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Research paper

Applications of GIS and Remote Sensing for Biodiversity Mapping and Conservation a Case Study of Trichy District

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Abstract

Utilization of GIS and remote detecting for biodiversity mapping is centers around the use of room borne remote detecting and GIS for biodiversity protection with regards to the best in class innovation which has improved the established approach. It surveys as of now accessible instruments, space-borne or satellite sensors giving information which can be utilized without examination or understanding for concentrate singular life forms, species arrays or natural networks on ground. Along these lines, the picture preparing and GIS procedures created to get data from the caught satellite information are checked on. In our undertaking looking into the utilization of remote detecting and GIS strategies for mapping, and modeling lichens and their territories.

Keywords: *GIS, Remote Sensing, Biodiversity, Mapping and Trichy.*

1. Introduction

"Biodiversity" is most regularly used to supplant the all the more plainly characterized and since quite a while ago settled terms, species decent variety and species wealth. Leverage of this definition is that it appears to depict most conditions and exhibits a bound together perspective of the conventional sorts of organic assortment already distinguished:

- Taxonomic assorted variety (typically estimated at the species decent variety level)
- Ecological assorted variety (regularly saw from the viewpoint of biological system decent variety)
- Morphological assorted variety
- Functional assorted variety (which is a measure of the quantity of practically divergent species inside a populace (e.g. Distinctive sustaining system, diverse motility, predator versus prey, and so on.)

2. Methodology

Fig.1 shows the methodology of the study.

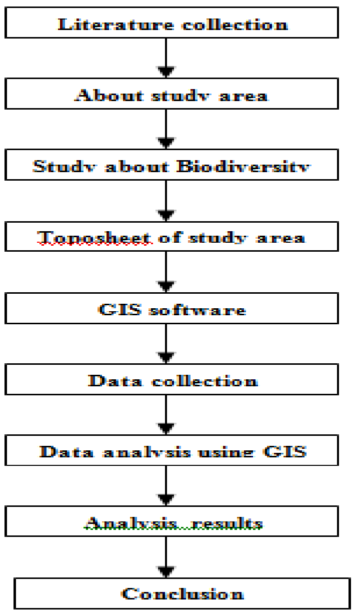

Fig.1: Methodology

3. Study Area

Tiruchirappalli district is an imperative locale in the state and had been a Center of exercises for some authentic occasions from the times of the early Cholas. Tiruchirappalli district with an area of 11096 sq. km as per Census of India 2001 is stretching between 10 and 11.30 of the northern latitude and 74.853 of the eastern longitude. Number of streams and river lets in the region provide drainage for the district. The Cauvery and Coleroon are the major rivers which contribute to the irrigation potential of the district. Fig.1 shows the toposheet for Tamilnadu.

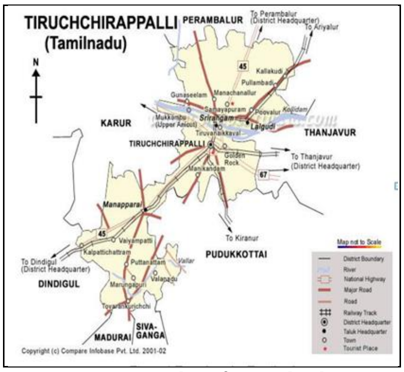

Fig.2: Toposheet for tamilnadu

Fig.3 shows the toposheet for trichy.

Fig.3: Toposheet for trichy

4. GIS Results

Fig.4 shows the location map of study area.

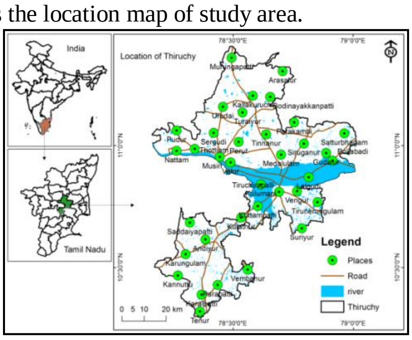

Fig.4: Base map of study area

Fig.5 shows the FCC of IRS P6 LISS III.

