



## RESEARCH ARTICLE

# ADEQUACY AND EFFECTIVENESS OF DISASTER AND EMERGENCY COMMUNICATION TOOLS IN THE MANAGEMENT OF DISASTER RISK INCIDENTS IN CALABAR SOUTH LOCAL GOVERNMENT, CROSS RIVER STATE, NIGERIA

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### ABSTRACT

This study examined the adequacy and effectiveness of disaster and emergency communication tools in crisis situation in Calabar South local government. Study method was the cross sectional survey involving the use of questionnaires. A total of 400 questionnaires were distributed to the sampled communities and key informants to elicit responses. The data collections were grouped according to research questions. The data were organized and presented in tables. Frequency counts of agree and disagree responded were obtained and mean scores were used for data analysis. Risk characterization using Risk Assessment Matrix was used to ascertain the level of probable risk residents may face in the event of emergencies or disaster incidents. Table 3 in the study shows the total sum for agree was (100), with a mean score of (20), while the total sum for Disagree was (300) and the mean score was (60). This result shows that the respondents admit strongly on the non-availability of the modern emergency communication tools, and also strongly disagrees on adequacy and the effectiveness of the available ones in the management of disasters in Calabar South local government Cross River State. Table 4 of the research also shows that residents are not aware of some of the modern emergency communication tools and how they are utilized during disaster situations in the local government. The study recommends that Emergency Management Agencies should improve on their communication level with the public to bridge the poor communication gap between the agencies and the people. This will improve on the level of helplessness and hopelessness of the residents to disseminate information during disasters. This assertion corroborates with the study by United States Centre for Disease Control which states that the most valuable way of information transformations and dissemination are based on a new key player in emergency management – ‘the public’.

### INTRODUCTION

The International Strategy for Disaster Reduction (ISDR) cited in (Niekerk, 2008) defines disaster risk reduction as “*the systematic development and application of policies, strategies and practices to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevent) or to limit (mitigate and prepare) adverse impacts of hazards, within a broader context of sustainable development*”. Niekerk (2008) emphasizes how important it is to first consider the factors contributing to the creation of the risk, before disaster risk itself can be determined, these include: Hazards, Risk, Vulnerability, Communication, Manageability and Capacity. According to (Wisner et al; 2004) reference was made to a selection of the United Nations (UN) conferences where remarkable developments and policies towards addressing the social aspects of vulnerability and disaster risk reduction issues were recorded. “*First was the 1994 Yokohama conference where the message “those usually most affected by natural and other disasters are the poor and socially disadvantaged groups*

*in developing countries as they are least equipped to cope with them”*. Adding to this affirmation was the encouragement on community involvement by authorities with a purpose of gaining insight into communities perceptions of developments and risks, as well as understanding the social dynamics of hazard-prone communities, and a need for “a clear understanding of cultural and organizational characteristics of each society as well as of its behaviour and interactions with the physical and natural environment. This knowledge is of utmost importance to determine those things which favour and hinder prevention of the environment for the development of future generations and in order to find effective means to reduce the impact of disasters”. In (1999) International Decade for Natural Disaster Reduction Programme forum in Geneva emphasized the four goals for International Strategy for Disaster Reduction (ISDR) with focus on the human dimensions of risk reduction, as well as concern for livelihood protection. They include increasing public awareness of risks posed to modern societies through effective communication, obtaining commitments by public authorities to reduce risk to people, their livelihoods, social and economic infrastructure and environmental resources, engaging public participation at all levels of implementation to create disaster-resistant

