on public education strategies for the poor and this an area that requires immediate attention. One area of particular concern is informal settlements which are rapidly growing in urban centres around the world (Huchzermeyer & Karam, 2006; Sheuya, 2010; Granbom & Ljunghusen, 2011). While traditionally governments have sought to remove informal settlements, there is a noticeable shift towards upgrading them (Granbom & Ljunghusen, 2011), and this provides a valuable opportunity to implement DRR on a broad scale (Blackburn & Johnson, 2012). Understanding how households manage hazards in these complex, uncertain and fragile environment, will help to identify pathways for strengthening public awareness and building resilience (GNDR, 2015). What is clear is that to be relevant and practicable for low-income communities, DRR public awareness strategies will need to be closely aligned with goals for poverty reduction and suitable livelihoods. This is particularly important since there is a trend to adopt a holistic approach post 2015 with closer integration of sustainable development and growth, disaster risk management and climate change adaptation initiatives (see Hamdan input paper).

People with access and functional needs

People with access and functional needs (AFN) are highly vulnerable to impacts of disasters. According to the United Nations Ad Hoc Committee on Disability, "Disabled persons suffer disproportionately during disasters. Disasters not only create impairment, they also further discrimination against already disabled people, compromising the determinants of their health and creating conditions for the worsening of their overall health and well-being. They perpetuate a cycle of poverty and isolation that is heightened during disasters."

According to FEMA's Office of Disability Integration, some of the most effective ways to engage people with access and functional needs in emergency preparedness efforts include: integrating AFN planning into all preparedness efforts; enlisting qualified individuals with access and functional needs in emergency preparedness, response and recovery processes; partnering with disability advocacy groups, service providers, para-transit providers, home health care providers and others to reinforce campaign messages directly with people with AFN; exploring and leveraging existing communications resources (both technical and non-technical) that can be used to reach the broad array of people with access and functional needs; encouraging overall grassroots community preparedness where individuals are prepared on a personal level and neighbour helps neighbour. However, a review of the literature reveals that these activities have not been institutionalised at the national or local level. It is important that emergency planning makes AFN a priority going forward.

Public awareness and good risk governance

> The UNISDR Making Cities Resilient Campaign highlights that it is those cities with proactive, responsive, accountable and transparent governance structures at local and national levels that are able to achieve higher levels of resilience than poorly governed ones. Good governance translates to well-designed policies that are informed by current risk information, enforcement of these policies in practice, enabling this enforcement through the provision of training and resources, and ensuring the delivery of finances and resources by maintaining non-corrupt and reliable distribution systems. The campaign has also highlighted that many cities value the role of community participation within the governance structure, both as a means of consultation to ensure the suitability of activities within the local context and as a source of microlevel data (refs).

The role of public knowledge and awareness in good risk government is gaining increasing prominence in the literature. The Global Assessment Report for 2011 (UNISDR, 2011) included several background papers which stressed the importance of governance in effecting change in DRM practices. For example, a thorough discussion was provided on the effect of political economy considerations on effecting change in DRM (Williams, 2011). In addition, the International Risk Governance Council produced a White Paper on risk

governance (IRGC, 2005), which proposed a risk governance framework that distinguishes between analyzing and understanding a risk (Technical and Social Assessment Stage) – for which risk appraisal is the essential procedure; and deciding what to do about a risk, where risk management is the key activity (IRGC, 2005).

A more detailed review of work carried out by various authors on the importance of governance and accountability in effecting DRM change was presented in a background paper to GAR 2013 (Hamdan 2013, 2013b). The latter paper combined the political economy framework for analyzing change (Williams, 2013) with the risk governance framework (IRGC, 2005) in order to arrive at a framework for analyzing incentives and resistance to change during different stages in the risk governance framework (i.e. the five stages in the risk governance framework as developed by the IRGC, namely Risk Pre-Assessment Stage, Risk Appraisal Stage, Risk Evaluation Stage and Risk management Stage, all of which center around the Risk Communication Stage) (See Table 1).

Table 1: The risk governance framework (see text for sources).