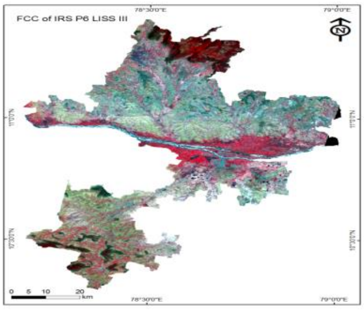

Fig.5: FCC of IRS P6 LISS III

Table 1 shows the collected sample specimens area I

Table 1: Collected sample specimens area I

Order	Description	No.of. individuals (n)	n/N	P_i	P_i^2	ln P_i	$P_i$ln P_i
Orthoptera (grasshopper)	Green with red legs	6	6/27	0.222	0.049	-1.505	-0.334
Orthoptera (grasshopper)	Brown with a yellow stripe	5	5/27	0.185	0.034	-1.687	-0.312
Lepidoptera (butterfly)	Large, blue	1	1/27	0.037	0.001	-3.297	-0.122
Lepidoptera (butterfly)	Small, blue	3	3/27	0.111	0.012	-2.198	-0.244
Coleoptera (beetle)	Red & blue	12	12/27	0.444	0.198	-0.812	-0.360

Table 2 shows the collected sample specimen area II.

Table 2: Collected sample specimens area II

Order	Description	No. of. Individuals(n)	n/N	P_i	P_i^2	lnP_i	$P_i$ln P_i
Hymenoptera (Wasp)	black	12	12/91	0.132	0.017	-2.025	-0.267
Hymenoptera (Wasp)	Purple	21	21/91	0.231	0.053	-1.465	-0.338
Hymenoptera(bee)	Striped	5	5/91	0.055	0.003	-2.900	-0.160
Orthoptera (grasshopper)	Green with red legs	25	25/91	0.245	0.060	-1.406	-0.345
Orthoptera (grasshopper)	Brown with a yellow stripe	2	2/91	0.022	0.0004	-3.817	-0.084
Lepidoptera (butterfly)	Large, blue	17	17/91	0.187	0.035	-1.677	-0.314
Lepidoptera (butterfly)	Small, blue	9	9/91	0.099	0.010	-2.313	-0.229

4.1. Assessment of Sustainable Landscape Ecological Zone

The landscape ecological stress zone mapping of the investigation zone has been done in light of the examination and regrouping of landscape ecological units based on the ecological effect of each zone. Table 3 demonstrates the subject of ecological stress zones.

Table 3: Theme of ecological stress zones

Theme	Feature class	Rank	Weightage
Geomorphology	Plains	4	30
	Inselberg	8	
	Lower pediplain	8	
	Flood plain	7	
	Pediment	5	
	Structural hills	8	
	Upper pediplain	8	
Slope	Level to nearly level (<6%)	1	40
	Very gentle (6-16%)	3	
	Gentle (16-27%)	4	
	Moderatly sloping (27-39%)	8	
	Strongly sloping (39-53%)	9	
Soil depth	Extremely Shallow	10	15
	Shallow	9	
	Moderately Deep	5	
	Deep	2	
	Very Deep	1	
Land use / Land cover	Agriculture Land	3	15
	Barren Land	8	
	Buildup Land	2	
	Water Bodies	1	

Fig.6 shows the geomorphology.

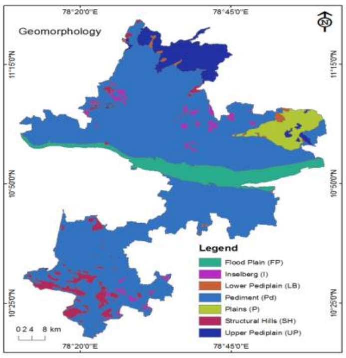

Fig.6: Geomorphology

Fig.7 shows the slope ratio.

