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CONTENTS OF ENGLISH PART - III

16. Empowering Women in Disaster Management as an Opportunity to use GIS Software: Drought Analysis of Cauvery Basin

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Abstract

Women play critical roles in various fields. This paper examines women contribution in disaster management and relief yet face significant challenges with the use of GIS software in Drought Analysis of Cauvery Basin and recommendation after analysis. During the disaster occurring condition, we knowing area and take a precaution before, but we don't know about the GIS software use in that type of disaster. So we present the research paper on the Drought Analysis of Cauvery Basin. We getting women's contributions barriers, and opportunities in disasters response, recovery and mitigation. The Cauvery river basin is a vital water source of water for south India, faces droughts impacting agriculture, water resources, and ecosystems. This study employed SPOT vegetation Normalized Difference Vegetation Index (NDVI) data to assess drought severity. We calculate NDVI and NDVI difference of 2001 and 2002. The study demonstrates the effectiveness of SPOT NDVI data for drought analysis. Remote sensing helps to gather data related to our area of interest which is more accurate. A GIS is not automated decision making system but that is a science or tool to quarry analysis and produce map in support of the decision making process. To analysis drought we have to get good spectral and temporal data. By using good spectral data we can identify drought affected area. At the same time we can analysis temporal changes of drought affects by using temporal data. The satellite data should processed and analyzed using image processing software.

Key words: Drought, Cauvery basin, ArcGIS 9.3, ENVI 4.6, NDVI.

Introduction

Women contribution in drought disaster management with the use of GIS software in Drought Analysis of Cauvery Basin and recommendation after analysis. During the disaster

occurring condition, we use the software and precaution before, A GIS is not automated decision making system but that is a science or tool to quarry analysis and produce map in support of the decision making process. To analysis drought we have to get good spectral and temporal data. By using good spectral data we can identify drought affected area. At the same time we can analysis temporal changes of drought affects by using temporal data.

So we present the research paper on the Drought Analysis of Cauvery Basin. We getting women's contributions barriers, and opportunities in disasters response, recovery and mitigation. In that time women face an economical challenge. If Government provide GIS and Remote Sensing software education in free of cost. Women defiantly doing the best in that area. Drought is a temporary deviation of climate and it is a normal recurrent feature of climate which occurs in all climatic regions, and is usually characterized in terms of its spatial extension, intensity, and duration. Technically, drought is a "temporary" condition, even though it may last for long periods of time.

Types of Drought

There is no universal scheme for classifying the drought. It may classify into different types by different organization:

Table No. : 1

(**Classification of drought as per Indian National Commission of Agriculture**)

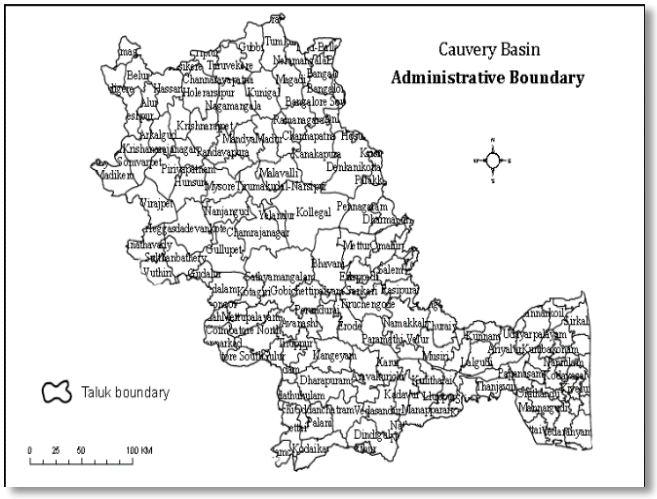
As per Indian National Commission of Agriculture:	
Meteorological	Normal precipitation bellows then 25%. A dry situation with 20% probability and rainfall Deficiency of more than 25% in drought-prone states of India. Prolonged meteorological drought and drying of reservoirs, Lakes, streams, and rivers.
Agricultural	
Hydrological	

1. Study Area

The River Cauvery originates at Talakaveri in Coorg District of Karnataka in Brahmagiri Range of hills in the Western Ghats at an elevation of 1,341 m. and drains a total of 81,155 Sq.kms. areas of which 34,273 Sq.kms. lies in Karnataka, 43,856 sq km. In Tamil Nadu, 2,866 sq km in Kerala and 160 sq km. in the Union Territory of Pondicherry. The Cauvery basin extends between 10°05'N and 13°30'N latitude and 75°30'E and 79°45'E longitude. The Cauvery basin is bounded by Tungabhadra sub-basin of Krishna basin on the northern side and Palar basin on the Southern side. The Western Ghats from the Western boundary, the Nilgiris, an offshore of Western Ghats,

extend eastwards to the Eastern Ghats and divide the basin into two natural and political regions i.e. Karnataka plateau in the North and the Tamil Nadu plateau in the South. In Tamil Nadu, the Eastern part of the basin is in the elevation range of 0 to 150 m slopping gently up from the sea.

