RESEARCH FRONT

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FLOODS AND DROUGHTS MANAGEMENT OF KRISHNA AND MANGANGA RIVER BASIN IN SOUTH MAHARASHTRA (INDIA): A GEOINFORMATICS CELL

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ABSTRACT

In the recent years large scale strenuous floods and droughts have been observed in the India. The researcher's policy level separated on Internatiopnal and national, state and regional, district and block, local and tehsil, village and hamlet, homestead and point of nock. In South Maharashtra repeated feature connected with flood and drought problem. Flood and drought occurrences over a region have spatial and temporal variations. In Satara district the upper part of river Krishna and Koyna basin generally the flood affects it in the past decades. In Solapur district Man basin affected continuously drought condition. Sangli district also affected both of situations of hazards. Remote sensing and GIS address to satellite geo-database allows us to view, identification, understand, monitoring, assessment, interpret and visualize data in many ways that reveal relationships, patterns and trends in the form of maps, models, statistic reports and charts. Geoinformatics Technology Integrated Flood Control and Drought Relief Management Programme Information System Framework.

KEYWORDS: RS, GIS, GPS cell, flood, drought, suggest plan.

1.0 INTRODUCTION

In Maharashtra western part of Satara and Sangli district 22 floods occurs in last 40 years. In the district mainly flood occurred in the tehsils of Patan, Karad and Sangli affected by Krishna and Koyan rivers and its tributaries. In this tehsils average every year 21 villages are affected due to flood as it lies on very low lying area on the bank of Krishna and Koyana rivers. Eastern parts of Satara and Sangli districts and western part of Solapur district falls in major rivers are Manganga, Yerala and its tributary. Those rivers come under the drought prone region, they have very low amount of rainfall on the origins of rivers course due to the severely affected drought.

Deficient of rainfall in south Maharashtra for successive years has severely affected agriculture in this region, which is the main source of livelihood and employment. The situation of droughts in continued to decline in 2016. Following the failure of monsoon declared droughts in namely Khandala, Phaltan, Man, Khatav and Eastern part of Koregaon and Karad in Satara district. Atpadi, Tasgaon, Palus, Kavathe-mahakal and Jat tehsil in Sangli district. Most affected tehsil is Sangola and Mangalwedha in Solapur district are seriously affected by the drought. Very low amount of rainfall are affected 240 villages due to the facing drought in last few decades.

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The Government of Maharashtra Department of disaster reports that, 2006 “Satara, Sangli and Kolhapur Districts are facing a large amount of flooding due to excess flood water in the Krishna River is not flowing”.

So, Flood and drought management of south Maharashtra there is needed to develop and applied integrated flood control and drought relief management programme. There is necessity to study handle spatial and non-spatial datasets of the parameters considered. The geographical point of view suggests measures to predict the problem. GIS and RS technology have played a vital role will be solving the problems of flood, drought and their management. To suggest plan for excess flood water divers to the drought prone region based on RS, GIS and GPS environment. To solve management problem of flood and drought in Krishna, Koyana and Manganga, Yerala rivers respectively. By knowing the importance of this kind of studies the present research work will relate to “FLOODS AND DROUGHTS MANAGEMENT OF KRISHNA AND MANGANGA RIVER BASIN IN SOUTH MAHARASHTRA (INDIA): A GEOINFORMATICS APPROACH”.

2.0 STUDY AREA

The South Maharashtra is selected for the study of dynamics of flood and drought changes. The area under study encompasses the southern part of Maharashtra plateau with its own identity and typical set of characteristics.

The South Maharashtra lies between15^0 44' and 18^0 35' North latitudes and 73^0 33' and 76^0 25’ East longitudes. The study area covers an area of 42,264 sq.km. Administratively, the region consists of 44 tahsil of Kolhapur, Solapur, Sangli and Satara districts. According to the 2011 census, the study area has a population of 14,014,039 persons. The study area shares 12.47 per cent of the total population of the state. The region comprises 55 urban centers including 06 Class I cities form the subject of the study. The area under study is one of the progressive regions of the state of Maharashtra.

The western boundary of the study area is well defined by the crest lines of the Sahyadris. The southern fringe runs along the inter-state boundary between Maharashtra and Karnataka states. In the north, the region is delimited by the course of Nira river which joins the Bhima near, Akluj. The boundary also runs along the Sina river on the north eastern side. In the north east the region is separated from the Manjra plateau by the crest lines. To the eastern side of the region lies the Gulbarga district of Karnataka.

