

## Use and Effectiveness of ICT Tools in Disaster Management: A Case of Kenya Red Cross Society

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### Abstract

*Information and communications technology (ICT) can potentially play a pivotal role in disaster prevention, mitigation and management. For instance, remote sensing for early warning is made possible by various available technologies, including telecommunication satellites, radar, telemetry and meteorology. Enhanced early warning systems especially at national and community levels can save many lives and property if managed and implemented well. The Kenya Red Cross Society (KRCS) has been at the forefront in disaster management in Kenya. In the recent past, the society has diversified and invested in the use of modern information communication technologies in addressing myriad disasters. The KRCS investment in ICT for disaster management has been achieved through networking at the headquarters, regional and branch offices countrywide. This paper therefore sought to explore the use of ICT tools in disaster management and its effectiveness in Kenya Red Cross Society. Questionnaires, key informant interviews, structured interviews and secondary data analysis (content analysis) were the sources of information used. The overall research design was mainly qualitative in nature; adopting a case study approach. Purposive sampling was used to select Kenya Red Cross society for this study due to its participation in ICT based disaster management. The findings indicated that ICT facilities used by the Kenya Red Cross Society in disaster management are mainly HF radios and butterfly cameras, located in Nairobi. HF radios are the most effective tools used in disaster management; however there is inadequate investment in ICT tools for disaster management by the Kenya Red Cross Society. The author recommends more government support and more investment towards the use of ICT in disaster management.*

**Key Words:** Effectiveness, ICT Tools, Disaster Management, Kenya Red Cross Society

### INTRODUCTION

Kenya has recently been characterized by frequent floods, famine, human displacement, ethnic clashes and other catastrophes which have caused both loss of property and life. For example the post election violence, collapse of buildings in Nairobi and other areas, frequent occurrence of famine and starvation of people have rekindled the public debate on the country's disaster management capacity, preparedness and responses systems. Currently, various departments and ministries in the Kenyan Government are responsible for disaster management, early warning and coordination. The Ministry of state for Special Programmes (MoSSP) has the lead role in disaster related issues

Natural disasters have profoundly affected humanity in many ways. The United Nations International Strategy for Disaster Reduction (UN/ISDR) has calculated that there have been more than 5,210 disasters recorded in the world between 1991 and 2005 (UN/ISDR, 2004). This has mainly been in the form of natural and human made including the earthquakes, fires, famine and floods. Africa especially has suffered from human made disasters mainly in the form of genocides, wars and other natural disasters ranging from floods to earthquakes (UN/ISDR,2004 *ibid*).

Yet the government has not been fully prepared in handling frequent disasters experienced in the country. Disasters such as collapse of buildings, mass killings, and famine have been mismanaged due to poor communication technology that slackens the disaster management process leading to high loss of lives and property which would not occur if communication had been smooth.

### Information and Communication Technology

Powell (2003) conceptualizes information and communication technology (ICT) as a range of technologies - computers, audio and video - which developed separately but which have now converged towards the point where the technologies that support computers, telephones and televisions are highly

interconnected. According to UN/ISDR (2006), ICT includes any communication device encompassing radio, television, mobile phones, computer and network hardware and software, satellite system and so on, as well as the various services and applications associated with them like video conferencing and distance learning.

In the light of recent natural and man-made disasters that have occurred, great attention and efforts have been directed towards the application of ICT in disaster management, especially early warning, prediction, and mitigation. Emphasis is steadily being placed by both international agencies and governments on the use of various communication facilities to manage disasters. The application of ICT in disaster management is in a realization, through experience, that has shown that communication in disaster management helps speed up responses, including deployment of rescue, recovery and evacuation teams, and information sharing among diverse audiences and saving of lives.

Suda (2007, pp. 91-103) states that disaster of any kind is a development issue. The devastation from the floods and landslides in many parts of the world in terms of displaced populations, loss of lives, destruction of property and the collapse of vital infrastructure clearly reflects lack of disaster preparedness nationwide. The consequences of natural and man-made disasters and the vulnerabilities to which populations are exposed can be mitigated if they are targeted proactively. In this context, ICT can play a pivotal role in disaster prevention, mitigation and management. Suda (2007) states that the ability to anticipate disasters before they occur and to respond to them expeditiously and effectively in a well-coordinated manner requires, among other things, an efficient early warning system with state-of-the-art equipment for early warning system preventive action. She further explains that the issue of preparedness is rooted in the question of what capacity exists in the country as a whole to effectively deal with natural and man-made calamities.

