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Research Article

Use Geotechnical to Build Disaster Management Systems to Mitigate the Effects of Wars

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ABSTRACT

This study examines the role of GIS in emergency management through the lens of comprehensive emergency management and its four phases: mitigation, preparedness, response, and recovery. The primary concern before a potential disaster is mitigating the impact of a hazard. Here GIS is gaining favour in risk assessment and the development of long-term mitigation strategies. In the preparedness and response phases, GIS may serve either as the integrating centrepiece for a comprehensive disaster preparedness and response system or as a portable, on-site source of spatial information. In the wake of a disaster, GIS is becoming integral in supporting damage assessment, rebuilding, and public education. The studying concludes with an example application of GIS in emergency planning: evacuation vulnerability mapping As happened in the Gaza war in 2014, where dozens of people lost their lives as a result of the random evacuation of the population and the absence of pre-preparation for disasters, especially wars.

Keywords: GIS- Applications-Management-Disasters - Gaza Wars

INTRODUCTION

Gaza Strip is one of the densest places in the population. The population density in the middle of 2018 was about 6027 people per kilometer, about 26,000 inhabitants in Gaza City and about 180,000 people in refugee camps. This reflects the great importance of preparing studies for disaster management Especially studies that deal with disaster management before and after the war because the Gaza Strip is one of the most war-prone areas in the world [1].

Many of the critical problems that arise are inherently spatial. Whether an analyst is assessing the potential impact of a hazard, or an emergency manager is identifying the best evacuation routes during a disaster, or a civil engineer is planning a rebuilding effort following a disaster, all of these individuals face tasks with a strong spatial component. For this reason, geographical space is a valuable framework for reasoning about many problems that arise in the context of emergency management [2].

GIS were designed to support geographical inquiry and, ultimately, spatial decision making. The value of GIS in emergency management arises directly from the benefits of integrating a technology designed to support spatial decision making into afield with a strong need to address numerous critical spatial decisions. For this reason, new applications of GIS in emergency management have flourished in recent years along with an interest in furthering this trend. In addition to this growing interest, the adoption of GIS into the emergency management arena has been bolstered in some countries by favourable legislation regarding the use of spatial information in emergency[3].

Study Subject

Gaza Strip has witnessed a remarkable development in the field of preparation of studies related to the management of disasters and crises, which affected the quality of decision-making and will not stop the work of emergency centers as long as there are needs and appeals distress, so the problem of the study in answering the following questions:

1. What is the role of GIS in disaster and crisis management?

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2. What is the size of the distress calls and what is the capacity of the civil defense centers?

3. Can GIS manage all elements of a disaster cycle?

4. Do the emergency services centers have methods of prevention and a system to cope with the most difficult circumstances?

5. Are the number of civil defense centers sufficient to meet the needs of the residents of the Gaza Strip?

Objectives

1. Clarifying the role of GIS in disaster prevention.

2. Proper planning for the evacuation of civilians at the time of disasters and wars.

3. Identify the shortest routes that civil defense vehicles will take to meet relief appeals

ANALYSIS METHOD

As defined by the United Nations International Organization for Risk Reduction, emergency is defined as a problem that disrupts the functioning of society and involves a wide range of humanitarian, physical, economic, environmental or security impacts and losses that are beyond the capacity of the affected community to use private resources with it[4].

Emergency management in the last decade has evolved by focusing on responding to disaster appeals and post-emergency recovery to a focus on disaster risk reduction. Disaster disasters have long been viewed as a result of exposure to hazards, serious human phenomenon or activity, a situation that may cause loss of life or Injury or other health effects, damage to property, loss of livelihoods and services. At present, emergencies are seen as the result of a complex interaction of risk, vulnerability and inability to withstand the effects of risk[5].

GIS and disaster cycle

The overall classifications of activities and procedures related to disaster management agree on the existence of three basic stages, detailed in different forms in the scientific publications concerned with disaster management[6].

Figure 1: Disaster Cycle.

The researcher has prepared the accreditation of the indonesian supreme audit body for the working group on accountability and audit of disaster assistance 2014.

Pre-disaster: It includes planning and preparedness for future expected disasters, including the attempt to predict potential disasters for pre-preparation and coordination of disaster response measures and to conduct operational training data for emergencies, In the emergency management phase well before a disaster, or more appropriately 'between disasters the overarching goal is mitigation. Perhaps the most active role of GIS in this area relates to analytic al modeling This is a phase characterised by the opportunity to conduct long-term assessment planning, forecasting, and managemen.[7].

In the preparedness and response phase, GIS is primarily utilised to help formulate and execute emergency response plans. Emergency managers take centre stage in this phase, which is frequently characterised by urgent, mission-critical decision-making. The tremendous demand for timely accurate answers to geographical queries makes this GIS application area unique. The primary benefits of GIS in this phase lie in spatial information integration and dissemination (Disaster Cycle Analysis).

Disaster phase: related to disaster relief and mitigation activities with disaster relief and an attempt to restore the normal functioning of the disaster-prone human gathering. (Disaster Cycle Analysis).