Risk Governance Stage	Description
Pre-Assessment Stage	Frames the risks, identifies the perspectives of various stakeholders on risks and the major assumptions and methodologies for assessing the risk, through a four step process: 1. Risk framing which underlines a common understanding of risk, 2. Early warning and monitoring of risks, 3. Risk pre-screening models and practices and corresponding capability requirements, and finally, 4. Selection of major assumptions, methods, conventions and procedural rules for assess the risk and associated societal concerns.
Technical and Social Assessment Stage	Comprises both a scientific risk assessment (hazard frequency, exposure and consequences); and a societal concern assessment (including associations, societal benefits and risks) which must inevitably account for gender considerations. A flawed decision making process may lead to scarcity in collating and analyzing data and / or misuse of such data regarding a particular risk (related to both scientific assessment and societal concerns). It may also lead to inadequate addressing of societal and stakeholder concerns.
Evaluation Stage	This stage is intended to ensure that evidence based on scientific facts is combined with societal values considerations when judging the tolerability of risk according to three main categories: i) Acceptable where further risk reduction is considered unnecessary; ii) Tolerable where the level of risk may be acceptable due to its benefits, but subject to appropriate risk reduction measures and considerations; and ii) Intolerable where the level of risk must be reduced, irrespective of cost.
Management Stage	All tolerable risks will need balanced and adequate risk management practices (comprising compensatory, prospective and corrective approaches) and financing strategies for risk reduction (comprising retain and reduce, insure or transfer the risks.
Communication Stage:	Communication and coordination with all stakeholders is implicit to all stages within the risk management framework. Furthermore, once the risk management decision is made, communication should explain the rationale for the decision and allow citizens / stakeholders to make informed choices about the risk and its management, including their own responsibilities.

Hamdan argues that the soundness of awareness raising strategies in terms of their effectiveness, inclusiveness, transparency and accountability is best developed for each specific risk governance stage. An example of how this would apply to the adoption of a National School Safety Programme (NSSP) is presented in Table 2.

Table 2: Application of the risk governance framework to a National School Safety Programme

Risk Governance Stage	Adopting a NSSP for improving Resilience in Schools
Pre-Assessment Stage	Has the NSSP been flagged as a solution to school safety in the pre-assessment stage? Was the awareness of national and local decision makers raised on this issue? Was the awareness of the general public raised on the decision making process at this stage which may have included or excluded the adoption of a NSSP?
Technical and Social Assessment Stage	Has awareness been raised on the importance of assessing the physical, natural, social, economic, and institutional factors that contribute to risks in schools and the education sector in general? Does the assessment include a societal assessment that accounts for the apprehensions and concerns of society?
Evaluation Stage	Was the awareness of the general public and decision makers raised on the criteria implicitly or explicitly adopted to judge the level of unacceptable and tolerable risk levels in schools?
Management Stage	Are there any awareness raising strategies to raise awareness of public and decision makers on how to reduce risk to practicable levels and the implied cost benefit analysis decisions including the cost of saving a student / teacher human life?
Communication Stage	Is awareness raising seen as a one way strategy by decision makers and is their awareness being raised on the importance of incorporating social apprehensions and concerns?

Hamdan's framework provides a valuable mechanism for the further exploration of the relationship between public awareness and good risk governance. Most importantly, it provides a concrete and verifiable mechanism for opening up political space and strengthening the capacities of the community to participate in policy and strategy formulation, planning, implementation and monitoring, facilitate knowledge sharing and local change processes (GNDR, 2011). It also supports a rights-based approach that turns human rights standards and procedural rights into actions, and puts the relationship between people as rights holders and governments as primary duty bearers at its centre (GNDR, 2015). Regardless of how risk governance is formulated in the post-Hyogo framework, the role of public awareness should be given special emphasis.

Monitoring and evaluation

Rigorous methodologies for monitoring and evaluation are essential to the validation of public awareness strategies and the critical assessment of progress in the field. Notwithstanding the importance of the indicators and questions in the national monitoring template, examination of the core indicators reveals that most of these refer to inputs (e.g. policies and strategies in place) [see Hamdan input paper]. Indeed a limited number of questions address outputs such as the impact of awareness raising campaigns on the adoption of National Schools Safety Programs and the adoption of corrective risk management strategies for the most vulnerable communities, households, livelihoods and sectors [see Hamdan input paper].

