

**AERODROME EMERGENCY PREPAREDNESS:
CASE STUDY OF KISUMU AIRPORT**

BY:

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**A RESEARCH PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT
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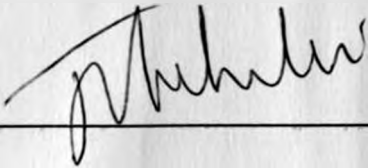


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OCTOBER, 2010

Declaration

This research project report is my original work and has never been presented in any other institution for the award of an academic credit.

Signature  Date 12/11/2010

JERRY KIPTOO CHELULEI

This research project report has been submitted for examination with my approval as the University supervisor.

Signature  Date 16/11/2010

DR. KARATU KIEMO

Dedication

To my son Steve, who together we had to sacrifice precious time to be away from each other, so I could amply write this research project report.

Acknowledgements

I would like to thank my wife Catherine, for her love, support and for persistently nudging me to complete this work. To my brother Joseph thanks for your unquestionable love and unconditional support even in the most difficult of times. To my mother Veronica, father Raymond and sister Joyce thanks for your encouragement and support. To my Uncle Bernard and aunt Matilda thanks for the moral and material contribution to my education and life.

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Above all, I give thanks to the almighty father God, for the gift of life, courage, willpower, wisdom and determination that have seen me come this far.

Abstract

The purpose of this study was to assess the extent of emergency preparedness at Kisumu airport, especially in light of the foreseen increase in risks due to increased flight operations once the current ongoing infrastructural upgrading activities are completed. This is also against the backdrop of a recent surge in aviation accidents and incidents occurring within the Kenyan airspace that require better preparedness efforts to reduce disaster damage.

The study employed a case study design with the population of interest being the emergency preparedness stakeholders at Kisumu airport. Questionnaires were used to collect data from on aerodrome respondents whereas interviews were used to collect data from selected key informants within and without the aerodrome. Data was analysed both quantitatively through descriptive statistics and qualitatively through themes. The results were presented by use of tables and general statements derived from themes.

The study found out that whilst the aerodrome had put in place some measures to ensure emergency preparedness, it still remained elusive. This was mainly evidenced by failure to undertake regular drills, inadequate resources especially marine rescue and medical aid related, limited community participation, limited collaboration among stakeholders, and insufficiency on adherence to regulations. The study concluded that though the aerodrome was found to be prepared for emergencies in some aspects, much more still remains to be done. Consequently, to enhance emergency preparedness the organizations concerned are advised to allocate more resources, undertake regular drills, conduct continuous staff and public awareness trainings, strengthen interagency coordination, address staff welfare issues, decentralize decision making, ensure adherence to regulations, establish aerodrome owned marine unit and improve navigation and berthing in Lake Victoria.

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Acronyms and Abbreviations.

ACI- Airports Council International

Doc. Document

D.O-District Officer

EMA-Emergency Management Australia

FAA- Federal Aviation Administration

FEMA-Federal Emergency Management Agency

IATA-International Air Transport Association

ICAO-International Civil Aviation Organization

IFRC & RCS-International Federation of Red Cross and Red Crescent Societies.

JKIA-Jomo Kenyatta International Airport

KAA-Kenya Airports Authority

KCAA-Kenya Civil Aviation Authority

KMA-Kenya Maritime Authority

KMFRI-Kenya Marine Fisheries Research Institute

KRA-Kenya Revenue Authority

KWS-Kenya Wildlife Service

MOF-Ministry of Fisheries

MOSP-Ministry of Special Programmes

PFO-Provincial Fisheries Officer

RVR- Rift Valley Railways

SARPS – Standards and Recommended Practices

UNHCR-United Nations High Commissioner for Refugees.

USA-United States of America.

USOAP- Universal Safety Oversight Audit Programme

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Emergency preparedness is a continuous cycle of planning, organizing, training, equipping, exercising, evaluation and improvement activities to ensure effective coordination and the enhancement of capabilities to prevent, protect against, respond to, recover from, and mitigate against natural disasters, acts of terrorism, and other man-made disasters. It is a continuous process and involves efforts at all levels of government and coordination among government, private-sector, and nongovernmental organizations to identify threats, determine vulnerabilities, and identify required resources. (FEMA, 2007). It entails arrangements to ensure that, should a disaster occur, all those resources and services which may be needed to cope with the effects can be rapidly mobilized and deployed (EMA, 1999). Emergency preparedness is increasingly becoming a global enterprise for international organisations, governmental institutions and arguably individuals (Kamota, 2009:2)

Emergency preparedness in air transport still remains a global challenge due to endless tragedies that continue to occur over different spaces and times. Notable Kenyan ones include the 2003 Busia and 2005 Marsabit fatal crashes in which prominent government officials among others died. (Daily Nation, 2008). Despite recommendations to avert future tragedies, two government ministers died in an air crash near Narok, followed by the Kapsabet crash in which one government official died amongst other casualties three years later (Standard, 2008). Since then, there have been numerous similar occurrences mostly within the vicinity of Nairobi Metropolis, especially involving light aircraft operating from Wilson airport. Njathi and Opot (Sunday Nation 2009, 24) attribute these accidents to an unsound safety culture characterised by breaches of various regulatory requirements and pressure to perform regardless of safety considerations. It is worth noting that the Busia and Marsabit crashes both occurred near airstrips that lacked basic navigational facilities and emergency services therefore posing a litmus test to emergency preparedness status in the Kenyan air transport sector.

Aerodrome emergencies have been attributed to a litany of causes ranging from human error, mechanical failure, poor weather conditions and sabotage (bombs, hijackings, shoot-downs) among others. Fiorino, (2007) notes that poor regulatory oversight, lack of safety management systems and deficient flight crew training are particularly considered by IATA as major in causing aviation accidents in Africa. This is against the backdrop of various local and international regulatory requirements in place that cast serious doubts on whether or not they are effective in mitigating the effects of disasters.

Okumu (2010, 15) notes that various disasters that have occurred in Kenya have exposed the country's disaster preparedness and response as wanting and overdue for up-scaling. Communities have been found to be poorly prepared in terms of lack of awareness of hazards and their recommended protective measures and lack of their involvement in preparedness and response activities, a scenario that has aggravated the destructive effects of emergencies. For instance, communities living near aerodromes have to be aware of impending dangers associated with living near such areas and know what to do in terms of protecting themselves and if possible assisting in response operations when such emergencies strike. Since it is the communities themselves that are present and first on the scene after disaster strikes and in that crucial time when lives can be saved, it is pertinent that they be involved in emergency preparedness activities.

Kisumu Airport, one of the Kenya's Domestic Airports, was built in the 1930s on the shores of Lake Victoria to the North West of Kisumu City. It is 3.5 Kilometres from Kisumu city via Busia road. The airport was widely used during the 2nd World war, with amphibian type of aircraft landing in the neighbouring Lake Victoria (KAA, 2010). It is the third busiest airport in Kenya despite the fact that it doesn't offer international services (Wikipedia, 2010). The airport is managed by the Kenya Airports Authority (KAA)

The airport is currently undergoing upgrading of its facilities to international status following the increase in passenger and airline traffic volumes, (The Runway, 2009,

6-7). It is therefore expected to play a greater role in facilitating air transport considering the opening up of the horticultural, tourism and fishing industries in the Western region. The airport is also set to become a regional hub considering its strategic location in the East and Central African region and the current integration of the East African Community, (KAA, 2010). It would therefore be crucial to assess the emergency preparedness status of the airport in light of the fore stated developments.

1.2 Problem Statement.

Safety in air transport has been an issue of concern to air travel operators, regulators, the media and even the general public who constitute the majority of the affected incase of air emergencies. It is estimated that airport operations safety problems cost the airlines an estimated \$5 annually worldwide (US National Safety Transportation Board, NTSB). Statistics show that African air travel carries higher risks than the world average. It is estimated that although Africa has about 4% of world air traffic, it accounts for 17% of all fatal aircraft accidents. (Sunday Nation, 2009:24). According to IATA, in 2005 alone, the average of plane crashes that occurred in Africa was more than 9 times higher than the world average. (African Air Safety Analysis & Action Plan -2007).

Possible reasons attributed to these accident rates include; infrastructure decay in areas such air traffic control, navigation aids, airport equipment, and weather services; unsafe airline operations procedures in such areas as training, maintenance, and dispatch; ineffective regulatory oversight in aviation legislation, civil aviation regulation; resource constraints due to corruption (internal and external) and socio-political interference. Aviation also competes for the limited resources with equally important sectors of the economy such as health, education, road, water, food, welfare and social services. To add to this is the lack of political will or corporate governance and lack of accountability. (Okumu, 2008; 4)

Kisumu airport equally shares in the statistics of air transport emergencies. One is the October 7th 1988 crash in which a Kenya Airways aircraft, Fokker F-27 friendship crash landed on the runway after the landing gear failed to come down (Fiorino, 2007). Though there were no fatalities, the aircraft sustained serious hull damages. Back in 1987, the same aircraft underwent an almost similar experience, as an account by a passenger in the flight reveals,

.....'Talking of air disasters, I remember way back in 1987 on a flight to Kisumu in the then Kenya Airways Fokker 27 that used to ply domestic routes; On getting to Kisumu airport, the wheels of the aircraft failed to unlock- so we could not land. The only option to the pilot was to fly back to Nairobi in preparation for crash landing. When we asked why we could not crash land in Kisumu, we were advised that there were **no crash landing facilities** in Kisumu! Yet there was a high possibility that we would run out of fuel before getting to Nairobi..... ,

.....At that time, the question that came to mind was; how come Kisumu airport that was once and the first international airport way back in 1920s was 60 years later so neglected and so degraded that it lacked the basic minimum facilities of an airport? There could be no better explanation other than that the neglect was political'..... (Okungu, 2006)

According to the Federal Aviation Administration (FAA), air travel, while generally safe, is expected to double in the next two decades, leading to an increased risk of aviation accidents. It has been predicted that airline accident rates will grow in a corresponding ratio to the increasing number of airline passengers (AviationLawNews.com, 2009). Kisumu airport, currently undergoing upgrading to international status due to the increasing volumes of both passenger and airline traffic, cannot be an exception to the expected increase in risks as a result of increase in flight operations. In light of this scenario, assessing the emergency preparedness situation of the airport cannot be denied.

Approximately 80% of all aircraft accidents occur shortly before or during takeoff and landing Krasner, (2009). Kisumu City falls within the range of aircraft landings and takeoffs, by virtue of its nearness to the aerodrome a situation that increases the elements at risk in terms of the city's infrastructure, activities, and population. Infrastructure upgrading activities in the airport on the other hand translate to an increase in the elements at risk in terms of the persons, equipment and operations. Likewise, equipment such as plants and other machinery are by their very nature hazardous hence their use helps to increase the levels of risk. Whilst occupational safety measures may be in place to reduce accidents arising from the construction activities, scenarios of interactions between normal aircraft operational emergencies and these new emerging hazards that may lead to more catastrophic situations cannot be overlooked.

Kitchen, (2008) notes that other additional hazards in and around aerodromes that have to be taken into account include carriage of dangerous goods, bulk fuel storage, and surrounding water. The close proximity of the airport to a water body, in this case Lake Victoria makes it a difficult environment in conducting search and rescue operations considering a scenario of an aircraft accident on the water body. Mailu et.al (2000),note that invasion of water hyacinth in Lake Victoria has led to among others an impediment to water transport, a situation which would obviously complicate emergency response in water accident scenarios. According to the airport services manual (ICAO, doc 9137 -1990 part 7), airports adjacent to large bodies of water require special rescue facilities in form of procedures, personnel such as divers and equipment such as helicopters, hovercraft, amphibious vehicles and boats. The presence of a bulk fuel storage facility on the other hand, in this case the Kisumu Kenya Pipeline Company depot near the aerodrome is another hazard that has to be factored in while planning for the aerodromes emergency preparedness.

The aerodrome is also adjacent to both human settlements and a wide range of food processing industries, which are associated with the production of wastes that increase bird population. Pesthunters (2003) confirm that the Kisumu aircraft bird

strike incidences are mainly associated with fishing activities at the adjacent Lake Victoria. Owino et.al (2003), also note that Kisumu airport has the second highest number of aircraft bird strike incidences in Kenya, a scenario that portends the occurrence of catastrophic incidences.

It is against this background that the purpose of this study is to assess the extent of emergency preparedness at Kisumu airport in terms of measures in place to address emergency preparedness, community participation and regulation.

1.3 Objectives of the study.

1.3.1 Broad Objective

The overall objective of this study was to assess the extent of emergency preparedness at Kisumu airport.

