

INPUT PAPER

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DISASTER AND CRISIS COMMUNICATION: TREND ANALYSIS OF TECHNOLOGIES AND APPROACHES

Based on a review of contributions to the International Disaster and Risk Conferences IDRC Davos 2006, 2008, 2010, and 2012, which are organized by the Global Risk Forum GRF Davos

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Abstract

New communication technologies are revolutionising the modern world and also the practice of disaster risk reduction and crisis management. Technology can provide important tools for crisis communication and disaster risk reduction. During the IDRC Davos conferences several new technologies for crisis communication were presented and discussed. Based on the presentations, discussions and papers of the IDRC Davos conferences, this paper provides an overview about current trends and research findings for technologies within crisis communication and disaster risk reduction. The outcomes of the analysis highlight five different issues that are important for effective and efficient crisis communication and future directions of disaster risk reduction activities. The paper also highlights that existing and new technologies and approaches promise a huge potential for providing support before, during and after a crisis, as well as for and with local communities including the most vulnerable people.

Introduction

The following paper presents a trend analysis from presentations given, the proceedings, the outcomes report and the summaries of session chairs of the International Disaster and Risk Conferences IDRC Davos from the period 2006-2012. The IDRC Davos conferences take place every two years with its first conference in 2006. IDRC participants cover representatives of United Nations and International Organisations, research from natural and social sciences, non-governmental organisations, governmental bodies and the private sector. With an average of 1000 representatives from 100 different countries, IDRC is the global gathering of various stakeholders involved in disaster and risk management for knowledge transfer and exchange, networking and strategy development.

Methodology

In order to identify trends in risk communication based on the knowledge exchange from the last four IDRCs, a keyword search has been undertaken within the archived outcome documentation of the IDRC Davos conferences to identify relevant extended abstracts, presentations and reports related to risk communication, ICT and social media.

Keywords used were: Risk communication, disaster communication, crisis communication, technology, Information and Communication Technology, ICT, social media, twitter, facebook, linked in, google, knowledge management, platform, online, telephone, fax, sms, mobile phone, radio. The identified literature was then analysed and thematically clustered. In this way, trends have been identified and highlighted.

Crisis and disaster communication for efficient and effective risk management

Exchanging knowledge and information is not only important for the everyday life, risks, disasters and crisis cannot be managed efficiently and effectively without appropriate communication. Communication is an essential part of risk and crisis management and not only important for the response to risks and crisis. Correct communication can change the decision-making and the behaviour of the recipient and thus can help to prevent and mitigate risks and crisis as well as to recover from them.

During the last four International Disaster and Risk Conferences IDRC Davos, taking place in 2006, 2008, 2010 and 2012, several trends in risk and crisis communication approaches and information and communication technologies could be identified.

Frameworks and standards for risk knowledge management systems and platforms are developed, improved and established.

In 2006 the World Bank highlighted that data provided by risk estimation and assessment models, developed by the international scientific community are technically complex and sophisticated; it has been difficult to communicate the results to non-technical persons. Therefore, the World Bank has developed a communication tool which blends the results of these risk models with infrastructure assets and socio-economic data. This communication tool aimed to have the ability to present large amounts of data in an easily understood format (Sinha, 2006).

A similar goal, to implement an integrated pre-operational safety information and management service for the alpine region has been aimed at by the ASSIST – Alpine Safety, Security and Informational Services and Technologies - project. The overall objective of the project was to specify, design, implement and validate a generic system architecture for the production and exchange of data products used for risk prevention and risk event management (Rhyner, 2006).

The Natural Disasters Networking Platform (NADiNe) goal was in 2006 to integrate the existing scientific expertise and activities in a synergetic way by providing a framework for communication, cooperation and information (Haubrock et al., 2006). In 2008, the MONITOR project aimed at monitoring methods and risk communication providing an internet portal in which this knowledge base is incorporated. This portal provides different institutions with a communication structure for the exchange of experiences, results and best practice methods and should therewith increase the understanding of risk management methods (Kollarits et al., 2008).

