DISASTER MANAGEMENT USING GEO-INFORMATICS-REVIEW

Seema Rani[1], Ritu Sharma[2], Ravindra Prawasi[3]

Haryana Space Applications Centre,CCS HAU Campus, Hisar

Abstract: The frequency of natural disasters, particularly in Asia Pacific regions, has drastically increased in the recent years. Responding to this unprecedented frequency and magnitude, the corporate sector has started to play a vital role in lessening the damage and impact after disaster as well as risk-reduction activities. It provides a wide range of corporate activities in disaster management field and their tendencies. Space technology provides critical and timely information on various disasters, which play a vital role in disaster management. Floods, cyclones, drought, landslides, tsunami, earthquakes and forest fires are the natural . floods are the most widespread and frequent disasters occurring in country. Suitable satellite optical or microwave data was used in generating information on floods in the form of maps and damage statistics. Utilizing the multi-resolution, multi-temporal and multi-spectral satellite remote sensing data. Presently mapping and monitoring activities of all the disasters are being carried out on regular basis. Actions were initiated for development of support tools required to utilize the available data for hazard zonation and the vulnerability maps of various disasters.

Keywords: Remote Sensing, GIS Risk Reduction, community-based disaster management.

1. Introduction

"A disaster is a natural or man-made event that negatively affects life, property, livelihood or industry often resulting in permanent changes to human societies, ecosystems and environment." As the definition suggests, disasters are highly disruptive events that cause suffering, deprivation, hardship, injury and even death, as a result of direct injury, disease, the interruption of commerce and business, and the partial or total destruction of critical infrastructure such as homes, hospitals, and other buildings, roads, bridges, power lines, etc. Disasters can be caused by naturally occurring events, such as earthquakes, hurricanes, flooding, or tornadoes, or they can be due to man-made events, either accidental (such as an accidental toxic spill or nuclear power plant event), or deliberately caused (such as various terrorist bombings and poisonings).

Certain types of natural disasters are more likely to occur in particular parts of the world. For instance, areas near coastline, lakes or rivers are more likely to experience flooding problems than are land-locked areas. However, most every place you could live is prone to one type of natural disaster or another. No place is absolutely safe from natural disaster. And, of course it goes without saying, that no place is safe from the threat of terrorism and other man-made disaster events.

It may be impossible to avoid disasters, but it isn't impossible to plan ahead of time so as to minimize the impact that any given disaster might have on you or your family's health, safety and property. There are steps you can. take ahead of time, including, purchasing the proper types of insurance, preparing a disaster kit and supplies, making a disaster plan and rehearsing it with your family, and staying informed so that you can do your best to get out of the way of predictable dangerous occurrences, that can help you, your family, and your property stay as safe as possible

The following documents describe various types of disasters that can occur, and outline the important steps to take to prepare for their occurrence. In many instances, disasters act as catalysts in the adoption of new and emerging technologies. Spawned by the need to rapidly collect vitalinformation for disaster management, technology innovations have often helped emergency responders to assess the impact of large disasters more efficiently and rapidly, and to track and monitor progress in critical response and recovery operations. Some examples of where technology implementation has been driven by the occurrence of a major disaster include Hurricane Andrew in 1992, where the lack of rapid damage or situation

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assessment tools hindered the deployment of federal resources and thus identified.

2. Objectives

- Study of Environment building, education, awareness programs me and strengthening the capacity at all levels in natural disaster risk management and sustainable recovery.
- Satellites Image Analysis of Disaster Area on earth.

