Monica Kaushik

Role of Urban Green Spaces for Conservation of Bird Diversity in the Rapidly Urbanizing Capital of Himalayan State of Uttarakhand, India

Town/Region	Dehradun
Country	India
Continent	Indian Sub-continent
Categories	Birds, Habitats
Date	27 Nov 2018

In 2014, 54% of the world's human population was residing in urban areas which is projected to grow to 66% by 2050. Such rapid transformation of earth's land surface especially the natural areas is undoubtedly a significant threat to the global biodiversity. However, the key of conserving the global biodiversity is also hidden in urban areas in form of urban green spaces (UGS). These are all form of natural, semi-natural and man-made ecosystem within and around urban areas. These habitat ranges from city gardens, green campuses, urban wastelands to plantations.

UGS have been integrated in Urban Planning in developed countries but received little or no attention in developing countries such as India. By 2050, more than 50% of the Indian population would be living within urban areas emphasising the urgency of including UGS in urban planning.

Following the concepts of Island Biogeography, the ability of a given UGS to support biodiversity depends on its size, surrounding matrix, connectedness to other green spaces and quality of vegetation. However, dearth of urban ecology studies in developing countries including India hampers ours understanding about the features that maximize

What is the importance of cities in conservation?

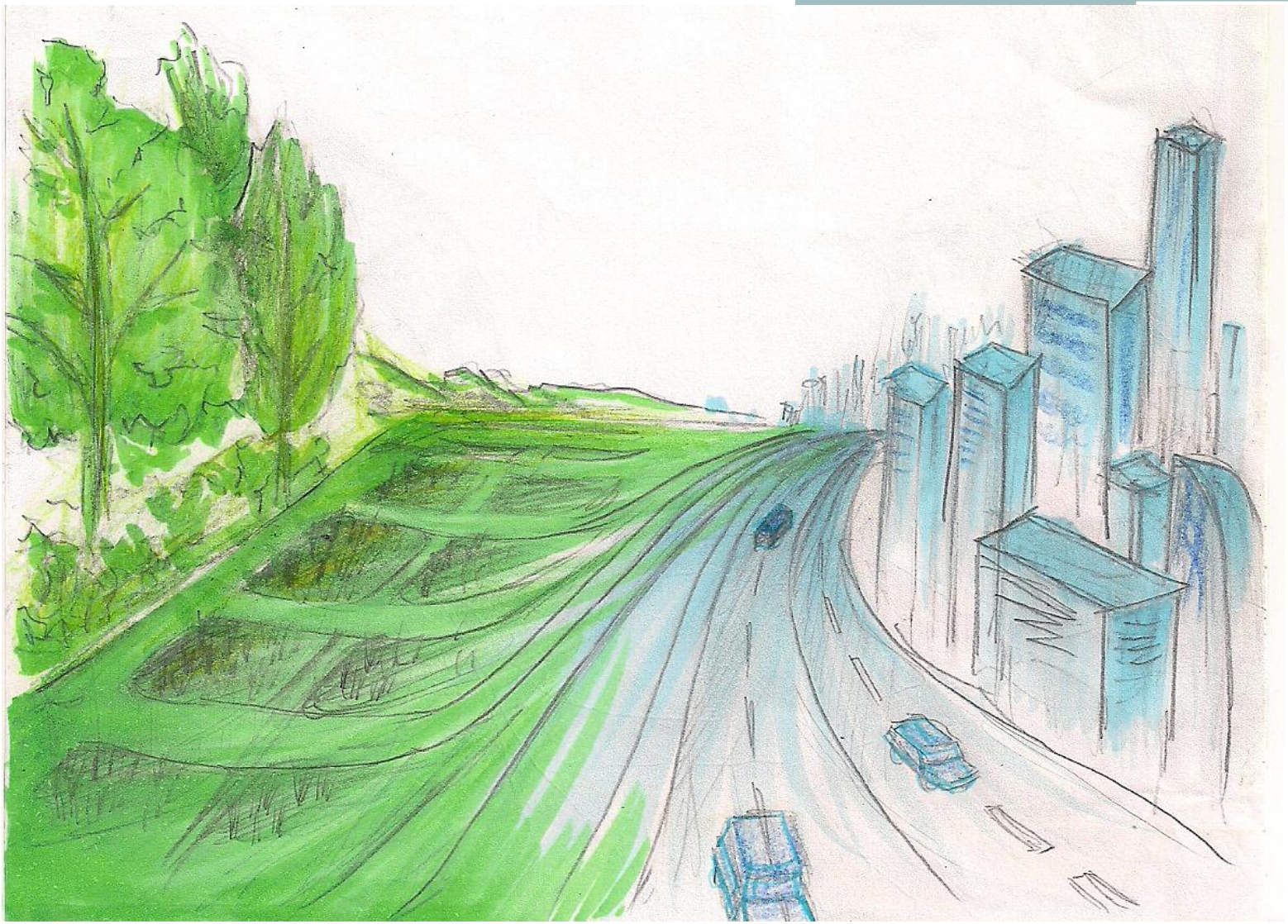
- Why do we need to study urban areas?
- Why are UGS important?

68% of the world population projected to live in urban areas by 2050, says UN

16 May 2018, New York

Today, 55% of the world's population lives in urban areas, a proportion that is expected to increase to 68% by 2050. Projections show that urbanization, the gradual shift in residence of the human population from rural to urban areas, combined with the overall growth of the world's population could add another 2.5 billion people to urban areas by 2050, with close to 90% of this increase taking place in Asia and Africa, according to a new United Nations data set launched today.

