

Assessing the Role of Information and Communication Technologies (ICTs) in Disaster Management of Balochistan

Social Sciences

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Abstract

Balochistan is comparatively less developed province of Pakistan confronting natural hazards and disasters. Disaster occurrence cannot be eliminated but that can be better managed. In this context, information and communications technologies (ICTs) can potentially play a pivotal role in all phases of disaster management. The objective of this paper is to assess the role of ICTs in disaster management of Balochistan. This paper discusses the extent of disaster preparedness and knowledge of people about ICTs use for disaster management. For this purpose, 200 household questioners were administrated on the basis of stratified random sampling in Balochistan specifically in provisional head Quetta according to 1998 population census. The research key findings revealed that respondents have the high level of education and properly good access to technology set-up and enjoy an information distribution culture but they are not aware of ICTs use in pre and post disaster situation, additionally having poor preparedness level. The Paper recommends to make ICTs accessibility for every far flung areas of Balochistan and raise the awareness level of the community about ICTs use in the disaster situation.

Keywords: ICTs, Disaster, Balochistan, Disaster Management

1 Introduction

Disaster are actions that cause dramatic losses of property and life and disrupt the normal activities of the economy and society on a large scale. It's a common fact that country development status does not effect on disaster

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occurrence but least developed and developing countries are more vulnerable with high scale natural disasters (Sujit, M. 2005). Balochistan is comparatively less developed province of Pakistan and Pakistan is a country which is part of most hazard-prone continent Asia (ESCAP 2010). It is a developing country so confronting a number of problems like natural and manmade disasters. Several hydro-metrological and geophysical disasters are occurring in Pakistan. Its unique geo-climatic conditions and geographical situation disclosures to different types of natural disaster because a big proportion of Pakistani people live in disaster risk areas (S. Farhan 2014). Pakistan is vulnerable to disaster risks from a range of hazards including landslides, hurricanes, storms, droughts, earthquakes, epidemics floods, glacial lake outbursts, avalanches, erosion work of river and tsunami. Man-made hazards that threaten the country include transport, industrial, oil spills, civil conflicts, urban and forest fires and internal displacements of communities due to multiple factors (PDMA 2008). Balochistan is mainly vulnerable to four natural disasters that are Earthquake, drought, flood and cyclone in southern areas.

Disaster existence cannot be removed but they can be well managed. The effective management of crisis conditions need to be handled with well guided and coordination mechanism. The major vital role of ICTs is to concede wide geographic space through people and organization. The major potential of ICTs lies in their capacity to rapidly connect vast networks of people and organizations across great geographic remoteness and to enable fast flows of information, resources, thoughts, individuals and goods. ICTs have become essential tools for cooperation and collaboration. with ICTs – in individual computers, mobile phones and the internet (Robert Crane Williams 2014). ICTs (information and communications technologies) is the collective term for the variety of tools, systems, applications used to input, edit, store, recover, examine, produce and process information and distribute data in all its forms. ICTs includes, television, radio, broadband, cellular mobile phones and satellite, computer and software hardware, and network, portals, websites, satellite systems, remote sensing and so on, additionally the different applications and services linked with them, for example, data storage incorporation and analysis, distance knowledge and video conferencing (Heeks 2011).

2 Importance of ICTs in Disaster Management

The aim of disaster management is decreasing the extreme disasters impacts cause to humanity, the lives of people and societies and the economy. That challenge needs disaster supervisors to decrease risk, to analyze and compare costs and benefits, and to handle means, frequently on a great scale and at a

much quicker speed than are maintained by approaches and resources for the solution of ordinary problems with the help of information technologies abilities people can understand the active certainties of a disaster more obviously and help them frame well decisions more rapidly and information technology can support to improved methods of the many details involved in all disaster management stages (Ramesh 2007). There is no reason to take ICTs as inferior when we discuss about disaster management. People affected by disaster required information equally as they need other necessities of life such as food, shelter and medicine. Appropriate use of information can protect community lives, resources, and livelihood. The miscommunications among Community warning system and disaster response result in serious problems in times of disaster. Such as delay in Information processing, duplication, and dual management; replication and uneven data storage and recording; and excessive expenses, resource depletion, and useless response are caused by system errors. There is a need to arrange more connected and highly cooperative information management and measures around the societies, people, systems and ICTs setup that increase development in disaster response and Community Warning system (Deborah 2009).

