Facilitating Institution

Jawaharlal Nehru University (JNU)

Speaker: **Ms Sonali Sharma, Jawaharlal Nehru University, New Delhi**
Topic: **Regulating ecosystem services in urbanising landscapes of Western Himalaya**

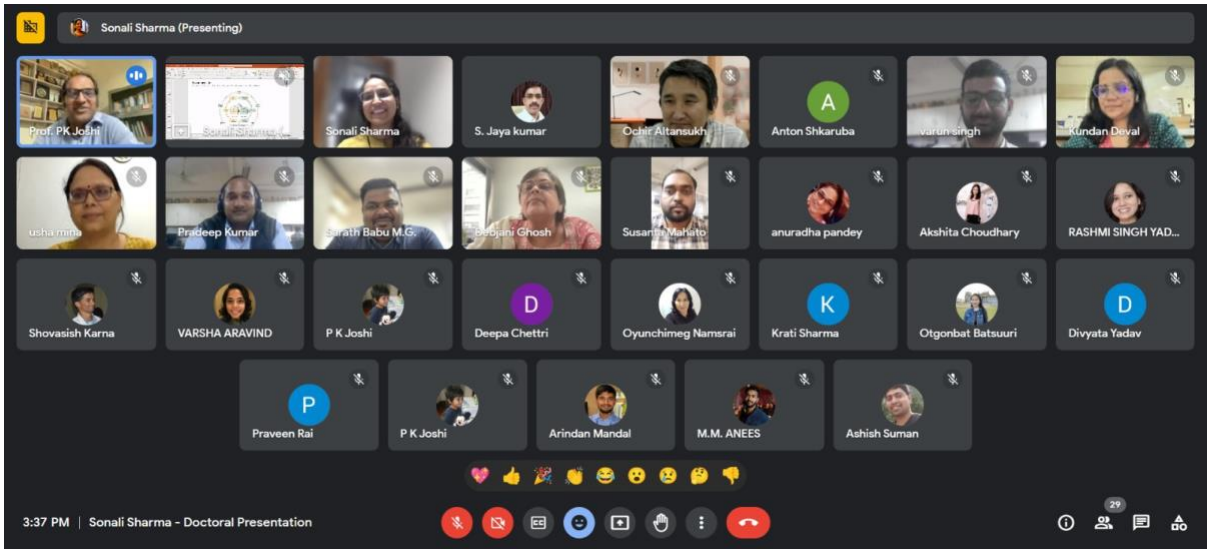
Ms Sonali Sharma presented significance of using multi-resolution and multi-temporal remote sensing datasets for evaluating spatio-temporal landscape dynamics and measuring the impacts of urbanization in the western Himalaya of India. Her research integrates diverse mapping and modeling techniques with scenario analysis, proving to be an effective method for understanding ecosystem services (ESs). Her studies areas - Pithoragarh, an urban center situated in valley floors with minimal topographical constraints, has efficiently utilized its immediate surroundings to develop into an urban continuum. In contrast, - Dharamsala, which spans various altitudinal gradients, has experienced irregular and fragmented growth, resulting in suburban clusters across different parts of the sub-watershed.

The results revealed, that the urban growth in both areas is mostly spontaneous, with little or no governmental intervention, especially in Pithoragarh. Such unplanned and extensive urban expansion in the Himalayas leads to the loss and fragmentation of natural ecosystems, adversely impacting the urban environment and overall human well-being. Given the general lack of integration of the spatial peculiarities of remote ecosystem services (RESs) in existing land use and land cover (LULC) change studies in the Himalayas, this study attempts to link the structural and functional components of mountainous landscapes. The research identifies the spatial peculiarities of individual RESs within and between different ecosystems across the landscapes. Significant spatial variability in RES supply was detected even within a single LULC class, with oak forests exhibiting higher carbon sequestration potential than others. These variabilities, mostly identified in biophysical estimations of RESs, hold significant information for ecosystem accounting and conservation decision-making.