The *2018 Revision of World Urbanization Prospects* produced by the Population Division of the UN Department of Economic and Social Affairs (UN DESA) notes that future increases in the size of the world's urban population are expected to be highly concentrated in just a few countries. Together, India, China and Nigeria will account for 35% of the projected growth of the world's urban population between 2018 and 2050. By 2050, it is projected that India will have added 416 million urban dwellers, China 255 million and Nigeria 189 million.



sustainablespu - WordPress.com - https://www.who.int/heli/risks/urban/urbanenv/en/

WE HUMANS

When sleeping in public is an act of protest

Dec 13, 2018 / Karen Frances Eng

SHARE THIS IDEA

FRESH IDEAS IN YOUR INBOX

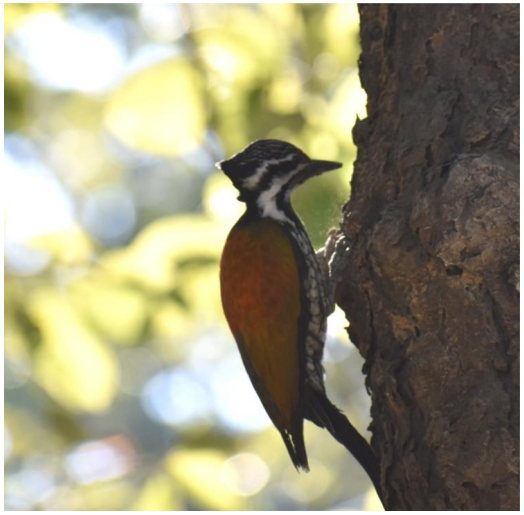
Sign up with your email address

Assessing the role of UGS in conservation

We choose birds as a model taxon.