The Torrens Resilience Institute (TRI), a research centre based in Adelaide, Australia, has undertaken two projects to address the issue of measuring disaster resilience, i.e., a Community and a Household project. The first concerned the design of a community disaster resilience measurement model. The aim was to develop a straightforward and pragmatic tool for non-academic community stakeholders, while keeping sufficient effectiveness and rigour to enable objective measurement of disaster resilience in a community. The tool was designed to be used by communities interested in measuring their disaster resilience and acts to support community members in their plans to strengthen their resilience in the

future. Specifically, it would enable stakeholders to establish priorities, allocate funds and develop disaster plans more effectively. The second project was aimed at developing a household disaster resilience toolkit to be used by government, non-government and community-based organisations to assist potentially vulnerable households to prepare for emergency events, including disasters. The foreseen outcome using this tool was the provision of relevant information on hazards and available community and regional emergency services (including information) to meet any assessed needs of a household to build their resilience [see Arbon et al. input paper].

From several perspectives, the measurement tools developed by TRI represent good practice in measurement development. First, the indicators selected for inclusion were based on an extensive systematic review of the disaster resilience literature which means that the tools are underpinned by theoretical and conceptual rigour. Second, the indicators selected for inclusion were presented to a range of community stakeholders to ascertain validity and gain feedback on applicability of the tools to the local context. Third, both tools were tested by relevant user groups in a wide range of communities (both urban and rural, some disaster affected and some not) who also provided feedback on the usability of the tool and how it might be improved to ensure uptake across the sector. This also provided insight into whether the user groups were using the tool in the way that was intended. Finally, the indicators selected are verifiable indicators of outputs.It is important to note that while the tool itself provides stakeholders with a validated means of monitoring the impacts of particular policies and programs on resilience indicators, the public release of the development process also provides stakeholders in other regions, both nationally and internationally, with knowledge on how to develop their own locally relevant tool, thereby contributing to capacity building for monitoring and evaluation, which is essential to the continuous improvement of public awareness strategies.

For tools such as those developed by TRI and others like them, the key questions relate to uptake across the sector and the application of results to policy and practice. It is here that knowledge sharing strategies such as those identified earlier will be useful, particularly those that involve direct social interaction with other users of the tool (e.g. communities of practice, peer assists, online forums etc). Another issue relates to the extent to which results are used and shared. If uptake is significant at the local level and results are shared with the public, this would offer a valuable mechanism for increasing public awareness of resilience levels within the community, thereby providing leverage for good risk governance. Meanwhile, if regional uptake up-take is significant and large data sets accumulate, local governments could use analyses of that data to influence policy decisions at the regional and national level.

Conclusion

This Chapter has produced an unusually comprehensive synthesis of awareness and education activities and possibilities for disaster risk reduction. This has included the difficult

issue of learning from our activities as well as experimenting to ensure continuous improvement.

The list of recommendations sets out the challenges clearly. It is important to emphasise that knowledge and awareness are necessary but not sufficient for building a culture of resilience. Many factors intervene. One factor is choice or its absence (Wisner et al., 2004; Cutter, 1996; Hewitt, 1997). For instance, poor rural and urban households are often faced with social and economic constraints on their ability to reduce risk (GAR, 2009). Often the poor and marginalised have no choice but to live in the most exposed areas and they lack the economic resources and political voice to ensure that the required protections are put in place, even when fully aware of what is required (Hewitt, 1997; GNDR, 2014). In any case, we need to appreciate that the first priorities for most people much of the time are the day-to-day concerns of livelihoods and family. Disaster risk reduction typically struggles for attention.

This underlines that risk reduction needs to be part of development. It also argues for maximum inclusion of people, men and women from children to elders, and of sectors including commerce. Support for learning and action is often patchy, and there is much scope for connections and sharing of experience and expertise across communities, regions and countries, through connecting established networks or through new communities of practice. New media is a major facilitator of such exchanges and support. Social media has its issues and problems, but many people use and increasingly rely on it.

