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Rayat Shikshan Sanstha's



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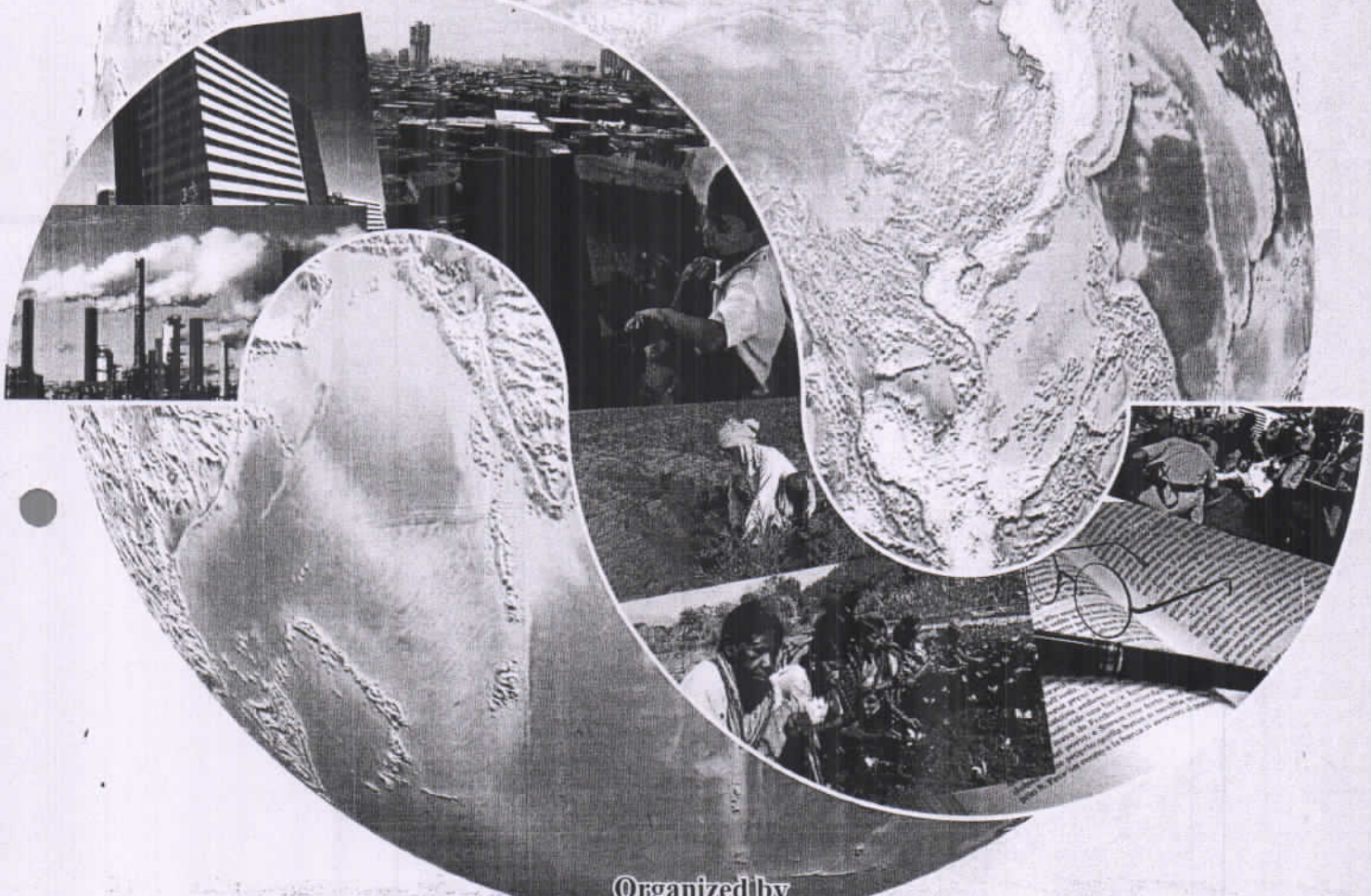
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CONFERENCE PROCEEDING

Two Day International Conference

On

**"Business Management, Information System, Social Sciences & Language & Literature :
A Need for 2020"**



Organized by

Chandrabai-Shantappa Shendure College, Hupari in Collaboration with Shivaji University
Commerce and Management Teacher's Association, Kolhapur and BVDU's Institute of
Management and Entrepreneurship Development, Pune

On 4th and 5th December, 2015

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LANDSLIDE VULNERABILITY ZONATION MAPPING USING GIS AND REMOTE SENSING

Subhash Chavare¹
Dr. Vinod Veer³

Sudhakar Koli²
Dr. Meena Potdar⁴

LANDSLIDE VULNERABILITY ZONATION MAPPING USING GIS AND REMOTE SENSING

INTRODUCTION

Landslide is the major disaster event occurring in the hilly region. It is an event occurs slowly and rapidly. It classified differently as per its types. Landslide creates damage to mankind and infrastructure. These events are associated with pre and post of earthquake, soil erosion, rainfall and anthropogenic activities. The combination of remote sensing and GIS can able to prepare Landslide vulnerability maps. To minimize the loss of humans and associated assets is necessary.