NATURAL AND M ANM ADE DISASTERS

Disasters may be natural or manmade. Natural disaster like earthquake, flood, tsunami, etc will occur and
t is not possible to prevent them. Nevertheless their effect on human health and property can be mitigated effectively if appropriate anticipatory measures based on Geospatial technology in a timely, coordinated manner is planned and implemented in each phase of operation like relief, rehabilitation and reconstruction. Earthquakes are caused by the motion of tectonic plates -individual sections that make up the earth's surface like panels on a football. Immense strain accumulates along fault lines where adjacent plates meet. When the rock separating the plates gives way, sudden seismic groundshaking movements occur. The point where the seismic activity occurs is the
epicenter, where the earthquake is strongest. The seismic waves usually travel out from the epicenters, sometimes creating widespread destruction as they pass. Earthquakes
lead the list of natural disaster in terms of damage and human loss and they affect very large areas, causing death
and destruction on a massive scale.
Cyclones are the deadliest of all natural disasters worldwide associated with strong winds, storm surges, heavy precipitation and floods. The property damage caused by winds depends on quality of construction and maximum wind speed. Storm surges which are rapid increase in sea level along the coast due to strong winds driving the water ashore cause maximum damage.
When rain falls, it drains down from hillside to streams, along rivers and out into sea. When this rainfall is incessant, the land becomes saturated and the natural drainage system fails. The upper reaches of rivers quickly fill and force the excess water downstream. In the lower reaches water flows slower. Here the river swells and begins to break its banks. This results in flooding of the
plains especially the low lying flat wide areas in the lower reaches of a river.

3. DISASTER MANAGEMENT USING BY GIS & REMOTE SENSING

The Geographic Information System (GIS)
based methodologies are now being developed for disaster lossestimation and risk modeling. These data can be used not monly for real time damage assessment but also for long term planning of efficient land use measure and adoption of building codes (minimum construction standards) or retrofitting methods. The easy availability of such maps, which include details of infrastructure, roads, hospital, school, shelters, engineering structure etc. simplify disaster management and rehabilitation efforts. In this paper, we survey the literature to identify potential resea rch directions in disaster operations, discuss relevant issues, and provide a starting point for interested researchers. From the literature review it has been concluded the most of the authors worked on the following
unique three phases of disaster.

3.1 Earthquakes

IKONOS satellite on February 2, 2001 shows the town of Bhuj, located in the northwestern state of Gujarat, India. The image shows extensive damage to individual buildings as a result of the earthquake that struck Bhuj on January 26, 2001. while many buildings suffered structural damage, such as cracked walls, the IKONOS satellite can only detect buildings that have fully collapsed with altered rooflines. This type of imagery could be used to assist authorities with immediate mitigation activities such as search and rescue efforts, emergency relief and major infrastructure damage assessment. 3.2 Volcanic

Eruptions There are some 500 active volcanoes around the globe, about 100 of which erupt every year (www.SPOTimage.fr).

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FIG:1

Landslides

An area with a potential landslide hazard usually has some evidence of previous occurrences. An examination of stream traces frequently shows deflections of the bed course due to landslides. Typical features that signify the occurrence of landslides include, chaotic blocks of bedrock whose only source appears to be upslope, crescentic scarps or scars whose horns point downward on a normal- looking slope, abnormal bulges with disturbed vegetation at the base of the slope, large intact beds of competent sedimentary or other layered rock displaced down dip with no obvious tectonic relationship and mudflow tongues stretching outward from the base of an obviously eroded scar of relatively unconsolidated material *(www.oas.org/usde/publications/)*. The spatial resolution required for the recognition of most landslide features is about 10m (Richards, 1982).

Result and Conclusion

Spatial information and GIS have allowed important new analyses and views of the flood Intelligence,Displaying data graphically, including spatial views, communicates concepts and scenarios quickly and efficiently in an environment where speed and accuracy are paramount. The system that has been developed incorporates all aspects of the existing 'manual'

There is utilization of the concept that, whilst decisions are based on temporal considerations (portrayed in an evacuation time line), spatial data plays an important part in illustrating the interplay of disparate data by geographically displaying the flood scenario. There is also an emphasis on the preparation of data, queries and scenarios well in advance of a flood rather than putting it all together 'on-the-day'. In the planning phase, scenarios can be tested through exercises and then refined as the urban landscape changes or new information or methods become available.

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