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Research Article

DISASTER RESPONSE MANAGEMENT IN GHANA: A CASE OF THE NATIONAL AMBULANCE SERVICE

Matilda Kokui Owusu-Bio[1]., Daniel BoakyeAcheampong[2] and John Frimpong Manso[3]

[1,3]Kwame Nkrumah University of Science and Technology School of Business PMB, Kumasi-Ghana
[2]KNUST School of Business Information Systems and Decision Sciences Department Kumasi-Ghana

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ABSTRACT

Minimizing, responding and managing disasters has been of great concern to all nations and Ghana's initiative and policies in this direction has seen the establishment of the Ghana National Ambulance Service (NAS).Ever since the organisation commenced its operations, little has been known about its operational framework, its humanitarian logistics needs and challenges through empirical research. The study focused on the Ashanti regional branches of NAS and collected data from the management and sixty-one staff using interviews and questionnaires respectively. Data were analysed qualitatively and quantitatively. The study's findings indicates that NAS has, to some extent, played a key role over the years and has been successful in responding to disasters, and this manifests in its ability to swiftly respond to disasters, alleviate discomfort of victims and minimize mortality rates as well as being cost-effective. NAS's operational constraints were found to lie within humanitarian logistics needs like: human resources, equipment and supplies as well as funding and support from disaster management stakeholders. Specific challenges to NAS were found to include: inadequate and lack of appropriate communication devices and systems, paramedic materials, and protective clothing; location and accessibility problem, poor road network and poor road quality and funding and external support. Lastly, the findings indicate that the NAS's ability to respond to disasters and recuperate victims greatly depends on its preparedness and as well as the role of stakeholder in addressing above listed challenges. Based on these findings, the researcherss recommends a total stakeholder collaboration and support, a broadened scope for sources of funding, improved road quality and network system, street naming and address system, and deployment of up-to-date information system. Further studies should also be conducted by focusing on responses from other stakeholder in order to verify the findings of this present study.

INTRODUCTION

The growing health needs of people (e.g. pregnant women) and the increasing accidents on our road which leads to a lot of victims requires that urgent measures should be put in place to improve emergency medical services in the country as warned by NAS in order to prevent more accident victims from dying before reaching the medical facilities (Asiedu, 2014).

Following recent disasters such as the Melcom Disaster, the El-Wak cargo plane crash, and the victims of floods, the director of NAS stated that air ambulance or air medical services is a pressing need of the service especially in view of the country's poor road infrastructure and inadequate ground ambulance fleet, which makes it difficult for NAS to generally respond to emergency situations within the standard time (Asiedu, 2014).

The main purpose of this study is to evaluate how Ghana responds to disasters and manages it by focusing on the operations of the National Ambulance Service (NAS). The specific objectives are:

- To map-out the operations of NAS in responding to emergencies
- To assess NASs effectiveness in responding to emergencies
- To assess the humanitarian logistics needs of NAS in addressing disasters in Ghana
- To evaluate the challenges that NAS faces in its operations

In recent times, many natural disasters and humanitarian emergencies have attracted the attention of the international media and humanitarian logistics seeks to address these issues

Corresponding author: **Matilda Kokui Owusu-Bio*
Kwame Nkrumah University of Science and Technology School of Business PMB, Kumasi-Ghana

(Mbohwa, 2010). The components in addressing emergency needs include procurement, transportation, warehousing, inventory management, tracking and tracing, bidding and reverse bidding, reporting and accountability. Activities and decisions in the preparedness and response phase of disaster logistics have an impact on the amount of transportation eventually needed to fulfill the end beneficiary's requirements (Eng-Larsson and Vega, 2011).

Generally, the challenges encountered by the humanitarian organizations logistics systems are mainly due to the poor political and economic situations. The humanitarian environment continues to be complex requiring a deeper understanding of conflict, security and local and international politics (Mbohwa, 2010).

A crucial element in the prevention of life loss from emergencies is the ability to provide on the spot first response to a medical emergency and an important element in the delivery of emergency services is the ambulance service (Boateng and Kratzer, 2010).

As reported by Mbohwa (2010), the distribution of aids in countries such as Zimbabwe is mostly affected by factors such as nature of existing roads, dusty roads or gravel roads and their condition as well as inadequate information and communication technologies. This is no difference from Ghana as the medical emergencies and disasters that have been occurring in the country over the years have accentuated the nation's need to initiate an Emergency Medical Service. This was reiterated by the then President His Excellency John AgyekumKufour in year 2001 at the sessional address by emphasizing on the crucial need for a national ambulance services to be part of the emergency response institutions in the country (NAS, 2008).