Effective information systems are the needs of Disaster Risk Management that arrange access to complete, significant, and accurate information which is critical to humanitarian processes within time. The rapidly the community is capable of gathering, examining, broadcast, and take action on important information, the better needs will be met, the more effective will be the response, and the extremely advantage to affected populations. There is no technology that has more importance than that which saves lives (Curion 2007). Everyone must be aware of it so that complete removal of a risk is not always possible, general experience and preparation in the last some years have confirmed that the loss produced by any disaster can be diminished mainly by proper preparation, mitigation, and rapid action. In this situation, information and communications technology (ICTs) can possibly play an essential part in disaster prevention, management, and mitigation. Early warning by remote sensing becomes possible through many accessible technologies, such as radar, telecommunication satellites, meteorology, and telemetry. ICTs includes both new media (Internet, cell broadcasting, satellite radio) as well as traditional media (radio, television), this all technologies are important and have a great role for giving the awareness to the community on the possible risks or coming disaster. Before danger occurrence, ICTs are used for distributing information on coming disasters, which is beneficial to take the essential precautions to minimize the impact of these disasters (Wattegama 2007). ICT's can support to create preparedness systems that

connect crisis operation centers, disaster broadcasting networks, and vulnerable communities or responders. This setup can be applied to inform communities about emergency preparedness to make them resilient, track potential threats, aware authorities and notify communities who are possible to be damaged (Yodmani 2001). The highly adverse and challenging duration of a disaster is the instant disruption. This duration needs fast and effective action, within a very short time period. In the result of any disaster, a great number of persons will be displaced or injured. Effected community might also face the shortage of basic life needs such as food, water and medicines etc. ICTs can be used in a valuable way in such conditions for management of accessible resources (Sata 2008).

3 Methodology

The study area is Balochistan specifically provincial headquarter i.e Quetta. Balochistan region of Pakistan is by area the largest in size having lowest population it is sparsely populated region. The location of the province is South-Western (220N to 320N, 660E to 700E) Pakistan. The study is exploratory in nature and the data is collected through both primary and secondary methods. Secondary data collected through Scientific journals, research articles, magazines, case studies, online databases, government/conference reports, policy documents and other statically records like Webpages of firms, governments, semi-government organizations, databases NDMA, PDMA and many others website. Primary data is collected through household questioners to check the public perception about ICTs use during disaster situation and there level of disaster preparedness. Disproportionate stratified random sampling is used for primary data collection. Population based on 1998 census and according to the population census of 1998, Quetta district was divided into two zones Zarghoon town and Chiltan town and 67 wards/union councils, Chiltan town has 30 wards/union councils and Zarghoon town has 37 wards/union councils. The sample size obtained on the basis of the population size for the calculation of sample size following Slovin's formula used with 95 % level of confidence: $n = N / 1 + Ne^2$

200 questioners administrated covering almost all union councils of both zones. 110 respondents selected from Zarghoon town and 90 from Chiltan town. Questioner composed of six sections Section 1: Respondent Profile, Section 2: Expectations and Experience on Disasters, Section 3: Perceived Disaster Preparedness. Section 4: Disaster Mitigation, section 5: Disaster Response 6: Disaster Recovery and Rehabilitation. The data from the field was analyzed using SPSS software for the findings of thus such study.

3.1 Respondents' Profile

Throughout the survey majority of respondents were males (109) and females (90). In terms of age group, respondents were 18 to 29 age brackets which accounted 78% of total. 75% of respondents were single where educational level was concerned. Only 47% of individuals were having higher education (University level). Occupation level indicated that most of respondents were unemployed and still studying which accounted 58%. 40% of respondents were inhabitant of Quetta since 20 years. The data revealed that the average family size in both zones was 10 persons which accounted for 16%. Finally, the Internet accessibility showed 80% of the respondents had internet access.

4 Result and Discussion

4.1 Expectations and Experience on Natural Disasters

Based on the observations in the field, a number of questions were asked from the respondents about their expectations and experience on disasters in Quetta. Quetta is more prone to earthquakes. Studies revealed that 93% people experienced earthquake in last five years and rest of 7 % are those who recently started living in Quetta. Household respondents were questioned to rank the hazard which threatened them the most in the study area. The finding reviled that most of household respondents were serious about specific disaster like earthquake, where the respondents were extremely concerned. The results showed that many were not sure about the risk of other hazards. It reflected that they were unsure about risks posed by geo-hazard phenomena.

Table 1 Respondents' concern of the occurrence of natural disaster

	Natural Disasters	Extremely Concerned %	Very Concerned %	Concerned %	Somewhat Concerned %	Not Concerned %
A)	Drought	1.5	14.5	12	19	52.5
B)	Dust Storm	2.5	11.5	33.5	27	23
C)	Earthquake	91.5	7	0	0.5	0
D)	Flood	1.5	1.5	4	9	83.5
E)	Landslide	11	2.5	1.5	19.5	63.5
F)	Wildfire		1	2	1.5	93

G)	Household Fire	15	16.5	25	21.5	20
H)	Wind Storm	0	4.5	26.5	31.5	35.5
I)	Winter Storm	13	8	20	21.5	35.5

According to survey local TV channels remained main source of information. 46 % respondents came to know about disaster occurrence. 100% respondents have accesses to mean of communication in which mobile is highly accessed mode of communication. 47% respondents own cell phones. Use of communication during disaster made easier information sharing as 88% respondents used it during disaster.