OBJECTIVE

The objective of the study is to prepare Landslide vulnerability zones for part of Uthagamandalam Taluk.

STUDY AREA

The study a part of Uthagamandalam Taluk is taken for analysis, is located between 76° 28' 22"E and 11° 36' 32" North Latitude and between 76° 49' 32"E and 11° 19' 59" N Longitude.

DATA USED

Satellite imagery Landsat ETM+, ASTER DEM for creating contour with 30m Resolution. Survey of India Toposheets on 1:50,000 scales, soil map prepared from agriculture engineering department.

SOFTWARE USED

Arc GIS 9.3 and ERDAS 9.2

LAND USE

The Land use/Land cover map derived from the hybrid use of Survey of India Toposheets and Landsat ETM+. The image classified visually by manual digitizing and the area is classified into following Land use/Land cover dense scrub, open scrub, thick vegetation, healthy vegetation, water body, settlements, mountains and plantations. For by understanding the Land use class and landslide suitability the ranks were given in the land use Land cover map shown in fig.

LINEMENTS DENSITY

Lineaments represent features such as fracture, joints, and faults, etc. The influence of these structures is conducive to infiltration and development of hydrostatic pressure on the slope forming materials. Faults and landslides have a close association; about 88% of the landslides were detected within an area closer more than 250m to major faults lineament map has been prepared from the Landsat ETM+ satellite imagery by visual interpretation. The map was overlaid on a 1 Sq.km grid and the lineament density is calculated.

DRAINAGE DENSITY

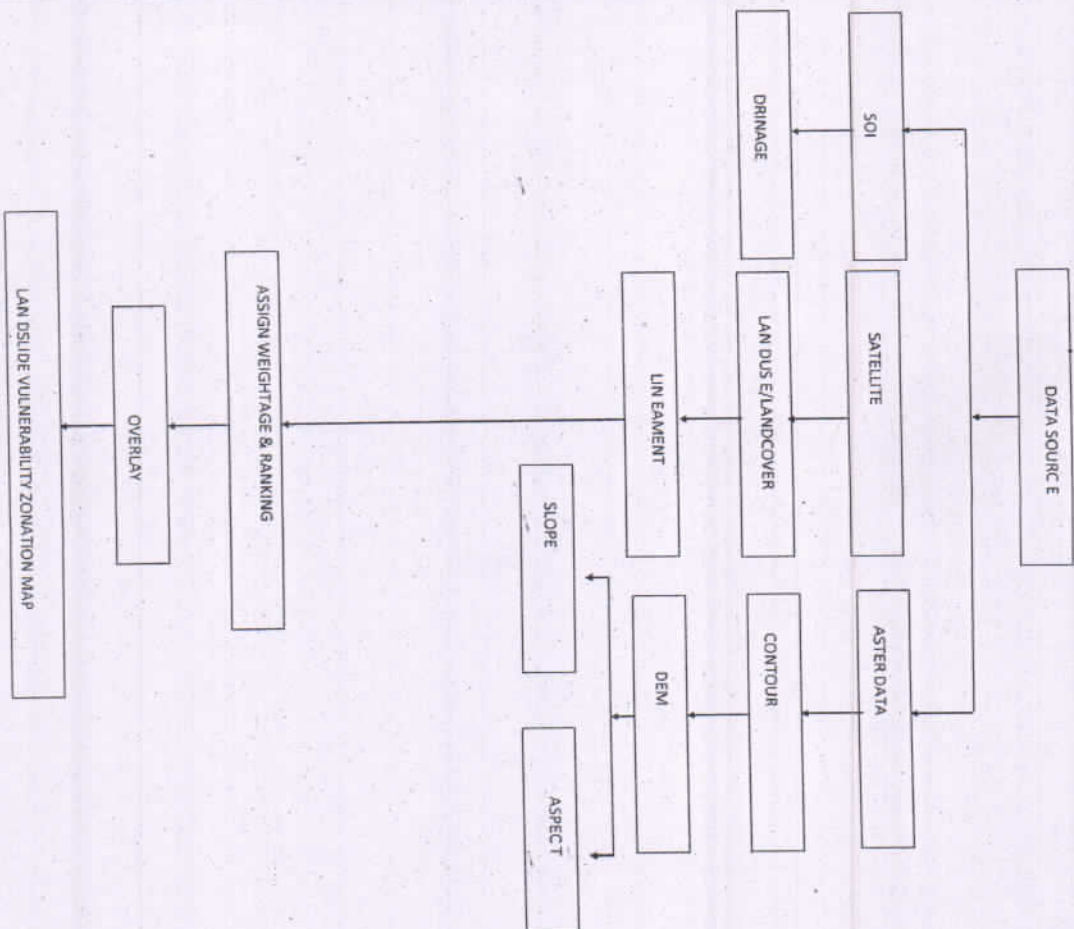
The stream network of the selected part is digitized from Survey of India Toposheets. Drainage density calculated for each 1 Sq.km grids. The higher ranks were given for higher density.

