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Information Technology: Roles, Responsibilities in Disaster Management

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ABSTRACT: Now, in the era of scientific technology, it is much easier to handle disaster is natural as well as man-made. We can handle a variety of functions that can be used in information technology. It helps to prevent, restore. The development of information technology in the Internet, geographic information systems, remote sensing, satellite communications, so on, helps to assist in the planning, implementation process of risk reduction. Geographic information systems have sufficient capacity and capability to improve the quality and the power of the analysis, the natural hazard assessment, to guide the development of activities as well as assist in the planning of the mitigation measures and implementation of the emergency preparedness for response. Remote sense, however, as a powerful tool that can help you to identify areas of risk, monitoring plan, so that the change in a real-time. Information Technology is playing a big as well as vital role in disaster management. It provides all the required to anticipate, analyze to find the correct solution Just In Time. GIS, remote sensing, other IT tools are available, are being used by different competent authorities for this purpose. Disaster Management is now days a buzz word. Every country, their government, other organizations are working hard to make use of Information Technology in all possible ways to tackle the problems of disaster.

KEYWORDS: Disasters Management, Warning and Forecasting System, Information Technology, GIS.

1 INTRODUCTION

It is well known that natural disasters strike countries, both developed and developing countries, causing enormous destruction and human suffering and create negative consequences for national economies. Due to various geo-climatic conditions prevailing in different parts of the world, different types of natural disasters such as floods, droughts, earthquakes, cyclones, landslides, volcanic eruptions, etc. after strikes vulnerability of the area. India is considered the country's natural disaster world. It has witnessed devastating natural disasters in recent history as droughts, floods, cyclones, earthquakes, landslides...

2 NATURAL DISASTERS IN INDIA

India is a great country and subjected to a series of natural disasters. Among all natural disasters facing the country, the river is flooded. More frequent and often devastating rainfall deficit in stimulus causes such as drought or drought in different parts of the country. The country has experienced an earthquake caused severe damage to life and property. India has a coastline of about 8000 km, which is prone to very severe cyclonic formations in the Arabian Sea and the Bay of Bengal. Another major problem facing the country is in the form of landslides and avalanches.

With an increase in the perception for the promotion of a culture of disaster prevention management, now a major emphasis is placed on research and development of information on disaster preparedness and prevention. It has brought significant positive change, although the number and frequency of disasters in the country has increased.

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3 APPLICATION OF INFORMATION TECHNOLOGY IN DISASTER MANAGEMENT

Although you cannot completely avoid natural disasters, but the suffering can be minimized by creating proper awareness of the potential disasters and their impact by developing a suitable warning system with the use of IT based disaster preparedness and disaster management. The changing trends have opened a wide range of scientific and technological resources and skills to reduce disaster risk.

There are mainly applications you can use to manage disasters:

- GIS and Remote Sensing [1].
- Internet.

4 GIS AND REMOTE SENSING

GIS is an efficient tool for the storage and manipulation of remotely sensed data and other spatial and non-spatial data, both for the management of scientific and policy-based. This can be used to facilitate the measurement, mapping, monitoring and modeling of the various types of data on natural phenomena. The GIS application specific risk assessments are: - Hazard mapping to show earthquakes, landslides, floods or fires. These cards can be created for cities, counties and even for the whole country and the threat of tropical cyclones maps used by the meteorological departments to improve the quality of services of tropical storm and quickly communicate the risk of people who may be affected by the cyclone.

Remote sensing allows the observation of any object from a distance without actual contact. Remote sensing data can be obtained much faster than ground-based observations; can cover large area at once to give an overview of the process. Remote sensing comprises Aerial remote sensing, which is the process of recording information, such as photographs and pictures of aircraft sensors and remote sensing satellites, which consists of several remote sensing satellite systems that can be used to integrate the assessment natural risks in development planning studies. These are: Land Sat satellite SPOT Satellite Radar System, Radio Advanced Very High Resolution. Some applications of GIS and remote sensing in various disasters are:

4.1 DROUGHT

GIS and remote sensing can be used to manage drought relief, such as early warnings of drought can help plan strategies for organizing relief efforts. Satellite data can be used to target sites for potential groundwater programmers include well excavation. Satellite data provide valuable tools for evaluating areas subject to desertification. Slides, photographs and digital data can be used to locate, assess and monitor the deterioration of natural conditions in a given area.