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communities through increased partnership and emergency communications. All the conferences held indicated the growing consciousness and serious concern about the need to have a joint responsibility of governments, communities, NGOs, alike to apply concerted efforts towards improved disaster and emergency communications. There is a growing concern for a shift from “relief and response vulnerability analysis” to “risk management” through exploitation of linkages between effective communications so as to reduce poverty and vulnerability in communities (Yodmani, 2001). Adequacy and effective communication tools have powerful impact on how national and international resources are mobilized. It is essential for after-action analysis, evaluation, and lessons to be learned after an emergency incident (Guha-Sapir *et al.*, 2004). Stakeholders depend on information to guide their work and to translate their interest and concern into concrete action. Information on emergency or disaster situations comes from many sources; it represents different points of views and serves a wide range of interests and needs (PAHO, 2009). The type of information provided reflects the multi-disciplinary nature of emergency and disaster response and the ever-growing number of specialists and organizations from different technical disciplines who are involved in disaster response. The adequacy and effective management of disaster communication tools both for national and international actors (response team) will be beneficial to affected populations (victims) to the extent that they have precise, timely, and relevant information. This synergy is strategic and obviously applies to communication channels and tools that can facilitate dialogue and build partnerships in an emergency situation (Guha-Sapir *et al.*, 2004). The challenges are to show how communication and information management contribute to more effective and timely response, and therefore to saving lives, and how these activities can lessen the impact of disasters and emergencies and improve the quality of life of affected populations. It is against this backdrop that this project seeks to investigate the adequacy and effectiveness of emergency communication tools in the management of disaster risk incidents in Calabar Municipality, Cross River State, Nigeria.

### Aim and objectives of the Study

The study examined the Adequacy of Disaster and Emergency Communication Tools in the Management of Disaster Risk incidents in Calabar South Local Government Cross River State, Nigeria.

The objectives of this research are to:

- Identify the various emergency or disaster management agencies in Calabar South Cross Rivers State.
- Identify the emergency communication tools that are available to these agencies in the management of disasters or emergencies in Calabar South Cross Rivers State.
- Ascertain the adequacy and effectiveness of the disaster communication tools in the management of emergencies in Calabar South Cross Rivers State.
- Assess the level of awareness of residents of Calabar South of these disaster or emergency communication tools for effective disaster management in the local government.
- Suggest ways to improve the effectiveness of the emergency communication tools in the management of

disasters in Calabar South local government Cross River State.

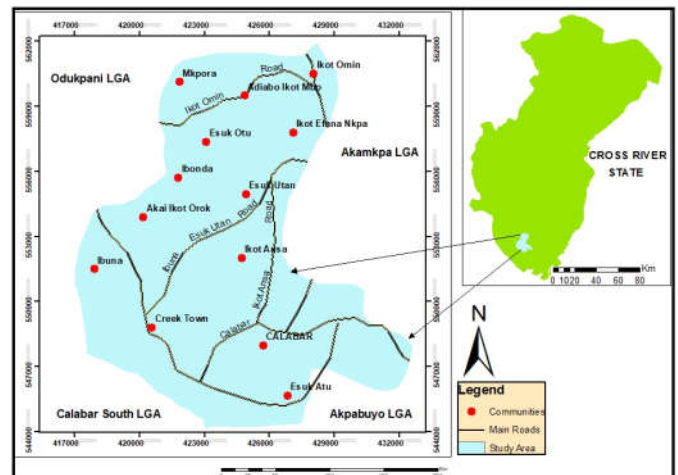


Figure 1. Showing Communities in Calabar South Municipal Local Government

## MATERIALS AND METHODS

The research design for this study was cross-sectional survey research. This will include identification of target population (the agencies involved in emergency management in Calabar South local government, i.e. The National Emergency Management Agency (NEMA), The Red Cross Society, The Federal and State Fire service, Federal and State Ministries of Health, and Federal and State Ministries of Environment, Multinational Agencies in Calabar South LGA, etc.

### Sample Population

The sample population includes;

- Staff of the agencies, both management and field staff.
- Residents of the local government who have experienced the disasters.
- Key informant Surveys.
- Direct observation by the researcher.