Zemp (2010) tried to link ICT based user centered risk communication systems to the wider public and the media, as it is essential to know what the public believes and how they interpret specific issues. ICT raises issues of access, exclusion and participation, and as disasters are not only dynamic events but also events that intersect with the public's information habits and a rapidly changing media environment (with all its technological possibilities), these factors need to be fully understood and continuously monitored in order to strategically plan and effectively adapt disaster management and communication, hence much more research is needed (Zemp, 2010).

Within a follow-up of the IDRC Davos 2012 conference, a consultation day workshop on Scientific and Technical Platforms was organised during the United Nations International Strategy for Disaster Risk Reduction UNISDR 4th Session of the Global Platform for Disaster Risk Reduction 19-23 May 2013 in Geneva, Switzerland. The expert-workshop identified that scientific and technological platforms have proven science to be useful, useable and used in disaster risk management. However, there was also consensus that the available research output is not yet fully used. Participants expressed their concern and commitment. In order to make research more useful and effective for policy making and other applications, platform

activities and products need to be better driven by user needs, thus becoming more demand driven. Specifically, there is a need for more emphasis on products that translate scientific results into information for DRR decision makers. It was agreed that the Science and Technology platforms and networks provide added value to this process and therefore should be encouraged to continue their work. Mechanisms as well as some standards should be developed on how future collaboration and coordination amongst the different platforms can be facilitated and even more synergies gained.

Science should further develop and strengthen the multi-sectorial and multi-disciplinary approach, especially including social science, and addressing issues at local, national and international levels. A gap in knowledge and data management was highlighted; therefore mechanisms for the collection, access and sharing of knowledge and data at the national and international levels (and for all stakeholders) should be improved (Ammann & Murray, 2013).

Crisis Communication and ICT are not only important for the response phase, but they are also important elements in the prevention and recovery phase of disasters and crises.

Developing capabilities to reach the majority of the population in a timely way and with the right information before, during and in the aftermath of disasters, is a particular challenge that was highlighted by several contributions at the last IDRC Davos conferences. In 2006, Sapristein (2006) highlighted that human impact planning is a strategic planning process that organizations and communities of all sizes should use to prepare for the inevitable consequences of disasters. This human centred planning and a deep understanding of human reaction to stress and disasters, a comprehensive planning process accounts for individual, organizational and community factors which would influence functioning during and after a disaster (Sapristein, 2006).

An established risk management information system should follow the motto "Acting instead of reacting" (Moran et. al. 2008). The proactive, preventive and strategic character of risk management encompasses a comprehensive investigation of risks and serves as a vital support in the decision-making process. These guidelines were taken into account by developing ORTIS, an Organizational Risk Management Tool and Information System. ORTIS offers a structured, homogenous and systematic approach in bundling the often dispersed risk information and bringing it into a user-friendly, pragmatic, target-oriented form. Furthermore ORTIS brings together different individual risks often only considered independently and takes their possible interactions into consideration. It poses an aid in implementing appropriate measures and serves as a continuous reminder in the important long-term monitoring process (Moran et. al., 2008).

Donovang-Kuhlisch and Small (2010) have provided a state-of-the-art report on information and communication technologies to build capabilities for the prevention, intervention and recovery from disasters. These pillars were identified as point out references in research and production in different areas of private and public life in both mature and emerging economies and societies. In their view, ICT takes a crucial role in risk, crisis and disaster management. Protection and recovery across the whole lifecycle of a crisis can be achieved and managed through a balanced system called the digital economy platform consisting of a technology layer, an information layer and the governing policy layer (Donovang-Kuhlisch & Small, 2010).

