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# Integrated Flood Control Management: A Case Study Of Satara District ( Maharashtra )

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Research Scholars, Dept. of Geography, Shivaji University Kolhapur.

Abs tract:-*In the recent years large scale strenuous floods have been observed in the India. Floods are among the most disturbing natural hazards in the India. National and International organizations makes a top policy management of flood. In the present research paper an attempt has been made to suggest integrated flood control management plan by selecting Satara district of Maharashtra as case study.Present research approach is utilized as a long term water disaster management in the study region. These integrated plan to changes in the study region of land use land cover pattern, nature complex, region variation, achieved high quality to extent, water imbalances, environmental crises and its future prediction. These help in planning and development of sustainable land for use. To generate integrated flood control management plan using GIS and RS cell for the Satara district.*

Keyw ords:RS, GIS Cell, Integrated plan, flood control management, satellite images.

## INTRODUCTION

Flood control management program involves the process of rescue, relief, evacuation, habitation, mitigation response and recovery pattern which is combination of investigation, measuring, design, techniques, planning, decision making and action. These synchronized efforts to features being vital way to make sure disasters are flood in control.

The geographical coordinated processing of GIS, RS and GPS data gateway is the application applied for using the satellite data set to result is skill and efficiency. Information about the region related to water (flood). Collected information basis to make the integrated flood control management programme and analysis in order to make the best possible way to control flood water to the repeated flood affected regionin Satara district.

To suggest flood disaster integrated plan model in study region the plan modeling can be done using different dataset. Disaster management for applied study on geographical point of view with related Geoinformatics approach. In the Satara district used special technology to collect, store, combine, analyse and overlay large amounts of information and spatial data related to locations. The more precisely study to understand the climatic climax on the study region.

Present study mostly relies on collected spatial and non-spatial data from different sources. Collected data uses different types of techniques in flood analysis is scientific real time outline. This research runs for data processing and its arrangement through the various computer softwares and different methodological techniques. Study awareness of rescue, relief, mitigation, flood management plan. To overall Integrated flood control management programme in Satara district.

## STUDY AREA

Satara district lies in the south part of Maharashtra state in India. It is situated in the south western part of the state and western limit of the Deccan table land. The geographically extends between 17°50' to 18°10' N latitude and 73°33' to 74°54' E longitude. The area covers of the district are 10480 sq.km. The district is bounded by Pune district on the north, Solapur district on the east, Sangli district on the south and Ratnagiri district of Konkan region on the west. The district has 15 towns and 1,739 villages, having population of 3,003,741 of which males constitute 50.29 per cent and females 49.70 per cent. According to 2011 Census population density of 271.77 persons per sq. km. Administratively the district is divided in four sub-division including eleven tehsils. Satara sub-division under Satara, Koregaon and Jaoli tehsils, Wai sub-division under Wai, Mahableshwar and Khandala tehsils, Phaltan sub-division under Phaltan, Man, Khatav tehsils and Karad under included Patan and Karad tehsils (Fig. 1)

Fig. 01

**OBJECTIVES**

1.Geo-Statistics analysis in different stations in tehsil wise rainfall regions in study region.
2.To suggest plan for Integrated flood control management in Satara district
3.To study spectral characteristics of flood by using satellite technology.

**METHODOLOGY**

The methodology consists of data collection and data basing required for flood hazard analysis and Geo-Statistics analysis. Based on the flood hazard analysis and Geo-Statistics analysis, the instigated flood control management programme is carried out.

**USED SATELLITE DATA**

1.Google Imagery: Visual viewing up to 700 metres.
2.GPS/DGPS Trimble: Point, Polyline and Polygon collection.
3.Satellite data: Landsat-7 ETM+ images SRTM (2010), IRS-ASTER (2006) and IRS-P6 LISS-III(2006)

**USED HYDRO-METEOROLOGICAL DATA**

Rainfall from 11 meteorological stations and stream flow data at 2 gauging stations were used. Daily rainfall data of 13 rainfall gauging stations for the same period were obtained from the Indian Meteorology Department. Rainfall of 110 years (1901 to 2012) period for the Satara district was obtained from the Meteorological Department at Pune.

**GIS AND RS DATA PROCESSING METHOD**

GIS is used in managing the wide range of hazard and disaster stage. Remote Sensing provides the structure information of the river basin. Disaster relief phase, use to search and rescue operations in areas. In the disaster rehabilitation stage, useful to arrange the damage information and to find sites suitable for temporary or permanently for habitation. Information from remotely sensed data can be inputted to a Geographic Information System (GIS) and other networking system which can then be combined with ancillary data to provide information of disaster management. This research work following data handling from GIS fame.

Pre-processing of data (Geo-statistical techniques)
Defining area of Interest
Processing of Images
Reconnaissance Survey including cross-check
Generating base layers
Visual Interpretation of satellite Images mosaic
Display the terrain pattern (Slope, Aspect, TIN, and DEM)
LULC coding of image
Networking Analysis (Time dependent flood warning Buffer)
Map compositions
Site investigation scale and Site suitability for habitation
Suggest to the disaster management plan
Model builder to suggest Integrated flood control management programme

This research work plays role of RS and GIS shows in following schematic chart. (Fig. 2)