Drainage Density = L/A

SLOPE

The slope map is generated from the ASTER, DEM of the study area, in this area, there are 5 categories of slope were found in degree, they are 0-15, 16-25, 26-35, 36-45 and more than 45° slope of 36-45° have higher rank than the other slope categories.

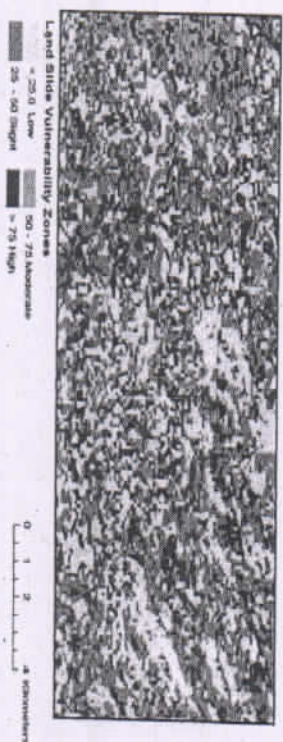
METHODOLOGY



RANKS AND WEIGHTAGE

Thematic layer	Map weight	Individual features	Rank
Land use/ land cover	0.2	Water body Thick vegetation Settlements Open scrub mountains healthy vegetation Dense scrub & Sand Barren land	0 2 1.6 8 1 4 1.4 0
Lineament Density	0.2	< 0.06 0.62 - 0.24 0.24 - 0.47 > 0.88	5 15 25 55
Slope	0.35	0-15 16-25 26-35 36-45 >45	5 22 33 44 6
Drainage Density	0.1	Very low (<1.5) Low (1.5 - 2.5) Moderate (2.5 - 3.5) High (3.5 - 4.5) Very high (>4.5)	0 10 13 33 44
Soil Depth	0.15	Typic cromusterts, Typic haplustis, entric cromustert, Mixed rhodic Paleustalfs, typic Rhodustalfs, typic Ustropepts, mixed Fluventric ustropepts, vertic ustropepts	10 0 10 12 18 7 25 5 5

LAND SLIDE VULNERABILITY ZONES



SOIL

From the soil map soil depth is taken for the analysis in the study area 70 to 140m soil depth is found 70m depth soil found more area than other category

ANALYSIS

To prepare landslide vulnerability map of part of Udhagamandalam Taluk is taken. The Weight age and ranked themes were overlaid with union operation as result of this cumulative vulnerability map been prepared. In the attribute of the cumulative map by adding the each themes weight and rank products were used to develop landslide vulnerability index. Based on the statistics computed from the Column. The final vulnerability landslide zones were classified. Data in the form of thematic maps such as slope, soil and land use were input in to GIS. The detailed method of assigning weights has been discussed above. Finally the landslide prone areas map has been prepared.

$$LSVI = \sum W \times R$$

LSVI = Landslide vulnerability Index

W = Weight age, R = Rank

RESULT

The landslide vulnerability zones map are showing low, slightly, moderate and high vulnerable zones.

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CERTIFICATE

This is to certify that Dr./Shri/Smt. Sudhakar Kalyan.....

(Co-author)..... of

..... participated and presented paper on

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Dr. V. A. Mane
Convener,
CSS College,
Hupari

Dr. A. M. Gurav
President,
SUCOMATA,
Kolhapur

Dr Sachin Vernekar
Dean & Director,
IMED,
Pune

Dr. T. S. Patil
Principal,
CSS College,
Hupari