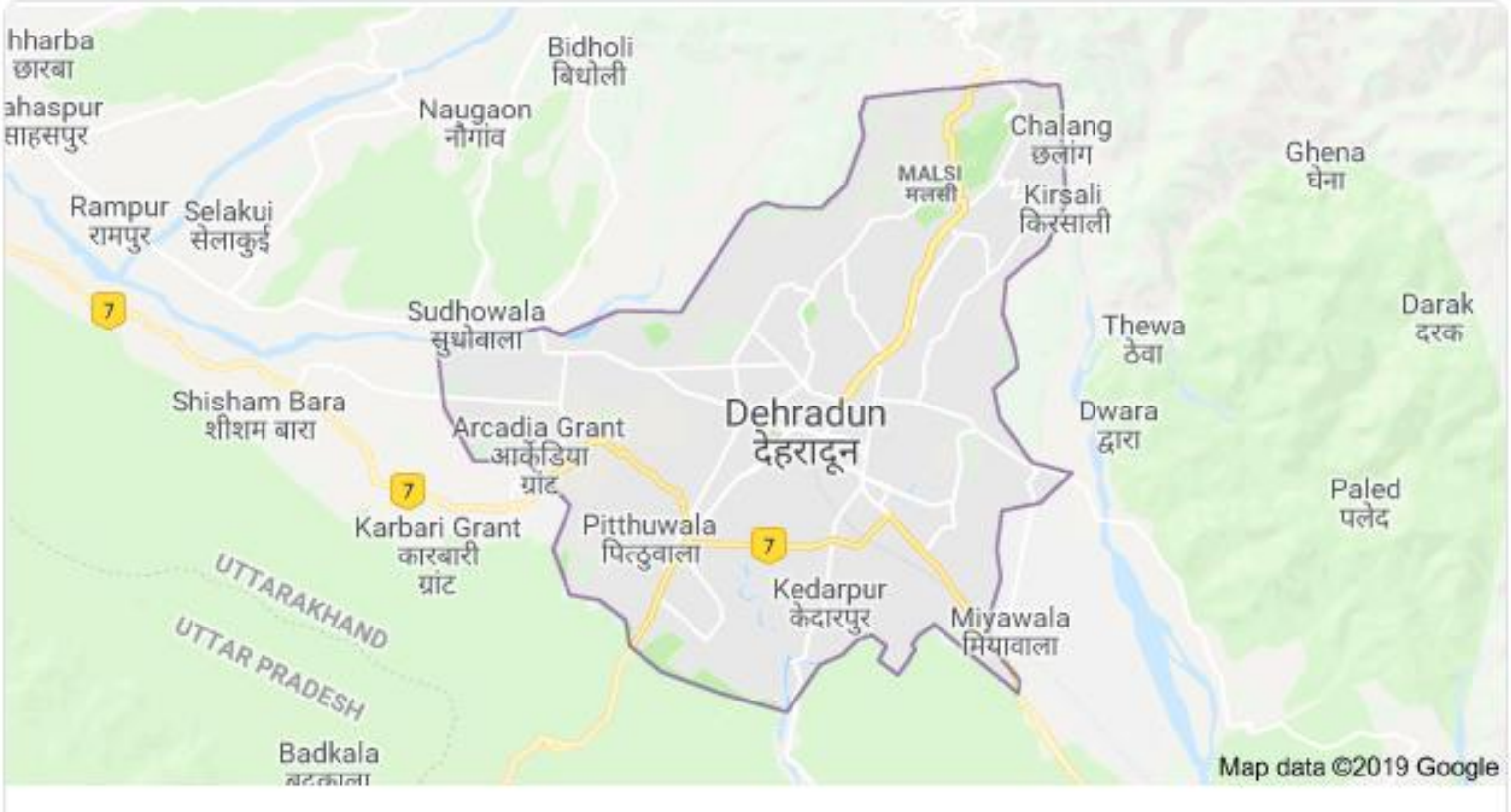
- Parameters

--Size
--Matrix composition
--Vegetation structure

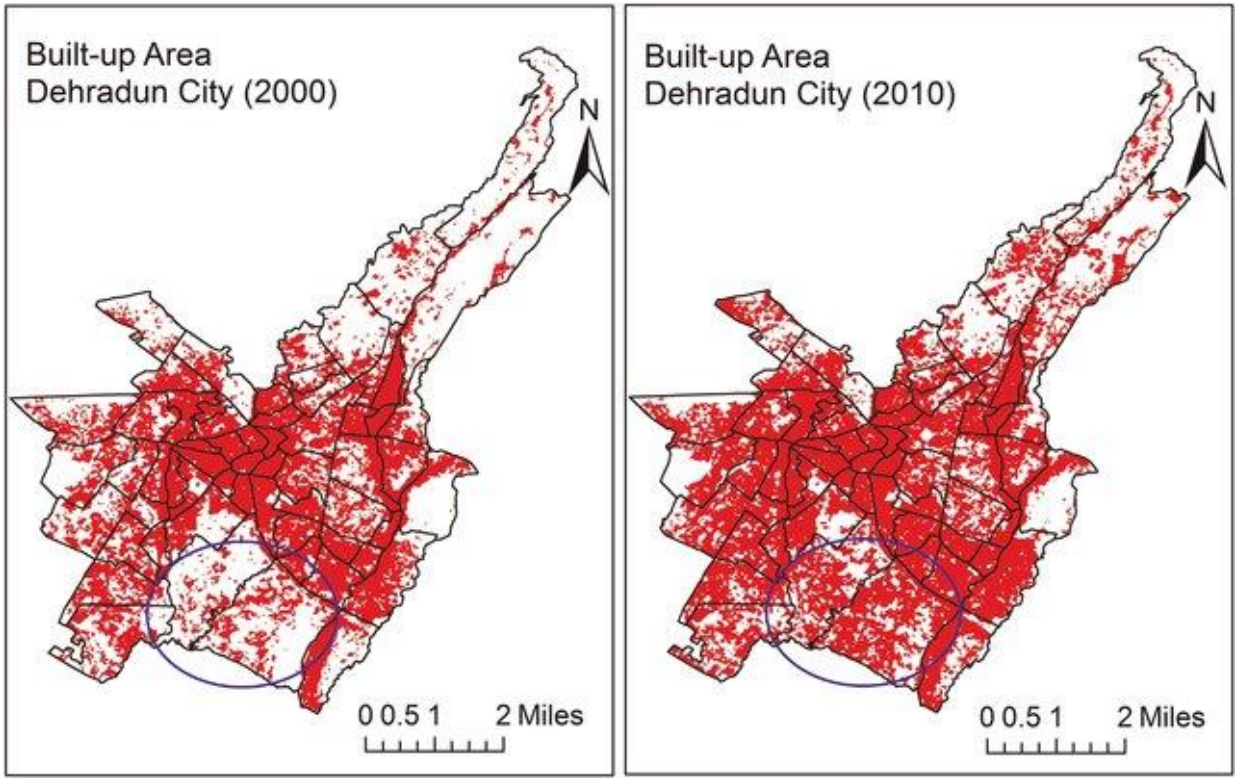


Study area- Dehradun

- It became the capital of Uttarakhand in 2002
- Population- 447,808 in 2001 to 1696694 in 2018.

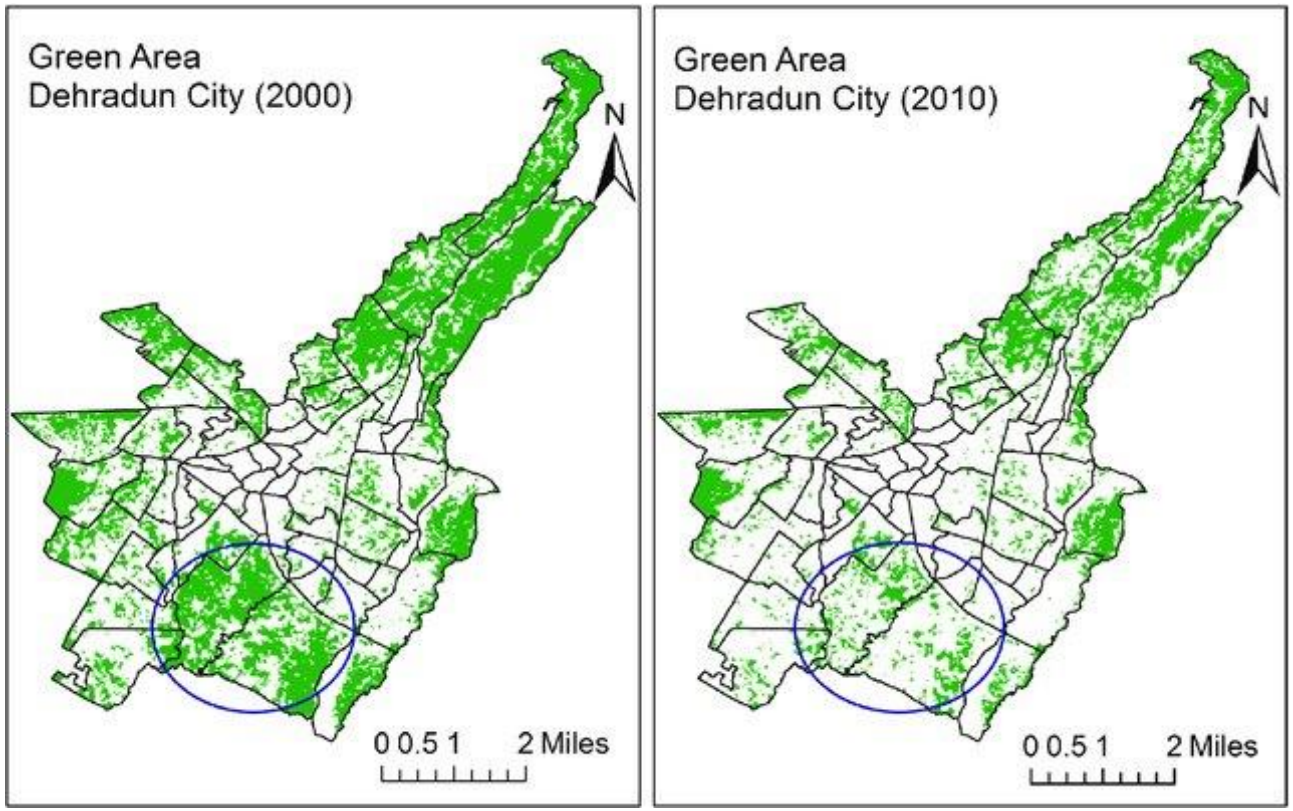


The urban cover nearly doubled during 1998-2008, after the city became a state capital.