3.0 SELECTION AND JUSTIFICATION OF THE TOPIC AND STUDY AREA

Like India, Maharashtra, Satara, Sangli and Kolhapur in overall and the upper Krishna and Koyna basin in specific area is affected by the floods in the last few decades. The Manganga and Yerala river is the more affected from droughts in the recent decades. The River Krishna and Koyna originating at Mahabaleshwar carry lot of water during Monsoon every year. During rainy season, River Krishna and Koyna flows with abundant water and flood passes through Patan and Karad tehsil in Satara district and also affected region in Sangli district but at the same time Yerala and Manganga River which are tributaries of the Krishna River, remains totally dry due to receive very less amount of rainfall. These vast drought prone areas are severely and perpetually water starved.

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4.0 OBJECTIVES

The main objective of the present study is to propose sustainable comprehensive plan for the flood control and drought relief management for the disaster area and to suggest excess floodwater diversion to the drought prone region a GIS approach. Remote Sensing and GIS for displaying, documenting, and analysing of flood and drought information for the efficient action management. Following are specific objectives.

1. To study the geographical personality of the study area.
2. To suggest preventive measures for flood and drought disaster and to recommend Integrated Flood Control and Drought Relief Management Programme for the study region.
3. To solve disaster management problem of flood and drought in affected region.
4. To develop and suggest plan for excess flood water divers to the drought prone region based on RS, GIS and GPS cell.

5.0 METHODOLOGY

5.1 DATA COLLECTION METHOD

For propose research work different types of data collection method to utilized particular application analysis. The primary data concerning the causes and consequences of flood and drought. Also field investigation observation and face-to-face interview for informal personal communications to feel the real ground disaster phenomena thus purpose of the used data processing method attempt to qualitative and quantitative analysis.

Secondary data will collection from various books, journals, statistical abstracts, socio-economic review and district reports published by Government and Non-Government Organisations etc. Few secondary data collected from some unpublished records, articles, newspapers etc. Web browser is the most important sources of collection secondary data.

5.2 SPECIFIC DATA USED

1. To use Google Imagery: Visual viewing.
2. GPS/DGPS Technique: Point, Polyline and Polygon collection.
3. To analysis propose Rainfall Dataset
4. To quantity and qualitative study for use Satellite data

5.3 SOFTWARE USED

For this research work fallowing softwares will be use,

- ArcGIS Desktop
- Erdas Imagine
- Auto CAD Map
- Microsoft office
- Google Earth

5.4 DATA PROCESSING METHOD

To be collection primary and secondly data will be process through the appropriate statistical techniques, making charts and graphs, design diagrams. The cartographic and quantitative techniques use in the propose research work. The qualitative and diagrams use at appropriate places and their interpretation realize the propose study.

Geography Information System (GIS), Remote Sensing (RS), and Global Positional System (GPS) will use for the cartographic analysis and application of disaster using Geo-

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statistical method. To various applications prepared with the help Satellite Imageries and best understanding of the Google Earth Viewing. Will be generation a new physical, thematic and to suggest plan maps. The process of data carried out by using computer software such as Excel, Graphical design etc. Erdas Imagine play a vital role to image processing. This research work following methodology handling.

6.0 ORGANISATION OF THE SUGGESTED PLAN (SCHEME)

For the Flood and Drought Disaster Management of Satara an emphasis should have given on the preventive measures. Along with the preventive measures the flood control measures like, diversion of excess flood water to the eastern drought prone area.