Additionally, geospatial technologies in risk reduction and disaster management are not only providing information for the intervention phase of a disaster, they also provide useful information for the prevention and preparedness of disasters and enhance the accuracy during the recovery phases of disasters. Additionally, crisis response imagery and related spatial information may greatly assist priority setting and resource allocation in DRR, and may speed up information exchange (ESRI, 2012). According to Sullivan (2012) the new rise in communication technologies should also be facilitated for the preparedness, practice and situational awareness before, during and after disasters. Mobile technologies offer significant possibilities for preparedness, alerting and response. However, the growing ubiquity of this technology comes with a multi-stakeholder challenge of using it effectively to support an integrated and adaptive approach to risk management (Sullivan & Häkkinen, 2012).

Social media may serve as relevant means of information and communication in times and situations of crisis.

Social media is a most general term that holds together blogs, micro-blogs, forums, audio-photo-video-sharing, wikis, social bookmarking, social networking and other digital tools and applications that facilitate interactive communication and content exchange among and between individuals, audiences, publics, organizations. On the one hand, these may serve as direct means of information and communication. On the other hand, these may serve to monitor issues and environments for authorities to get a coherent picture of the situation. Hence, social media may be relevant means of information and communication in times and situations of crisis (Schanne, 2012). There is still a huge unexploited potential to set free by using social media systematically for risk and even crisis communication or for the integration of social media into alert conceptions as well. Social media have the potential to improve communication from authorities to authorities, authorities to citizens and amongst themselves as well. The contribution of media studies and linguistics as scientific disciplines, and the socio-cultural aspects (demographic, cultural, linguistic, and religious) are important factors to enhance the resilience of the multilingual and multicultural modern society (Eggenberger, et.al., 2012).

Not only for instructive communication purposes can social media be a facilitator, it is also possible to crowd source information (crowdsourcing can be understood as the process that involves outsourcing tasks to a distributed group of people) in nearly real time for risk mapping and mobilization during and after a crisis occurred. It has been observed, e.g. during the floods in Australia, that a lot of people with access to the internet were posting information to provide support and help mobilize people. Nevertheless, this method of crowdsourcing has to be seen critically and a sound methodology has to be developed for risk mapping as the amount and variety of information is vast and the potential for hoax is there.

Credibility is a particular problem of social media as many social network sources spread inaccurate or even false information prior to official assessment (Zemp, 2010). Mobile devices can and will play a significant and effective role in improving personal preparedness and safety, yet there technical challenges and research gaps remain, as well as promising new trends and developments. Research should evaluate the potential of social media as an additional technical mean to improve the communication between authorities and citizens and amongst themselves as well. Additionally, the influence of professional communication across the

frontiers of language and the behaviour of using social media across the population on the resilience of our multicultural societies has to be identified and evaluated. This will help outline the opportunities, challenges and limits of a better use of social media in favour of an enhanced resilience (Alexander, 2012).

Local community engagement benefits data gathering and technology implementation.

As a valuable asset to data gathering, local community engagement was identified to provide valuable inputs for ICT systems and risk and crisis communication. Data gathering by local communities is not only beneficial to the collectors of the information; it also provides ownership of the outcomes to the data providers which help risk and crisis communication awareness and implementation.

Various geographically different projects and research efforts highlight this local community engagement. In Japan, for example, an e-community platform of disaster risk communication has been established. Within this platform, local residents can use this system from their simple browser or their cell phones not only to enhance their literacy of disaster risks and knowledge concerning previous disaster experiences, but also to share the information of early warnings, or evacuation alarms at their locations so that they are able to cooperate with each other (Nagasaka, 2006).

In 2010 Ikeda et al. added that local community map-making and scenario making methods may improve risk governance to reorganize local collaboration among residents and organizations. Also in Japan, an interdisciplinary approach to disaster risk communication has been developed based on social experiments carried out in a variety of Japanese cities and communities in over 15 different places since 2008. Case studies in Fujisawa and other cities in Japan revealed that, when disaster risks are expressed in the narrative form of risk scenarios assisted by experts, local, and experiential knowledge, the residents' better understanding and awareness improved risk governance in their communities (Ikeda, 2010).