1.3.2 Specific Objectives

1. To identify and assess the measures in place to address emergency preparedness.
2. To establish the extent of community participation and collaboration of stakeholders in emergency preparedness
3. To establish the effect of regulation in addressing emergency preparedness.

1.3 Significance of the study

The study generated invaluable information regarding the state of emergency preparedness at Kisumu airport in light of the current infrastructural developments transforming it to international status. Such data and recommendations will inform the aerodrome management, airlines and other stakeholders on what needs to be done to enhance emergency preparedness.

The study also provided information that may be useful to regulatory and other aviation bodies such as ICAO, IATA, ACI, KAA and KCAA in their oversight and advisory roles. Such information may enable them enhance compliance with regulations and subsequently improve emergency preparedness.

The study helped create awareness on the need for emergency preparedness among the stakeholders at Kisumu airport. As a result, measures to ensure preparedness as well as participation and collaboration of stakeholders were stepped up at the end of the study.

Lastly, the study provided information that may assist governmental agencies and the scholar community in formulation of policies that will address emergency preparedness.

1.5 Scope and Limitations of the Study.

The study assessed the emergency preparedness situation at Kisumu airport in terms of measures to ensure emergency preparedness such as planning and resource allocation, training and exercises. It also explored the extent to which the concepts of local community participation and regulation contribute to emergency preparedness.

The study was limited to the various aerodromes and off aerodrome agencies at Kisumu airport that have a stake in aerodrome emergency management. The findings of this study are therefore context specific and as such cannot be generalised to other aerodromes in the republic.

Definition of Key Terms

Aerodrome: A defined area on land or water, including any buildings, installation and equipment, intended to be used whether wholly or in part for the arrival, departure and surface movement of aircraft.

Aerodrome Emergency: Includes aircraft emergency, natural disasters, sabotage including bomb threats, unlawful seizure of aircraft, the effect of improper handling, transportation and storage of dangerous goods and occurrences of building fires.

Preparedness: State of full readiness to respond to an aerodrome emergency.

Emergency preparedness measures: These are steps taken to ensure that an aerodrome is prepared to respond to emergencies and includes planning and resource allocation, training and exercises.

Planning: formulation of actions to be taken and coordination of the actions during an aerodrome emergency.

Resource allocation: dedication of resources (human and material) towards responding to an aerodrome emergency

Training: learning activities directed towards the acquisition of knowledge and skills for the purpose of enhancing the capacity of responding to aerodrome emergencies.

Exercises: Activities involving simulation of a real emergency situation conducted to test the emergency plan as well as the response of the various aerodrome emergency services.

Community participation: The involvement of the surrounding local community including the off aerodrome emergency services in aerodrome emergency preparedness activities.

Collaboration of stakeholders: The working together of the agencies and communities at Kisumu airport towards the success of emergency preparedness.

Regulation: Legal restriction(s) to ensure emergency preparedness promulgated by ICAO and KCAA through rulemaking supported by a threat of sanction, which contracting states and their respective local aviation players have an obligation to comply with.

CHAPTER TWO: LITERATURE REVIEW

2.1 Concept of Emergency Preparedness

Emergency preparedness refers to the readiness of a political jurisdiction to react constructively to the threats from the environment in a way that minimizes the negative consequences of impact for the health and safety of individuals and the integrity and functions of physical structures and systems.(Perry and Lindell,2003:338)The achievement of emergency preparedness takes place through a process of planning, training and exercising accompanied by the acquisition of equipment and apparatus to support emergency action.(Gillespie and Collignon,1993).

Kamota (2009:17) further notes that emergency preparedness has the objective of ensuring that in times of an emergency there are appropriate systems, procedures and resources in place to assist those afflicted by the emergency and enable them help themselves. Preparedness is the realm of emergency planners who construct plans to minimise the effects of hazards and emergencies. (Kapucu, 2008, 244) Emergency managers in this phase develop plans of action to be taken when the disaster strikes. The actions include among others, communication plans, emergency population warning methods, evacuation plans, maintenance and training of emergency services and stock piling of emergency supplies and equipment. (Wikipedia, 2009)

Emergency preparedness can be equated to contingency planning.Contingency planning is defined as a forward planning process, in a state of uncertainty, in which scenarios and objectives are agreed, managerial and technical actions defined, preparedness measures undertaken to mitigate the effects and response systems put in place in order to prevent, or better respond to, an emergency. (UNHCR, 2007, 68). Similarly preparedness involves planning and allocating resources, human or material, for the various probable uncertain eventualities that may occur, outlining roles of all the stakeholders in an emergency situation, training and maintenance of emergency technical services, enumerating

communication, command, co-ordination and control aspects of an emergency situation and testing of plans in order to sufficiently respond to a disaster and to the highest degree possible, reduce losses or damages.

In *Lessons from Hurricane Rita*, Mayer et al (2008; 15) notes that Disaster preparedness can be thought of as any activity that has the potential to save lives, decrease property damage, and reduce the negative impacts of disaster events, including long-term interruptions of business operations. In their study to investigate the lessons learned and preparedness behaviours of businesses in the south east Texas region affected by Hurricane Rita, they confirm the realization by the firms on the importance of having a preparedness plan and preparing for the future. While concluding that disaster preparedness can be complex, they however note that having a plan may improve the likelihood that a company will survive and recover from a disaster

2.2 A Structure for Emergency preparedness

An emergency preparedness structure in any jurisdiction ensures a coordinated and organized response and recovery to all emergency incidents and disasters. It also provides the framework for a standardized emergency response.

According to the *Generic Aerodrome Manual*, (ICAO, 1999) Emergency preparedness activities in aerodromes are executed by the airport emergency committees. The airport emergency planning committee develops, distributes and amends the emergency plan. The committee comprises of core members such as airline representatives, air traffic control staff, medical and ambulance services personnel, police, airport staff representatives, and fire brigade services personnel. The Committee may form sub committees from time to time to deal with the detail of the planning processes such as; Welfare, media, training and emergency exercise planning.

Emergency preparedness activities in Kenya are coordinated by the provincial administration through the provincial and district disaster management committees.

The various departments of government including aerodromes are integrated under these committees, whereby their respective emergency management functions are coordinated to create harmony and reduce conflict in order to ensure success of emergency preparedness.

2.3 Emergency Preparedness Measures.

2.3.1 Emergency Planning

According to EMA, (1999) Emergency management planning refers to the analytical and consultative process by which governments, organizations and communities determine the arrangements and related strategies which can most effectively manage the risks they face.

The interactive process of planning should result in: Assessment of a community's hazards, vulnerabilities, and risks of disasters and their likely effects; Strategies encompassing prevention, preparedness, response and recovery; an understanding of all agencies' roles and responsibilities; Strengthening of emergency management networks and a comprehensive written plan.

The response measures and protocols generated by the planning process and rehearsed via training and exercises are documented in the written plan. In this way, written plans become living documents, to be revised and changed as the threat changes and the system for detecting and responding to the threat changes.

Often, there is a tendency to equate emergency planning with the presence of a written plan and similarly believe that a written plan is evidence of jurisdictional preparedness. In practice, it is important to avoid confusing planning with a written plan; planning is a never-ending jurisdictional process, while the plan itself represents a snapshot of that process at a specific point in time. Similarly, a written plan does not guarantee preparedness; preparedness is dynamic and contingent upon ongoing processes. Thus, possession of a written plan is an important part of, but not a sufficient condition for, community emergency preparedness. Preparedness is a state of readiness to respond to environmental threats. It results

from a process in which a community examines its susceptibility to the full range of environmental hazards (vulnerability analysis), identifies human and material resources available to cope with these threats (capability assessment), and defines the organisational structures by which a coordinated response is to be made (plan development). Because vulnerability, resources and organisational structures change over time and performance skills disappear when not exercised, planning and training must be continual processes in order to establish and maintain emergency preparedness (Daines, 1991; Buckle et al. 2000). It is consequently important to examine carefully the emergency planning process, making explicit its relationship to preparedness and examining both the elements and products of planning. (Perry and Lindell 2003, 338)

Communication is an important aspect of emergency planning. Manseau (2008, 20) argues that "every company should develop a crisis communication plan that outlines basic protocol that employees follow in the event of a crisis. Additionally, of course, the plan should be developed before you face a crisis, when you have time to carefully consider the details, like who will serve as your company's crisis communications spokesperson. "

IFRC & RCS (2000, 38) declare that sharing and exchanging information among representatives of various agencies is crucial during emergencies. To ensure clear and effective communication in an emergency the plan should specify how communication will take place and via what mediums (e.g. email, radio, telephone, in person, etc.) If radio communication will be used, it is important to designate the radio frequency in the preparedness plan. This way, responding agencies will use the correct radio frequencies in the event of an emergency. The plan should also specify who will have (and maintain) the equipment and who will have access to a radio.

Resource allocation and mobilisation is another important element of preparedness planning. Responding to an emergency and implementing the preparedness plan will require resources. The preparedness plan, therefore, should consider among others: The resources available and their quantities; Staff available in times of emergency

including volunteers; resources required that are unavailable; plans for procuring the resources that are unavailable.

It is generally agreed that pre-crisis planning processes should: 1. be based on accurate knowledge of threats and likely human responses. 2. Encourage appropriate action by crisis managers. 3. Encourage flexibility in responses. 4. Promote inter-organisational coordination. 5. Integrate plans for each hazard into a multi-hazard approach. 6. Involve the training of relevant personnel. 7. Provide for testing through drills and exercises. 8. Be adaptable as part of an ongoing process adjustment to new circumstances. 9. Be a strong advocate in the face of inevitable resistance to resource commitments for low probability events. 10. Recognise the differences between crisis planning (preparedness) and crisis management (implementation and performance). (Perry and Lindell, 2003)

2.3.2 Training

That plans should have a training component is indeed prerequisite for emergency preparedness (Perry and Lindell, 2003). The planning process has many audiences, in part because many different individuals and organisations are involved in implementing emergency plans. Audiences even extend beyond the types of organisations that directly respond; for example, government bodies that fund emergency management programs and evaluate plans and incident response are a critical audience. Thus, effective planning requires explaining the provisions of the plan to the administrators and personnel of those departments that will be involved in any phase of the emergency response. Also, elected officials and citizens need to be informed about community disaster plans, preparedness and response operations. The public-at-risk must also be involved in the planning process, especially if they are expected to undertake personal protections in an emergency. Minimally, all citizens and officials should be aware that planning for community threats is under way and what is expected of them under the plans. Moreover, they need to know what is likely to happen in a disaster, and what emergency organisations can and cannot do for them.

The function of emergency preparedness training is two fold. One is an information function primarily aimed at elected officials, public administrators who do not have a specific emergency role and citizens. Traditionally, sharing plan information with these audiences is called risk communication and is oriented to educational exchanges. In some very special cases, communications to the public-at risk may include specific training and equipment. For example residents close to nuclear power plants may be given potassium-iodide tablets and instructed on their use. Similarly, residents near the US army centre in Alabama charged with incinerating chemical warfare agents have been given gas masks and other special training by the county emergency management agency. Two, when plan information is shared with personnel of emergency response organisations; it is usually more formal and comes under the rubric of training. Such training is distinguished by the fact that it tends to be administered by technical specialists and focused on specific protocols and processes.

For example, many terrorist response plans assume that fire and police department dispatchers will screen all calls for assistance for signs that the emergency being reported is really a chemical, biological or radiological attack. Even if the elements of call screening protocols are explicitly developed in the plan, initial training (and refresher training) by specialists will be needed to ensure that dispatchers can effectively use the protocol. Training is consequently an integral part of the disaster planning process, and when carefully attended to, is likely to yield high dividends in terms of the effectiveness of emergency response. As an added benefit, the training process can also become an important source of feedback regarding potential problems with the plan. (Perry and Lindell, 2003; 345-346)

IFRC&RCS (2000, 14) notes that disaster preparedness must be supported by public education campaigns, training of response teams and rehearsals of emergency response scenarios. The aim of public awareness and education programmes is to promote an informed, alert and self-reliant community, capable of playing its full part in support of and in co-operation with government officials and others

responsible for disaster management activities. An essential part of a disaster preparedness plan is the education of those who may be threatened by a disaster. Although television, radio and printed media will never replace the impact of direct instruction, sensitively designed and projected messages can provide a useful supplement to the overall process. As the preparedness plan is being developed, and upon completion, it is important to rehearse its major elements. Rehearsals invariably expose gaps that otherwise remain overlooked.

Rehearsals are most effective when they are system wide and engage as many of the disaster response players as possible. Rehearsals also keep the plans fresh, during extended periods of time when no disaster strikes. Rehearsals might simulate search and rescue operations, first aid provision, and response or needs assessment, coordination meetings between major organisational players and population leaders, relief transport and logistics, and many other aspects of an emergency response.