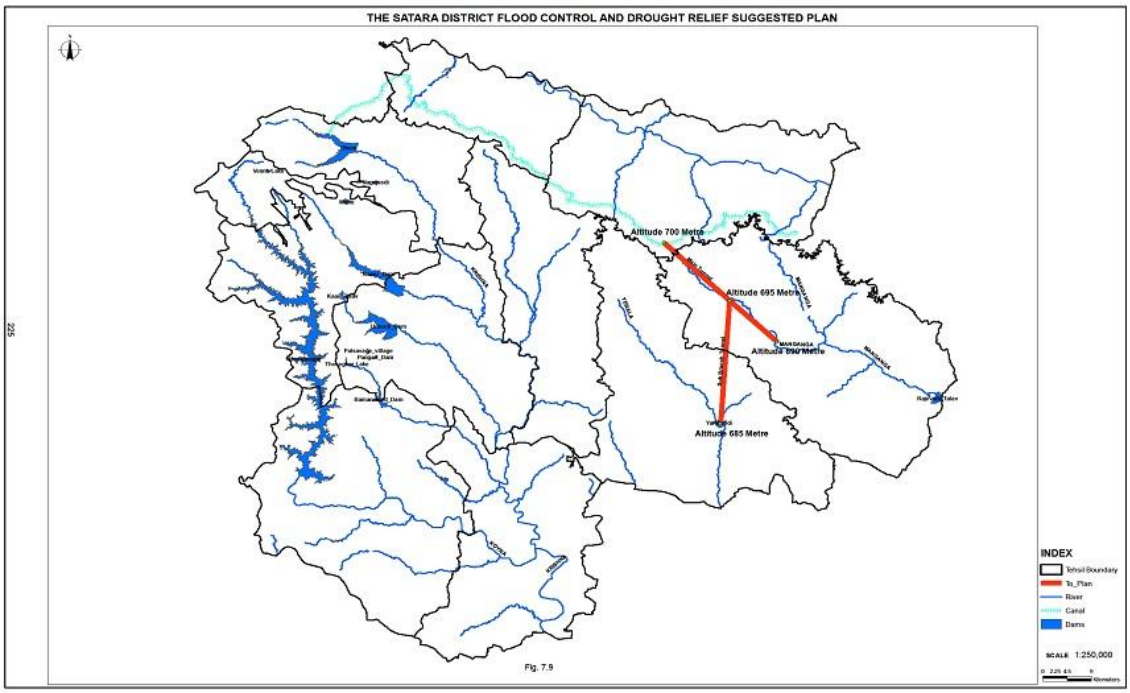

Fig. 001

Design the master plan for flood control in Krishna and Koyna river and drought relief of Manganga and Yerala river basin which are tributaries of Krishna river (Fig. No. 001). Waste weir of water for Dhom dam every year in Krishna river which is caused the flood occurred in Patan tehsil for Koyna river and Wai, Karad tehsils for Krishna river in Satara district and continuous up to Almatti dam (Sangli district). But it same time in eastern part of district mainly Man and Yerala river flows hardy once in 5 to 6 years at about 2000 to 2500 cuses for a short period i.e. 4 to 10 hours in Man and Khathav tehsils.

The proposed gravity method excess flood water diversion plan thus, tunnel starts at a point us of available open channel from Dhom Major Project (Dam), at Veloshi village in Phaltan tehsil on the Krishna river and exit point near Gondavale M.I.Tank and one sub-branch tunnel from Andli M.I.Tank taking towards Yeralwadi M.I.Tank in Yerala basin.

From Topo-sheet, satellite image and field investigation details, it is seen that the MSL of open cannel bed level at Dhom Dam is 750.20 metres and at Veloshi village bed level is 700.13 metres. So the tunnel bed level at Veloshi village is proposed as 699.00 metres and the full reservoir level of Gondavale Bk. M.I.Tank is 688.70 metres. This means there is a fall of about 10.30 metres. And sub proposed branch tunnel, taking main tunnel bed level at

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Andli M.I.Tank is 696.00 metres towards Yeralwadi M.I.Tank height 685.00 metres in Khatav tehsil. Total tunnel admeasuring about 52.5 Km which is main tunnel 28.5 Km. and sub tunnel 24.00 Km. So, no lift irrigation is required to construct. Further there is a proposal of feeding various M.I. Tanks with the help of flow tunnel. Project booing prosperity to Man, Khatav, Pathan, Khandal tehsils in Satara district, Khanapur, Palus, Tasgaon, Atpadi tehsils in Sangli district and Sangola, Mangalwedha, Pandharput tehsils in Solapur district.

7.0 CONCLUSTION

Integrated Flood Control and Drought Relief Management is founded on a master concept that uses a combination of policy, regulatory, financial and physical measures which focus on coping with floods and droughts within a framework of RS and GIS while have beneficial to be fully controlled. For the needed to develop Integrated Approach and to start Integrated Flood Control and Drought Relief Disaster Management Programme at district level.

The suggest plan of Krishna – Man river linking project can be multi-purpose project. As this plan can serve the purpose of diversion 4 to 5 TMC excess flood water of Krishna river to the water short of Man river and Yarala river basins. The diver's 4 to 5 TMC water in Dhom dam to automatic reduces Krishna river flow intensity and water capacity to more exploit the Koyana flooding water very fast transport to downstream. So, can be used as a flood control activity in Wai, Patan, Karad tehsils and up to Sangli district. At the same time those suggest plan can be a suitable and assured way to stabilize the existing Man and Yerala river basins with well-defined irrigation Man, Khatav, Pathan, Khandal tehsils in Satara district, Khanapur, Palus, Tasgaon, Atpadi tehsils in Sangli district and Sangola, Mangalwedha, Pandharput tehsils in Solapur district up to connected of Krishna river.

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