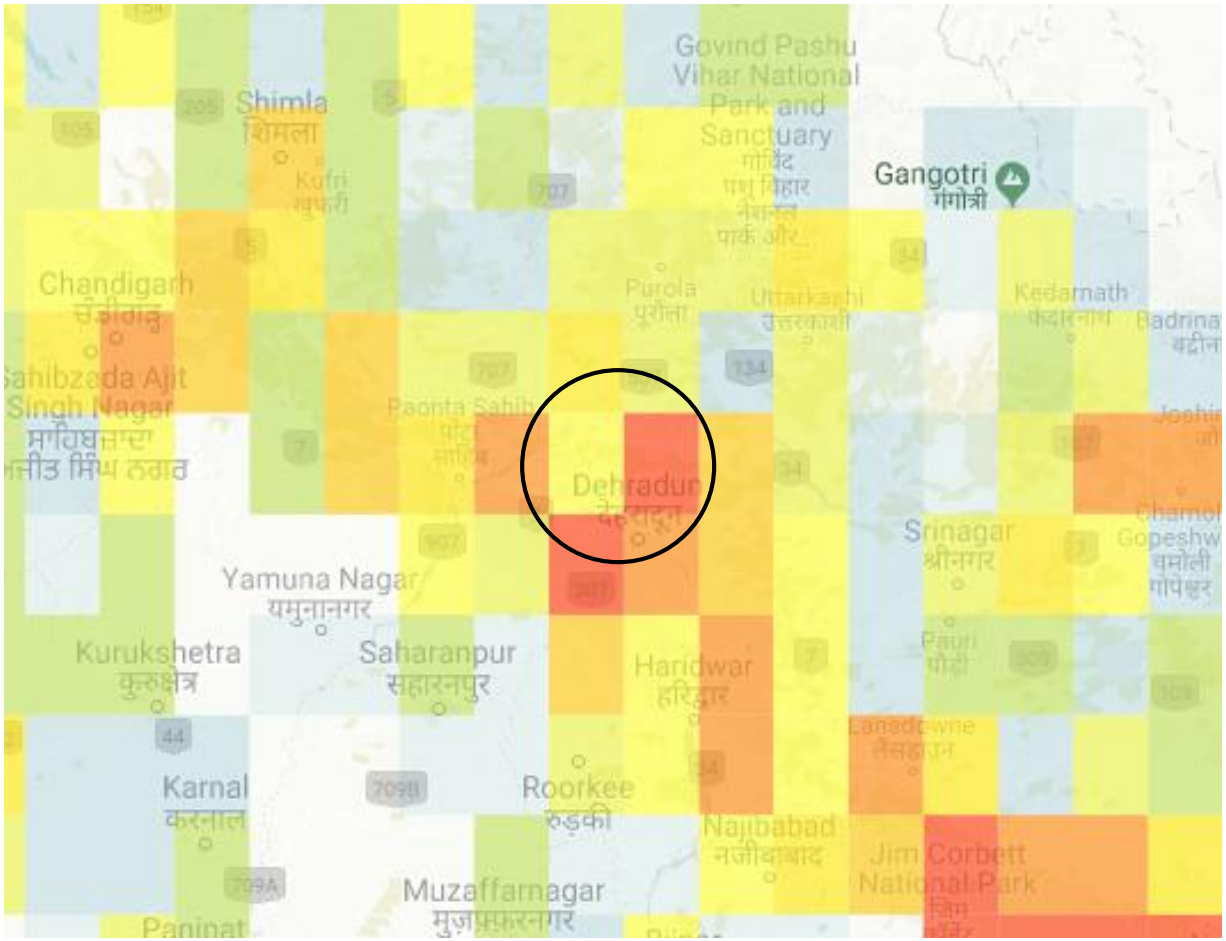
Dutta, D., Rahman, A. and Kundu, A. (2015) Growth of Dehradun City: An Application of Linear Spectral Unmixing (LSU) Technique Using Multi-Temporal Landsat Satellite Data Sets. Remote Sensing Applications: Society

All forest types are undergoing reduction in size due to urbanization.



Dutta, D., Rahman, A. and Kundu, A. (2015) Growth of Dehradun City: An Application of Linear Spectral Unmixing (LSU) Technique Using Multi-Temporal Landsat Satellite Data Sets. Remote Sensing Applications: Society and Environment, 1, 98-111.