2.3.3 Exercises.

In Canada, Australia and the United States, exercises are sometimes referred to as "drills" and in Europe and Great Britain they are sometimes called "simulations." (Perry 2004; 65)

Emergency exercises are of three types: full scale; partial and table-top. Full scale emergency exercise involves assembling and utilization of all the participants and resources that would be available and used in a real emergency and is done to ensure the adequacy of the plan to cope with different types of emergencies; Partial emergency exercise involves one or more but not all the participants in an emergency plan and is done to improve efficiency of response to individual participating agencies and components of the plan, such as communications system; Table-top emergency exercise entails testing the integration and capability of emergency response resources through planning, critiquing and updating various responses before trying them in the field or after an emergency exercise in order to

reconfirm procedures,policy,communication such as telephone numbers and radio frequencies and changes in key personnel.(ICAO,1991)

Emergency drills and exercises provide a setting in which operational details may be critically examined (Ford and Schmidt, 2000; Simpson, 2001; Alexander, 2003). Perry (2004, 65) notes that they enable detection of difficulties in executing the strategy or tactics proposed in the plan, whereby operational failures or weaknesses are identified. He further notes that the problems revealed in an exercise can be specific, procedural as well as general. For example, during an exercise, one might learn that hazardous materials technicians in full protective gear are unable to clearly see a particular instrument, or equally important, it might be discovered that an interagency agreement to share ambulances was not viable. Furthermore, drills constitute a simultaneous and comprehensive test of emergency plans, staffing levels, personnel training, procedures, facilities, equipment and materials. In the case of planning for terrorist attacks for instance, an inter-organisational testing process is complicated because it involves types of organisations that may not normally deal with one another. These can be organisations that cross public and private sectors, cross emergency disciplines, and different types and levels of government.

Testing of plans also allow personnel from responder groups and agencies to develop working relationships with one another. The smoothness and effectiveness of inter- and intra-organisational relationships promotes successful performance during the response phase. Exercises offer organisational personnel the opportunity to develop a history of interaction and co-operation that enhances their ability to work together when disaster strikes. This is best illustrated from the findings of a study conducted to examine the teamwork perceptions of police officers, fire fighters and trained civilians in an airport emergency response disaster exercise required for continued certification in the USA, whereby (Perry,2004) found out that participation enhanced the perceptions of response knowledge and teamwork for all three types of participants.

Drills also serve an educational function; new responder personnel have an opportunity for “hands on” exposure to emergency equipment, vehicles, procedures and protocols. There is also an educational function for elected and appointed public officials, particularly those who are not directly involved in emergency planning and response. The conduct of an exercise informs such officials of emergency management efforts, and offers an opportunity for them to ‘see’ the performance of various agencies. It serves as one form of publicity for the larger emergency planning and management process. Publicising drills informs both the public and community officials that planning for a disaster is under way and that preparedness is being enhanced. (Perry and Lindell, 2003, 346)

This study seeks to identify the emergency preparedness measures in place to address emergency preparedness at Kisumu airport. To achieve this following research question will be posed;

Research Question 1; What measures in terms of plans and resource allocation, exercises and training activities are in place to address emergency preparedness at Kisumu airport?

2.4 Community Participation and Stakeholder Collaboration.

In assessing issues after the Bhopal¹ Disaster, Kayastha and Nag (1989:216) observe that “ the general public who are often exposed to grave danger from such events is not involved in policy matters; they are not even informed of the possible hazards of the operation of such factories or plants. In their study of “Technological hazards in the third world”, which includes a systematic analysis of perceptual responses in the case of the Bhopal catastrophe, Karan, Bladen and Wilson (1986); observe that “most slum dwellers were not aware of the hazards of living adjacent to a producer of toxic chemicals?”

¹ City and capital of Madhya Pradesh State in Central India. It was the site of the world’s worst industrial accident when a gas leak at a chemical plant killed more than 3,300 people in 1984.

They further observe that in all policy matters the citizens must be informed and involved if the policy objectives are to be served. 'Well informed and involved community efforts are assets to policy implementation. If there is one lesson to be drawn from the Bhopal disaster, is that public perception of risk is as important a factor in planning as the actual risk.'

Community-based disaster preparedness is the culmination of community participation in management of emergencies to which it is vulnerable .IFRC&RCS (2000, 15) argues that disaster preparedness and response are not solely the work of experts and emergency responders from National Societies and government disaster organisations. Local volunteers, citizens, organisations and businesses have an active and important role to play before, during and after major emergencies and disasters.

Community-based disaster preparedness (CBDP) is a process that seeks to develop and implement a locally appropriate and locally "owned" strategy for disaster preparedness and risk reduction. Successful participation in pre-disaster, consensus-building emergency planning processes can lead to strengthened organisational relationships that improve the effectiveness of response operations and community coordination (Kapucu, 2008, 244). Emergency response operations are more effective when the organisations from different sectors interact with one another prior to a disaster. Pre-disaster communication is a key aspect of truly effective community preparedness and response (Drabek, 2003; Tierney, Lindell and Perry, 2001; Tobin and Month, 1997; Dynes and Tierney, 1994).

Local populations in disaster-stricken areas are the first to respond to a disaster. They are usually involved in search and rescue activities as well as in providing emergency treatment and relief to their families, friends and neighbours. National Societies, ideally in partnership with other community organisations and networks, can play an important role in improving the skills and knowledge of these "spontaneous" disaster responders by providing them with education and training in preparedness measures, basic rescue techniques, and first aid and emergency treatment.

Sagun et al, (2009, 215) asserts that minimising the impacts of disasters requires among others, the collaboration of stakeholders. Collaboration and communication patterns have to be designed and implemented efficiently to create disaster resistant communities. It is the design of an environment that enables efficient organisation and easy and secure data access and dissemination (Mansourian et al., 2006). Asimakopoulou ET al. (2006) agree that disaster management is a cyclic and collaborative process in which the gathering together, organisation and dissemination of information and data are critical.

Stakeholders have divergent responsibilities at various levels at the physical scale: disaster site, local regions, and national and international levels. It is very important to pass the right information, in the right amount, at the right time, from the right place, to the right person. The collaboration process involves sharing decision making as well as data and resources (Popp et al., 2004).

There are four channels of information flow during a disaster: within each participating organisation; between organisations; from people to organisations; and from organisations to people. (Sagun et al, 2009, 216). Similarly, collaboration between the respective channel ends through timely gathering and dissemination of information is crucial in effectively managing emergencies.

The manual on aerodrome services (ICAO, Doc. 9137) affirms that “each airport emergency plan should be a coordinated programme between the airport and the surrounding community”. It further asserts that “the plan should set forth the procedures for coordinating the response of different airport agencies (or services) and those agencies in the surrounding community that could be of assistance in responding to an emergency”

MOSP, (2009) notes that the Kenyan community has not been sufficiently sensitized on disaster management, especially on preparedness and coping mechanisms thereby, increasing vulnerabilities and potential impacts on the victims.

In view of the foregoing, it is worth noting that successful emergency management in any jurisdiction cannot be achieved without adequate community participation and collaboration of the stakeholders. This study seeks to explore the extent to which local vulnerable communities participate in emergency management and the level of collaboration of the various stakeholders in disaster preparedness at Kisumu airport. To achieve this, the following research question will be posed;

Research Question 2; To what extent do communities participate and stakeholders collaborate in emergency preparedness efforts?

2.5 Regulation.

Regulation refers to a legal restriction promulgated by government administrative agencies through rulemaking supported by a threat of sanction or a fine. In the aviation sector regulations come in form of the International standards and recommended practices (SARPS) which member states have an obligation to adhere to. Globally, the International Civil Aviation Organisation (ICAO) regulates the aviation industry whereas the Kenya Civil Aviation Authority, (KCAA), regulates the industry locally.

ICAO, Article 44, provides that states, among others have to ensure safe and orderly growth of international civil aviation globally, encourage the development of airways, airports and air navigation facilities, and meet the needs of the peoples of the world for safe, regular, efficient and economical air transport, and promote the safety of flight in international civil aviation.

ICAO Annex 14 touches on aerodrome design and operations and specifically on various aspects of aerodrome emergency preparedness. The guidance material on how emergency preparedness is to be attained is captured in the airport services manual (ICAO, Doc, 9137), which requires among others that airports establish emergency plans commensurate with the aircraft operations and other activities conducted at the aerodrome. The aerodrome emergency plan shall provide for the

coordination of the actions to be taken in an emergency occurring at an aerodrome or in its vicinity. It further asserts that the plan should contain at least: types of emergencies planned for; agencies involved in the plan; responsibility and role of each agency; the emergency operations centre and the command post, for each type of emergency; information on names and telephone numbers of offices or people to be contacted in the case of a particular emergency and; a grid map of the aerodrome and its vicinity. Regulatory requirements also stipulate that adequate communications systems linking the command post and the emergency operations centre with each other and with the participating agencies should be provided in accordance with the plan and consistent with the particular requirements of the aerodrome.

The agencies involved in an emergency plan are either on aerodrome or off aerodrome. On aerodrome agencies include; air traffic control, rescue and fire fighting services, medical and ambulance services, aircraft operators, security services and the police. Off aerodrome agencies include and are not limited to; fire departments, police, medical and ambulance services, hospitals, military and harbour patrol or coast guards (KCAA,2008,647) It is further required that the plan should contain procedures for periodic testing of the adequacy of the plan and for reviewing the results in order to improve its effectiveness. KCAA (2008,648) requires that the plan should be tested by conducting: a full-scale aerodrome emergency exercise at intervals of not exceeding two years; partial emergency exercise in the intervening year to ensure that any deficiencies found during the full-scale aerodrome emergency exercise have been corrected and; reviewed thereafter or after an actual emergency, so as to correct any deficiency found during such exercises or actual emergency and; tabletop exercise at least once every six months except during that six month period when a full exercise is held.

Aerodromes close to water, swampy areas or difficult terrain should in their respective emergency plans, include the establishment, testing and assessment at regular intervals of a pre-determined response for the specialist rescue services. It also requires the provision of rescue and fire fighting equipment and trained services

which should be commensurate with the level of aircraft operations of the aerodrome and the aerodrome category. Other requirements include: provision of emergency access roads to facilitate minimum response times; communication and alerting systems linking the fire station, air-traffic control tower and rescue and fire-fighting vehicles; and a plan for the removal of disabled aircraft on, or adjacent to movement areas. (ICAO, Doc, 9137)

Belai (2002) notes that audits conducted under USOAP have identified that states experience problems in their efforts to implement regulations. These problems are attributed mainly to lack of adequate legislative framework and appropriate organisation, including adequately qualified and experienced personnel and guidance material. Such shortcomings have been found to lead to consequences which include among others failure to identify safety concerns and failure to follow up on identified safety deficiencies and take remedial actions to solve such deficiencies.

All aviation organizations must meet regulatory requirements to ensure acceptable levels of safety. The organizations that just meet these minimal requirements, however, may not be healthy from a safety point of view. Although they have reduced their vulnerabilities to the unsafe acts and conditions most conducive to accidents, they have only taken minimum precautionary measures. Weak organizations that fail to meet the acceptable levels of safety will be removed from the aviation system either proactively, by the regulator revoking their operating certificate, or reactively, in response to commercial pressures such as the high cost of accidents or serious incidents, or consumer resistance. (Okumu, 2008, 16). Acceptable levels of safety therefore, follow from not only promulgation of regulation but also implementation.

It is worth noting that regulation has three major aspects: effectiveness of the regulations so promulgated; implementation of the regulations by the aviation organisation and enforcement of the regulations by the regulatory bodies through safety audits and sanctions for violations. This study seeks to assess the extent to

which regulation is effective in addressing emergency preparedness at Kisumu airport. To achieve this, following research question will be posed:

Research Question 3: How effective is regulation in addressing emergency preparedness at Kisumu airport?

2.6 Theoretical framework

2.6.1 Risk Society, towards a new Modernity

Risk society is not intended to imply an increase in risk in society, but rather a society that is organized in response to risks. 'It is a society increasingly preoccupied with the future (and also with safety), which generates the notion of risk' (Giddens 1999:3)

Risk can be defined in the risk society as a systematic way of dealing with hazards and insecurities induced and introduced by modernization itself, (Beck 1992:21). It is argued that the distribution of risk originates from knowledge as opposed to wealth. While the wealthy person may have access to resources that enable him or her to avert risk, it would not even be an option were the person unaware that the risk even existed, and therefore risk position is fundamentally dependent on knowledge and access to information, which may or may not correlate to economic status, but often does.