4.2 EARTHQUAKE

GIS and remote sensing can be used to produce seismic hazard maps to determine the exact nature of the risks.

4.3 FLOODS

Satellite data can be effectively used for mapping and monitoring of flood inundated areas, flood damage assessment, flood hazard zoning and after the floods of the rivers of the survey work and protection settings.

4.4 LANDSLIDES

Zonation map [2] landslides include a map identifying the zone journeys or different degrees of slope stability or instability planned. The card has a built-in planning and therefore the probabilistic nature. Depending on the methods adopted and the versatility of the inputs used, a mapping of landslide hazard zonation able to provide assistance with the location, extent decanting area that may be affected, and the speed of the mass movement of the mass of the slope.

4.5 SEARCH AND RESCUE

GIS can be used to perform search and rescue operations in a more efficient by identifying areas that are prone to disasters and zoning sizes accordingly risk.

5 INTERNET

In the current era of electronic communication, the Internet provides a useful platform for disaster communications. Implementing a secure website is a very cost effective to make an intra-national presence felt worldwide. It offers a new and potentially revolutionary for the rapid dissemination, automatic and global disaster information. A number of individuals and groups, including several national meteorological services, are experimenting with the Internet in real-time dissemination of weather forecasts, satellite and other data. In the most critical phase of natural disasters electronic communication has the most effective and in some cases may be the only means of communication with the outside world.

6 WARNING AND FORECASTING SYSTEM

A feed system prediction, monitoring and issuing early warnings played the most important role in determining whether a physical danger or not reach catastrophic proportions. It has the following security systems:

6.1 INDIAN METEOROLOGICAL DEPARTMENT (IMD)

IMD's Area Cyclone Warning Center (ACWCs) has developed the necessary infrastructure to originate and disseminate cyclone warnings at appropriate levels. It has been the operating system of satellite communications Cyclone Warning Dissemination System for direct broadcasting cyclone warning cyclone-vulnerable coastal areas. IMD operationally running a limited area and Forecast Analysis System (LMIS), based on an optimal interpretation (OI) analysis and a limited area Primitive Equation (PE) to provide guidance numerical model.

6.2 NATIONAL REMOTE SENSING AGENCY (NRSA)

Long-term programs against drought on natural resources have been greatly aided by the use of satellite data obtained by the NRSA. Satellite data can be used very effectively for mapping and monitoring flood inundated areas, flood damage assessment, flood hazard zoning and previous flood study settings and river protection works.

6.3 SEISMOLOGICAL OBSERVATIONS

Seismological observations in the country are through the national network of 36 seismic stations operated by the IMD, which is the coordinating body. These stations have collected data for long periods.

6.4 WARNING SYSTEM FOR DROUGHT

The National Agricultural Drought Assessment and Management System (NADAMS) has been developed by the Department of Space for the Department of Agriculture and Cooperation, and is mainly based on the monitoring of vegetation status through the National Oceanic and Atmospheric Administration (NOAA) Advanced Very High Resolution (AVHR) data. Drought assessment is based on a comparative assessment of satellite observed vegetation (land and greenery) of a district in a given period, without corresponding period of the previous year.

6.5 FLOOD FORECASTING

Flood forecasts and warnings issued by the Central Water Commission (CWC), Ministry of Water Resources. These are used to alert the public and take appropriate action, as administrative or governmental technical agencies in mitigating flood risk. Network is gathered most stations CWC prediction of several rivers in the country.

6.6 CYCLONE TRACKING

Information about cyclone warnings are arranged in a real-time basis to the control room set up in the Ministry of Agriculture, Government of India. High power Cyclone Detection Radar (CDR), which is installed along the coastal belt of India has proved a useful tool for work cyclone warning [3]. These radars can locate and track tropical cyclones approaching a distance of 400 km. Satellite images from meteorological satellites are used extensively in the detection of the development and movement of tropical cyclones over oceanic regions, especially when they are away from coastal radars. The current mode of cyclone warning dissemination is to various officials through priority telegrams, telephone, telex and fax.