### Sample and Sampling Technique

A purposive sampling technique was used to select twenty five (25) selected key informants from the identified (5) emergency agencies, in addition to the total population of male and females in Calabar South local government which was put at 191,630 persons (National Bureau of Statistics, 2006). This was used to estimate the sample size. Sample size was estimated at

95% confidence interval using the Yaro Yamaneequation;

$$n = \frac{N}{1 + N\alpha^2}$$

Where;

n= sample size

N= total number residents in Calabar Municipality

$\alpha = 0.05$

$$n = \frac{191,630}{1 + 191,630(0.05)^2} = 400$$

**Table 1. Are Residents awareness of activities of agencies involved in Disaster management in Calabar South local government?**

S/N	NEMA	Red Cross	Fire Service	Federal/State Health	Responses Agree/Disagree	
1.	Are you aware of these emergency /disaster agencies operations in Calabar South local government?				50	20
5.	Are these agencies regularly seen at the scene of disaster/emergency in Calabar South local government?				20	35
8.	Are these agencies equipped to respond to emergency situation in Calabar South local government?				55	45
12.	Are these Agencies very prompt when disasters occur in Calabar South local government?				80	35
15.	Is there hope for improved performance by the agencies?				35	25
Total					240	160

Total for sum for Agree = 240  
 $X = 240/5 = 48$   
 Total sum for Disagree = 160  
 $X = 160/5 = 32$

**Table 2. What are the various emergency communication tools available for disaster management in these agencies?**

S/N	NEMA	Red Cross	Fire Service	Federal/State Health	Responses Agree/Disagree	
2	Helicopter	Ambulances/Buses	Fire trucks	Ambulance	30	40
3	Ambulances	Fire trucks/Buses	Telephones/emails	Telephones	20	40
4	Public address system/Satellite coverage	Observations by (Officers)Twtters/internet/Whaps App.	Running caller office (report)/Twtteer	Internet-message(what Sapp, face book	20	80
7	Trained officers	Television/newspapers	Radio	Bill-Board adverts	25	40
9	Hilux trucks	Earlywarning/Radio Signals	Fire Alarms	Fire Extinguishers	40	60
Total					140	260

From the Table 2; Total sum for agreed = 140  
 $X = 140/5 = 28$   
 Total sum of Disagree = 260  
 $X = 260/5 = 52$ .

**Methods of Data Collection:** The data used for this study were sought from two sources namely: primary and secondary sources. Alsrisk characterization using Risk Assessment Matrix was employed to also ascertain the level of probable risk that residents may face in the event of emergencies or disaster incidents.

**Instrumentation:** Questionnaire was administrated using random method in the selected communities in the local government. A total number of 400 questionnaires were distributed to the sampled communities to elicit answers from respondents. The questionnaires were of two sections. Section A, was on the personal data. Section B, was framed alternatively in response pattern i.e. Agree or Disagree were used to elicit the opinion of the respondents.

**Data Analysis:** Both qualitative and quantitative methods of data analysis were used. Statistics of percentages and frequency counts were tallied from the research questions. It involved coding, editing, and tabulation of responses on the questionnaires and interview guides. These statistics were analyzed using the Statistical Package for Social Sciences (SPSS) program and were used to make comparisons between responses and to draw conclusions about the various aspects of the study. Specifically the data for this study were grouped according to research questions. The data were then organized and presented in tables. Frequency counts of agree and disagree responded were obtained and mean scores were used for data analysis.

The formula used for calculation is

$X = \Sigma fx$   
 N, where:  
 $X = \text{Mean Score}$   
 $\Sigma = \text{summation}$   
 $fx = \text{Frequency of scores or responses}$   
 $N = \text{Total questionnaire items of the group thereof.}$