While humans have always been subjected to a level of risk, modern society is exposed to a particular type of risk that is the result of modernization process itself, altering social organisation. There are risks such as natural disasters that have always had negative effects on human populations, but these are seen to be produced by non-human forces. Modern risks on the other hand, are the product of human activity. These two different types of risk can be referred to as external risks and manufactured risks (Giddens, 1999). A risk society is predominantly concerned with manufactured risks. The marked difference between the two is that there is a significant level of human agency operating in the production and mitigation of manufactured risks.

Because manufactured risks are the product of human activity, there is the potential to assess the level of risk that is being produced, or that is about to be produced. As a result, risks have transformed the modernization process itself. With the introduction of human disasters such as Chernobyl² and the Love Canal³ Crisis, public faith in the modern project has declined, leaving a variable trust in industry, government and experts (Giddens, 1990). The increased critique of modern industrial practices has resulted in a state of reflexive modernization. Concepts that demonstrate reflexive modernization are sustainability and the precautionary principle that focus on preventative measures to decrease levels of risk.

Air transport emergencies represent manufactured risks produced as a result of the modernization process. The aerodrome management body, aviation regulatory organizations, the various on and off aerodrome stakeholders in emergency management and the surrounding community comprise the risk society which has to organize itself in response to risks through instituting measures to ensure emergency preparedness, ensuring that all stakeholders collaborate and the surrounding local communities participate in emergency preparedness activities and ensure the effective promulgation, implementation and enforcement of regulation to address emergency preparedness.

2.6.2 Systems theory

According to Parsons (1990), the society is a system which is a complete whole composed of separate interdependent and interrelated parts referred to as subsystems. For the whole system to function, each part must contribute by playing its respective role. Failure of one subsystem would therefore mean partial failure of the complete system. Emergency preparedness at Kisumu airport can be viewed as a complete system, whereas emergency preparedness measures, community

² Site of a nuclear power plant near Kiev in Ukraine, where there was a catastrophic accident in 1986, the world's worst nuclear power accident in history.

³ Section of the city of Niagara Falls, Western New York. It was evacuated in the 1970s because of toxic waste pollution.

participation and stakeholder collaboration and regulation are the subsystems which must work in harmony in order to ensure success of the entire system. Failure of any one of these subsystems would therefore translate to a poor emergency preparedness situation at the aerodrome.

The systems theory recognizes that a system must fulfil four main requirements also referred to as functional prerequisites for it to succeed which are: adaptation; goal attainment; integration and latency or pattern maintenance. Adaptation and goal attainment in emergency preparedness can be seen in emergency preparedness measures such as planning and allocating resources, testing and review of plans to ensure their adequacy and appropriateness through exercises and training. Intergration is evident when the local vulnerable community participates and all the stakeholders are brought on board into emergency preparedness activities at all levels. The continuity of emergency preparedness to ensure readiness to emergencies at all times hence maintaining a pattern is sustained through sufficient promulgation, implementation and enforcement of the necessary regulations to address emergency preparedness.

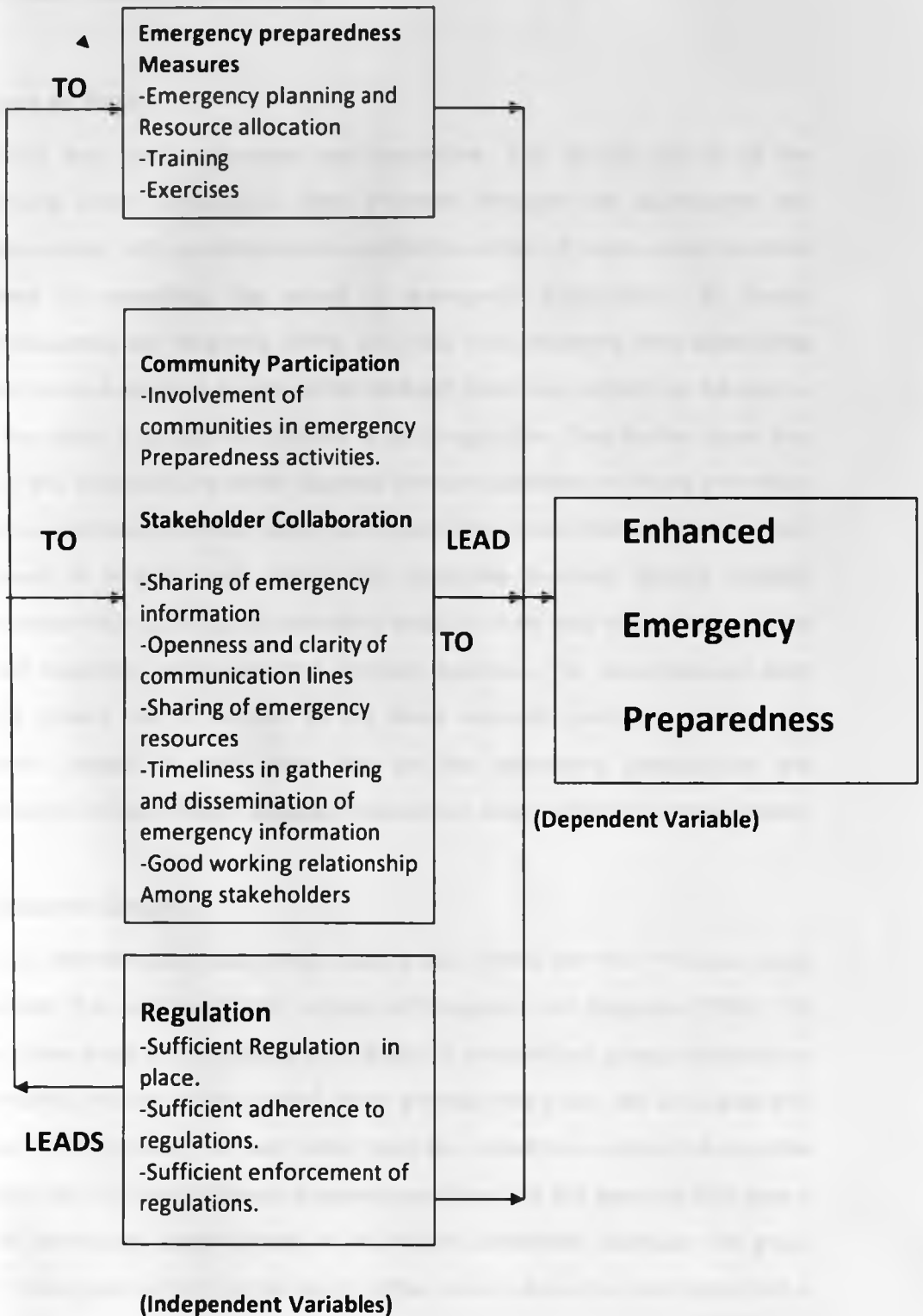
Senge, (1990) notes that systems are not chains of linear cause and effect relationships but complex networks of interrelationships. Systems are described as closed or open. Open systems exchange materials, energy and information with their environment. Emergency management at Kisumu airport characterizes an open system, since it involves stakeholders who are not only on aerodrome, but also off aerodrome. Emergency preparedness is therefore dependent on the input and collaboration of all participating groups and agencies whether within or without the airport, without which achieving readiness to emergencies at all times would not be possible.

2.7 Conceptual Framework.

Henderson (1994) argued that the major aims of research should be either to relate data to a theory or to generate a theory from data. In order to hold existing and new knowledge, theory should provide a conceptual framework so that knowledge can be interpreted for empirical application in a comprehensive manner.

Emergency preparedness is dependent on a number of factors which have been captured in detail in the literature review section. In this study, the factors have been operationalised as: measures to ensure emergency preparedness; community participation and stakeholder collaboration and; regulation, which form the independent variables. The dependent variable is the extent of emergency preparedness. Figure 2.1 outlines the conceptualization of the relationship between the dependent and the independent variables.

Figure 2.1. The Conceptual Framework.



Source: Researcher (2010)

CHAPTER THREE: METHODS

3.1 Type of Study

The study was both exploratory and descriptive. The various aspects of the phenomena under investigation were described through both quantitative and qualitative data. Both quantitative and qualitative modes of inquiry were therefore employed in unearthing the extent of emergency preparedness at Kisumu airport. Mugenda and Mugenda (1999, 156) note that employing both approaches reduces the bias inherent in each of the methods since one method can be used to check the other, a process also referred to as triangulation. They further assert that some of the objectives are better assessed through qualitative methods and others through quantitative methods, which is the case in this study whereby the objectives are varied. It is also worth noting that qualitative methods provide in-depth explanations while quantitative methods provide the hard data needed to meet the required objectives and answer the research questions. The questionnaires were used to collect data to answer all the three research questions whereas the interviews helped to shed more light on the community participation and collaboration of stakeholders' aspects of emergency preparedness at Kisumu Airport.

3.2 Research Design

The study applied a case study design. Bouma et.al (1995) aver that "The case study can answer the question, 'What is going on?' Mugenda and Mugenda (1999, 173) define a case study as 'an in-depth investigation of an individual, group, institution or phenomenon and the study is based on the premise that a case can be located that is typical of other cases.' The case under study here was Kisumu airport whereas the phenomenon was its emergency preparedness status. All the agencies that have a stake in emergency preparedness at the airport collectively represent the group under investigation which can be viewed either as an individual or institution that is unique from other individuals or institutions.

According to Mugenda and Mugenda (1999:14), units of analysis are individual units about which or whom descriptive or explanatory statements are to be made while a unit of observation is the subject, object, item or entity from which one measures the characteristic or obtains the data required in the research study. In this study the unit of analysis were the extent of emergency preparedness at Kisumu airport whereas the units of observation were all the emergency preparedness stakeholders at Kisumu airport.

3.3 Study Area.

The study was conducted at Kisumu airport, which was the case under study and involved all the on and off aerodrome agencies and selected local community representatives which in the view of the researcher, have a stake in emergency preparedness.

Kisumu Airport is among the oldest airports in Kenya that was built in the 1930s, on the shores of Lake Victoria, to the North West of Kisumu Town. It was widely used during the 2nd World War with amphibian type of aircraft landing on the neighbouring Lake Victoria. It is about 3.5 km from Kisumu City and is 3796 feet above sea level. It covers an area of 362 hectares (KAA, 2010)

The airport is currently being upgraded to accommodate the increasing passenger and airline traffic volumes. The main facilities being upgraded are: the construction of a new terminal building to accommodate more passengers; construction of larger parking apron and taxiway to accommodate more and larger aircraft; and extension of the runway from the present 2040 metres by 30 metres to a longer and wider 3,300 metres by 45 metres. (The Runway, 2009, 6-7)

3.4 Target Population

The target population in this study was comprised of staff from on aerodrome agencies which are airport management (KAA), airport security and safety, air traffic control services, airport police, fire, rescue and ambulance services personnel,

medical services (port health), airline operators and representatives of the contractors carrying out the upgrading activities. Key informants from both the on and off aerodrome agencies were represented by the respective management staff of; airport authority management, airport fire services, municipal fire services, airport police, public police, airport and public medical and ambulance services, hospitals, marine police and the local maritime authority. The local community was represented by the Mayor of the Kisumu Municipality and the District Officer, Winam Division, both of whom the airport falls under their respective political and administrative jurisdictions.

3.5 Sampling Techniques.

The study employed the proportionate random sampling and purposive sampling methods to sample the respondents from the on aerodrome agencies. The key informants were sampled through the purposive sampling method. Each agency had a specific number of employees with specific job description related to emergency preparedness and response.

Table 3.1 .Sample Design for on aerodrome Respondents

Agency	Population	Sample Size
Airport Management	8	3
Airport Safety & Security	19	6
Airline Operators	25	8
Fire & Rescue Services	9	3
Medical Services	3	1
Air Traffic Control	5	2
Airport & Anti-Terrorism Police	34	11
Contractors' Representatives	24	8
Customs and Immigration	5	2
Meteorological department	18	6
Total	150	50

Source: Researcher (2010)

Kasomo (2006) suggests that for a descriptive study 10% of the accessible population is enough. The sample size of 50 was therefore considered appropriate and representative of the whole population under interest

Table 3.2 Sample Design for Key Informants

Role	Agency	Target Informant	No.	Total
Airport Management	Kenya Airports Authority(KAA)	Airport Manager	1	1
Medical/Humanitarian Aid Services	Nyanza Gen. Hospital	Medical Supt.	1	4
	Agha Khan Hospital.	Nursing Supt.	1	
	Red-Cross	Branch Co-ordinator	1	
	St.Johns Ambulance	Branch Co-ordinator	1	
Regulatory Organisations	KCAA	Aviation Officer	1	2
	KMA	Maritime Officer	1	
Fire Rescue Support Services	Airport Fire Services	Senior Fire Officer	1	3
	Municipal Fire Brigade	Senior Fire Officer	1	
	Kenya Pipeline Company	Safety Officer	1	
Local Community Representatives	Provincial Administration	D.O Winam Division	1	2
	Local Authority	Mayor, Kisumu.	1	
Security Services (Police)	Airport Police	Officer in Charge	1	2
	Public Police	Officer in Charge	1	
Marine Rescue Support Services	Marine Police	Officer In Charge	1	6
	RVR	Chief Officer	1	
	MOF	PFO	1	
	KMFRI	Director	1	
	KWS	Officer in Charge	1	
	KRA(Marine Unit)	Officer in Charge	1	
	Total		21	21

Source: Researcher (2010)

The senior staffs from the above agencies were believed to possess the information regarding the various aspects of emergency preparedness by virtue of their positions in the organisations they represent.