Given similar developments in Ghana, governments and institutions over the years have been making efforts to improve humanitarian logistics. A typical case is the creation and resourcing of the National Ambulance Service (NAS). However, the increasing occurrence of unfortunate and disastrous events in the country still puts more pressure on stakeholders and thus requires that immediate search is conducted to critically examine the ground operations of NAS and come out with strategic remedial actions to help improve humanitarian needs of the country during the occurrence of mishaps. It is against this background that this study was carried out.

LITERATURE REVIEW

In recent years, the world has seen several and complex form of disasters in a variety of natural, man-made and technological disasters to humanitarian crisis (Ghana Web, 2013). Natural disasters can occur in the form of hurricanes, earthquakes, tornadoes, floods, and wildfires (Lazarus *et al*., 2003). Man-made disasters include structural, building and mine collapses, when this occurs independently without any outside force (Turner and Pedgeon, 1997). In addition, terrorism, domestic fire outbreaks and road traffic accidents are all man-made disasters. The occurrence of any of the above listed types of disasters creates emergencies that need to be responded to immediately. In responding to emergencies, the National Ambulance Service plays a major role in it.

In the United States of America, there are billions of dollars' worth of property destroyed and millions of lives put in danger in each year due to disasters (Federal Emergency Management Agency, FEMA, 2013).

In the third world countries, where poverty is on the ascendancy with lack of both human and material resources, research has shown that about ninety per cent (90%) of people die through natural disaster-related deaths (World Vision, 2015). Internationally, over 40% of patients are successfully treated by paramedics without the need to be transported to the hospital (Varadkar, 2014).Ghana has also suffered its fair share of the disasters, ranging from road accidents to catastrophical floods and wild fires such as the fall of a multi-purpose storey building of the Melcom company limited (Achimota Branch-Accra) which claimed several lives and injured so many people (Ghana Web, 2013). The most devastating one was the flooding and fire out brake which rendered thousands of Ghanaians homeless, destroyed billions of Ghana cedis worth of properties and claimed about two hundred lives in Accra and Kumasi on the 3rd and 4th day of June, 2015 (Ghana Web, 2015).

METHODOLOGY

The researchers adopted two of them; which are descriptive and exploratory approaches for this study. Descriptive research produces an accurate representation of the persons, events or situations and in this regard the response strategies of the NAS. It is also Exploratory research also aims to seek new insights into phenomena of disasters in Ghana as responded to by the NAS based on (Saunders *et al*, 2009). Data was collected through the use of Interviews, questionnaire administration and observation. Relevant literature from Journals, textbooks and NAS manuals as well were also used.

The population of the study of the study was the Ghana National Ambulance Service in the Ashanti region. Convenience sampling Technique was used to obtain a representative subset of the NAS's population. Seventy-five (75) respondents were sampled out of the total population of the Ghana National Ambulance Service (NAS) in the Ashanti Region.

Table 1 Breakdown of respondents

Respondents	Number
Supervisors	10
EMT Advance	30
EMT Basic	35

Source: field study 2015

Data was analysed with the Statistical Package for the Social Sciences version 20 (SPSS). The SPSS was used to obtain frequencies and percentages of closed end responses. This was to identify trends that appeared from responses. Open-ended qualitative responses were analysed through data reduction, display, conclusion creation, and triangulation to identify trends (Berkowitz, 1997).

Organizational Profile

The National Ambulance Service (NAS) was established in the year 2004 as an agency under the ministry of health (MOH). The Ghana National Ambulance Service aims at providing accessible 24-hour ambulance service nationwide through its own ambulance service and by collaborating with other emergency service providers like the National Fire Service and other hospital-based private ambulances. The service also delivers enhanced pre-hospital attention in disasters, accidents and emergencies.

DATA PRESENTATION, ANALYSIS AND DISCUSSION

NAS activities

The Researcherssgathered information on the activities of the NAS and presented it in the table below.

