Application of Information Technology in Disaster and Emergency Management

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ABSTRACT

This paper discusses application of information technology in disaster risk management and reducing impact of disasters in the community. Internet and mobile-cellular phone are the two ultimate manifestations, so far, of information technology. The number of subscription of mobile-cellular phone per 100 inhabitants increased from just below 23 to nearly 85 in the span of 8 years from 2005-12. Although the number jumped from 82 to 124 in the same period in the developed world, the increase in the rest of the world is also phenomenal. Increase in numbers individuals using internet has been, however, lower in developing world which increased from just below 8 users to about 28 users per 100 inhabitants in the duration of 2005-12. Use of internet in mobile phone is now merging to such an extent that access to mobile phone may ultimately mean access to internet in the future. Despite of the advancement, sophistication and widespread proliferation of the technology, its application in disaster risk management has not still been fully capitalized. One of the reasons for this is that information available doesn't necessarily mean reception of the information by the person in need and translation of the information to action that can reduce impact of disaster. Further groundwork is necessary for translating information into action and the next meet of stakeholders in 2015 in Japan to chart future direction of global effort in disaster risk reduction should focus on utilizing full potential of information technology for disaster risk management.

Keywords: *Application, Disaster Risk Management, Disaster Risk Reduction, Emergency, Information Technology, Mobile Phone*

INTRODUCTION

Digital technology has changed every aspects of human lives and the changes are happening at a phenomenal pace. Internet and mobile-cellular phones are two artifacts that are ultimate manifestations - so far - of the digital technology in information and communication. Each of them has strength, in their own capacity, to revolutionize not only politico-socio-economic sphere but also individuals' cognitive and physical space. Although long-term impacts of digital technology are still emerging, some sectors are already witnessing huge shift. Print media is one of them which is reflected in the phasing out of print edition of well known series such as Encyclopedia Britannica and newsmagazine such as NEWSWEEK whose last editions were

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published in 2010 and December 2012 (US print edition), respectively.

It is interesting to note that internet and mobile-cellular phones, at least from the vantage point of end users, are complimenting one another which will have further potential to amplify the changes brought by the technology. Furthermore, mobile phones are now replacing many of technical gadgets from camera to car navigation system. It is safe to say that the changes in the artifacts will be happening in the future as well and digital technology will not stop only with these two ultimate manifestations.

The proliferation of information technology is being used and have potential to be used in many areas that can improve living conditions of humans. In today's digital age every information can be digitized, stored, retrieved, processed and and this is very fascinating as it can change lives of millions for good. Disaster risk management is one of such areas where utilization of the technology can have multitudes of positive impact. Disasters claim thousands of lives each year, affect millions and damages billion dollars worth of property throughout the world and disaster risk reduction has become a mainstream agenda in the sustainable development (UNDP, 2004).

Disaster risk management comprises of three stages – preparation in advance to minimize impact of disaster, minimizing the losses during onset of a disaster and building back better in the aftermath of a disaster. In order to minimize impact from the disaster, in advance preparation at all three stages is very important. Information and information technology have tremendous potential to minimize disaster risk as they are key to preparation in all three stages of disaster management. The application of information technology in disaster management has been reviewed by many researchers such as Stephenson and Anderson (1997) and Raio, Eisenberg and Schmit (2007) and case studies of application of the such technologies in emergency management (Mulrow, 2010; Banjo, 2012) and in alert and preparedness (Kuula et al., 2013) are also reported.

In the evolution of disaster management, the importance of information for effective disaster management has been firmly grounded. Information is a vital form of aid in case of disasters (IFRC, 2005) and people need information as much as water, food, medicine or shelter. Information can save lives and information can save resources. Information management is collection of the information, processing it, translating the information into knowledge and action and disseminating them to the communities in need. However, the emphasis of institutions working in the field of disaster management is much on collection of information and the later stages of information management are not in priority. The technology has advanced by leaps and bounds in the last couple of decades and its advancement has opened the possibility of efficient and effective information management for disaster risk management.

The increased possibility for efficient information management will have a direct impact to reduce the disaster risk to communities. However, it has not been so in the past as the work toward interlinking information management to disaster risk reduction has not been given a priority and the attention has been given in this direction only recently. The approach so far has been more focused on emergency management rather than integrated disaster management. Furthermore, how best to utilize information technology in a disaster situation poses a number of problems for which there is lack of necessary and relevant informatics research.

Realizing the importance of information management in disaster risk reduction, the 2005 World Disaster Report (IFRC, 2005) has focused on information in Disaster. From the experience of response to Indian Ocean Tsunami in 2004, the report has stressed the fact that "aid organizations have focused on gathering information for their own needs and not enough on exchanging information with the people they aim to support…[T]he problem sometimes is not so much lack of information as a lack of communication and understanding between scientists, governments concerned and donors (IFRC, 2005, pp. 12)." From hazard assessment