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| **Course Title** | Urban ecosystems and sustainability: A social-ecological perspective\* |
| **Programme Title** | Azim Premji University School of Liberal Studies (Common Curriculum) Understanding India 4 |
| **Mode** | M1 | **Level** | 2 |
| **Course ID** | Not yet assigned | **Credits** | 3 |
| **Course Type** | Elective | **Semester** | 4 |
| **Credits** | 3 | **Academic Year** | 2017-18 |
| **Prerequisite** | NA |
| **Course Development Team**  | Seema Mundoli and Harini Nagendra |
| **Course Instructor(s)** | Seema Mundoli |

# \*Course document in review; this is not the final version

# **Rationale**

The fourth course in the Understanding India component of the Common Curriculum comprises courses under the broad rubric of "India and its Futures". These courses are intended as an introduction to the debates about key issues of relevance to the economy, society and the polity. Many of these debates touch upon and overlap in the notions of development and sustainability. India's ongoing urban transformation is one such issue that gives rise to contestations about natural resources, rights and justice. This course will introduce students to some of the issues from that perspective.

# **Introduction to course**

# Currently 33% of the urban population in India resides in cities: projections for the future indicate that more than 50% of the country’s population will be urban by 2050. The expansion of cities has had visible impacts on environmental degradation both within cities and increasingly into peripheral areas or the peri-urban interface. The impacts of ecological degradation are visible in many ways: in the loss of green and open spaces, increased risks to health, economic loss to the city, climate change related impacts and so on. The causes and impacts of this environmental degradation too have been highly unequal. While urbanization has meant a widening of the gap between the rich and the poor in cities, it has also resulted in urban marginal groups being alienated from both accessing ecological resources and participating in decision-making. Issues of environmental degradation cannot be decoupled from those of social justice, especially in the Indian context.

# Cities are in fact closely linked or coupled social-ecological systems, and the dynamic and unpredictable nature of the interaction between social and ecological aspects makes urban ecological sustainability a “wicked problem”, where purely technological solutions are unlikely to work. Analyzing these problems and finding solutions requires incorporation of different social and ecological research methods from multiple disciplines, and learning to build collaborations with civil society for positive actions.

# UI4 is the fourth of the five courses that comprise the Understanding India component of the Common Curriculum in the UG Program. In keeping with the objectives of the UI course, this course will focus on analyzing relations between human communities and ecological systems: in an urban context, thereby focusing on one of the critical challenges that India is facing, i.e. that of urban sustainability. The course is designed as a part of the ‘Centre for Urban Ecological Sustainability’ set up by the university recognizing the urgency of addressing the challenges to sustainability and equity posed by India’s urbanization. One of the Centre’s strategies is the outreach and dissemination of knowledge about urban issues and engaging with students is a step in this direction.

# **Course objectives**

# The course will introduce the students to new ways of looking at cities as complex, coupled social-ecological systems, by applying multiple research methods. The course will encourage students to critically reflect on a new normative outlook to govern urban ecosystems in Indian cities, reflecting on the role of nature in addressing issues of equity and sustainability. The objective of the course is to enable students to appreciate the complexity of urban problems, and realize the limitations of purely technological ‘solutions’ thinking for urban sustainability, but at the same time understand how to engage with social and ecological issues in an incremental, adaptive manner while not being so overwhelmed that complexity results in inaction[[1]](#footnote-1).

# This course is aimed at helping students identify the importance of nature for social and ecological wellbeing in Indian cities, by illustrating the importance of urban ecosystems in aspects such as buffering poverty by supporting subsistence and livelihoods, enhancing physical and mental well-being, supporting biodiversity and building resilience to climate change. Using specific urban challenges as cases (for example biodiversity loss and flooding) the course will help students understand why urban challenges are complex social-ecological problems that cannot be solved by technological fixes alone.

# The course aims to enable students to

# Understand cities as interconnected social-ecological systems, moving away from the dichotomy of nature and society as depicted in traditional urban planning

# Analyse urban environmental problems as complex problems, which cannot be solved by technological fixes alone owing to their interlinked social and ecological nature

# Apply multiple social and ecological research methods in evaluating specific urban problems and seeking incremental solutions

# Formulate an alternate normative model for governance of urban ecosystems

# **Pedagogy**

# The course will be taught through a mixture of readings, lectures, audio/visual aids, in class discussions and presentations, and field visits to learn and apply methods. Each class will begin with a brief summary by one or more students on the assigned reading for the day or a reading allotted for that class the week before. This will be followed by a lecture and class discussion. There will also be one faculty led field interactions, focused on deriving a social-ecological history of one of Bengaluru’s oldest areas (Begur). In addition, there will also be a field based exercise for students to learn ecological methods of tree census and carbon assessment.

