Graying and Greening in Bangalore — Urban Green Spaces in Indian Cities

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India - major land transformation in recent decades
- Massive conversion of ecosystems
- Rapid urbanization and industrialization
- Social and ecological vulnerability
- Lack of data on ecological change due to urbanization, implications for sustainability
Bangalore: One of the Indian cities where we have the most extensive information on how urbanization impacts biodiversity and ecosystem change in cities.
Biodiversity

Land cover change

Green networks

Urban collective action

Urban trees

Lakes

Biodiversity
Studies of Bangalore

- Simple studies
- Undergraduate students – motivated, enthusiastic, creative
- Education with research
- Shape the researchers of tomorrow, by impacting conservation through education
Changes in green cover, 2000-2007
Within the city, green cover in specific land use categories: e.g. streets, parks, home gardens, sacred spaces

Street and park trees

- Rich in species compared to other cities, but largely exotic (80%)
- Low density
- Largest trees in old parts of city
- Changes in preferences over time, towards small sized species


Environmental significance

Road without trees

Road with trees

Suspended Particulate Matter

Vailshery et al. 2013 Urban For Urban Green
Social-cultural significance
From tree-lined streets teeming with life...
To roads with high density traffic empty of pedestrians
Large scale tree felling has converted green streets filled with urban life – to barren heavy traffic roads – changing the nature of urban mobility.
Home gardens of Bangalore

- Traditional Bangalore bungalows with plants selected for food, medicinal or spiritual/religious properties
More “useful” endemic plants in home gardens compared to apartments

- **Ornamental Plants**: 30%
- **Medicinal Plants**: 19%
- **Fruiting Plants**: 20%
- **Religious Plants**: 25%
- **Cooking Plants**: 4%
- **Shade Plants**: 1%
- **Hobby Plants**: 1%
- **Other Plants**: 6%

These statistics illustrate the diverse use of plants in home gardens compared to apartments.
Changing aesthetic preference towards ornamental non-flowering plants with changing cultural habits, and increased apartment-living
Slums and biodiversity
(Gopal, 2012)
- Trees are centres of activity in slums
- 11 trees/ha vs 28 trees/ha in wealthier areas
- More endemic species
- Mostly “useful” plants
- *Ficus religiosa* - Activity hotspot
Biodiversity in Bangalore

- Rich variation
- Differs across streets, parks, slums, home gardens, apartments, sacred sites...
- People from diverse backgrounds have affinity for biodiversity
- Development is changing this rapidly
Active civic movements in Bangalore
• In 2001, Indian cities contained 377 million (11% of world’s urban population)
• By 2031, UN projects 600 million in cities (15%)
• Urban habitats will be critical in ensuring the sustainability of this transition

Urbanization, ecosystems and biodiversity: Assessments of India and Bangalore.

Released at the Cities for Life Summit, parallel to the eleventh meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD), 15th October 2012, Hyderabad India.
Directions forward

Issues

- Urbanization impacts on ecosystems and biodiversity
- Nature of urban stewardship in India’s urban era
- Heterogeneity in access to ecosystem services, vulnerability of urban poor
- Interaction of climate change and urbanization

Approaches

- **Wider scope** from megacities to emerging cities; create **baseline** datasets; conduct **long term** monitoring; study **teleconnections** between rural and urban locations