BUT… it also holds a good diversity of birds



Source- ebird

The study- Step 1

Selection of UGS

The study- Step 1

Selection of UGS

Parks

MDDA Park

Neetaji Park

Vasant Vihar Park

Gandhi Park

The study- Step 1

Selection of UGS

Institutes

Graphic Era

MKP College

Mindrolling Monastery

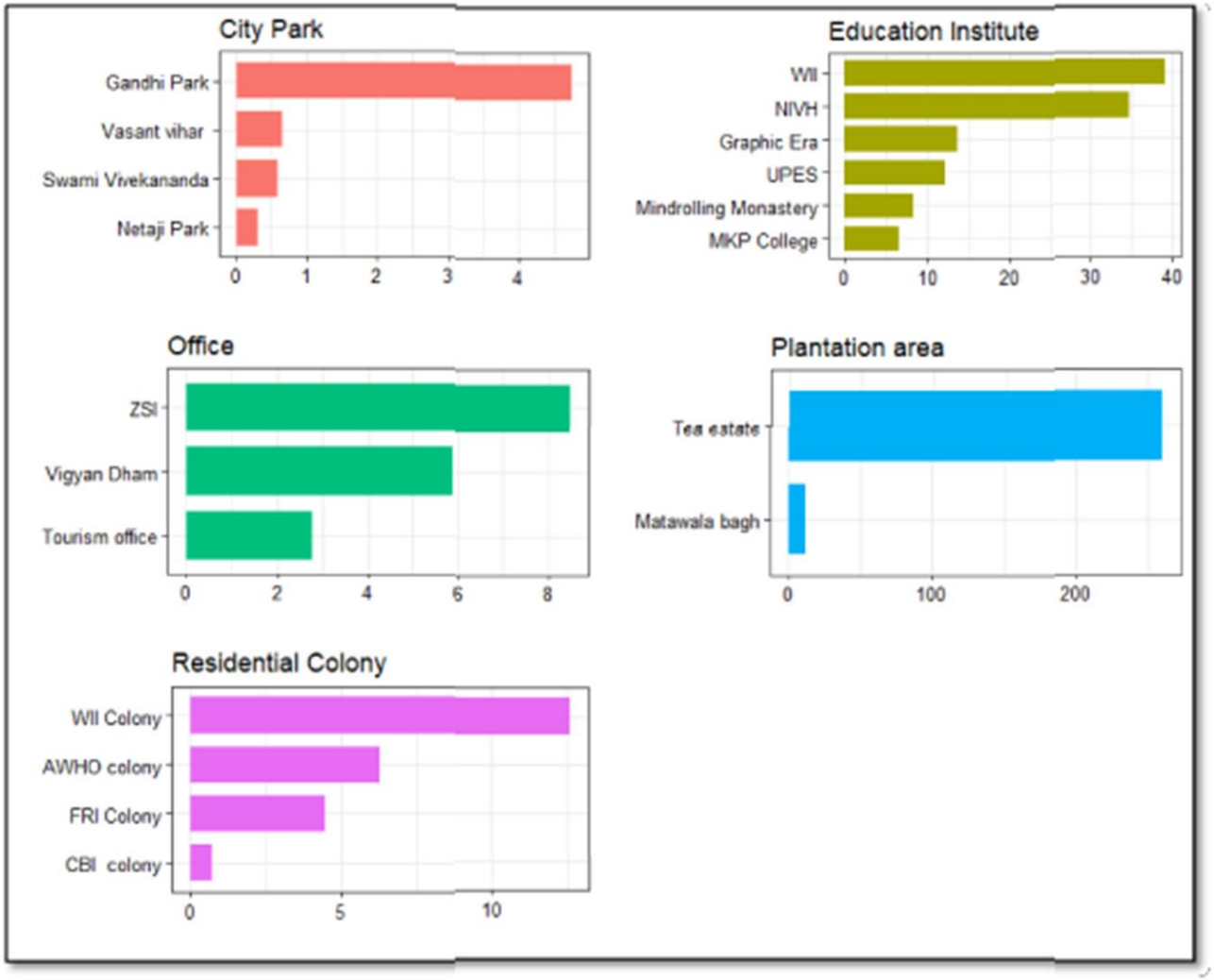
NIVH

UPES

WII

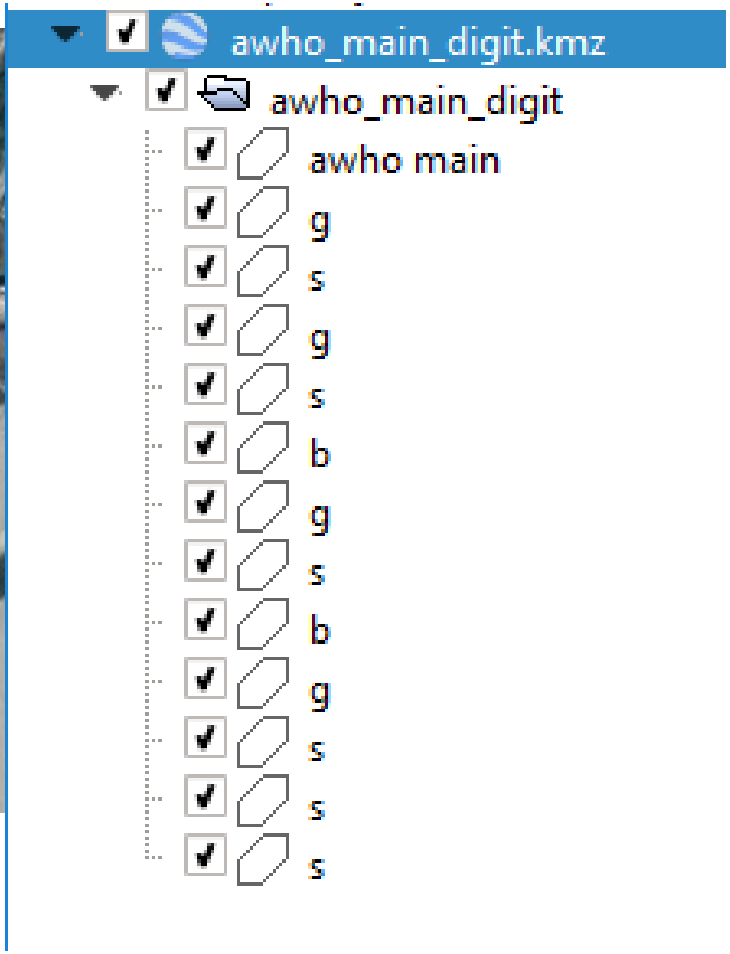