3.6 Data Collection Methods and Tools.

Data was collected from the on aerodrome agency staff using questionnaire technique. Data from the key informants was collected through interview method. The data collection tools were therefore male questionnaires and interview guides respectively.

The questionnaires yielded mainly quantitative data, which though objective are superficial. The interviews on the other hand largely yielded qualitative data which despite being subjective is in-depth. The two instruments complemented each other giving a true picture of the situation under investigation.

3.7 Data Analysis Methods.

The study generated both qualitative and quantitative data. The questionnaires were cleaned and coded. The data was then analysed into frequencies and percentages which were used to arrive at objective conclusions.

The qualitative data from the questionnaires was categorized into themes which were then translated into frequency distribution tables. Data from interviews was coded and classified through categorizing and indexing, a method referred to as content analysis. Themes and patterns as per the objectives of the study were arrived at from which general statements were made.

3.8 Constraints in Data Collection

1. The scope of study being wide, the target sample was scattered, hence it took the researcher a lot of time and expenses to issue questionnaires and carry out the interviews.
2. Not all respondents were willing to complete the questionnaire or be interviewed. However, more questionnaires were issued and alternative informants were sought to cater for the non responses.

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Questionnaire Response rate.

The questionnaires were pretested whereby the respondents were allowed a period of two days to fill them and a response rate of 88% was realized. The questionnaires were then subsequently distributed and respondents allowed a longer period of five days to fill and a response rate of 92% was achieved.

4.2 Demographics.

Table 4.1: Distribution of respondents by organization.

	Organization	Frequency	Percentage
a	Airport Management	3	7
b	Airport Safety & Security	6	13
c	Airline Operators	7	15
d	Fire & Rescue Services	2	4
e	Medical Services	1	2
f	Air Traffic Control	2	4
g	Airport Police	11	24
h	Contractors/Consultants	7	15
i	Customs Dept.	0	0
j	Immigration Dept.	1	2
k	Meteorological department	6	13
	Total	46	100

Source: Field Data 2010

The largest numbers of respondents are airport police, contractors, airline operators and airport safety and security. The respondents with the least proportion of the airport population were airport fire and rescue services, air traffic control, immigration airport health services.

Table 4.2: Distribution of respondents by gender

Gender	Frequency	Percentage
Male	36	78
Female	10	22
Total	46	100

Source: Field Data 2010

Majority of the respondents are male at 78%, while 22% are female; indicating that the airport staff population is male dominated.

Table 4.3: Distribution of respondents by years of service

Years of service	Frequency	Percentage
Less than 2 years	14	45.6
2-5 years	21	30
6-10 years	7	15
10+ years	4	9
Total	46	100

Source: Field Data 2010

A majority of the respondents have worked at the airport for more than 2 years at 54%, hence they are familiar with the airport work environment with respect to emergency preparedness.

Table 4.4: Distribution Of Informants By Role Played In Emergency Preparedness.

No.	Role	No. of Informants	Percentage
a	Airport Management	1	5
b	Regulatory Organizations	2	10
c	Fire Fighting and Rescue Support	3	14
d	Local Community Representatives	2	10
e	Security Services(Police)	2	10
f	Medical/Humanitarian Aid Services	5	24
g	Marine Rescue Support Services	6	29
	TOTAL	21	100

Source: Field Data 2010.

Majority of the informants were drawn from the marine rescue support and medical and humanitarian aid services .The proportion of the informants to the role played in emergency preparedness was dictated by the number of organizations playing that particular role, whereby 1 informant was picked per organization.

Table 4.5: Distribution of Informants by years of service.

	Work experience category	No. of Informants	Percentage
a	Less than 2 years	4	19
b	2-5 years	8	38
c	6-10 years	2	10
d	10+ years	7	33
	TOTAL	21	100

Source: Field Data 2010.

Majority of the informants have worked at Kisumu for over 2 years indicating that they are familiar with the Kisumu work environment particularly with respect to emergency preparedness.

Table 4.6: Distribution of Informants by Gender.

Gender	No. of Informants	Percentage
Male	19	90
Female	2	10
TOTAL	21	100

Source: Field Data 2010.

Majority of the informants were male, indicating that the senior staff of organizations involved in emergency preparedness at Kisumu is male dominated.

4.3 Concept of emergency preparedness

Table 4.7: Understanding of the concept emergency preparedness

	Variable	Frequency	Percentage
a	Readiness to respond to emergencies	39	85
b	Accidents, incidents, fire or terrorist bombs	5	11
c	Missing	2	4
	Total	46	100

Source: Field Data 2010.

When asked on their understanding of aerodrome emergency preparedness, 85% of the respondents mentioned "readiness to respond to emergencies". This means that most of the respondents generally understand the meaning of the concept.

Diagram 4.1: Commitment towards emergency preparedness



Source: Field Data 2010.

Majority of the respondents were of the view that the commitment towards emergency preparedness is high at 75%. This could be interpreted to mean that majority of the staff is generally committed to emergency preparedness.

4.4 Emergency preparedness measures

4.4.1 Emergency planning

Table 4.8: Emergency planning activities

N o	Variable	Yes		No		Don't Know		Total	
		F	%	F	%	F	%	F	%
a	Emergency plan present	44	96	0	0	2	4	46	100
b	Involvement in planning	38	83	7	15	1	2	46	100
c	Plan hazard specific	43	94	1	2	2	4	46	100
d	Planning is continuous	39	85	5	11	2	4	46	100
e	Plan commensurate with airport activities	34	74	6	13	6	13	46	100

All the variables related to emergency planning had ratings of above 74%, indicating that their corresponding activities are carried out.

The aerodrome operator (KAA) is the driver of the emergency planning process. The regulatory organizations particularly KCAA plays the role of developing regulations governing emergency preparedness and procedures involved in search and rescue and are also involved in review of plans. It was indicated that there is a national awareness plan currently being domesticated to Kisumu to sensitize the emergency services and the local community.

4.4.2 Resource allocation

Table 4.9: Status of on aerodrome emergency resources

No	Variable	Adequate		Inadequate		Don't Know		Total	
		F	%	F	%	F	%	F	%
a	Fire Brigade services	42	91	3	7	1	2	46	100
B	Alerting Systems(Alarms)	24	52	14	30	8	18	46	100
C	Communication(Phone &Radio)	33	72	10	22	3	6	46	100
d	Search &Rescue Facilities(Inland)	19	41	19	41	8	18	46	100
e	Search &Rescue Facilities(Marine)	6	13	27	59	13	28	46	100
f	Search&Rescue Personnel(Inland)	21	46	15	33	10	21	46	100
g	Search&Rescue Personnel(Marine)	7	15	23	50	16	35	46	100
h	Crash Site Maps	17	37	13	28	16	35	46	100
i	Emergency access roads	25	54	18	39	3	7	46	100
j	Emergency Medical assistance	15	33	26	57	5	10	46	100
k	Disabled aircraft removal facilities	12	26	26	57	8	17	46	100
l	Casualty evacuation facilities	15	33	25	54	6	13	46	100

Source: Field Data 2010.

The on aerodrome fire brigade services, alerting systems, communication, inland search and rescue personnel and emergency access roads had the highest ratings, hence considered to be adequate. On aerodrome marine search and rescue facilities, personnel, emergency medical assistance, disabled aircraft removal facilities and casualty evacuation facilities had the lowest ratings hence inadequate. Inland search and rescue facilities and crash site maps had middle level ratings hence average.

Reliable communication systems between agencies were lacking save for the on airport agencies, in which case it was not all encompassing since some agencies were not connected to the local PABX system. Many organizations rely on land and mobile telephones which aren't as reliable and effective as interconnected radio links and emergency tie lines. However; few agencies have internal radio communication, whereas emergency tie lines exist between a few airport agencies.

The off aerodrome municipal fire brigade indicated that their fire engines were inadequate. The KPC safety department reported that their fire fighting equipment was stationary (fixed to fuel reservoirs) and had no mobile fire engines nor ambulances hence could only support the airport in terms of trained human resources. All the fire support agencies do not have water rescue equipment.

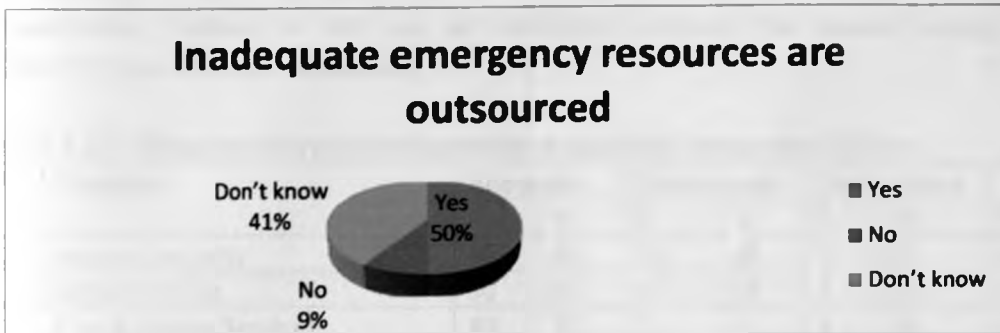
The government medical aid agencies didn't have adequate emergency resources, especially in terms of ambulances, medical equipment and materials. The private medical and humanitarian support agencies have adequate supplies and transport, and had adequate and reliable outsourcing arrangements in highly demanding situations.

The marine rescue support agencies had inadequate resources. They only had basic emergency equipment i.e. first aid kits, fire extinguishers, life jackets and life buoys. They lacked critical emergency rescue equipment e.g. life rafts, diving kits and speedboats. The regulatory agencies and the airport management lack inland and marine rescue resources especially aircraft, speedboats, diving equipment and crash site maps. The security services had no first aid equipment, no ambulances nor adequate transport.

Most of the agencies had inadequate human resources. The fire services, security services (including marine police) and the government medical services were particularly poorly staffed. The humanitarian aid services rely on trained volunteers who in some cases cannot be easily accessed within reasonably short times. The hospitals also have a shortage of specially trained personnel.

Problems in reliability and effectiveness of human resources were found to exist among government medical aid and some security and marine rescue support agencies. This was mainly attributed to negative attitudes and low morale due to among others poor remuneration and working conditions among government staff compared to those in the private sector. This was greatly considered to bear negatively on reliability and effectiveness of personnel in preparedness to emergencies.

Diagram 4.2: Inadequate emergency resources are outsourced



Source: Field Data 2010.

Majority of the respondents said that the inadequate emergency resources are outsourced, at 50%. Another 41% of indicated that they didn't know. This could be interpreted to mean that the while the airport out sources the inadequate resources, a good proportion of the respondents is not aware of the existence of such arrangements.

Table 4.10: Inadequate resources that are outsourced

	Variable	Frequency	Percentage
a	Medical aid	3	13
b	Marine Rescue Services	2	13
c	Municipal Brigade Services	3	13
d	To be outsourced in future	8	58
e	Missing	3	13
	Total	23	100

Source: Field Data 2010.

Medical aid, marine rescue and fire brigade services were considered as the inadequate resources that the airport out sources, at 13% each, respectively. However 58% of the respondents indicated that there were plans to outsource in future. This could be interpreted to mean that it is expected that efforts to boost emergency preparedness will be heightened upon the completion of the current airport upgrading activities.

4.4.3 Training

Table 4.11: Emergency preparedness training activities carried out

No	Variables	Yes		No		Don't Know		Total	
		F	%	F	%	F	%	F	%
a	First aid administration	22	48	22	48	2	4	46	100
b	Staff Emergency awareness	37	80	8	17	1	3	46	100
c	Emergency equipment use	33	72	11	24	2	4	46	100
d	Public emergency awareness	27	58	16	35	3	7	46	100

Source: Field Data 2010.