Figer No. : 1 (Study area)



2. Objectives of the Study

The primary aim of this research is to assess the spatial extension of drought in the year 2002 for Cauvery basin.

1. To obtain Normalized Difference Vegetation Index (NDVI) in the year of 2001 and 2002for the study area using SPOT Vegetation data.
2. To compute a NDVI differences between 2001 and 2002 and identify the spatial extension of drought.

3. Methodology

In the present investigation image processing techniques have been widely used. All the above data are collected and processed by using ENVI software. To know the geographical setup of the study area, various thematic layers were prepared. Spot vegetation images are sub-setting with the study area boundary and used it for calculating NDVI, NDVI differences. All the maps are carefully analyzed and classified into subjective zones for drought assessment.

4. Materials and Methods

The methodology in this study involves several steps with relation to the collection of data, processing and analyzing those data for the defined output. The data pertaining to this study was collected for two years viz. 2001 (Normal Year) and 2002 (Drought Year). Data processing has been done for these years only.

Sources of the data

Table No. : 2 (Sources of data)

Data	Source	Remarks
Administrative Boundary	Survey of India Toposheets	Traced from 1:50,000 scale
Spot vegetation	http://free.vgt.vito.be	Images on June, July, August, September for 2001 and 2002 @ pixel resolution of 1 Km
Soil	NBSS &LUP	Scale @ 1: 5,00,000
Geology	Geological Survey of India	Scale @ 1: 5,00,000
Rainfall	Indian Meteorological Department	
DEM	ASTER DEM	@ pixel resolution of 30 metre

5. Software Used

The following GIS software's have been used to perform the data processing and analysis

- ENVI 4.6 for data processing
- ArcGIS 9.3 for manipulation of data and preparation of maps
- Microsoft Excel 2007 for statistical calculation.

6. Result and Discussion

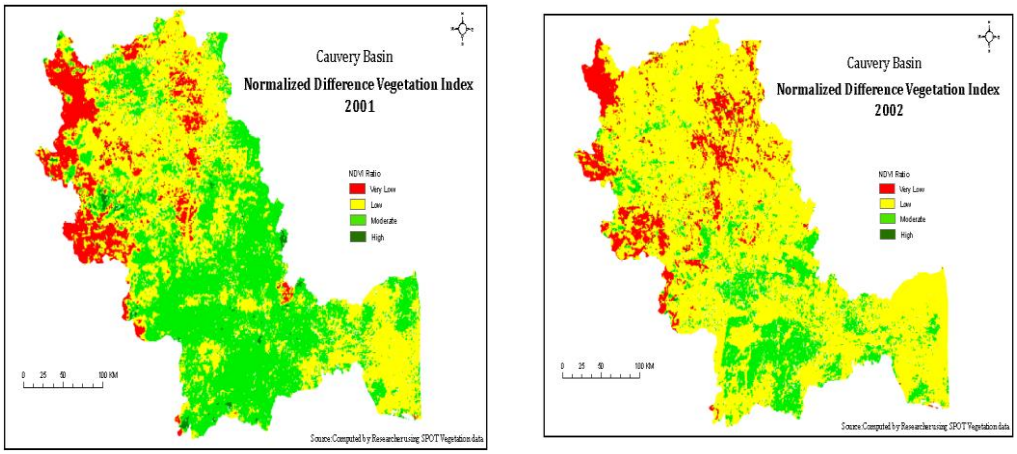
As drought is a slow-onset disaster, it's monitoring and early warning systems are central to drought management. Drought can be assessing easily through satellite images by calculating Normalized Difference Vegetation Index.