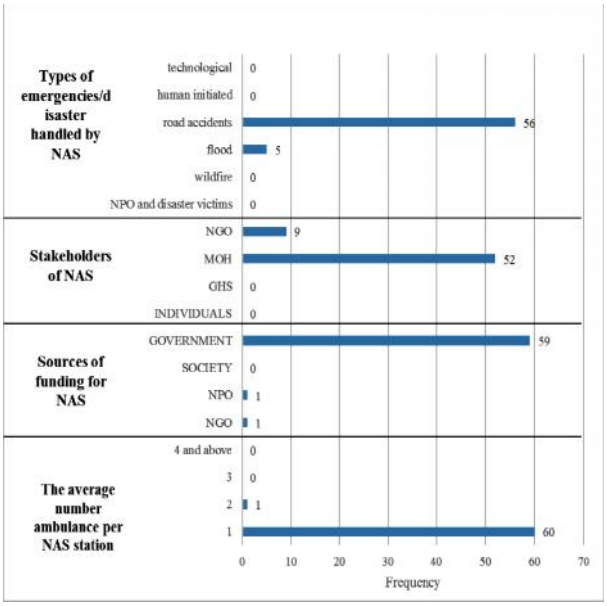

Figure 4 General information on NAS

Source: Field Study, 2015

A map-out of NAS's operations in responding to disasters

Through interviews with the management of the organisation, the researchers found that, NAS's operations in responding to disasters broadly falls into three phases, that is, pre-response preparation, response to incidence, and recuperation.

At the pre-response phase, it was noted that, the organisation always makes sure its vehicles (e.g. van) used in responding to disasters are fit and ready. There is also a continual assessment of the adequacy and appropriateness of materials (e.g. paramedic supplies) and other equipment. The organisation also continuously provides training and development for its personnel in relation to lessons learnt from the past and trending disaster issues. Lastly, it was found that various equipment used in communication and receiving of information on disasters are frequently maintained and made sure that they are working but needs to be updated to a more current and sophisticated ones which will enhance effective communication in the service.

With regard to 'response to incidence' phase, the study finds that before the organisation responds to any incidence; it has to be notified, which is handled by their Control Rooms (CRs). At the regional level, the CR receives calls from all health facilities as well as domestic cases and respond by informing the closest NAS station to attend to the incident. It's also the responsibility of the CR to identify and make preparations for a health facility with appropriate medical personnel to contain victims. To facilitate the process, the study finds that, the response team (RT) continually communicates with the CR get to the scene with all the necessary first aid materials and equipment.

At the last phase, that is, recuperation', upon getting to the scene, RT swiftly assess the severity of each accident victim, and administer first-aids. Here to, there is on-going communication between the CR and the RT. This helps the CR to make arrangement should there be the need for additional assistance. The CR also provides on-going attention in the van while taking victims to the health facility. The organisation's response operation ends upon successfully taking victims to health facility.

NASs' effectiveness in responding to emergencies

In terms of effectiveness in responding to disasters, the study finds that, on the average, NAS has been moderately been performing well in relation to their operational targets and expectations. Specifically, the study finds that, in mostly cases, NAS has been responsive in responding to disasters, successfully alleviating discomfort of victims at the time, enhancing the survival rates of victims, increasingly acquiring new knowledge after responding to incidents, and has been cost-effective in responding to disaster over the years.

Humanitarian logistics needs of NAS in responding to disasters

The study investigated into NAS humanitarian logistics needs of NAS in terms of (1) equipment and supplies, (2) human resources, and (3) funding and external support. In terms of equipment and supplies, it was revealed that the organization's operations require adequate and appropriate communication gadgets & systems, vehicles, protective clothing & gadgets, appropriate clothing, and paramedic/first-aids materials such as plaster, bandages, oxygen, among others.

Concerning human resources, the study found that effective operations of NAS depends on adequate and well-trained staff (particularly, the response team), well-motivated staff, and commitment from both employees and management. The study further found that NAS's effectiveness in its response to disaster is realized given adequate support and assistance from individual and organizations such the police, National Disaster Management Organization (NADMO), health facilities, donor agencies, government, and among others.

Challenges of NAS in its operations

Broadly, the study's results indicated that the challenges that NAS faces in effectively responding to disasters could be analysed in terms of managerial, operational, and external support and assistance. Concerning managerial, the researchers found that, the organization, to some extent, lack managerial

commitment, pro-activeness (i.e. training & developing staff), and finding ways to motivate staff.

The organisation's operational challenges were found to include inadequate size of response team, inadequate and lack of appropriate vehicles, communication devices & systems, paramedic materials, and protective clothing. Other operational challenges were found to include: inadequate rescue vans per station, lack of public awareness on how to reach NAS, location and accessibility problem (resulting from poor addressing and street naming system), poor road network and poor road quality.