Staff emergency awareness, emergency equipment use and public emergency awareness trainings were largely considered to be carried out at 80%, 72% and 58% respectively. Training in first aid administration received the lowest ratings, indicating that it is least carried out.

Table 4.12: Adequacy of training of aerodrome specialist emergency services

No.	Variable	Adequate		Inadequate		Don't Know		Total	
		F	%	F	%	F	%	F	%
a	Airport Security	30	66	13	28	3	6	46	100
b	Airport Police	30	66	8	17	8	17	46	100
c	Fire & Rescue Services	40	87	2	4	4	9	46	100
d	Medical & Ambulance Services	19	41	22	48	5	11	46	100
e	Air Traffic Control Services	35	76	5	11	6	13	46	100

Source: Field Data 2010.

The training of airport fire and rescue services and air traffic control were considered to be most adequate at 87% and 76% respectively followed by airport security and airport police each at 66%. The training of medical services was considered to be the most inadequate of all the categories at 48%.

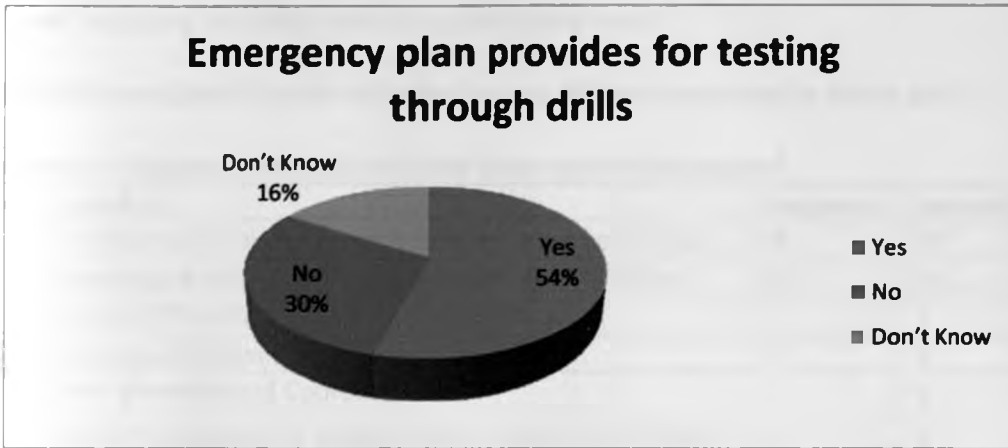
The security services indicated that their personnel are trained only in basic first aid administration but lacked refresher trainings in the same. The regulatory agencies reported that their personnel were adequately trained in as far as initiating and coordinating search and rescue activities is concerned. The provincial administration trains chiefs in disaster preparedness and response. The marine support services are trained in basic first aid administration but lack refresher trainings in the same. Some marine agencies have staff trained in marine search and rescue, fire fighting, diving and survival techniques but lack refresher trainings in the same. The medical and humanitarian aid services are well trained in various areas ranging from first aid administration, emergency rescue operations, emergency medical unit training and incident command system. The medical services however lack personnel with specialized training in areas such as neurosurgery. Some medical agencies also lack regular refresher trainings. The fire fighting and rescue support services are trained in first aid, search and rescue and evacuation both on land and in water. They however lack continuous trainings in the same. It was also found that there is a high staff turnover at the airport occasioned by retirements and frequent transfers of trained personnel hence the need for regular trainings.

Informants indicated that the airport management conducts safety awareness seminars targeted at various airports and off airport agencies as well as the local community through the provincial administration. The elected representatives i.e.

the councillors are seldom used by the airport to sensitize the locals. It also organizes meetings between the various stakeholders where emergency preparedness issues are discussed. The fire fighting support agencies occasionally conduct joint trainings. The provincial administration and humanitarian aid organizations invite the airport for trainings on emergency preparedness and response.

4.4.4: Exercises

Diagram 4.3: Emergency plan provides for testing through drills



Source: Field Data 2010.

Most of the respondents (54%) were of the view that the airport emergency plan provides for testing through drills. However another 30% indicated that it doesn't with 16% saying they didn't know. This could be attributed to lack of awareness on the contents of the plan.

Table 4.13: Undertaking of drills

N o	Variable	Yes		No		Don't Know		Total	
		F	%	F	%	F	%	F	%
a	Full scale drill done in the last 2 years	6	13	30	65	10	22	46	100
b	Partial drill done in the last 1 year	9	20	30	65	7	15	46	100
c	Table top drill done in the last ½ year	10	22	28	61	8	17	46	100

Source: Field Data 2010.

All the three categories above regarding failure to undertake drills had high ratings. This could be interpreted to mean that drills are not undertaken regularly at the airport.

Informants from all the agencies noted that drills were not regularly undertaken at the airport.

Table 4.14: Date when last drill conducted

	Date	Frequency	Percentage
a	No idea/Never seen or heard of one	34	78
b	Between 2000 and 2003	4	9
c	Between 2004 and 2007	4	9
d	In 2008	1	2
e	Many years ago	1	2
	Total responses	44	100

Source: Field Data 2010.

When asked to state when the last drill was conducted at the airport if not in the last 2 years, 78% of the respondents said “they had no idea’ or “had never seen or heard of one’ indicating that drills are not regularly conducted.

Key informants could neither tell when the last drill was conducted at the airport.

Table 4.15: Reasons why drills have not been regularly conducted

No.	Variable	Frequency	Percent
a	Negligence or lack of commitment by those concerned	18	39
b	Inadequate resources(Funds, equipment or facilities)	12	26
c	Bureaucratic organizational procedures	4	9
d	Inadequate training	2	4
e	Poor planning and Coordination	2	4
f	Airport operations & construction activities a hindrance	2	4
g	Insufficient regulation	1	2
h	Missing	5	10
	Total	46	100

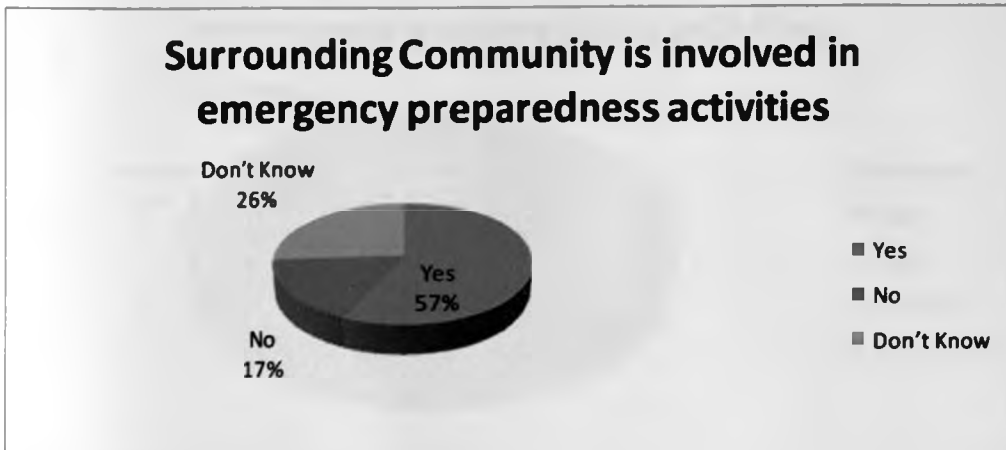
Source: Field Data 2010.

Negligence on the part of those concerned was considered to be the greatest hindrance to regular undertaking of drills. Other factors with high ratings were inadequate resources and bureaucratic organizational procedures.

Other factors attributed to this were low staff capacity, poor organization by those concerned and ignorance due to the fact that the airport has a long history devoid of frequent emergency occurrences mainly because aircraft developing problems prefer turn back and land at the ports of origin(mainly, JKIA Nairobi)

4.5 Community participation and Collaboration of stakeholders.

Diagram 4.4: Surrounding community is involved in emergency preparedness activities



Source: Field Data 2010.

A majority of the respondents (57%) were of the view that the airport involves the surrounding community in emergency preparedness activities. This means that emergency preparedness at Kisumu airport brings on board participation of the local community.

Table 4.16: Ways in which the surrounding community is involved in emergency preparedness

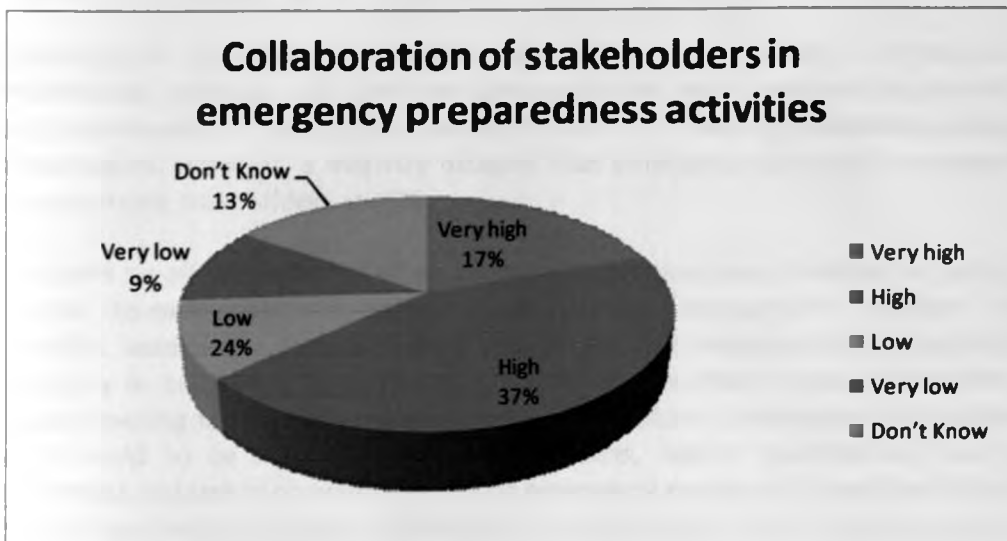
No.	Variable	Frequency	Percentage
a	In emergency planning	7	13
b	Enlisting their specialist emergency aid	13	25
c	In emergency awareness trainings	23	43
d	Involving them in drills	10	19
	Total	53	100

Source: Field Data 2010.

Most of the responses indicated that the surrounding community is mainly involved in trainings and emergency assistance. Planning and drills elicited the lowest ratings, showing that the airport least involves the community in these activities.

The informants indicated that they were involved by the airport management in planning for drills. The maritime rescue support agencies reported that they had just been brought on board recently, following the establishment of a maritime rescue committee. The airport sensitizes the local community through the provincial administration (Chiefs) on aerodrome emergencies. The provincial administration also coordinates disaster preparedness and response through provincial and district disaster committees.

Diagram 4.5: Collaboration of stakeholders in emergency preparedness activities



Source: Field Data 2010.

Majority of the respondents were of the view that collaboration of stakeholders at Kisumu airport is high at 54%. However, 33% of the respondents mentioned that it is low. This could be interpreted to mean that while it appears that stakeholders generally collaborate in emergency preparedness activities, more needs to be done to improve the process.

Table 4.17: Extent of Collaboration of stakeholders in emergency preparedness activities.

Variable	Strongly Disagree		Disagree		Neutral		Agree		Agree Strongly		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
a Emergency information is equally shared	1	2	6	13	10	22	16	35	13	28	46	100
b Communication lines are open and clear	3	7	6	13	11	24	15	33	11	24	46	100
c Emergency resources are equally shared	7	15	15	33	12	26	6	13	6	13	46	100
d Gathering & dissemination of emergency information is timely	5	11	8	17	10	22	17	40	6	13	46	100
e There is good working relationship	0	0	8	17	13	28	15	33	10	22	46	100
Total	16	7	43	19	56	24	69	30	46	20	230	100

Source: Field Data 2010.

Majority of the respondents agree that stakeholders collaborate in emergency preparedness activities at 50% as opposed to those who disagree 26%.

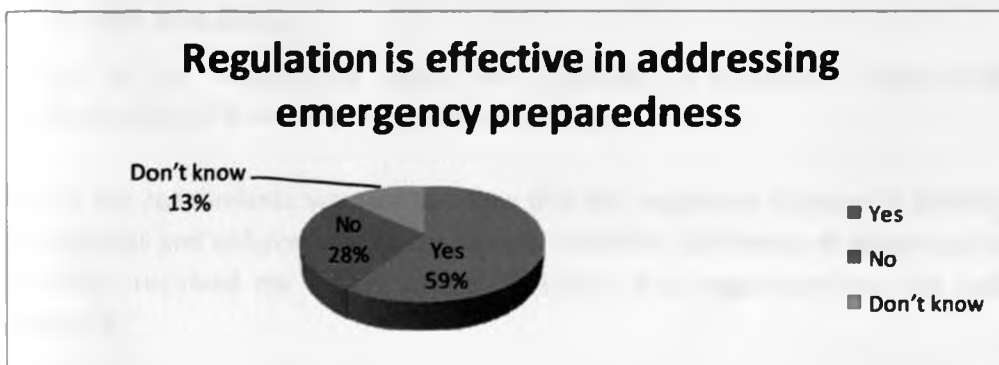
Collaboration activities that received high ratings were: sharing of emergency information; openness and clarity of communication lines; timeliness in gathering and dissemination of emergency information; and good working relationship among stakeholders. However, a majority disagree that emergency resources are equally shared among stakeholders at 48%.

