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Application Of Geospatial Technology In Environmental Hazards And Disaster Managment

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Abstract

Environmental hazards and disaster are the major issues' in the present context. Every year in the worlds facing problems of environmental hazards and disaster. These hazards and disasters results loss of wealth and human life. The solutions and management of this environmental hazard and disaster geospatial technology is the key factor in the present world. To reduce the intensity and control the impact of hazards and disaster, modern geospatial tools like Remote sensing, GIS and GPS are used widely. The present paper deals with the application of geospatial technologies in hazards and disaster management.

Keywords: Environment hazards, Disaster Management, Geospatial, Remote sensing, Geographical Information System, GPS

Introduction

Hazards and Disaster usually look like same, but both term are different. Hazard is a situation in which threat to human and environment. Disaster is an event or incident produced destruction of human life and property.

Environmental hazard and disaster management includes the disaster risk reduction, disaster mitigation, preparedness, disaster response, disaster recovery etc. GIS, Remote Sensing and GPS are the modern tools plays vital role in the hazards and disaster management. Hazards like earthquake, volcanic eruption, landslide, flood, tsunami, cyclone, fire etc are the major threat for human and environment. Application of Geospatial technologies in hazard and disaster management helps to reduce the risk and control the impact of event.

Objectives

The present study is based on the certain specific objectives. These are as follows:

1) To study conceptual framework of environmental hazard and disaster management.
2) To study application of geospatial technologies in the environmental and disaster management.

Database and Methodology

The present paper is based on the secondary and tertiary data. It includes the books. ebooks, journals, websites and magazines etc. Some of the data retrieved from the software from the software functioning and application. For the present research work the explorative and descriptive research methodology is adopted.

Application of Geospatial technology in environmental hazard and disaster management

The term geospatial formed from two words. Geo means earth and spatial related with the space. Geospatial technology means use of equipment or instrument or software to measure, analysis, and mapping and for prediction of events on the earth and its atmosphere. Now a day's geospatial technology used in various field like agriculture, climatology, oceanography, geomorphology, environment, engineering and planning etc.

Application of Remote sensing in hazard and disaster management

Remote sensing technique is an effective toll to minimise loss of life, effective mitigation, preparedness response and recovery. For any hazard and disaster to know the intensity, damage and ways to provide immediate helps require accurate, frequent and almost instant data. These data can be providing by satellite imageries through remote sensing. Remote sensing is the only option to understand and observe the hazard and disaster. Remote sensing is a satellite based technology will helps in cyclone. It gives risk

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modelling for predictive analysis and movement of cyclone. Mapping of cyclone affected areas also observe through the satellite images. For the purpose to study cyclonic hazard and disaster Insat3A, Quicksat, Radar, Meteosat and Kalpana-1 satellites are used. These satellites provide early warning of cyclones and also give the long range climate modelling for the climatic hazards. It also gives mapping areas for escape routes in the cyclone affected area. Cyclone monitoring also possible with the help of remote sensing. This geospatial technology provides impact assessment and damage assessment.

After the strike of earthquake remote sensing provides earthquake affected regions maps. With the help of previous and current satellite image comparison is possible for damage assessment and building stock assessment. It also provides planning routes for search and rescue operation in the site. To locate the rehabilitation sites remote sensing technology helps to identify. PALSAR, SPOT, IRS, IKONOS satellites are used for the monitoring and earthquake risk reduction.

In the flood affected area remote sensing plays effective role for making flood prone area mapping area, delimitations of flood plains, flood detection and early warning, flood mapping evacuation, flood forecasting etc. AMSR-E and Kalpana 1 satellites are used for flood hazard and its management.

Landslide in one the natural hazard mostly happens in the hilly and mountainous region. In that region accessibility and connectivity is very poor. Landslide affects on the surrounding area. After the strike of land sliding, it is very inaccessible area to reach the site. Remote sensing will helps for damage assessment. A comparative study is possible with the pre and post landslide satellite images. RS provides digital elevation model, landslide affected area mapping, risk modelling to reduce the impact and damage. IRS, INSAR, SPOT, PALSAR and IKONOS 2, these satellites are used for the landslide study.

In drought situation, remote sensing also very useful for risk modelling, land water management planning, vulnerability analysis etc. Images of drought prone areas give the information of amount of loss of vegetation cover and assess the damage. For this purpose EEWS, NET, AVHRR, MODDIS and SPOT satellites are useful.

Volcanic eruption is also one of the major hazards. Field study is not possible after the volcanic eruption at particular place. Remote sensing technology helps to emission monitoring and also giving thermal alerts. After the eruption of volcano, lava flow mapping and evacuation planning is possible due to remote sensing. MODIS, HYPERION, AVHRR satellites are useful for volcanic study.

Application of GIS in Hazard and disaster Management

Geographical Information system is software based technology. It is very useful for during the emergency situation and hazard area mapping. This geospatial technology is useful in merging the data from the various sources. It is helpful in modelling of disaster risk. Its main key role is to provide decision making system in disaster management. GIS also predict the level of damage, forecasting of water level, lava flow etc.

Application of GPS in Hazard and Disaster management

Global positioning system is satellite navigation system. It is useful for identify the geographical location. GPS plays very effective role in disaster situation, because this device is functioning in anywhere and any weather condition. It gives precise location to reach the particular location and provides the help. This device plays vital role during the response and recovery stages after the strike of hazards.

Conclusion

Remote sensing, GIS, and GPS these geospatial technologies plays important role in disaster management. Thematic mapping like DEM, hazard zone mapping used for disaster management and planning.

Micro, meso and macro level maps helpful to detect vulnerability and threat situation. These geospatial technologies provide to locate safe zones and evacuation and management of rehabilitation. These geospatial technologies useful for the impact assessment. GIS, Remote Sensing and GPS are very powerful tool for the disaster monitoring in all cases from the global to local.

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