The study also found that the size of NAS's donor base is small. There is also lack of frequent subvention from the government, and donations from individuals and business and non-profit making organisations.

Operational framework of NAS

To understand the operational framework of NAS, the researchers conducted an interview discussion with the personnel in charge of the Ashanti Regional NAS control room (an Advanced Emergency Medical Technician [EMT]) located at the KomfoAnokye Teaching Hospital (KATH), Kumasi. Particularly, the interview covered the pre-response preparations/preparedness of NAS prior to an incident; response procedure; and recuperation/recovery of accident victims. The responses are reported followed by their respective discussions.

Preparedness of NAS prior to a disaster incident

The first aspect of the discussion sought to know what preparations NAS need to make prior to an incident of disaster; so as to effectively and efficiently respond to incidents. The EMT personnel in response stated that; the NAS's are mostly in the form of ensuring the availability of materials (paramedic supplies such as plaster, bandages, etc.), equipment and training of staff to be astute for task at all the time in order to respond effectively and efficiently to incidents. The personnel stated specifically that "Before we are called, the van need to have been charged to ensure that there is enough power for the usage of the siren", which is a basic preparation required by all units. In terms of material supplies, the manager stated that "we are always replenished with all the needed first aid materials from plaster to oxygen". Staff preparedness was said to be in the form of "… periodic training from the basics to the paramedical level to enhance efficiency and effectiveness in our service delivery".

From these, it can be drawn that the key preparedness of NAS prior to any accident incident take the form of ensuring availability of medical supplies needed for their job; the preparedness of van in terms of functionality and energy sufficient enough to respond to any incident at all time; and finally the preparedness of staff to respond effectively and efficiently to an incident. When all these resources and measures are put in place before they are called unto an incident, NAS would then be able to respond appropriately to reported incidents.

Response to accident incidents

The discussion further sought to know how NAS responds to disaster incidents when reported. The discussion covered the means by which NAS is contacted and informed of incidents; the means by which NAS accesses the location of the incidents on point and in time; as well as the quality of information received.

Means of receiving information on incidents

The researchers inquired from the EMT personnel how they get informed of emergencies/incidents and the average lapse of time for reporting incidents/emergencies after it has happened. According to the manager; there is a regional control room (based in the KomfoAnokye Teaching Hospital [KATH], Kumasi-Ashanti) that serves as a link between clients and the various service branches in the region. The control room receives calls from all health facilities as well as domestic cases and respond by informing the closest NAS station to attend to the incident.

The control room after informing the nearest service station also books a bed with the appropriate health facility and communicates back the information to the rescue van before it arrives at the health facility for the doctor's attention. All other 16 branches/stations (the regional station at KATH adds up to 17 stations) of NAS in the Ashanti region only take instructions and directives from the regional control via a dedicated land line, whenever an emergency is reported.

As such, NAS does not interact directly with clients, and do not make arrangements with hospitals/health facilities; but rather, take instructions from the regional control room. According to the manager, between NAS stations and the control room, it takes a maximum of two (2) minutes to deploy the service van and staff upon information reaching each station. However, the lapse of time from the happening of an incident to reporting often happens between the time of incident occurrence and time taken to report the emergency to the regional control room. According to the EMT personnel, initially, the general public were not aware of the emergency short code or 'Toll free number" of NAS (193), which often led to delays in reporting incidents. Also, where accident and emergencies occur at outskirts where people do not spot the case in time, reporting often delay. However, the EMT personnel avowed confidently that, in the best case scenario; thus where accidents are spotted early, coupled with the ubiquitous of the use of mobile phones and increasing knowledge of the public of the ambulance short code, incidents are reported in matter of minutes (two minutes) to the regional control room.

On the quality and sufficiency; the EMT personnel, indicated that the responding personnel to an emergence reporting from the public in their best try to obtain all the necessary information about the emergency and the location. The control room ensures that they obtain precise information with regards to the location of the incident (including locality, street name, etc.), the nature of the emergency, and the caller's location and number, so as to communicate clearly to the dispatch team who is tasked to respond to the incident. Thus, information is quite precise from the regional control room to the dispatch team

(nearest NAS station) to pre-inform them of the nature of emergency and give appropriate directions to the location.

