URBANIZING KERALA AND ITS AMPHIBIANS

The aura of the nature owes to the inhibiting beholders. The ecstatic part of this heavenly environment is its emerald and organic greenery. India, a country with intense diversification wraps up a broad spectrum of flora and fauna within it. Kerala is one among the cluster region in India sustaining vast number of living entity. With the growth of time, it is also found that in forests, which is one among the green covers, speciation of flora and fauna is apparently observed which vitally contributes to biodiversity of our country. But, to fulfil the unending greed of humans, modern anthropogenic activities has affected some organisms to such extent that it compelled the entire species to move into IUCN red list of threatened species. The map created by our team solely provides the idea as to how with the advent of time, urbanizing human settlements in the state of Kerala is correlated to decreased count of various amphibian species in that region.

COMBINATIONS OF ISRO DATA

1. Satellite data: BHUVAN LISS-III images
2. Shape files:
2.1. India_District_Boundary.shp
2.2. India_State_Boundary.shp
3. Band used: Band 5, Band 4, Band 3
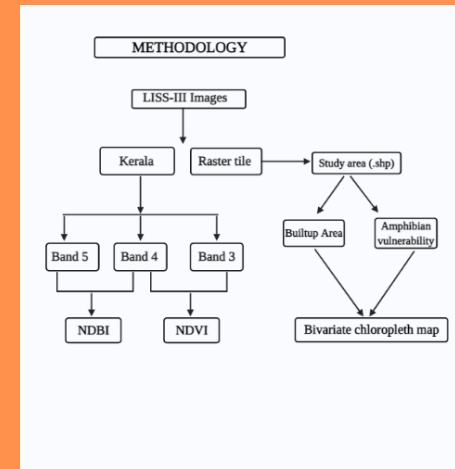4. NRSC, LULC database
5. Study area: Kerala

APPLICATIONS

1. These satellite derived data combined with several government sources could help in better development of environmental modelling.
2. This map could be applied for monitoring and managing impact of land-use change at regular time intervals.

USES

1. Cost-effectiveness of the map could help in obtaining land cover alteration processes.
2. This could help in adopting several restoration and conservation measures.

PROCEDURE

1. 84 tiles of LISS-III images were dowloaded during the years of (2011-13) and (2017-18).
2. Band 5 of all the downloaded tiles were merged to create a band-5 raster file stretching through the entire study area and more.
3. Same procedure is applied to band 4 and band 3 as well.
4. Similarly merged band 3,4,5 were clipped to the study area to produce the raster tiles to exact extent of our study area, i.e., Kerala.
5. Further, NDBI and NDVI indices were used to generate the respective values.
6. NDBI= (SWIR - NIR)/(SWIR+NIR), NDVI= (NIR-Red)/(NIR+Red)
7. On the other hand, amphibian biodiversity for the years 2012, 2018 collected from ENVIS and Zoological Survey of India were used to generate points (random) on the basis of IUCN REd list.

METHODOLOGY

LISS-III Images → Kerala / Raster tile → Study area (.shp) → Band 5, Band 4, Band 3 → NDBI, NDVI; Builtup Area, Amphibian vulnerability → Bivariate chloropleth map

COMPLEXITIES

1. The NDVI is not the most reliable method for built up index.
2. Since the images are from harvesting seasons, NDVI > 0.5 suggests dense forests/canopy cover
3. The points generated for amphibian diversity are suggestive; not to be confused with their actual habitat.
4. Each point Indicates one type of species.