Obstacles to effective sharing of emergency information were identified as lack of forums, co-ordination and proper communication arrangements between the agencies. Inadequate communication and bureaucratic organizational procedures were key in hampering open and clear communication lines among stakeholders. Factors leading to untimely gathering and dissemination of emergency information were found to be poor communication channels, lack of coordination, lack of awareness and lack of commitment among emergency personnel. It was also difficult to tell how timely emergency information is relayed due to lack of previous major disaster occurrences at Kisumu airport.

The working relationship among stakeholders was generally cordial. Factors attributed to poor relationship were lack of representative forums to create familiarity between agencies and competition for dominance among organizations performing similar roles, especially the humanitarian aid organizations. The informants were of the view that agencies are generally willing to share resources. Constraints in sharing of emergency resources were found to be bureaucratic organizational procedures, limited resources especially marine rescue and medical aid related, lack of binding pre-disaster mutual aid agreements between agencies and lack of an inventory of resources at the disposal of various agencies in order to arrange for sharing.

4.6 Regulation

Diagram 4.6: Regulation is effective in addressing aerodrome emergency preparedness



Source: Field Data 2010.

Most of the respondents were of the view that regulation is effective in addressing emergency preparedness at 59%. This could be interpreted to mean that regulation is to a high degree effective in addressing emergency preparedness.

Table 4.18: Ways in which regulation addresses emergency preparedness.

	Variable	Frequency	Percent
a	Leads to awareness hence ensuring compliance	7	25
b	Regulations are mandatory, hence compliance is a must	3	11
c	Safety audits increases the level of compliance	1	4
d	Increases participation of stakeholders	1	4
e	Ensures proper control of movement and operations, hence safety	3	11
f	Bureaucracies ensuing from regulations frustrate preparedness	1	4
g	No regulations, since no penalties so far for not performing drills	1	4
h	Missing	10	37
	Total	27	100

Source: Field Data 2010

The most critical way in which regulation ensures emergency preparedness is through creating awareness at 25%. Other factors with high ratings are that it is mandatory ensuring compliance and that it ensures proper control of movement and operations at airports.

Table 4.19: Effect of regulation in addressing emergency preparedness

No	Variable	Strongly Agree		Agree		Neutral		Disagree		Disagree Strongly		Total	
		F	%	F	%	F	%	F	%	F	%	F	%
a	Regulation is sufficient	7	15	12	26	16	35	11	24	0	0	46	100
b	Adherence is sufficient	6	13	9	20	18	39	11	24	2	4	46	100
c	Enforcement is sufficient	6	13	13	28	12	26	9	20	6	13	46	100
	Total	19	14	34	25	46	33	31	22	8	6	138	100

Source: Field Data 2010.

Majority of the respondents agree that regulation is effective in addressing preparedness at 39% than those who disagree at 28%.

Most of the respondents were of the view that the regulation in place to address preparedness and enforcement of the same is sufficient. Sufficiency of adherence to regulations received the lowest ratings, indicating that regulations are not well adhered to.

4.7 Challenges in emergency preparedness and remedies.

Table 4.20: Challenges in ensuring aerodrome emergency preparedness

	Variable	Frequency	Percentage
a	Inadequate material Resources(Funds, facilities and equipment)	17	25
b	Inadequate human resources(manpower)	11	16
c	Inadequate training/awareness programmes	11	16
d	Poor collaboration /commitment among stakeholders	11	16
e	No regular undertaking of drills	5	7
f	Poor aerodrome marine preparedness	3	4
g	Inadequate medical services	2	3
h	Inadequate access roads	2	3
i	Poor communication	2	3
j	Poor planning and organization	2	3
k	Bureaucratic organizational procedures	2	3
l	Ongoing construction activities	1	1
	Total responses	69	100

Source: Field Data 2010.

Inadequate material resources was identified as the most critical challenge in ensuring aerodrome emergency preparedness at 25%. Other challenges with high ratings were inadequate human resources, inadequate training, poor collaboration among stakeholders and no regular drills .

Other challenges identified by informants were lack of regulation and coordination of players in emergency preparedness, lack of forums to bring agencies together and enable them share information, low human resource morale and negative attitudes towards voluntary service, lack of binding pre-disaster mutual aid agreements, poor physical infrastructure(inadequate and congested roads) and lack of public awareness which translates to hostility and uncooperativeness from the public to emergency services during response.

The marine rescue services faced water navigation and berthing problems due to water hyacinth proliferation, decreased water levels and no navigation beacons which makes navigation difficult and dangerous. They also faced increased vessel maintenance costs due to high berthing fees. Non-compliance to safety regulations among vessel owners also remained a challenge.

The medical services faced problems of limited physical facilities (hospitals). Public hospitals had uncommitted staff whereas private ones fear financial implications, leading to reluctance to receive and treat casualties.

Table 4.21: Ways in which the challenges can be overcome

	Variable	Frequency	Percentage
a	Increase emergency resources(funds, facilities and equipment)	18	30
b	Train personnel and conduct awareness campaigns	10	16
c	Increase trained human resources(manpower)	8	13
d	Undertake drills regularly	5	8
e	Improve collaboration and working relationships	4	7
f	Create & maintain fora for information sharing	3	5
g	Incorporate all stakeholders and surrounding community	3	5
h	Increase emergency access roads	3	5
i	Increase medical facilities	2	3
j	Make emergency preparedness an organizational priority	2	3
k	Decentralize decision making	2	3
l	Aerodrome operator should establish its own marine unit	1	2
	Total responses	61	100

Source: Field Data 2010.

Majority of the responses suggested that more material resources should be devoted to emergency preparedness at 30%. Other suggestions to overcoming challenges that had high ratings were; conduct staff and public awareness trainings, increase manpower, regularly undertake drills and improve collaboration among stakeholders.

4.8 Additional Comments on emergency preparedness

Table 4.22: General additional comments by the respondents regarding emergency preparedness at Kisumu airport.

	Variable	Frequency	Percentage
a	Drills should be undertaken regularly	4	24
b	Improve airport security especially access control & screening	2	12
c	Increase emergency resources(facilities, equipment and funds)	2	12
d	Preparedness should be taken more seriously	1	6
e	Train all stakeholders in emergency preparedness	1	6
f	Increase independence of aerodrome in emergency planning	1	6
g	Sensitize local community on emergencies	1	6
h	Avail regulations to all stakeholders	1	6
i	Aerodrome operator should establish its own marine unit	1	6
j	Improve collaboration among stakeholders	1	6
k	Involve all stakeholders in emergency planning	1	6
	Total responses	17	100

Source: Field Data 2010.

Majority of the comments from the respondents indicate that drills should be conducted regularly, airport security should be improved and more resources should be allocated to emergency preparedness.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS.

5.1 SUMMARY OF KEY FINDINGS

The study sought to assess the extent of emergency preparedness at Kisumu airport in terms of; measures in place to address preparedness, community participation and collaboration of stakeholders and regulation.

In line with emergency preparedness measures and particularly emergency planning and resource allocation, the study found out that there is a plan for emergencies at Kisumu airport that is hazard specific and commensurate with airport activities. The planning process is continuous and involves the various on aerodrome stakeholders. The on aerodrome emergency resources were found to be adequate, save for marine rescue resources, medical aid resources, casualty evacuation and disabled aircraft removal arrangements. The airport out sources medical aid, marine rescue and fire fighting services from off aerodrome agencies within Kisumu, to cater for inadequacies in overwhelming emergency situations. The marine rescue support services had basic emergency equipment, but lacked specialized emergency rescue equipment. Save for government owned agencies, other off aerodrome medical aid services had adequate emergency resources. Security services had inadequate emergency resources. Mobile and fixed land telephones are widely used for communication. Radio communication and emergency tie lines were few and confined to specific agencies. Reliable communication links between agencies was found to be lacking. Human resource capacity problems were found across the agencies, as well as staff discipline, effectiveness and reliability problems among some government owned emergency services.

In line with training, the study found out that staff and public emergency awareness trainings are carried out as well as training on emergency equipment use. The airport sensitizes the local community on emergencies through the provincial administration. Training in first aid administration was found to be inadequate. The training of the airport fire, police, security, and air traffic control services to handle emergencies was found to be adequate. The training of the airport medical services was however, inadequate. The various on and off aerodrome agencies are trained in

emergency preparedness and response, but lack continuous trainings to refresh their skills. Regular undertaking of drills at Kisumu airport was found to be lacking as it was not clear when the last drill was conducted. This was mainly attributed to negligence, due to lack of exposure to serious emergency situations.

The airport involves the surrounding community in emergency preparedness activities mainly in emergency awareness trainings and enlisting their specialist aid in times of emergencies. However, they are not involved in emergency planning and in emergency drills. Stakeholders were found to collaborate well especially in terms of equal sharing of emergency information, openness and clarity of communication lines, gathering and dissemination of emergency information and good working relationships. Collaboration was weak when it came to sharing of emergency resources. Major obstacles to effective collaboration among stakeholders were poor communication, ineffective coordination, lack of awareness, bureaucratic organizational procedures, limited resources and lack of forums to bring agencies together.

Regulation was found to be effective in addressing emergency preparedness, since it is mandatory and leads to awareness. It was also found out that regulation is sufficient enough to address emergency preparedness. Adherence to regulations was found to be insufficient whereas enforcement of regulations was found to be sufficient.

Inadequate funds and material resources, inadequate human resources, inadequate training, poor collaboration among stakeholders and failure to regularly undertake drills were the major challenges to ensuring emergency preparedness at Kisumu airport.

5.2 CONCLUSION.

From the findings it can be concluded that whilst the aerodrome plans for emergencies and allocates resources to the same, it is not possible for it to know how response during a real emergency situation would be since the plan is not regularly tested through undertaking of drills. Most agencies also lack critical emergency resources and sufficient training to ensure preparedness.

The study also concluded that the surrounding communities are not involved in entirely all emergency preparedness activities. Collaboration of stakeholders in emergency preparedness activities still remains a big challenge.

While regulation had enabled preparedness in as far as its sufficiency and enforcement are concerned, adherence to regulations still leaves a lot to be desired. Constraints in resources, training, drills and collaboration among stakeholders stand in the way of ensuring emergency preparedness at Kisumu airport.

5.3 RECOMMENDATIONS.

Based on the findings, the study made the following recommendations, which if considered and implemented would enhance emergency preparedness not only at Kisumu airport but also at other airports both locally and internationally;

Objective 1: Emergency Preparedness Measures.

A) Emergency Planning and Resource allocation

1. Allocate sufficient resources towards preparedness through sufficient funding to enable agencies: - procure and sustainably maintain emergency equipment, facilities and infrastructure; recruit and maintain adequate emergency personnel; and continuously train emergency personnel. Where it's difficult to obtain sufficient funding, other measures can be used e.g. outsourcing through mutual aid agreements to cater for contingencies; innovations to generate income through commercial means e.g. transport service provision in order to maintain and hence sustain vessels or; make joint arrangements between agencies for the purpose of training, procuring and maintaining emergency equipment.
2. The airport authority should establish its own marine unit (with equipment and fully trained personnel) to reduce dependency and increase self sufficiency.
3. Improve navigation and berthing in Lake Victoria through: - initiatives to control and manage water hyacinth; dredging of the lake to increase water levels; putting in place navigation beacons to make navigation safer; lowering or waiving of emergency vessel berthing fees to reduce vessel maintenance

costs; enlist the use of airboats to complement efforts of controlling obstacles to navigation, i.e. water hyacinth.

4. Address the various human resource aspects that hamper efficient service delivery e.g. high staff turnover rates and put in place initiatives that will motivate staff and bring about attitudinal change especially towards voluntary service.

B) Training

5. Conduct staff and public emergency awareness trainings: - Emergency personnel training should be continuous to enable them refresh their skills. Staff should be exposed to other challenging environments through exchange programmes in order to sensitize them better. The public should be sensitized on emergency preparedness and response to enable them be helpful rather than obstructive during emergencies.

C) Exercises

6. Regular undertaking of joint emergency drills: - This should be undertaken regularly as prescribed by the relevant regulations and jointly to create familiarity and synchrony among staff in order to improve response in a real emergency situation.