Accessing the emergency/incident location

Also, the discussion sought to consider how NAS response team accesses an emergency scene/location, and the challenges they encounter in such efforts. The EMT personnel distinguished between two types of emergencies as 'Domestic emergencies' and those coming from Hospitals (usually in the form of transferring a patient(s) to another facility). The specialist posited that NAS in all cases do not have challenges with hospital emergencies requiring transfer between hospitals due to the fact that hospitals have definite locations that are easy to locate within the region, and usually, have good (comparatively) roads networks linking them.

However, NAS's greatest location access challenge comes from domestic emergencies reported by individuals, who may not be able to provide accurate description of the incidents, the exact location of the incident, perhaps due to the Poor Street and house numbering system in most parts of the region. This coupled with poor road networks and structures make it difficult for NAS dispatch team to access the accident scene late than desired. This often require an on-going communication between the dispatch team and the regional control room, and between the regional control room and the individual who reported the scene until the emergency/accident spot is located successfully by the rescue team or dispatch team. The EMT personnel lamented that in areas where the road structures are poor, it also significantly reduces the response time of the rescue van, in the sense, that it reduces the speed with which the van can go where there are pot-holes, untarred or feeder roads, where roads are poorly linked, and streets are obstructed by poor domestic constructions, etc.

Recuperation/Recovery

The final section of the interview discussion aimed at exploring the recuperation process of NAS, until the emergency victim(s) is successfully handed in the care of a hospital or a health care facility.

The EMT personnel explained that, response team are trained in such a way that upon reaching the incident location, they swiftly assess the severity of each accident victim. The necessary first aid is applied and victims of high priority (those in the most critical condition) are first taking into the van for immediate transfer to the nearest hospital. Depending on the number of victims, a request is made at the control room to dispatch additional vans from the other nearby stations to aid in the rescue. An on-going attention is given in the van, with on-going communication/reporting to the regional control room who also feeds the hospitals with the details. This is to inform the need for diversion to a different hospital based on the condition of the victim(s).

The challenge usually, from the accident scene to the hospital is mostly the numerous speed rumps, and pot holes, which adversely affect the speed of transporting the victims given that the victim is already not in good condition and this apart from slowing down the transfer, sometimes impede the on-going medical attention to victims.

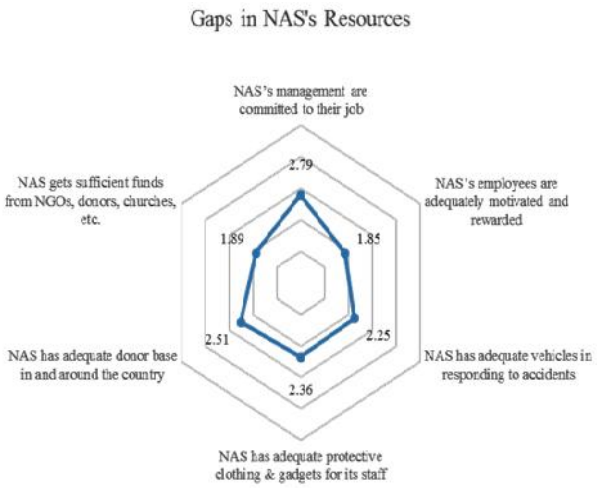

Figure 1 Gaps in NAS resources

Source: Field Study, 2015.

From the figure above, it can be observed that the most inadequate (largest gaps) resources are as follows:

Poor motivation and reward for NAS employees

The level of motivation and reward for NAS employees among the HR needs were among other things rated poorly by staff. Implying that the motivation offered and rewards offered by NAS to its employees is not satisfactory given the nature of the work they perform, not to talk about the risks involved.

Insufficient of funding from Donors

About the sufficiency of funds from NGOs, Churches, and other donors, etc., staff on the average scored it poorly at 1.89 out of 5, implying they strongly disagree obtaining sufficient funds form these sources. This therefore leaves the government as the sole or major financier of the NAS. This impart explains the limited branches/stations per region in the country. According to the EMT personnel at the Ashanti regional control room who was interviewed, normally, a branch or station is established in a particular district/municipal if they are prepared to accommodate staff and provide an office space for NAS. This further reveals the insufficiency of the funding from central government coffers through the ministry of health (MoH).