4.2 Perceived Disaster Preparedness

Reliable information is essential to take decision on time. This can only ensure the comfort and safety of people concerned. Respondents were questioned whether they get information at right time during disasters. 75% of the respondents answered that they do receive information during emergencies. But received information was not up to date. The result showed that about 20.5% of them receive such information or warning within last 6 months, 9 % Between 6 And 12 Months,10.5% Between 1 And 2 Years, 13.5% Between 2 And 5 Years and 22% respondents received information 5 years ago which directed majority of respondents had no up-to-date information. Households were also asked the powerful source of media to be used during disaster for information retrieval. The research indicate that 67% of the respondents agreed that electronic media has provided the information of large emergencies in Pakistan.

It was analyzed that ICTs is the preferred tool for disaster risk analysis and forecasting. Knowledge of respondents about ICTs tools and their use during disaster exposed that 49% respondents didn't have knowledge of any ICTs tool. 5% respondents were in favor of Digital cameras, 19% in Geographic Information Systems (GIS), 6% for Global Positioning System (GPS), 5% for Information & knowledge databases, 21% for Mobile applications, 1.5% for Remote sensors, 12% for Social media tools, 1.5 % for Satellite imaging, 10% for Websites and 0% response for Commercial off-the-shelf software, Free or open source software and Mass text-messaging-services (MMS).

When the respondents were asked that were they prepared for future disaster. Only 11% replied positive where 54% response in no and 35% said that they didn't know. Respondents were asked about their community ICT capability in disaster preparation activities. This changed into a try to determine the degree to which citizens are disposed to using ICTs for receiving communications on disaster related issues, and whether citizen populations may be engaged, via ICTs, to assist in the basic country wide DRM effort. According to 31% respondent's community capability was average, 23% believed that extra education is required to boost functionality, 19 % said that community was not capable and 26% said community was capable. When they were asked about understanding level of how ICTs fit in to disaster preparation activities 17% respondents were aware of it, 41% were not aware while 42% were not sure about it which indicated that community have very low level of awareness about ICTs use in disaster context.

4.3 Disaster Mitigation

In perspective of mitigation ICTs are strongest tool for non-structural mitigation through which can raise awareness level from the survey responses, it is able to be seen that 81 % respondents preferred local TV channels as communication mode for creating public awareness about the negative consequences of natural disasters and how to reduce them 48% respondents choose this communication mood because it is fast according to 11% its reliable 40% said it has national coverage 26% said its affordable and 17% said its accessible. when Respondents were asked about if they feel any problem in updating people in other parts of Balochistan and the world about the conditions of their loved ones in the disaster area with the specific mode of communication 62% response receive as yes and 38% as no and main problem indicated by respondents was poor network conditions in province.

4.4 Response

On the community degree, 15 per cent of respondents had been stated that there was definitely a clear set of rules and metrics that ruled events, together with whilst early warning alerts are induced 22.5% Some existent 38.5% said there is no predesigned rules despite it 24% were not sure. The statistics generated by using the survey shows that respondents recognize at a cognitive level that ICTs can and must have a more powerful response and instant post disaster co-ordination. The vast majority of respondents confirmed that they sees ICTs as a key enabler they proportion 58% of general respondents who in favor of no are 4 %, 21 % are not sure and 17% have mixed view. The communication mode which mostly use for sending

and receiving information during any disaster condition is mobile phone which is selected by 77% of respondents. There are 58% respondents who are comfortable with using ICT tools but 71% who are not aware that how to cope with inundation of information for disaster management.

4.5 Disaster Recovery and Rehabilitation

As a standard statement, the majority of respondents indicated that they have been now not relaxed with their existing practices and methodologies for disaster control. Only 37% people are satisfied while 63% were not comfortable due to low awareness level even they don't know what disaster risk management is. Community needs long time to recover from a disaster and some time it not completely recovers to it previous conditions according to 23% respondents it take 10 to 15 years to recover, 13 % replied it take more than 15 years, 26 replied 6 to 10 years, 25% said 1 to 5 years and 12% for less than one year. Major proportion of respondents recommend ICTs practice and use during disaster recovery 96% respondents said that ICTs use during disaster recovery phase make it fast, 86% respondents said ICTs use made information seeking and gathering process easier that is the main reason that 66% respondents strongly agree that Pakistan should have a national information system for disaster management.

5 Conclusion

The paper has mainly concentrated to understand the public perception about the role of ICTs in disaster management of Balochistan and also focus on the respondent's level of disaster preparedness and awareness level of people about ICTs use in disaster management. People living in Quetta do agree that ICT devices play a very important role in disaster management and relief operations but they are not aware how constructively ICTs use in disaster situation. Our field survey results indicate that respondents are not well prepared for any high magnitude disaster but we cannot deny that Quetta is extremely concerned about earthquake disaster. The poor understanding and loss of access to smart and up to date ICTs infrastructure can critically hamper the effectiveness, timeliness and functionality of a community to correctly respond to and cope with the incidence of a catastrophe. The article recommends that increase the public awareness level through different awareness programs centered on ICTs appropriate use in context disaster management. The article also suggests that introduce new technologies to mitigate disaster instead of traditional methods and make ICTs accessibility

for every far flange areas of Baluchistan. In crisis management, information is an important factor when making the right decisions and consequently for the success of the whole operation. It could be the vital strategy for effective awareness and preparedness which are main ways to mitigating the impact of future disasters in the province.

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