Normalized Difference Vegetation Index (NDVI)

The Normalized Difference Vegetation Index equations produses values in the range of -1.0 to +1.0, where vegetated areas will typically have values greater than zero and negative values indicate non-vegetated are as such as barren, snow, water bodies etc. It is calculated using red band and infrared band by applying the formula below:

(NDVI)= (NIR-IR) / (NIR+IR)

Figer no. : 2 (Normalized Difference Vegetation Index in Year 2001 & 2002)



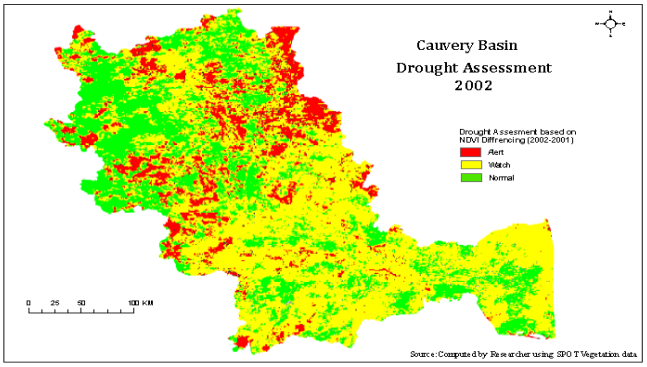
This normalization is to reduce topographic, illumination and atmospheric effects, and it creates a statistically desirable normal distribution. Free standing water have very low positive or slightly negative values. Very low values of Normalized Difference Vegetation Index correspond to other objects like as barren areas, rock, sand, snow etc. Moderate values represent scrub and grassland. Highest values indicates healthy forest.

By using SPOT images of year 2001 and 2002, NDVI index was calculated for the study area as shown in the figure. In the year 2001, central part and bottom of the Cauvery basin have high vegetation cover whereas north western part have very low vegetation Index. In the year 2002, high vegetation cover of the entire region was reduced and it indicated prevailing of drought. Average NDVI for taluk also calculated by overlaying taluk map over NDVI images for easy reference and comparison.

NDVI Differences

By comparing NDVI of normal and drought prone year, we can assess the conditions and spatial extension of the drought. In these study spatial-temporal changes of drought was calculated by differencing NDVI of 2002 with 2001. All the high positive values are indicating normal condition whereas high negative values are indicating drought condition and considered as alert for early warning. Values nearer to zero indicate watch condition as it may transfer to drought when further moisture is reduced. Karnataka part of Cauvery shows high negative values and it categorized as Alert, whereas lower part of Cauvery prevailing with normal condition in the year of 2002.

Figer no. : 3 (Drought assessment of Cauvery Basin 2002)



7. Summary and Conclusions

According to IMD standards, Year 2001 is Normal year whereas 2002 is Drought year. But spatial extension of drought cannot be precisely measured using rainfall data due to paucity of weather stations. NDVI differences image and Drought Index are clearly representing spatial

extend of drought in the year 2002. In central part of Cauvery basin and part of deltaic region have highest extension of drought and extreme dry condition was prevailed. This methodology is very straight forward and can used for all the years by comparing NDVI values with normal year. It can be also used to real time drought warning.

8. Recommendations

1. Increases women representation in disaster management decision making.
2. Provide training and resources.
3. Promote community based initiatives

9. Referances

- Albert J. (2002). "Drought Monitoring With NDVI-based on Standardized Vegetation Index," Photogrammetry, Engineering and Remote Sensing.
- Anil K. Gupta, Pallavee Tyagi, and Vinay K. Sehgal (2011). "Drought Disaster Challenges and Mitigation in India: Strategic appraisal," General Article, Current science, Vol.100, No, 12
- Hasan Murad (2011). Drought Assessment Using Remote Sensing and GIS in North-Western Region of Bangladesh," Third International Conference on Water and Food Management.
- Anandaraj S. (2001). "Drought Monitoring and Assessment for Cauvery Basin, South India Using IRS 1D LISS-III / Awifs Satellite Data and GIS," Unpublished Dissertation, Department of Geography, School of Geosciences, Bharathidasan University, Trichy.
- IMD Monsoon Report (2009). India Meteorological Department, Government of India.
- Manual of Drought Management (2009). Ministry of India, Department of Agriculture.
- The Disaster Handbook (1998). "National Institute of Food and Agricultural Sciences," University of Florida.
- UN-women, "Gender Equality and Women's Empowerment in Disaster Risk Reduction."
- US National Drought Summery, (2012). US Department of Disaster Management.