Limited/inadequate ambulance vans

Staff indicated (confirmed by the interview) that each NAS station had just a single rescue van which has a maximum capacity of 1 (one) fatal casualty victim if an adult, and a maximum of 2 (two) minors. It is only when minor injuries are involved, where the victims can actually sit in the ambulance that, two to four victims can be accommodated in a single van.

As a result, an accident involving multiple victims often requires dispatching rescue teams from other stations to assist on the scene; implying that where multiple incidents occur in multiple locations in a region, there would be serious ineffective responsiveness and as such affects the survival rates of victims.

Inadequate protective clothing and gadgets for NAS's staff

With regards to the adequacy of protective clothing and gadgets for NAS staff, it was poorly scored by staff (thus a

mean score of 2.36 out of 5). Implying staff disagree that NAS have adequate protective gadgets for staff. This should be serious concern for given level of risk exposure of their staff in the work they perform. This boils down to the insufficient funding problem for NAS operations.

Insufficient support/donor base for NAS

It was further discovered from staff opinion that NAS do not have adequate support of funding base in and around the country (with a mean score of 2.51). Coupling with the inadequate funding from the few donors, presents a serious financial challenge to the operations of NAS in the country.

Poor management commitment

Comparatively, the less serious lacking resources for NAS is 'management's committed to their job'. Staff responses implies that management of NAS were not committed to achieving high efficiency and effectiveness of their operations (All these together were found to be inadequately met in NAS's operations and are as such challenges that NAS need to address in order to improve upon their operations within the Ashanti region of Ghana.

CONCLUSION AND RECOMMENDATION

Conclusion

Accelerating and stabilizing economic and social development through improved healthcare delivery and management of disasters has over the years, been on the prior list of many nations around the world. As it is often said, a healthy nation is a productive one, as such, past and current government of the Republic of Ghana have taken initiatives and implemented policies that seek to minimize the occurrence, management, and response to disasters. The creation of the National Ambulance Service (NAS) to provide emergency response services in handling disasters that occur in the country is therefore of essence.

Ever since the organisation was established and commenced operations, little has been known about its operational framework, the effectiveness of its operations, its humanitarian logistics needs, and challenges through empirical research. Given its key role in the nations bid to address disasters, and yet the lack of informed knowledge on its operations prompted the need for this study.

The study's findings suggest that NAS has, to some extent, played a key role over the years and has been successful in responding to disasters, and this is manifested in its ability to swiftly respond to disasters, alleviate discomfort of victims, and minimize mortality rates as well as being cost-effective given the constraints on its budgets and funding. The study further finds that the organisation's humanitarian logistics needs spans from human resource to equipment and supplies, and to funding and support from disaster management stakeholders. The organizational challenges are broadly found to include managerial difficulties (e.g. lack of management commitment), operational (e.g. inadequate and lack of appropriate communication devices & systems, paramedic materials, and protective clothing; lack of public awareness on how to reach NAS, location and accessibility problem, poor road network and poor road quality) and funding and external support

Lastly, the findings suggest that the organization's ability to respond to disasters and recuperate victims greatly depends on its preparedness and as well as the role of stakeholder in addressing above listed challenges.

Recommendation

Total stakeholder collaboration and support

It is recommended that all stakeholders; police, health facilities, NADMO, fire service, donorsand community support services come on board so that the country's initiative to minimize, respond to, and manage disasters could be fully realized.

Identifying and broadening the scope of sources of funding

It is recommended that the management of NAS identify alternative sources of funding oter than that from the government and donor agencies. This can be done by encouraging corporate businesses, non-profit making organizations, and individuals to contribute to the funding of its operations.

Improving road quality, network system and street naming and address system

The study finds that the speed of NAS in responding to disasters is slowed due to poor quality road (e.g. potholes, speed rums) and poor road network system. Further, locating disaster scene is also constrained as a result of poor street naming and address system in the country. It is accordingly encouraged that agencies (E.g. Ministry of Roads and Transport, metropolitan/municipal/district assemblies, etc.) whose responsibilities relate to improving these challenges take immediate action.

Adequate use of information technology

The study also finds that most of the organisation's operations were done manually. For instance, technologies to aid the location and accessibility of disaster scene (e.g. GPS) and maintain and managing records and relationships with stakeholders (e.g. database) will be key to improving the operations of the organisation.

Further Studies

Finally, it is recommended that further studies needs to be conducted involving other stakeholders such as victims, health facilities, NADMO, all security services especially the police, Fire Service, and Military and the ministry of health. This would give a better picture of the disaster response management in Ghana.

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