### **Theoretical Underpinning**

This study was guided by the Two-step Flow Theory. The model emerged originally from the first study of the effect of mass communication in presidential election campaign of 1940 in the USA by Lazarsfeld, Berelson and Hazel Gaudet. It was based on the conclusion that media had a limited effect in changing people's election choices as compared to personal contact. In diffusion of innovation, information flows through a diffusion network, which is mainly in a *two-step flow of communication*. It was discovered that the major source of information and influence was other people that is individuals turn to other individuals to obtain information about issues. Those who provided the information also provided the interpretation. Thus the flow of information between people also included a flow of influence. Those who served most often as sources of information and influence were called opinion leaders. They had the following characteristics. Firstly, they have greater attention to the media. Secondly, their social economic status was similar to those of whom they influenced (Alexis, 1986). Alexis (1986) concludes that content moves from the mass media to opinion leaders, who then pass it on to others whom they inevitably influence. Personal influence has been found to play a major role in spreading innovations and bringing about technological and cultural change.

This theory is relevant in ICT since those competent in the use of ICT tools can influence the rest of the society by explaining and interpreting to them what they have learned from the mass media. In most African societies, few people have access to ICT facilities like the mobile phones, radio, television, Internet and so on. Therefore, the rest of the society turns to these individuals to obtain more information. This could be in form of the latest news from the radio, television or disaster warnings given on mobile phones about current issues like impending floods, or disasters like fire tragedies, accidents and so on.

The two-step flow theory also reveals another important element in the society of social classes. This is whereby the high class people who happen to have more ICT tools and the ability to interpret messages from, for example, sirens and surveillance cameras tend to influence the low class people who rely on other personal contacts as guides. The use of new technologies and flow of information as advanced in the two-step theory is clearly reflected in the use of ICT in disaster management by the Kenya Red Cross Society.

## MATERIALS AND METHODS

The overall research design was mainly qualitative in nature; adopting a case study approach. Purposive sampling was used to select Kenya Red Cross society for this study due to its participation in ICT based disaster management. The study employed the use of questionnaires, key informant interviews, structured interviews and secondary data analysis (content analysis) in its data collection. The researcher interviewed key informants mainly from the Kenya Red Cross Society. Data was also collected through secondary data in libraries, content analysis, web browsing, and interviews with key informants. The author also read the KRCS newsletters and reports to provide more information about the society on disasters and ICT. Web browsing too was used for additional information on ICT and disasters. Most of the websites referred to in this study are those of institutions dealing with disaster management.

Face-face interviews and telephone interviews were used to gather information from the key informants in the KRCS. The researcher prepared three sets of questionnaires; one with questions for the Kenya Red Cross Society ICT, Disaster Management and Communications staff. The questionnaires contained both open ended and closed ended questions. The closed ended questions were captured through a Likert scale and contingency questions.

Content analysis was used in data analysis. After collecting data from the questionnaires, interviews and documentary analysis, the author classified it into various categories. The data then was analyzed in view of the objectives of the study.

## FINDINGS AND DISCUSSION

The objective of the study was to explore the ICT facilities and their application in disaster management by the Kenya Red Cross Society. The Kenya Red Cross Society is a humanitarian relief organization created through an Act of Parliament, Cap 256 of the Laws of Kenya of 21st December 1965. Previously, the Kenya Red Cross existed as a Branch of the British Red Cross between 1939 and 1965. As a voluntary organization, the Kenya Red Cross operates through a network of 62 Branches and eight Regional offices throughout Kenya. The Kenya Red Cross, which gained recognition by the International Committee of the Red Cross (ICRC) in 1966, is also a member of the International Red Cross and Red Crescent Movement since 1967, the largest humanitarian movement represented in 185 countries worldwide.

The Disaster Preparedness and Response (DPR) department of KRCS aims at increasing the capacity of the Kenya Red Cross to forecast, prevent, mitigate and respond to disasters whenever they occur. The Kenya Red Cross usually responds to disasters with food such as maize, beans, vegetable oil, unimix, seeds and water, and non-food aid such as blankets, jerricans, kitchen sets, clothes, tents, tarpaulins and mosquito nets.

The challenge of reducing vulnerability and enhancing capacity requires an intimate knowledge and understanding of local realities. The Kenya Red Cross therefore, utilizes its grassroot structures as channels through which to tackle this challenge to be able to minimize vulnerabilities and disaster risks and limit the adverse impact of hazards on vulnerable communities in the country.

The Kenya Red Cross Society's Information and Communication Technology (ICT) Unit is mandated to enhance communication through the networking of Regional Offices and Branches, capacity building and cost reduction by enhancing radio network, improving efficiency, reporting and staff output through shared and distributed services over the Wide Area Network. The Unit also ensures reliable and secure infrastructure is in place, proper utilization and performance of ICT equipment as well as Branch capacity building through deployment of ICT equipment.