## RESULTS AND DISCUSSION

Questionnaire items 1, 5, 9, 12, and 15 were used for answering research question one. Table 1 shows the questionnaire items and data collected for answering research question one. Data in Table 1 show that the total sum for agreed responses for the five items was 240, while the mean score was 48. The total sum for disagree responses for the five items was 160 while the mean is 32. Since the mean score (48) for agreed responses was higher than mean score (32) for disagree responses, it was concluded that the research question was answered in the affirmative of question 1,8, 12 and 15, which attest to the fact that the emergency agencies are known by the residents in the local government. They have some of the equipment needed for the execution of their job in State. The Table 2, above addresses research question 2 using question; 2 3, 4,7 and 9 to elicit the various disaster and emergency communication tools that used by the agencies in Calabar South local government. From the analysis, it shows that the sum total of Disagree for the five items was 260 with a mean score of (52), while the sum total for Agree was 140 with a mean score of 28. These analysis shows that the residents of the local government Disagrees that these equipment especially the modern emergency communication tools are available in these agencies. This makes it difficult for them to attend to disasters situations in the local government promptly. Incidences are only reported by the agencies when it has already occurred and caused harm and damage to the victims. From the table 3, above the total sum for agree was 100, with a mean score of (20), while the total sum for Disagree was 300 and the mean score is 60. This analysis shows that the respondents admit strongly on the non-availability of the modern emergency communication tools, and also strongly disagrees on the adequacy and effectiveness of the available ones in the management of disasters in Calabar South local government, Cross Rivers State. This was because the easiest and quickest mode of dissemination of information to the people was through the social media.

**Table 3. What is the level of adequacy and effectiveness of these emergency communication tools?**

Question items	ResponsesAgreed	Disagreed
6 The emergency/disaster communication tools are Radio, TV, Telephone, Newspapers, public address system; Social Media etc. are effectively utilized.	10	100
13 The effectiveness of these emergency communication tools could be enhanced when masses are properly enlightened and well mobilized	40	20
14 The emergency/disaster communication tools are Radio, TV, Telephone, Newspapers, public address system, Social Media etc. are not effectively utilized	20	80
10 The emergency communication tools are obsolete and need repairs	10	70
11 The emergency communication tools needs are deployed on time	20	30
Total	100	300

The table 3 shows the research questions 3 on the level of effectiveness of emergency communication tools. The sum total for Agree = 100

$X = 100/5 = 20$

The sum total for Disagree = 300,  $X = 300/5 = 60$

**Table 4. What is the level of awareness of residents and utilization of these emergency communication tools in Disaster management in Calabar South local Government?**

Question Items	Agree	Disagree
16 The emergency/disaster communication tools are Radio, TV, Telephone, Newspapers, public address system, Social Media etc.?	40	50
22 The emergency communication tools are; Fire trucks, early warning signals, and public enlightenment campaign, Fire alarms etc.?	20	80
25 The emergency communication tools are deployed swiftly?	20	50
19 Which of these tools are at your disposal at emergency; phones, social media, television, town crier etc.	20	50
20 Which of the tools are easily responded to by the agencies; phone calls, text messages, face book what Sapp etc.	20	50
Total	120	280

**Table 5. What ways can these emergency communication tools can be improved upon for better emergency management of Disaster in Calabar South local government?**

Question items	ResponsesAgree	Disagree
17 The emergency/disaster communication tools can be improved upon by training and retraining of persons on use of state of the art equipment.	20	26
18 The emergency communication tools can be improved upon through adequate funding of the agencies by the government.	100	24
21 The emergency communication tools are obsolete and requires complete overhaul for effectiveness.	50	30
7 The emergency communication tools need to be provided at strategic areas in the state for residents to use to enhance effectiveness.	50	40
23 There is need for massive orientation on the use of emergency communication equipment to avert disasters.	20	40
Total	240	160

Although many households in the local Government may boast of possession of smart telephones. In the same vein, most residents are yet to grasp with the usage of the new technology. While those that can use the technology may be constraint by funds for data recharge on their smart phones and the issue of recycled information that may not be the true situation on ground. The Table 4, shows the research question 4 on the level of awareness of residents and the utilization of emergency communication tools in the management of disaster in the study area.

The sum total for Agree = 120

$X = 120/5 = 24$

The sum total for Disagree = 280

$X = 280/5 = 56$ .