**GIS AND RS DATA PROCESSING METHOD**

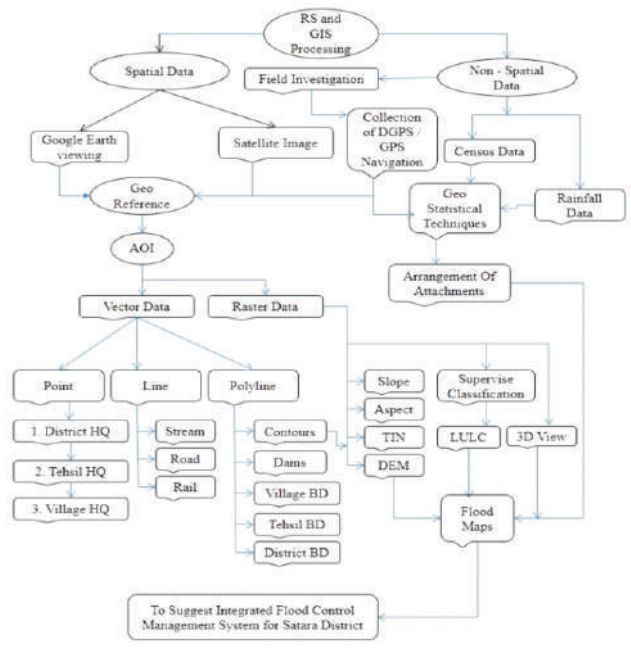


Fig. 02

**APPLICATION OF INTEGRATED FLOOD CONTROL MANAGEMENT SYSTEM**

Flood forecasting and latest flood warning information system of Krishna and Koyna edge flood affected villages under Patan and Karad tehsil and Wai city need to install automatic generated database and showing flood intensity affected areas buffer zone maps. Thus need base map in RS, GIS techniques river and its tributary pattern and water flowing capacity, catchment area, Dams capacity, elevation of each cell, Arial topography, settlement parcel, infrastructure network etc. To collect the online information for rainfall monitoring stations a hoarse basis, Rainfall forecasting for next 24 hours (satellite information), Dams release water, river availability water. The Geo-statistic

calculation on software basis for collected information with respect to base maps. Output of Web GIS built maps including statistics, flood forecasting and flood warning information system in study region. The output flood information to release in various media likely TV, Radio, Newspapers, local annulments, Notice board and Davndi etc. In the Satara district the western side flood control system is developed based on RS, GIS and GPS cell. The appreciate management of regulation for Patan, Wai and Karad tehsils flood control. Flood management of Satara district there is needed to develop and applied integrated flood control management program. Fig. 3depicts the concept of integrated flood control management program at Satara district.

Functional key elements for integrated flood control management program in Satara district.

1.Multiple functional software platforms
a.GIS database construction
b.RS, GIS, ENVI and GPS provide base maps which show pattern of district
c.Information attached to real fly on Google earth
d.GIS web maps
2.Supporting base information
a.Historical information integration for flood
b.Rainfall data available backwashed 1900 to 2012 and continuous applied
c.Water regime system
d.Dam water storage capacity
3.Module management network
a.Slope model show the slope pattern to make excess flood water directionway
b.Aspect shown the slope facing angle to clearly understand water flow direction
c.DEM show physiographic analysis model
d.TIN model show the high level river edge pattern and 3D view of study region
e.LULC model show land pattern for useful rescue, evacuation, relief, rehabilitation and to making the suggest plan
4.Technical application
a.To suggest excess floodwater divers to the dry prone region
b.Recommend Flood control management programme

**The Satara District**

**Integrated Flood Control Management Programme**

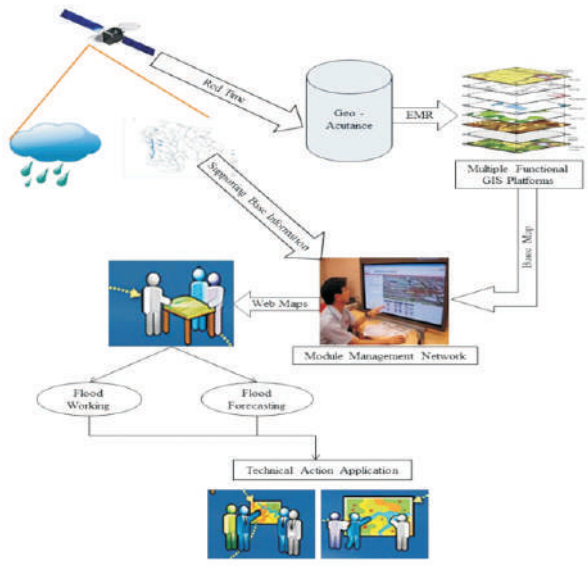


Fig. 03

**RESULTS AND CONCLUSIONS**

Sustainable social development. The integratedflood control plan has provided many functional key to control the flood. The integrated network system has played a very important role in flood control and disaster mitigation, especially in the serious floods occurring along the middle and lower reaches of the Krishna and Koynariver in study region. Through daily remote monitoring of floods in whole district or part of Karad and Patan tehsil, the integrated plan can quickly let makers flood maps know the exact extent and development of floods. This allows them to adopt effective measures for disaster relief. Through detailed assessment of damage and losses caused by floods, the system can help decision makers better understand the behavior of floods, related human activities, and their interaction. This network system remove the flood intensity andbetter flood performance understand. Some considerations for future improvement follow.

For flood plan management the more needful to control the flood of Patan, Karad tehsils and Wai city in Satara district. In Patan tehsil villages are Patan city, Chopdarwadi, Maundraul Haveli, Khilarwadi, Sajur and Mhopre. In Karad tehsil management for villages are old Sakurdi, Tambave, Old Supane, Yerwale, In Karad city (Preetisangam, Shikhurvarpeth, old Gote, Chawadichowk, some part of Rukmininagar, Mujawar colony), Karve, Kapil, Atake, Shere, Gondi, Rethare Bk. Kh., NavinmalkhedaKhubi etc. Also management of Wai city a specific for surrounded by GangapuriGhat, Marathi vishwakoshkaryalaya, DholyaGanapati and Shivajiudhyan chock etc.

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