Bongo (2010) highlighted that there are still gaps in the integration and linking of disaster related information with the community level. It is argued that, for effective community level dissemination of disaster information, there is a need for unpacking and simplifying the current jargon. This jargon creates 'institutional isolation of humanitarian agencies' and hinders communication strategies to communities. When communities are given the opportunity to formulate and develop their own disaster communication strategies based on own experience and conceptions, linking such strategies to 'official' strategies enables the generation of relevant and timely disaster communication for community resilience. Key to this process is capacity building of community level disaster management committees and institutional arrangements to enhance livelihood sustainability (Bongo, 2010).

Especially in the case of early warning systems, local community engagement is highlighted as a crucial part in the last mile process. Lessons learned show that the last mile can be bridged sustainably where communities and their vulnerabilities are taken as the starting point for local system development and strong links to national systems are established (Capistrano & Singh, 2012).

Needs for local communities have also been highlighted, such as the need for a broader usage of portable satellite communication technology for local communities. A wide coverage of such technologies would enable local communities to be better equipped and respond faster to disaster situations (Bharti, 2008). Amateur radio was also mentioned to be a useful tool for crisis and disaster communication, especially for remote areas. There is a need for an increased usage of home radio, which should be facilitated through positive amendments in amateur radio policies (Padmanabhan & Bhatnagar, 2008).

ICT technologies and crisis communication have to also address and be available to the most vulnerable.

ICT raises issues of access, exclusion and participation (Zemp, 2010), this is especially the case for the most vulnerable parts of societies. Physically impaired people, such as deaf or blind people receive communication and information in different ways. ICT, crisis and risk communication tools have to also address and be available to the most vulnerable.

Due to the lack of cultural and personal sensitivity of existing alerting systems, warning messages are currently not ideally adapted to the recipients, and therefore cannot achieve optimal impact and compliance. The choice of the alerting tool should therefore correlate with the age of the recipient, the area of residence and the respective "national trust context" (Meissen, et.al, 2012). For example, the coverage of the alerting system is also an issue and remote areas should benefit from communication technologies. The increasing use of mobile phone services is therefore an asset that should be used for alerting those communities (Capistrano & Singh, 2012). The challenge to address the demographic change and the respective media usage patterns in how to address all recipient groups appropriately, has to be addressed. Whilst new technologies offer many opportunities, "keeping it simple" and using a step wise alerting, giving step by step messages with information on where to find additional information has proven to be effective (Zemp, 2010).

Conclusions

Communication is influenced by many factors. For risk and crisis management the state of the art in Information and Communication Technology (ICT) and the availability of these technologies are important. Additionally, the supply with relevant and timely data and information can be converted to knowledge, if this knowledge and lessons that have been learned from previous events cannot be stored and communicated properly; the information will be lost. Therefore, knowledge management is an important factor not only for risk and crisis management but also for risk and crisis communication. In this context, new communication technologies are revolutionising the practice of disaster risk reduction and crisis management. Their power and flexibility make them particularly suited to command and control functions, emergency response, the creation and sharing of situational awareness, and the systematic assessment of hazards, vulnerabilities and risks. They can be designed to complement and augment particular missions, roles and workflows. In a world dominated by ever larger cascades of information, they can be used to pinpoint vital information and filter out 'noise'. (Alexander, 2012).

Technologies and innovative approaches can provide important tools for crisis communication. Existing and new technologies and approaches promise a huge potential for providing support before, during and after a crisis, and for and with local communities including the most

vulnerable people. However, there are various gaps, issues and still open lessons to be learnt for more effective and efficient crisis and risk communication. As the various disciplines and areas addressed within each trend highlight, an inter- and multidisciplinary research approach is mandatory to advance risk and crisis communication in the future as well as increased funding and policies to foster such research and technology development.

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