Major changes – perhaps transformational for some authorities – are to ensure that resources do are shifted from reliance on traditional print and broadcast media to embrace the full range of strategies including social media, and to shift from awareness programs to those encouraging action for risk reduction.

Recommendations

The objective of public awareness

- The dissemination of risk information is not enough. The objective of public awareness strategies should be to manage the process of internalising risk information and translating it into learning and safe action for today and the future.

- The end goal of public awareness strategies should be that the different social strata, from individuals to nations, understand and pro-actively prevent, prepare and mitigate, respond and build back better and ultimately manage the causes and adapt to the consequences of the multiple and cumulative risks that they face

- Public awareness is a process and not a one off event; it requires continuity and the fulfilment of every citizen's rights, including children, to be informed and to participate, to be included equally and with no discrimination in the process of risk management.

- The key objective of risk knowledge management is that the population can access evidence and research that is translated into concrete and relevant information for their decisions. This information should be based on sustainable development principles. However, the concepts of uncertainty needs to accompany each step of the process.

The content of country wide public awareness strategies

- The content should be co-designed by interested stakeholders within a geographical area and tailored to the specific context. The process of developing the messaging and strategies is in itself a process of learning and sharing, of creating a network of multipliers and a sense of civic responsibility.

- The content can only be relevant, pertinent and non-discriminatory if marginalised groups are involved in the design and dissemination of public awareness strategies. In order to be effective – subject matter experts need to work with behavioural psychologists, education specialists, practitioners and community members to design and implement effective approaches.

- Principals of social inclusion and protection – in particular child protection - should form the basis of all public awareness strategies.

- While women, children, the elderly, ethnic minorities, people living with disability and the poor are globally the most impacted by disasters, these groups are often overlooked in public awareness strategies. All levels of government, civil society organisations, the private sector, and the public need to be made aware of the specific needs of these groups.

- Awareness strategies are often focussed on the issues of mitigation, preparedness and response. The public also need to be informed about their rights and entitlements as well as the duties and responsibilities of state and non-state actors.

- Risk management is a process which is more than crisis management. On top of identifying the hazards, it includes managing vulnerabilities of assets, people and their ecosystem services; the underlying causes and cascading effect of multiple risks; and understanding the institutional, physical, social and environmental capacities to build upon. An effective public awareness strategy tackles these issues as part of a long term risk reduction plan.

The means of communicating a public awareness strategy

- Public awareness strategies should avoid relying solely on media campaigns. Media campaigns increase knowledge and awareness but are not enough for effective risk management. In order to affect behaviour change, media campaigns must be combined with participatory processes that promote social interaction and experiential learning (text ref p. 6).

- Public awareness campaigns shouldn't be standalone, they have to be included in every DRR project across sectors and complement concrete action. Social media and mobile technologies are powerful modern tools for risk management and civic engagement. However, they should supplement, not replace traditional modes of communication such as radio, television, newspapers, flyers, billboards and campaigns.

- Crowdsourcing should be used to collect essential data before, during and after crises. The effectiveness of crowdsourcing as a method for rapid and accurate data collection both during and after major disasters has been widely established. Crowdsourcing also provides an effective mechanism for collecting baseline data in high risk areas (text ref.

- Levers for change and/or transformation need to identify: Peer to peer learning, social learning, virtual communities of practice and in particular faith based services and networks are crucial for the promotion of a culture of disaster resilience. Because of the extend of the outreach, it is key to identify the leverage points in systems, time and location and the multipliers (people) who could influence and promote a culture of safety.

- Principles of marketing and advertisement should be explored through public private partnerships. The study of the market is a powerful tool to understand the motivations, aspirations and priorities of populations. Marketing in combination with mobile technologies and social media can provide a wide reaching platform for behaviour change.

- Localised knowledge hubs should be designed and included. An effective strategy would ensure linkages (virtual or face to face) between different risk knowledge actors and knowledge hubs for cross-pollination and support.

- All citizens should have access to information about risk regardless of language and literacy levels. Public awareness strategies remain heavily dependent on print media and messages are not always translated into local languages and dialects. It is essential that provisions are made for low levels of literacy and language diversity.