7 FINANCIAL ARRANGEMENTS FOR NATURAL DISASTER IN INDIA

Natural disasters are huge economic burden on developing economies like India. Every year huge amount of resources mobilized for rescue, relief and rehabilitation work after natural disasters events. The central government plays an important role in regard to the mobilization of financial resources is concerned. A system called Calamity Relief Fund (CRF) was created for each state, with contributions from the central and state government to carry out the relief and rehabilitation measures. This makes it possible for states to manage and provide disaster relief on your own using the resources available to a fund established for that purpose separately for each state. Besides CRF, a National Fund for Calamity Relief (NFCR) was created to address the severity of hazards administered by a National Committee for Disaster Relief (NCRC). State governments are required for this purpose notes provide information on the damage and destruction and the cost of relief and rehabilitation. Upon receipt of these notes, decide the Indian government on an individual if a core team is required to be appointed to assess the situation.

8 ADMINISTRATIVE STRUCTURE OF DISASTER MANAGEMENT IN INDIA

Department of Agriculture and Cooperation (DAC), Ministry of Agriculture, Government of India, is the nodal department for all matters related to natural disaster mitigation at the Centre. The National Contingency Plan (CAP) facilitates the implementation of the relief and rescue operations immediately. There are various national committees for disaster management, such as the Committee of Ministers for the effective implementation of relief measures in the wake of natural disasters, the national crisis management committee headed nationally by the Cabinet Secretary which is responsible for various types of disasters and supporting ministries as members, Crisis Management Group reviews the different measures are needed to deal with a natural disaster, and coordinates the activities of the central ministries and state governments for emergency preparedness and disaster relief efforts and seek information from the nodal officers on measures relating to the above. Figure 1 shows the pattern of interaction in the government.

State governments are autonomous in organizing relief operations in case of natural disasters and long-term measures of emergency / rehabilitation. State Governments efforts are supplemented by the Center.

There is a crisis of the State Management Group (SCMC), under the chairmanship of Chief Secretary / Relief Commissioner to consider the infrastructure and guidance received from time to time by the Government of India and develop action plans to address to different natural disasters. There is statewide Control room set when a disaster situation develops.

States are divided into districts, each headed by the District Collector (also known as District Magistrate or the Deputy Commissioner), which is the focal point at the district level for the management, monitoring and corrective measures and disaster for the preparation of district level plans. The collector shall exercise powers of coordination and supervision of officials from all departments at the district level. Support measures are reviewed by the District Relief formed by official and unofficial members, including local legislators and members of parliament. A control room can be set up in the district to monitor the day-to-day relief and rescue operations continuously.

The Commissioner Collector / Deputy works closely with state authorities in the districts, namely, Army, Air Force, Navy, Department of Water Resources, etc., to complement the efforts of the district administration in rescue operation exercises . They also coordinate all efforts to mobilize volunteers for NGOs can work in those situations.

The country's armed forces have played a crucial role during disaster emergencies provides fast relief for victims, even in the most inaccessible and remote areas of the country. The organizational strength of the armed forces with its disciplined and systematic approach, and their skills in managing technical and human resources makes them indispensable for such emergencies.

India has a federal structure of integrated disaster management mechanism under the existing government.

9 CONCLUSION

Note that the growth of information technology in the area of Internet geographic information systems, remote sensing, satellite communications, and so on, so as to assist in the planning and implementation of the process of reducing the risks. To get the maximum benefit, in the case of new technologies in general contacts natural resources and mitigation messages must pass through these measures. Geographic information and the ability to improve the quality of evaluations and the analysis of natural hazards helps the relevant activities to assist planners in identifying and implementing measures to

alleviate the emergency preparedness and response. Remote sensing, however, as an effective tool to assist in identifying areas of risk, monitoring the planet to changes in real time, provide early warning future disasters

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