The study- Step 1

Selection of UGS



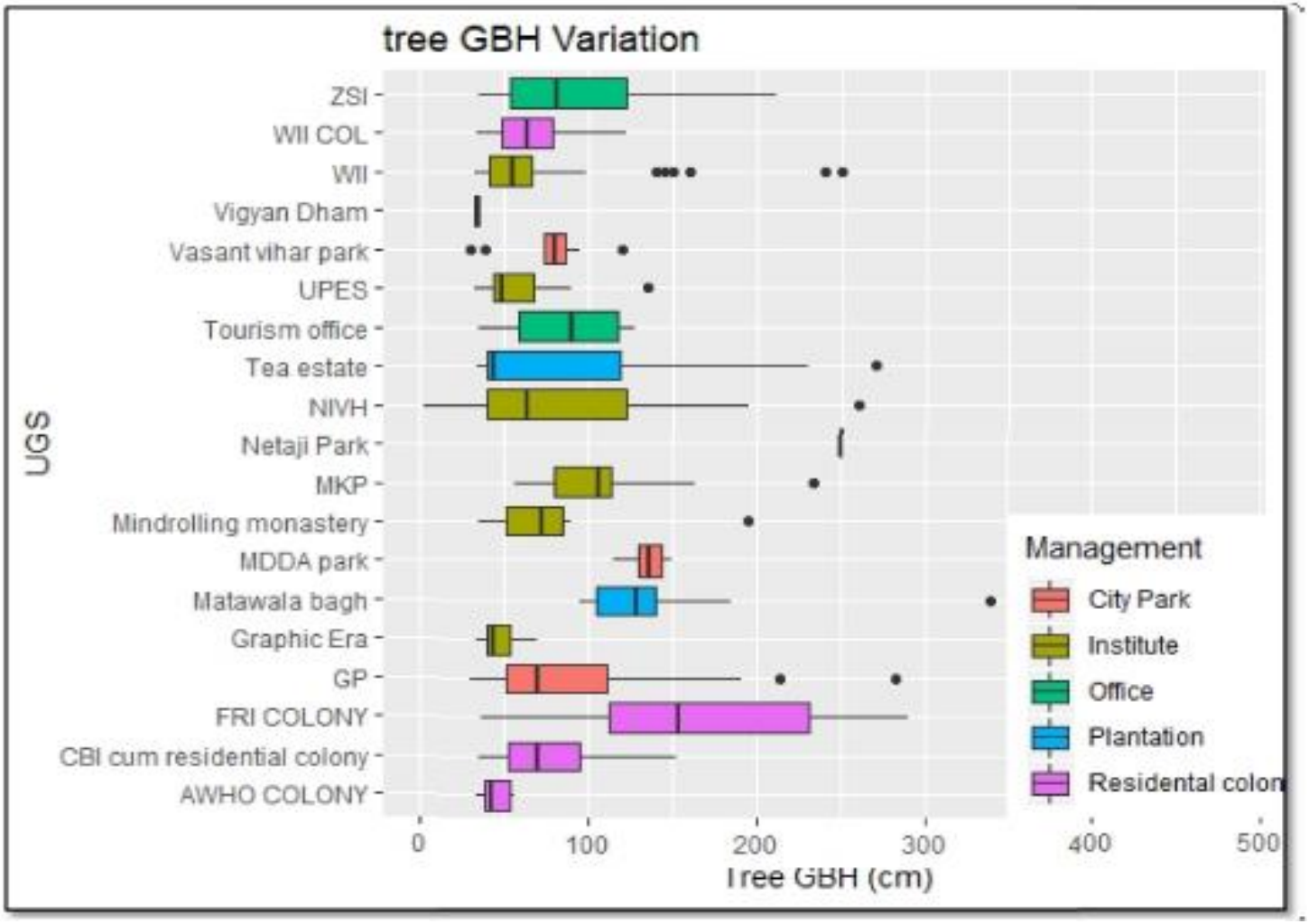
The study- Step 2

Estimating different features of green space and its matrix.

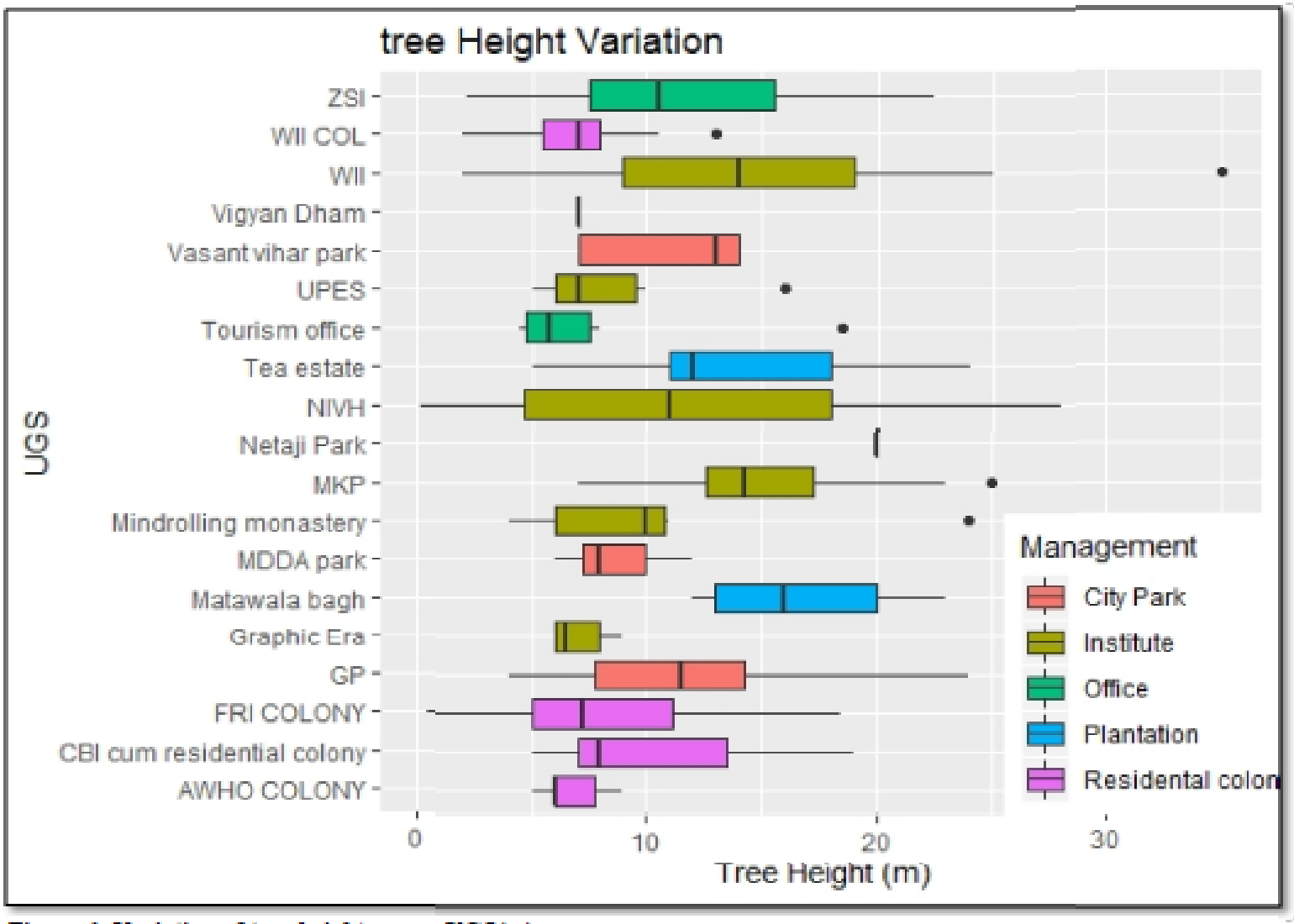


The study- Step 2

Step 3- Estimating different features of vegetation in an urban green space.



Step 3- Estimating different features of vegetation in an urban green space.



