

COMBINATION REMOTE SENSING AND SPATIAL METRICS TO STUDY URBAN GROWTH IN LONG BIEN DISTRICT - HA NOI - VIET NAM

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Introduce

Long Bien is officially established in 2003 basing on communes from suburb area. It had many support policies and detailed plan. Urbanization in this district is occurring very fast and characteristic of urban object had been changed. Combination remote sensing and spatial metric to study urban growth were used in this research. The results will be valuable information for planner and urban management.

Purpose.

- To explored land use change
- To study the change patterns of urban areas over time
- Monitor urban growth in by spatial metric

Methodology

- Object-oriented image processing using Ecognition. Land surface was classified into the 4 main class such as urban land, agriculture land, water surface, vacant land.
- Spatial metrics were computed for urban land class in each year (1993,2000,2007) by Fragstat software

Data and spatial metric

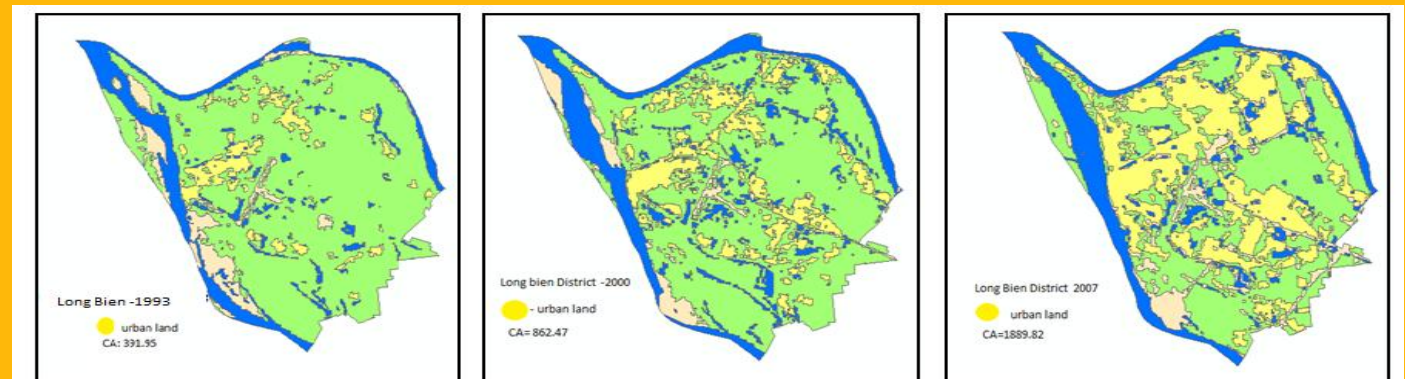
- Satellite images of Hanoi (1993,2000,2007)
- Topology map of Ha noi

Metric	Description	Unit	Range
CA	Measuring total growth of urban area	hectares	>0, without limit
ED	Measure of the total length of the edge of the urban boundary	Meter per hectares	≥0; without limit
LPI	Describing the percentage of the total urban land represented in the largest urban blob	Percent	0 < LPI ≤ 100
IJI	Degree of interspersion or intermixing of urban land	Percent	0 < IJI ≤ 100
C_land	Urban land class/total landscape area	Percent	0 < PLAND ≤ 100

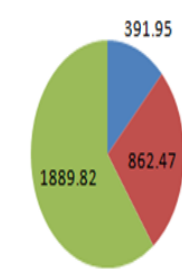
References

1. K. McGarigal,SA.Cushman, M.C. Nell, and E.Ene, Fragstats.
2. A. Noda and Y.Yamaguchi, " Charactering urban sprawl using remote sensing, GIS and a spatial metric for a medium sized city in Japan (2008)

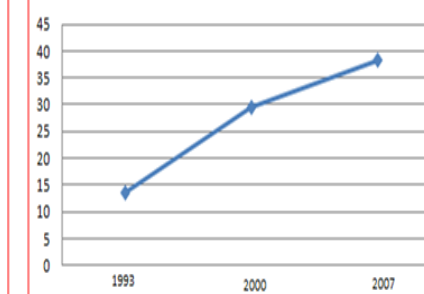
Results



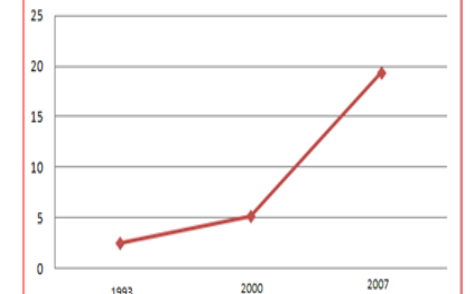
CA - Total urban land area(ha)



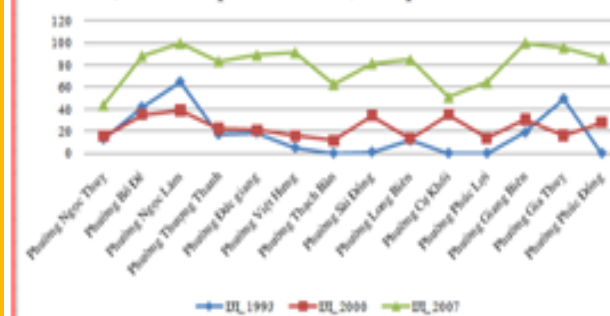
ED- Edge Density



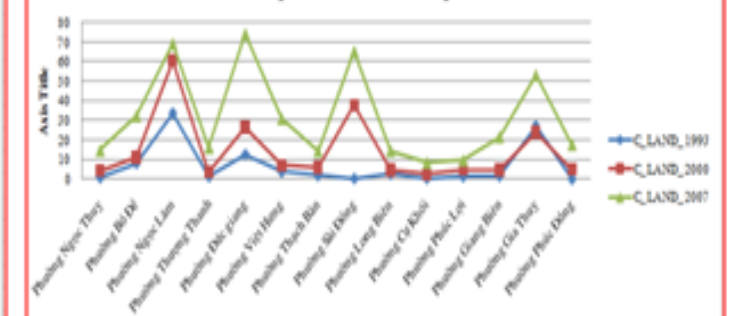
LPI - Largest Patch Index



IJI - Interspersion and Juxtaposition Index



percent of landscape



Conclusions

- Effective method in urban analysis
- Support for urban planning , urban management
- Urbanization of Long Bien district developed rapidly because it is a new district. Before 2003, all ward of Long Bien are villages
- ED and LPI index (urban boundary) illustrated urban growth here (in 1993 LPI = 3 and 2007 LPI = 20)
- A large amount of non urban land in the suburb has been converted to urban land from 1993 to 2007(CA metric) and construction density is higher which present by IJI metric.

Acknowledgments

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