Objective 2: Community Participation and Collaboration of Stakeholders

7. The airport should bring the participation of surrounding local community on board in all the emergency preparedness activities, especially in emergency planning and drills.
8. Strengthen coordination between emergency management agencies:- This can be best accomplished through establishment of a new emergency management agency by government or empowering the current structure(provincial administration) to effectively coordinate and regulate emergency preparedness activities between stakeholders through: defining the roles and limits of operation of emergency management agencies in

order to bring harmony and avoid competition and conflict; creating and maintaining forums to enable agencies share information; ensure there is well structured and reliable communication links and arrangements between agencies; make mutual aid agreements between agencies binding; make an inventory of resources (human and material) at the disposal of the various agencies and ensure that adequate proportions of the same are always available on standby basis and; monitor and evaluate emergency preparedness activities.

9. Decentralize decision making in organizations to overcome bureaucratic organizational procedures: - This can be done by empowering middle and lower cadre personnel involved in executing emergency drills and routine handling of the various emergency response facilities to be able to make decisions during distress calls.

Objective 3: Regulation

10. Find ways of ensuring adherence to regulations governing emergency preparedness among the various agencies. The aerodrome regulatory bodies and aerodrome operator should play a leading role in this.

5.4 AREAS FOR FURTHER RESEARCH

Further studies are recommended in the following areas

1. Extent of awareness on regulations and its role in governing emergency preparedness.
2. Misconception between mitigation and preparedness phases of emergency management as well as between safety and security aspects of airport operations.
3. Challenges in ensuring aerodrome emergency preparedness.
4. Role of the local communities in aerodrome emergency preparedness.

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Appendix I: Questionnaire for on Aerodrome Respondents.

Aerodrome Emergency Preparedness: Case Study of Kisumu Airport.

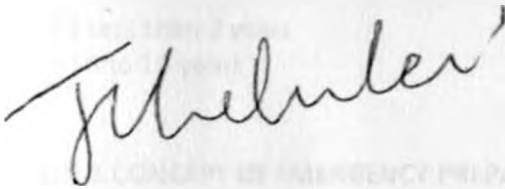
Introduction:

This study is being conducted by Jerry Kiptoo, postgraduate student working towards fulfilling the requirements for a Master of Arts in Sociology (Disaster Management option) degree at the Department of Sociology, Faculty of Arts, University of Nairobi.

The aim of this questionnaire is to elicit your responses regarding the status of the various aspects of emergency preparedness at Kisumu airport, in order to be able to assess its extent, especially in light of the current developments geared towards transforming it into international status.

Your input is therefore extremely crucial in the success of this study. Your responses will be treated with utmost confidentiality.

Thanks in advance for your assistance and support,



Jerry Kiptoo Chelulei.

SECTION C. EMERGENCY PREPAREDNESS MEASURES.

i) EMERGENCY PLANNING AND RESOURCE ALLOCATION

6. Is there a plan for emergencies at Kisumu Airport? Yes No Not sure/don't know.
7. If yes in (6) above, is your organisation involved in emergency planning/Review of plans?
 Yes No Not sure/don't know.
8. Is the plan hazard specific? Yes No Not sure/don't know.
9. Is the planning process continuous? Yes No Not sure/don't know.
10. In your view, is the plan commensurate with the activities at the airport i.e. flight operations and construction activities? Yes No Not sure/don't know.
11. How would you rate the status of the following emergency resources at Kisumu Airport?
- | | | | |
|---|-----------------------------------|-------------------------------------|---------------------------------------|
| a.) Fire Brigade Services | <input type="checkbox"/> Adequate | <input type="checkbox"/> Inadequate | <input type="checkbox"/> Don't know |
| b.) Alerting systems i.e. Crash alarms | <input type="checkbox"/> Adequate | <input type="checkbox"/> Inadequate | <input type="checkbox"/> Don't know |
| c.) Communication (Phone and radio) | <input type="checkbox"/> Adequate | <input type="checkbox"/> Inadequate | <input type="checkbox"/> Don't know |
| d.) Search and Rescue Facilities (Inland) | <input type="checkbox"/> Adequate | <input type="checkbox"/> Inadequate | <input type="checkbox"/> Don't know |
| e.) Search and Rescue Facilities (Marine) | <input type="checkbox"/> Adequate | <input type="checkbox"/> Inadequate | <input type="checkbox"/> Don't know |
| f.) Search and Rescue Personnel (Inland) | <input type="checkbox"/> Adequate | <input type="checkbox"/> Inadequate | <input type="checkbox"/> Don't know |
| g.) Search and Rescue Personnel (Marine) | <input type="checkbox"/> Adequate | <input type="checkbox"/> Inadequate | <input type="checkbox"/> Don't know |
| h.) Crash site Maps | <input type="checkbox"/> Adequate | <input type="checkbox"/> Inadequate | <input type="checkbox"/> Don't know |
| i.) Emergency access Roads | <input type="checkbox"/> Adequate | <input type="checkbox"/> Inadequate | <input type="checkbox"/> Don't know |
| j.) Emergency Medical assistance Resources (Human & Material) | <input type="checkbox"/> Adequate | <input type="checkbox"/> Inadequate | <input type="checkbox"/> Don't know |
| k.) Disabled aircraft removal Arrangements | <input type="checkbox"/> Adequate | <input type="checkbox"/> Inadequate | <input type="checkbox"/> Don't know |
| l.) Casualty Evacuation plans | <input type="checkbox"/> Adequate | <input type="checkbox"/> Inadequate | <input type="checkbox"/> Don't know.) |

m.)For any of the inadequate response above, are there outsourcing arrangements e.g. fire brigade

Yes No Don't know

Please specify and briefly explain as appropriate.....

.....
.....
.....
.....

ii.)TRAINING.

12. Are the following emergency preparedness training activities conducted at Kisumu airport?

a.)First aid administration Yes No Don't know

b.)Emergency sensitizations Yes No Don't know
(i.e. Staff Safety awareness training)

c.)Emergency equipment use Yes No Don't know
(i.e.) Fire Extinguishers)

d.)Public emergency awareness Yes No Don't know
(E.g. passenger information)

13. How would you rate the level of training off the following aerodrome specialist emergency services to effectively handle emergencies?

a.)Airport Security Adequate Inadequate Don't know

b.)Airport Police Adequate Inadequate Don't know

c.)Fire and Rescue Services Adequate Inadequate Don't know

d.)Medical and Ambulance Services Adequate Inadequate Don't know

e) Air Traffic Services Adequate Inadequate Don't know

iii.)EXERCISES/DRILLS

14. Does the emergency plan at Kisumu airport provide for testing through drills?

Yes No Don't know

15. Which of the following descriptions characterizes the undertaking of emergency drills at Kisumu airport? Please tick as appropriate.

Full scale emergency drill was conducted within the last two years
 Yes No Don't know

Partial emergency drill was conducted within the last one year
 Yes No Don't know

Table top emergency exercise conducted within the last six months
 Yes No Don't know

16. If No in all the three categories in 15) above when was the last emergency drill conducted at Kisumu airport?.....

17. What reason would you attribute to the No/Negative responses above?.....
.....
.....
.....

SECTION D.COMMUNITY PARTICIPATION AND COLLABORATION OF STAKEHOLDERS.

18. Does the Kisumu airport emergency plan bring on board the participation of the surrounding community in managing emergencies?

Yes No Don't know.

19. If Yes in 18), above, in what ways? (Please tick as appropriate)

In Emergency planning and Review of plans.

Through enlisting their specialist mutual emergency assistance

Through safety and emergency awareness programmes.

Involving them in Emergency Drills.

20. How would you rate the collaboration of the various stakeholders in emergency management activities at Kisumu airport?

Very high high Low Very low Don't know

21. The statements below are related to the various aspects of collaboration among stakeholders in disaster preparedness, please rank them using the scale provided below (Tick as appropriate)

No	Statement	Disagree Strongly	Disagree	Neutral	Agree	Agree Strongly
a	Emergency and Safety Information shared equally among stakeholders.					
b	There are open and clear lines of pre-disaster communication among stakeholders.					
c	Emergency resources are equally shared among stakeholders.					
d	Gathering and dissemination of emergency information among stakeholders is timely.					
e	There is good and healthy working relationship among stakeholders					

SECTION E. REGULATION.

22. Do you think regulation has had an effect in addressing emergency preparedness at Kisumu airport?

Yes No Don't know.

23. If your answer to 22 above is yes, please indicate to what extent?

.....

24. The statements below are related to the various aspects of regulation in addressing aerodrome emergency preparedness. Please rank them using the scale below. (Tick as appropriate)

No	Statement	Strongly Agree	Agree	Neutral	Disagree	Disagree Strongly
a	Regulation is sufficient					
b	Adherence is sufficient					
c	Enforcement is sufficient					

25. What challenge(s) do you face in ensuring emergency preparedness at Kisumu airport and why?.....

.....

26. In what ways can the challenge(s) above (if any) be overcome?.....

.....
.....
.....
.....

27. Is there anything you would like to add as a comment/suggestion or opinion that you feel was left out?.....

.....
.....
.....
.....
.....
.....
.....
.....
.....

END.

THANKS FOR YOUR RESPONSES.

=====
Jerry Kiptoo-email kiptoochomu@yahoo.com Tel- 0720931214, P.o Box 13-40100 Kisumu.

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Appendix II: Interview Guide for Key Informants.

Aerodrome Emergency Preparedness: Case Study of Kisumu Airport.

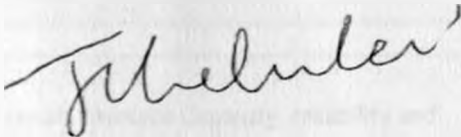
Introduction:

I am Jerry Kiptoo postgraduate student working towards fulfilling the requirements for a Master of Arts in Sociology (Disaster Management option) degree at the Department of Sociology, Faculty of Arts, University of Nairobi.

The aim of this interview is to elicit your responses regarding the status of the various aspects of emergency preparedness at Kisumu airport, in order to be able to assess its extent, especially in light of the current developments geared towards transforming it into international status.

Your input is therefore extremely crucial in the success of this study. Your responses will be treated with utmost confidentiality.

Thanks in advance for your assistance and support,



Jerry Kiptoo Chelulei.

SECTION A. DEMOGRAPHICS.

1. Which organization do you work for?

- | | |
|--|---|
| <input type="checkbox"/> Airport Management | <input type="checkbox"/> Regulatory Organization |
| <input type="checkbox"/> Marine Rescue Support Services | <input type="checkbox"/> Medical/Humanitarian Aid Service |
| <input type="checkbox"/> Fire fighting & Rescue Support Services | <input type="checkbox"/> Security Services (Police) |

2. How long have you worked for the organization at Kisumu?

- | | |
|--|---------------------------------------|
| <input type="checkbox"/> Less than 2 years | <input type="checkbox"/> 2 to 5 years |
| <input type="checkbox"/> 6 to 10 years | <input type="checkbox"/> 10+ years |

SECTION B. EMERGENCY PREPAREDNESS INFORMATION

3. Emergency preparedness measures.

Briefly comment on the status of the following aspects of emergency services at your organisation in relation to their effectiveness in ensuring emergency preparedness at Kisumu airport.

i) Emergency resources (Material)

.....
.....
.....

ii) Communication systems (Internal and external).....

.....
.....

iii) Human resource Capacity, reliability and effectiveness.....

.....
.....

iv) Training of personnel/Level of existing skills.....

.....
.....

4. Community Participation and collaboration of stakeholders

(a). Community participation

To what extent or in what ways is your organisation/local community involved in Emergency preparedness activities at Kisumu Airport?

.....
.....
.....

(b) Collaboration of Stakeholders

Collaboration of stakeholders is crucial in effectively managing emergencies. Briefly describe the Status of the following aspects of collaboration of stakeholders in emergency management at Kisumu airport.

i) Sharing of emergency information.....
.....
.....

ii) Timeliness in gathering and dissemination of emergency information.....
.....
.....

iii) Sharing of emergency resources.....
.....
.....

iv) Openness and clarity of pre-disaster communication lines among stakeholders.....
.....
.....

v) Nature of working relationship among stakeholders.....
.....
.....

5. What challenge(s) do you face in your efforts to ensure preparedness to respond to emergencies in your organisation or local community you represent?
.....
.....
.....

6. What do you think can be done to remedy the challenge(s) above (if any)?.....
.....
.....

7. Is there any comment/suggestion/opinion/criticism about emergency preparedness at Kisumu airport you would like to add that you feel was left out?.....
.....
.....

END

THANK YOU FOR YOUR RESPONSES.