Sampling

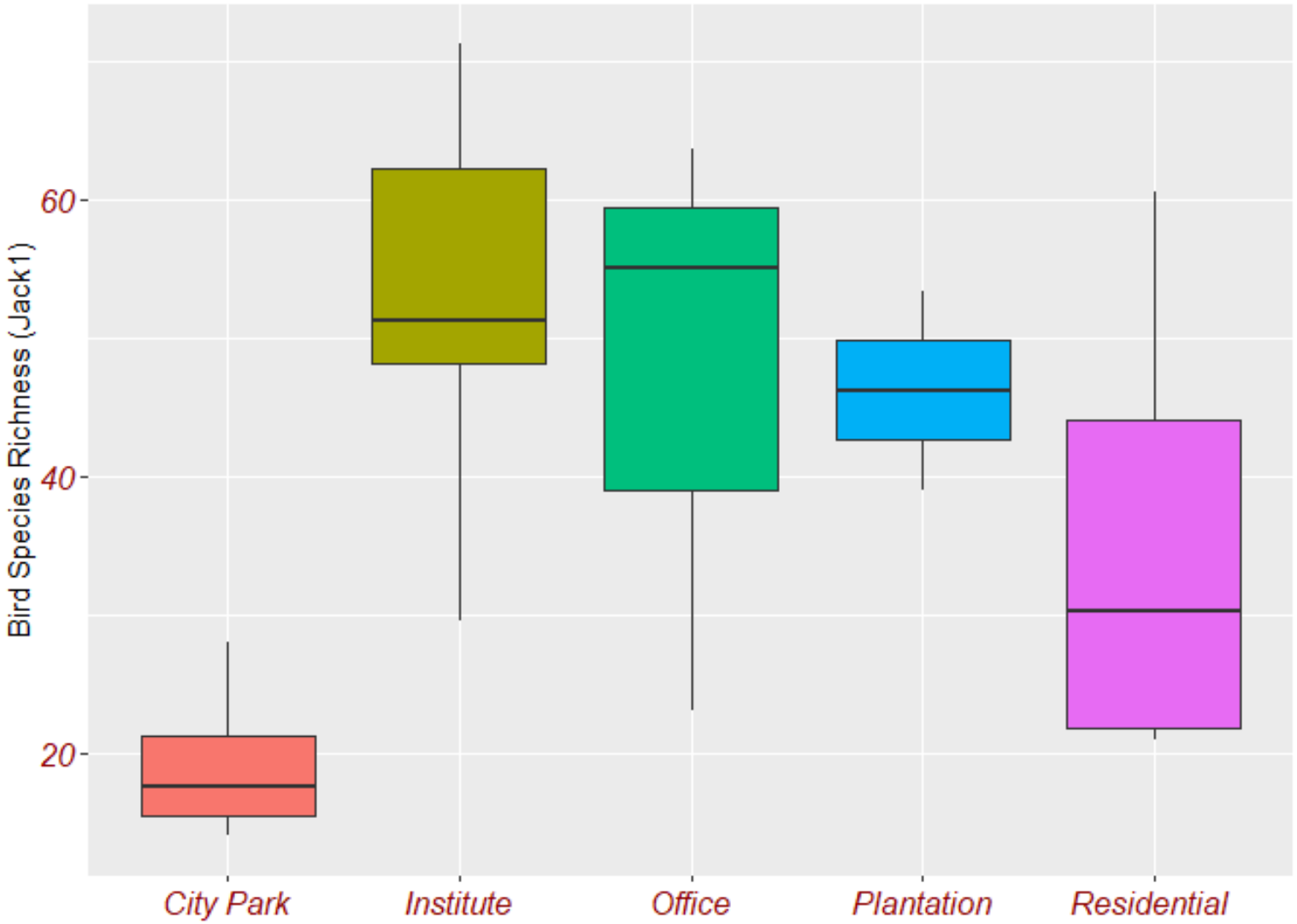
A total of 220 (55 points x 4 times) variable radius point transects were undertaken during the entire study period.

A total of **115 species** (2013 detections)were reported across urban green spaces of Dehradun.

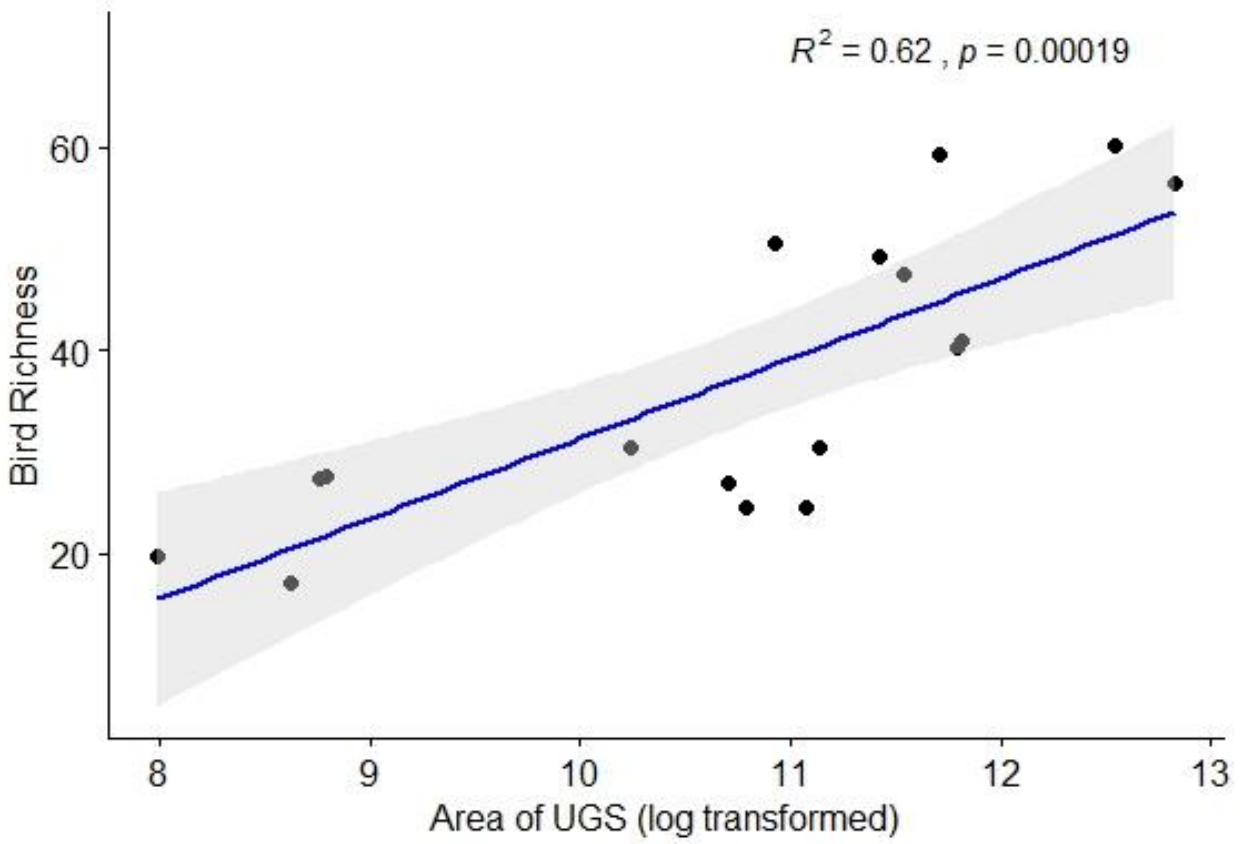
Results- Estimating bird species richness