The study revealed a consistently declining status of four crucial physical RESs, indicating a severe lack of planning and conservation measures in response to urbanization trends in these ecologically fragile landscapes. This is evident in individual and multiple RES hotspots maps, which show a severe scarcity of RES-rich areas within urban limits. This scarcity reduces resilience against multiple disasters, as RESs are crucial for mitigating disaster-related risks, ultimately posing socio-economic and well-being threats to the mountainous population. Furthermore, the results indicate that future RES supply is influenced by the interplay between climate change and LULC changes, with climate change having a stronger effect on RES trends in the western Himalayan landscapes. The climatological effects in both landscapes are primarily driven by precipitation. The simulation of multiple planning trajectories emphasizes the adoption of an ecosystem service provisioning (ESP) trajectory for ecosystem management. Such information can help decision-makers develop targeted and differentiated ecosystem management strategies.

In terms of research contributions, this thesis addresses four significant steps towards RES monitoring in two urbanizing landscapes of the Indian western Himalaya: (i) mapping and monitoring urban growth trends and patterns; (ii) spatially explicit mapping of crucial RESs; (iii) spatio-temporal monitoring of RESs, including their co-occurrence; and (iv) investigating the potential future of each RES. Thus, this research contributes significantly to the understanding and management of urbanization and its impacts on ecosystem services in the ecologically sensitive western Himalayan landscapes.

More questions pertaining to Ms. Sonali Sharma's research work can be corresponded through her email- ssonalijnu@gmail.com


Sonali Sharma (Presenting)
Prof. PK Joshi
Sonali Sharma
S. Jaya kumar
Ochir Altansukh
Anton Shkaruba
varun singh
Kundan Deval
usha mina
Pradeep Kumar
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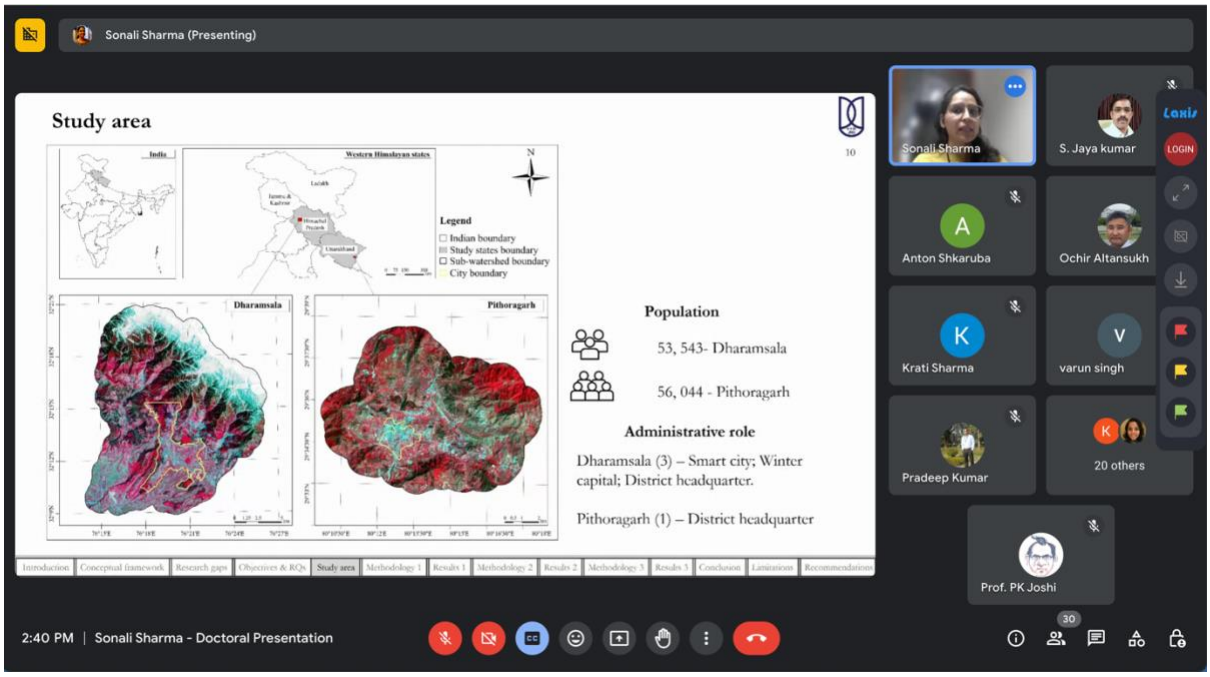
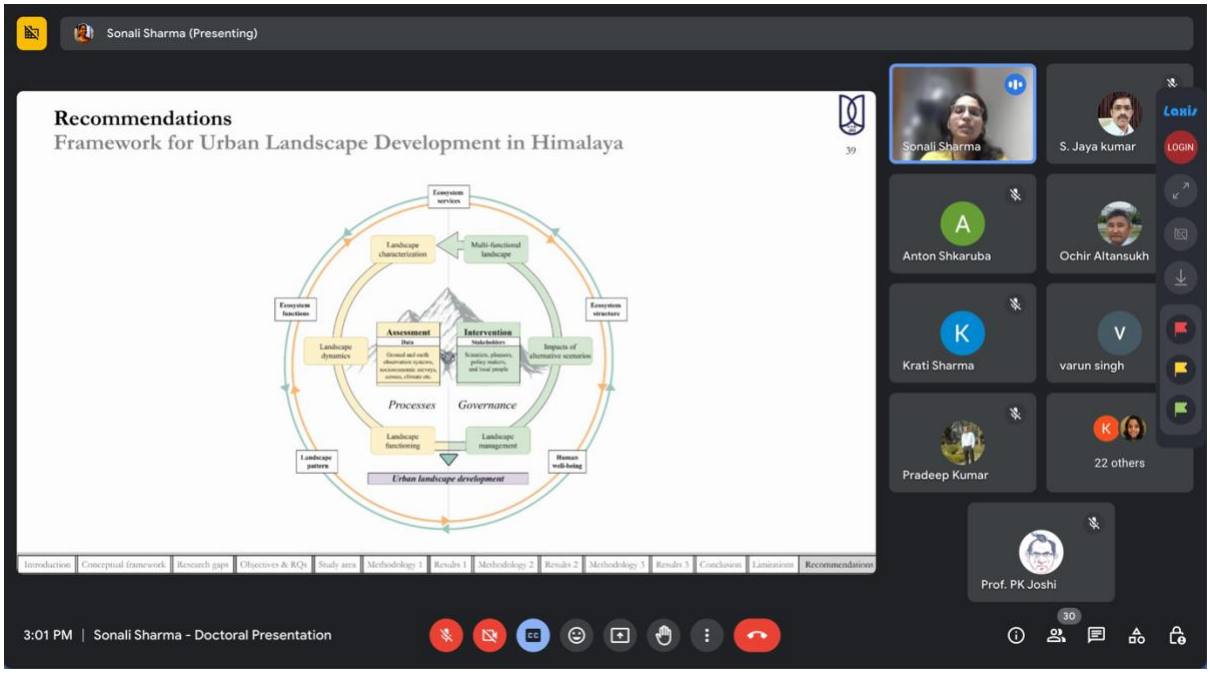
Arindan Mandal
M.M. ANEES
Ashish Suman
3:37 PM | Sonali Sharma - Doctoral Presentation