Therefore, from the Table 4, above the total sum for agree was 120, with a mean score of (24), while the total sum for Disagree was 280 and the mean score was 56. The analysis shows that residents are not aware of some of the modern emergency communication tools and how they are to be utilized during emergency or disasters situations in the local government. This assertion explains the level of poor communication between the agencies and the people and the level of helplessness and hopelessness of the residents being unable to disseminate information during disasters.

This assertion agrees with the study by (CDC, 2012) that the most valuable way of information transformations are based on a new key player in emergency management – ‘the public’. The table 5 shows the research question 5 which talks about the ways by which emergency communication tools can be improved upon.

The sum total for Agree = 240

$X = 240/5 = 48$

The sum total for Disagree = 160

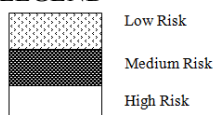
$X = 160/5 = 32$ .

Data in the table 5, indicate that the total sum for agree responses for the five items was 240; while the mean score was (48).The total sum for disagree responses for the five items is 160 and the mean score was 32. But because the mean scores agree responses (48) was higher than the mean score (32) for disagree responses, it was concluded that the research question was answered in the affirmative, that was the respondents for this study perceived effects of the ways by which emergency communication tools can be improved upon include; adequate funding by the government, training of staff on modern emergencies communication tools, massive orientation of the people (education/enlightenment),and the provision of enough modern emergency communication tools at strategic places in the local government for the people to use and to enhance information dissemination on emergency situations.

Table 6.Risk Assessment Matrix Model

Consequence					Increasing Probability				
Rating	Impact on people	Impact on environment	Probability	Socio economic impact	Never heard of impact	Heard of incidence	Occurred recently	Occurred several times	Occurred some years ago
0	No injury	No impact	No damage	No impact					
1	Slight injury	Slight impact	Slight damage	Slight impact					
2	Minor injury	Minor impact	Minor damage	Minor impact					
3	Major injury	Confined impact	Localized damage	Noticeable impact					
4	Low Fatality	Confined impact	Localized damage	Noticeable impact					
5	Multiple Fatality	Extensive impact	extensive damage	Colossal impact					

LEGEND



**Risk characterization using Risk Assessment Matrix:** The research identified the various risks faced by the residents in the local government with a view to presenting an assessment of the risk to live, property and the environment. The following factors have been identified as potential dangers and risks posed to the residents when there was an emergency incidents. Risk is a function of probability and severity. Applying the risk assessment matrix in the characterization of risk, a scale of consequence rated 0 – 5 was adopted to indicate the increasing severity of the identified hazards and risks to the magnitude of the disaster incident. The consequences were judged on the impact on human health, the environment and socio economic. Therefore the risk was classified using the matrix model to assess the effects on these variables:

- The Probability of the fire, flooding or collapse of building incidences occurring in the local government ranging from A to E.
- The severity of the incident on the People(residents) rated from 1 to 5.
- The effects on their socio economic lives such as loss of property and farmland etc rated from 1 to 5.

Table 6 shows Risk Assessment Matrix Model. The risk assessment matrix is explained thus, using the three characters mentioned above; that is impact on people (P), impact on environment (E) and impact on socio-economic (S). The intersection of chosen column and a chosen row gave the risk classification.

**FINDINGS AND DISCUSSION**

Technological advances have transformed how emergency communication teams can disseminate information to the public during a crisis event. Traditional media such as television, radio and newspapers is no longer the primary source of information as smart phones and tablets enable immediate mobile access to digital and social media platforms. In developed cities, emergency management officials make the most appropriate decisions; officials charged with coordinating crisis communication increasingly turn to social media for fast, reliable information. While in rural communities, community members have always served as volunteers in the response and recovery efforts, social media and its use in emergency response now makes the