- Humour - Disaster risk is a confronting and sometimes traumatic topic, often people have no choice but to live with that risk. Music, dance, and art contests have proven very positive in engaging people in becoming aware about the risk they are facing and how to manage it.

The responsibility and accountability for disaster resilience: actors and institutions

- Understanding the national DRM architecture, the institutional relationships, the tacit rules of decision making and the conditions within which DRM is playing out are key for promoting an effective culture of disaster resilience. The leverage points within that institutional landscape need to be identified.

- The private sector and some public services such as road transport, energy, water management, mining, agriculture, etc. have a key stake in development projects and should also be targets for DRM outreach.

- People at risk need to often balance livelihoods with risk management. Fatalism, day to day survival, peer pressure, and social norms can rob people of their sense of responsibility for their own lives and for their community. It is important that clear roles and responsibilities of all before, during and after a crisis are communicated emphasising that much can be done to save lives and assets.

- Understanding the power dynamics, the demographic variables and socio-cultural (and sometimes religious) contexts is crucial in the promotion of a culture of disaster resilience – DRM awareness raising needs to focus on building on the existing capacities, social capital and networks and promoting them through volunteerism, communal days, building more cohesion, clear responsibilities within a community and a sense of common good.

- A decentralised system is essential for effective DRM awareness, learning and action. Local authorities through their decentralised line ministries have a unique capacity and entry point for building public awareness, supporting behaviour change and addressing underlying vulnerabilities. This requires training of local government and other public officials.

- Cross-sectoral, multilevel partnerships should be established. A major impediment to the development and delivery of public awareness strategies is a lack of funding and human resources. This can be overcome by establishing partnerships between government, civil society organisations, community-based organisations, and the private sector.

- The foundation of effective action will be consensus based national and subnational key messages. All involved in public awareness must be given consistent and clear messages, which are defined and owned by government.

The promotion of innovation (transformation?) and change

- The Comprehensive School Safety Framework provides the foundation for building a culture of safety starting from school and must be intrinsically linked to community based approaches – they are symbiotic and mutually reinforcing on a number of levels: children are part of the community and take their ideas home, communities are involved in schools, children will be the community decision makers of tomorrow.

- There are many networks which should develop ways of sharing their experiences and expertise, both for their own benefit and to gain influence. These include successful existing and emerging global networks (such as Children in a Changing Climate Coalition, and the Earthquake Shakeout), regional and national networks (such as the various fire and flood associations; eg AFAC or Australasian Fire & Emergency Services Authorities Council), the international (eg Caritas, Islamic Relief) and national faith based (eg Mennonite Relief), private sector disaster risk reduction groups, and many others, including the very well established NGOs.

- Sustainable financing for public awareness will be based on demonstrable impact and cost effective analysis. It is concerning that as we reach the end of HFA the empirical basis underlining our approaches is still incomplete and unclear. There is an imperative for robust evaluation of effectiveness to be built into programs and policies.

- A change in the body of knowledge in professional curricula is acutely needed. Sustainable development and inter-linkages between economic, social and environmental spheres need to be understood; DRR has to integrate multiple levels of action, management and research whilst becoming a transdisciplinary topic and risk generation assessment needs to be integrated at the planning stage of feasibility studies.

- Research and evidence based decision making can often promote appropriate and informed community driven innovation. A public awareness strategy should include the most up to date research and evidence that could help the population make appropriate decisions.

- Risk sensitive and climate proof planning for large scale and small scale projects with due consideration for biodiversity and ecosystem services needs to be communicated in concrete simple language with localised examples.

- The value-add and co-benefits of risk proof planning should be marketed.

- Resources should be allocated to monitoring and evaluation and results should be made publicly available. Due to budget constraints and lack of technical capacity, public awareness strategies are not always evaluated and if they are methodologies and results are not made readily available to the public. Making monitoring and

evaluation a core feature of public awareness strategies and sharing the results will facilitate continuous improvement, allow for cost-benefit analyses of various approaches, increase the accountability of stakeholders.

- Validated methodologies for measuring success are required. What does success look like? How do we know when real learning has occurred or when a fundamental shift in understanding has taken place?

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