The Society has been involved in various disaster management activities, aimed at alleviating human suffering in the country. KRCS 2007 *Annual Report* highlights some disaster-related cases addressed by the Society. Since 2006, 18,000 people have benefited from physical installations of water points (North Eastern); health centres, maternity wings (Eastern); fish market and refrigeration facilities (Nyanza) from KRCS that have improved the livelihoods of the target communities in food, income generation, hygiene and sanitation. Emergency operations in Kuvasali in Kakamega to assist over 25,000 people displaced by

a mudslide, fire disasters mostly in the informal settlements countrywide, and road traffic accident victims in major highways. In emergency operations especially in drought prone areas, KRCS is the largest partner with the World Food Programme (WFP). KRCS continues to work with VCA tools and disaster management committees to identify and prioritize the needs of the beneficiaries, mapping of risk prone areas, and development of disaster management plans for Kwale, Kilifi, Lamu, Mombasa, Nairobi, Nyando and Machakos.

### Exchange Mail Service

The Society's mail system migrated from MDAemon to Exchange to extend the service to Regional offices and allow office mobility operation areas. Staff in the field with portable modem can now access their mail through web mail.

KRCS is a member of various local disaster management committees. This is especially important in flood-prone areas of Western Kenya and Coast, and the drought-prone areas. KRCS also operates the disaster management training which is crucial in training people in disaster preparedness, management and mitigation. Special training on Basic Health Care is provided in Emergencies and Public Health in Emergencies, among others. Teams and personnel trained in Field assessment and coordination (FACT) are part of the Regional Disaster Response Teams (RDRT) and National Disaster Response Teams (NDRT).

The study findings indicated that HF Radios were the most frequently used tool in disaster management. Four respondents indicated that the website and Intranet were most frequently used, whereas only one indicated the mass media as most frequently used. The respondents noted that Butterfly cameras were frequently used in disaster management. These findings are presented in Table 1.

Table 1. Use of ICT tools in disaster management

ICT tool	Not Frequent	Frequent	Most Frequent
Butterfly cameras		5	
HF Radios			5
Mass Media		4	1
Website	1		4
Intranet		1	4

When asked to rate the effectiveness of the ICT tools used by the Red Cross society in disaster management, all the eight respondents indicated that the website was effective. Six respondents indicated that the intranet was effective whereas two indicated that it was not. For the HF Radios, 6 respondents indicated that it was effective whereas two indicated that it was very effective. When asked to rate the butterfly cameras, 4 indicated that they were effective whereas two rated them as very effective. Mass media was rated as not effective by two respondents, effective by 4 respondents and very effective by 2 respondents.

Table 2. Effectiveness of ICT tools in disaster management

ICT tool	Not Effective	Effective	Very Effective
Website		8	
Intranet	2	6	
HF Radios		6	2
Butterfly cameras	2	4	2
Mass Media	2	4	2

The study findings indicated that most ICT tools were found only in Nairobi. These results are presented in Table 3.

Table 3. Location of ICT tools

ICT Tool	Location
Website	Nairobi
Intranet	Nairobi
HF Radios	Countrywide
Butterfly cameras	Nairobi
Mass Media	Countrywide

The findings indicate that the website, intranet and butterfly cameras were only found in Nairobi. HF Radios and the mass media were found country wide. This means that the use of ICT tools was limited by availability of the tools. Those in Nairobi had greater access to the ICT tools and thus they had an opportunity to utilize them in disaster management unlike their counterparts in other regions of the country.

### CONCLUSION AND RECOMMENDATIONS

The ICT disaster tools frequently used by KRCS include HF radios. Most of the ICT tools used by the society as well as the Emergency Operation Centre (EOC) are located in Nairobi. There is inadequate use of ICT tools in disaster management in the Kenya. The use of ICT tools by the Kenya Red Cross Society is gradually emerging as a new phenomenon that is expected to improve disaster management in the country.

There is inadequate investment and training in ICT tools for disaster management in the Kenya Red Cross Society and therefore the author recommends local capacity in institutions in ICT use in disaster management in order to ensure efficiency in handling various disasters in the country to avoid loss of lives as witnessed in the Nakumatt incident, Molo oil Tank tragedy and other disasters. The researcher also recommends future research on the effectiveness of ICTs in disaster management in Kenya. Lastly, the government should come up with policies on ICT and disaster management in Kenya.

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### BIO-DATA

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