community part of the communication about the crisis in the case of an emergency. Information no longer comes only from the top down, but is received and transmitted vertically and horizontally among all parties. This information can be disseminated and evaluated in real time, transforming the roles of both the public and the responder throughout a crisis event, (USCDC, 2012).This research examined the effectiveness of disaster and emergency communication tools in the management of disaster risk incidents in Calabar South local government Cross Rivers State, Nigeria. From the table 3, above the total sum for agree was 100, with a mean score of (60), while the total sum for Disagree was 300 and the mean score 60. This analysis shows that the respondents admit strongly on the non-availability of the modern emergency communication tools, and also strongly disagrees on the adequacy and effectiveness of the available ones in the management of disasters in Calabar South local government Cross Rivers State. This is because the easiest mode of dissemination of information to the people is through the social media (What Sapp, Phones, Twitter, Instagram, U -tube etc). Although many households in the Municipality boast of possession of smart telephones. In the same vein, most residents are yet to grasp with the usage of the new technology. While those that can use the technology may be constraint by funds for data recharge on their smartphones. This corroborate with a survey in (Silicone Republic, 2015) where these devices remain largely a message delivery device and cannot yet be considered as a two-way communication tool. Furthermore, Public Health England (2015) also noted that in some cases there is an ‘over-reliance on social media tools’ and that the limited nature of messages which can come from Twitter and Facebook or smart phones can restrict detail in emergency messages. Furthermore, Table 4, above in this research, examined the level of awareness of residents of the local government about the availability and usage of the emergency communication tools. The total sum for agree was 120, with a mean score of (24), while the total sum for Disagree was 280 and the mean score (56). The analysis shows that residents are not aware of some of the modern emergency communication tools and how they are to be utilized during emergency or disaster situations in the local government. This assertion explains the level of poor communication between the agencies and the people and the level of helplessness and hopelessness of the residents being unable to disseminate information during disasters. This assertion underscores the study by



Samuel, (2007), 'which identifies a process of setting up, developing and reviewing crisis management within all large towns and cities amongst the people. More importantly, however, was the need to avoid public confusion during an incident, as without lead responders, every category of responder would be obliged to issue warnings, putting lives at risk as a result of conflicting safety information'. More so, the social media has carried information which were later verified as fake information, therefore cannot be absolutely relied upon as a proper platform for information dissemination in cases of emergencies.

### Conclusion

Based on the findings of the study, the researchers concluded as follows:

- The respondents admittance in Table 4 in this research, strongly on the non-availability of the modern emergency communication tools, and also strongly disagree on the adequacy and effectiveness of the available ones in the management of disasters in Calabar South local government Cross, Rivers State. Although many households in the local government boast of possession of smart telephones and other devices. In the same vein, most residents are yet to grasp with the usage of the new technology especially in decoding emergency or disaster information.
- Furthermore, the analysis in Table 3 in this research shows that the residents of Calabar South residents Disagrees that these emergency equipment especially the modern emergency communication tools were not available in these agencies and the ones available are obsolete. This makes it difficult for them to attend to disasters situations in the local government promptly. Incidences are only reported to the agencies when that had already occurred and caused harm and damage to the victims.

### Recommendations

Based on the findings, summary and conclusion of the study, the following recommendations are made;

- The government should train adequate man power to execute disaster and emergency management incidences in the local government, State and the Nation at large.
- The emergency management agencies should be well equipped with the modern state of the art equipment and technologies used in the developed countries in the management of disaster and emergency situations both at the local government, State and the Nation at large.
- The emergency management agencies should improve on the communication level with the public to bridge the poor communication gap between the agencies and the people so as to improve on the level of helplessness and hopelessness situation the victims find themselves in times of disasters. This assertion agrees with the study by (USCDC, 2012) that the most valuable way of information transformations and dissemination are based on a new key player in emergency management – 'the public'.
- The study suggests that adequate funding by the government, staff training on use of modern emergencies communication tools, massive orientation

of the people through (education/enlightenment on emergency preparedness and responses) ,and the provision of enough modern state of the art emergency communication equipment/ tools at strategic places in the local government areas, even at community levels for use by the people as a wayto enhance information dissemination during disasters/ emergency situations.

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