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National Seminar on Present Scenario of Geofraphical Perspectives on Environment & Sustainable Development	20th Sept.
Organizer :- Jaikranti Arts and Commerce Senior College, Latur	2019

33	Dr. Phule Suresh J. Dr. Dharashive Sangmeshwar R.	AGeographical Distribution of Water Diseases with Environmental Impact Assessment: Based on GIS ways	118 To 121
34	Mr. P. V. Poul & Dr. R.B. Kotalwar	Geographical Audit of Surface Water Resources	122 To 128
35	Dr. Rupwate Raju	Environmental Hazards and it's Management	129 To 131
36	Dr.Sarwade Maya	Drought inMaharashtra And Government Policies	132 To 133
37	Dr. Sawate Sanjay	A Geographical Study of Types and Pattern of Rural Settlements in Georai Taluka	134 To 136
38	Dr. Shahapurkar O. V. Mr. Gorambekar Pradip G.	Role of Literacy Rate in the Socio- Economic Development of Kolhapur District: A Geographical Analysis	137 To 140
39	Dr. Shinde B. R.	Approaches of Natural Resource Management	141 To 142
40	Dr. Tatipamul Raghavendra	Application Of Geospatial Technology Environmental Hazards And Disaster Managment	143 To 145
41	Mr. Waghmare Balaji Mr. Zore Raju	Natural Hazards And Disaster Management	146 To 149
42	डॉ. भांगेचंद्रकांतबन्सीधर	राष्ट्रीय अंतर्गत सुरक्षा आव्हाने- आपत्ती व्यवस्थापन	150 To 152
43	प्रा.डॉ. बिराजदार एस.जी. प्रा. आव्हाड बालाजी WW	जिस्त्रोतांचे व्यवस्थापन आणि संवर्धन ÷ एक काळाची गरज भ वांगाना प्राप्ति देवा महत्त्व	153 To 156
44	प्रा. चकोर बाळासाहेब रघुनाथ	काळाची गरज V ajiricumal.com जैवविविधतेचे महत्त्व	157 To 159
45	प्रा. चाटे रा.ज.	मराठी साहित्य आणि पर्यावरण व्यवस्थापन	160 To 162
46	डॉ. प्रा.ढोणे कुसूम बाबूराव	पर्यावरण संवर्धनासाठी शुष्क नद्यांचा आक्रोश थांबवला पाहिजे	163 To 165
47	गायकवाड सदानंद दयानंद डॉ. कोटलवार आर. बी.	शेतीसाठी वापरल्या जाणाऱ्या रासायनिक खते व औषधांचा मानवी आरोग्यावर होणारा परिणाम : एक भौगोलिक अभ्यास.	166 To 168
48	प्रा. डॉ. गायकवाड श्रीकांत,	पर्यावरण आणि मानवी जीवन	169 To 173

			79-W-10
Aayushi International Interdisciplin	ary Research Journal (ISS	N 2349-638x) Impact Factor 5.707	
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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

(SSN 2349-638) 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 damages 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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144

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