Sonali Sharma (Presenting)
Study area
Legend
Indian boundary
Study states boundary
Sub-watershed boundary
City boundary
Dharamsala
Pithoragarh
Population
53, 543- Dharamsala
56, 044 - Pithoragarh
Administrative role
Dharamsala (3) – Smart city; Winter capital; District headquarter.
Pithoragarh (1) – District headquarter
Sonali Sharma
S. Jaya kumar
Anton Shkaruba
Ochir Altansukh
Krati Sharma
varun singh
Pradeep Kumar
20 others
Prof. PK Joshi
2:40 PM | Sonali Sharma - Doctoral Presentation


Sonali Sharma (Presenting)
Recommendations
Framework for Urban Landscape Development in Himalaya
39
Ecosystem services
Landscape characterization
Multi-functional landscape
Ecosystem functions
Ecosystem structure
Assessment
Data
Intervention
Stakeholders
Landscape dynamics
Impacts of alternative scenarios
Processes
Governance
Landscape functioning
Landscape management
Landscape pattern
Human well-being
Urban landscape development
Introduction
Conceptual framework
Research gaps
Objectives & RQs
Study area
Methodology 1
Results 1
Methodology 2
Results 2
Methodology 3
Results 3
Conclusion
Limitations
Recommendations
Sonali Sharma
S. Jaya kumar
Anton Shkaruba
Ochir Altansukh
Krati Sharma
varun singh
Pradeep Kumar
22 others
Prof. PK Joshi
3:01 PM | Sonali Sharma - Doctoral Presentation
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