Oriental pied hornbill, a forest bird, seen in Forest Research Institute colony (an old residential complex), may be due to its closeness to Forest Research Institute and the old native trees in the colony.

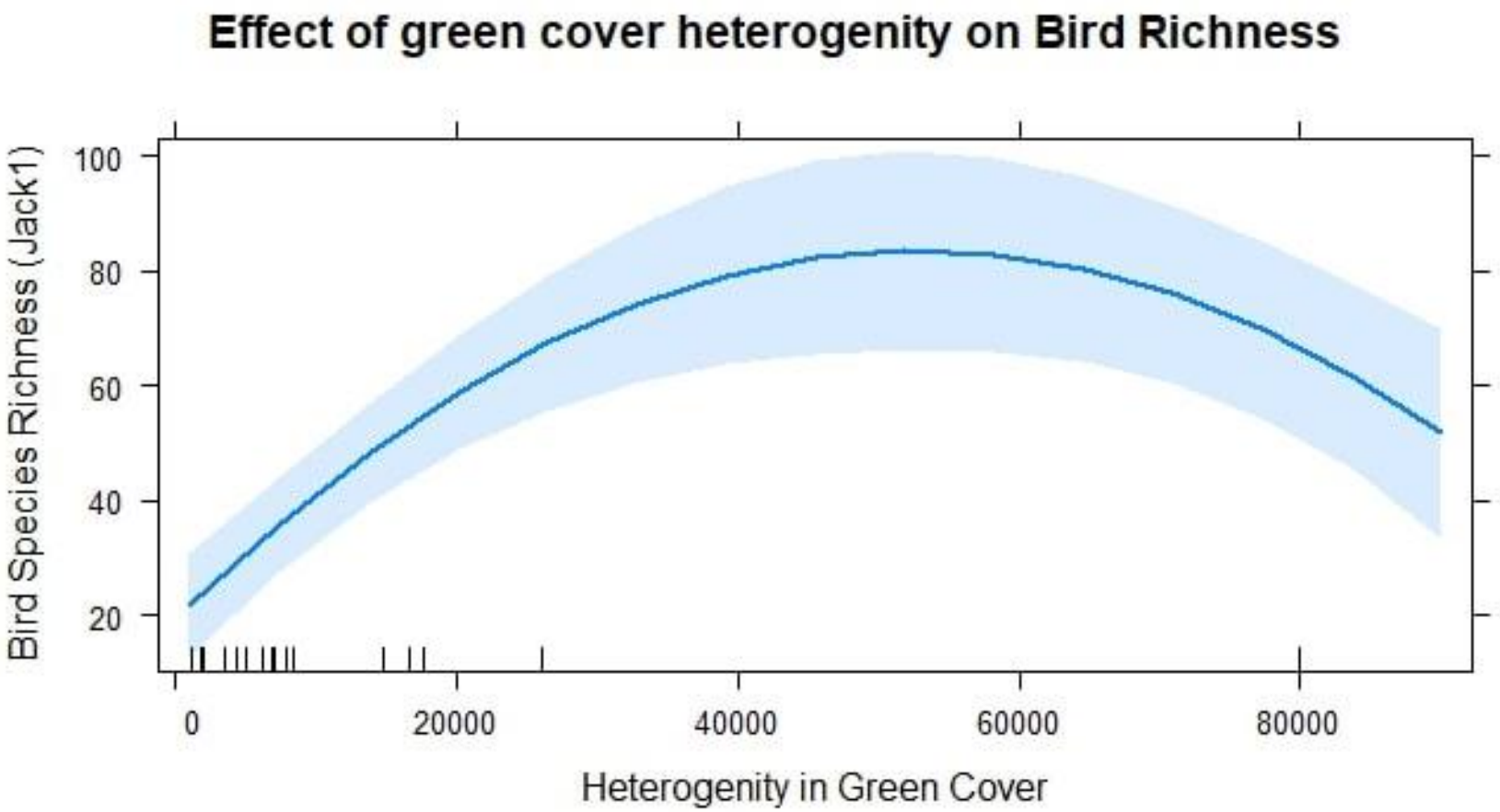
Blue bearded bee eater, largest bee eater in India was seen at few of the UGS.



City Park had lowest bird species richness during non-breeding season whereas old institutes and old offices had maximum bird richness



City Park had lowest bird species richness during non-breeding season whereas old institutes and old offices had maximum bird richness


Effect of green cover heterogenity on Bird Richness
Bird Species Richness (Jack1)
100
80
60
40
20
0
20000
40000
60000
80000
Heterogenity in Green Cover

Discussion

- Why don't city parks support as many species as other UGS?
- Why does species richness increase with size of UGS?
- Why does species richness increase with increase in green cover heterogeneity?

Conclusion

- Immediate action is required to minimize the disturbance within existing city park for improving their biodiversity potential.
- UGS planning should be conceptualized at a larger regional scale enabling required connectivity between UGS.
- Surrounding matrix too could increase the biodiversity potential of the UGS.

What lies ahead?

- Understanding the functional diversity of birds across UGS with a focus on generalist and specialist species.
- The study will be continued during the breeding period as well.