Post-disaster phase: In the recovery phase after the initial relief has been provided and the goal is returning life to normal or improved circumstances, a GIS can serve as a spatial inventory system for coordinating recovery activities. Government agencies policy makers, and civil engineers figure prominently in this phase. Some of the challenges during recovery include assessing the damage, assuaging and educating the public, rebuilding, and preventing reoccurrence. The goal of preventing reoccurrence ties the comprehensive emergency management cycle back to the mitigation phase[8]

It gradually includes extensive measures to rehabilitate the damaged buildings due to the disaster and then reconstruction and reconstruction and then resettlement of the human groups that led to the displacement of the disaster.(Disaster Cycle Analysis).

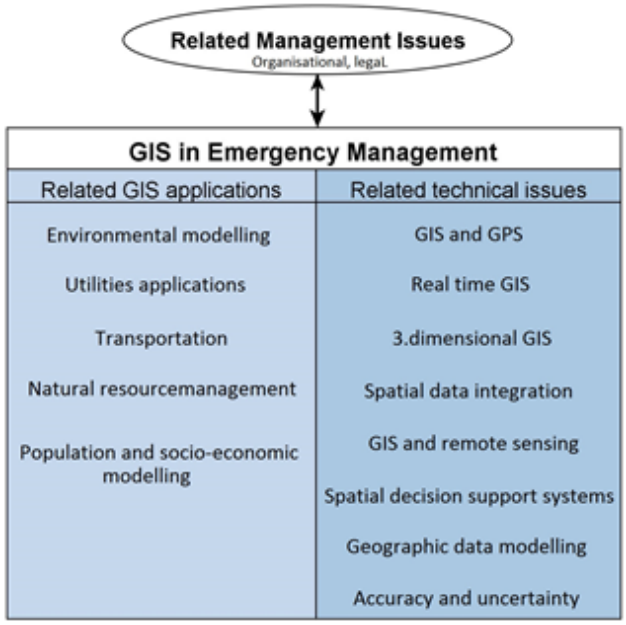
GIS in emergency management and related areas

An important step in examining the role of GIS in emergency management is selecting a conceptual framework to help organise existing research and development activities. One such framework that appears widely in the emergency management literature is comprehensive emergency management This relies on the temporal dimension of disasters to organise the emergency management process into a cycle of four often overlapping, phases: mitigation, preparedness response, and recovery[9].

Geographic information systems are associated with multiple areas related to disaster management, including natural and technical scientific journals. However, it is not possible to identify and limit the technical geographical area without presenting and understanding scientific areas See fig 2 which shows GIS in emergency management and related areas [10].

Figure 2: GIS in emergency management and related areas.

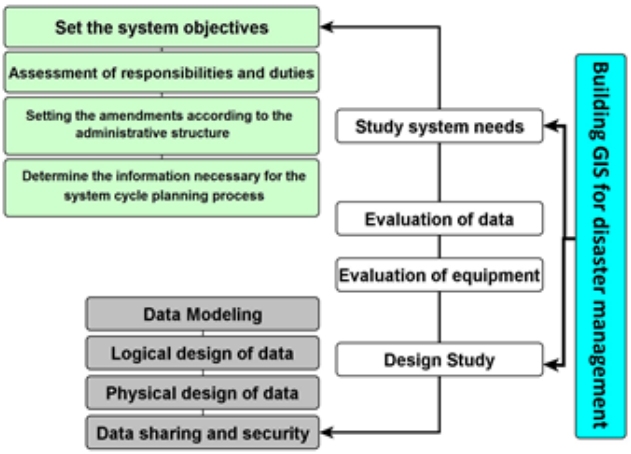
Preparation of the researcher to rely on reference (John Wiley & Sons, 1999)



PREPARATION OF GEO-DATABASES

The primary objective of building a geographic information system for emergency management is to determine the required infrastructure for the final database, which must contain all necessary information to deal with the disaster at various levels before, during and after.

Figure 3: Building GIS for disaster management.



It is clear that the data is the most expensive part of any system, and the evaluation of these data in both spatial and descriptivedimensions is considered to be of secondary importance. The evaluation of the available equipment and its location on the maps is one of the most important spatial stages that are based on integrated emergency management as a stage that shows the spatial dimension of the emergency and is considered the stage of the design study on which to model Data To find the relationship between the topological and spatial elements, all these stages must be maintained to identify specific security protocols to deal with the system and determine the powers.

CONCLUSION

Gaza Strip is a rapidly growing population, one of the highest in the world, and this is the main reason for the rapid decline of agricultural land.

Study showed that there is a very strong relationship between the expansion of the urban mass and the steady increase in the number of population in the Gaza Governorates. This is the main determinant of the planned agricultural planning. study succeeded in preparing a detailed study to show the evolution and change in the spatial distribution of land use maps since 1975. study showed the ability of GIS and remote sensing technology to study the evolution of agricultural and urban land area through the production of accurate maps. use of analysis according to the Markov Applied Mathematical Chain and the confirmation of results according to this Kaba accuracy index gives accurate results for relying on the results of the research in government decision making. use of cartographic modeling to determine the future agricultural and urban growth areas is more efficient than the methods used in local institutions, optimizing the use of resources, achieving the highest returns and minimizing land losses. process of relying on the distribution of the questionnaire to the planning and GIS specialists is one of the best ways to obtain the weights of the planning standards accurately.

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