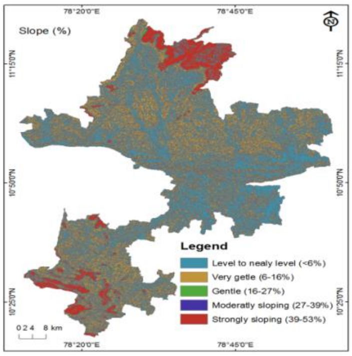

Fig.7: Slope Ratio

Fig.8 shows the soil depth.

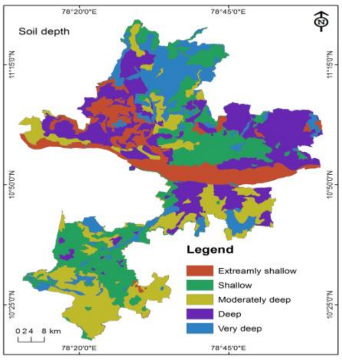

Fig.8: Soil Depth

Fig.9 shows the land use / land cover.

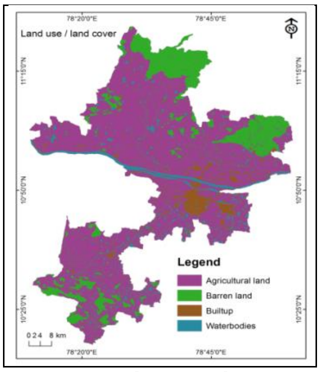

Fig.9: Land use /Land cover

Fig.10 shows the ecological stress zone.

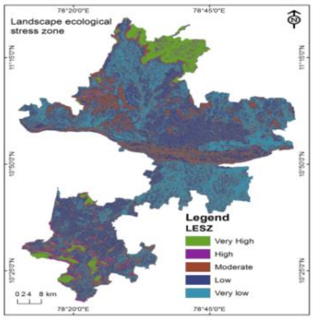

Fig.10: Ecological stress zone

Table 4 shows the landscape ecology conservation for sustainable management.

Table 4: Land scape ecology conservation for sustainable management

LESZ	Area and Percentage	Description	Management
Very high	91,20%	Subjected to erosion with slopes ranging from 47-121%, extremely shallow to shallow Soils, , limited crop, wastelands area	Soil conservation practices like gully control structures, stone terracing & contour bunding, development of pastures, afforestration and social forestry.
High	86, 19%	Headward erosion, slopes ranging from 31-47% with shallow to moderately deep soils and waste lands, and the single cropped area	Development of social forestry and horticulture crops.
Moderate	141, 31%	Moderate erosion and deposition, slope ranging from 18-31%, moderately deep soil, single cropped area and scrub lands	Terrace bunding, check dams vegetative bunding,
Low	32,6%	Deposition of alluvium and colluvium material, slopes ranging from 7.5-18%, moderately deep to deep soils, deciduous and the double cropped area	Land leveling, contour cultivation and strip cropping, soil moisture retention practices
Very low	112, 24%	Depositional processes are dominant, slopes ranging from 0-7.5%, soil depth varies from deep to very deep, single and double cropped areas	channel management, avoid ponding and channel excavation , protection of fertile soil
LESZ = Landscape Ecological Stress Zone			

5. Conclusion

It is currently doable to utilize smart technology, as an example, satellite information for statistics, registering calculations and techniques to investigate unpredictable and troublesome surprise, as an example, biodiversity monitoring. In view of the form of utilization, it's miles potential to now pick the perfect satellite data for pc dataset preserving in thoughts the cease goal to reach to conceivable tracking situations.

- Satellite remote sensing gives clever answers for biodiversity tracking and to put together conservation strategies with much less effort.
- Because of the provision of multi-date, multi-decision, multi-sensor datasets, it has grow to be possible to gather massive details of earth surface without making tedious subject go to.
- Due to the fact that high spatial decision datasets can acquire very best information over small areas at a everyday interval of time. as a result, this information will provide foundation for nearby scale monitoring of biodiversity.
- This research generally highlights the function that far flung sensing can play in supporting environmentalists to characterize and map biologically rich zones, generating information on adjustments in biodiversity, alteration and distribution in species diversity.

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