# **Assessment and grading**

# The assessment and grading is structured to ensure both individual and collective learning, as well as sharing of experiences.

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| Response paper 1 | 20% (Unit I) | Response to a single paper (750 words) |
| Documentary review | 15% (Unit II) | Students will write a review of a documentary (linked to a reading in class) drawing on the perspectives provided in the reading (500 to 600 words) |
| Response paper 2 | 20% (Unit III) | Response to two texts that deal with a similar idea but written from different perspectives (750 words)  |
| Tree census and carbon mapping | 15% (Unit III) | Students in groups of two will be required to map 5 trees in the vicinity of the campus and calculate the carbon content  |
| Project presentation (group work) | 15% (Unit IV) | Groups will be given topics to work at the end of Unit III which they will have to present in Unit IV. |
| Class participation | 15% (throughout) | In each class one or more students will be given a task related to prescribed reading or any other relevant small piece. This will be assigned in the previous week. By rotation, all students will make short presentations in class during the duration of the course, and participate in discussions following presentations.  |

# **Syllabus & Readings (16 weeks; each week 3 hrs)**

# **UNIT I: Introducing nature in Indian cities (3 weeks)**

# Traditionally cities were seen as human dominated landscapes, and the presence of nature in cities can be difficult to imagine. And yet it is present all around us. This unit will especially highlight cities as closely linked social-ecological systems, moving away from the dichotomy of nature and society that is a the more prevalent notion. This unit lays the ground for the need to address urban challenges incorporating perspectives from both the social and ecological perspectives. It will also introduce to the students to the multiple benefits urban residents derive from nature especially the urban marginalized.

# Week 1: (3 hrs): Introductory class to present the outline of the course, and draw from discussion with students what their idea of nature in the city is. This will be followed by an overview of how environment was traditionally presented in urban planning in India.

# Reading:

# Planning Commission. 2013. Urban development. In: Twelfth Five Year Plan (2012-2017) Economic sectors, Volume 2. New Delhi: Sage Publications

# Week 2: (3 hrs): The week will introduce the idea of cities as closely linked social and ecological systems. This week also will introduce the different spaces where nature exists in cities in India, and the extent of biodiversity these ecosystems support.

# Readings:

# Liu et al 2007. Complexity of coupled human and natural systems. Science, 317: 1513-1516

# Krishnan M. 2014. The wildlife of Madras City. Current Conservation 8.1: 6-12

# Week 3: (3 hrs): This week will introduce highlight the social, economic, ecological and cultural role of urban ecosystems. It will provide the students with an idea of the critical nature of urban ecosystems for the poor in cities.

# Readings:

Nagendra H. 2016. Nature and poverty: Vegetation in slums. In: Nature in the city: Bengaluru in the past, present and future. New Delhi: Oxford University Press. pp 79-97

Mukherjee J. 2015. Beyond the urban: Rethinking urban ecology using Kolkata as a case study. International Journal of Urban Sustainable Development, 7(2): 131-146.

ASSIGNMENT: Response paper (750 words) (Nagendra 2016)

Faculty led field visit (Begur temple, lake, fort and katte)

**UNIT II: Addressing urban ecological sustainability (5 weeks)**

Since cities are closely linked social-ecological systems, addressing challenges is complex and cannot be addressed through simplistic technology focus solutions alone. In this section we will explore some major challenges of urbanization faced by Indian cities. Through a discussion of case studies students will be able to understand the crisis facing cities owing to urbanization, and how these challenges can be addressed using an integrated social and ecological approach.

Week 4: (3 hrs): Ecosystem degradation and biodiversity loss is a major concern of urbanization. In this week we use two cases to highlight the social and ecological complexities that make protection of biodiversity a major challenge in the urban context.

Readings:

Vasudevan, V. 2013. No home for the bristled grassbird. In: Urban villager: Life in an Indian satellite town. Sage Publications, New Delhi. Pp. 121-139

Zerah M, Landy F. 2015. Nature and urban citizenship redefined: The case of the National Park in Mumbai. Geoforum, 46: 25-33

Week 5: (3hrs): Water bodies in cities provide many critical services, yet unplanned urbanization has disregarded the role of these waterbodies and associated wetlands resulting in crisis such as flooding of cities, and exclusion for marginalized communities such as grazers and fishers.

Readings:

# CSE. 2016. Why urban India floods. State of India’s urban water bodies. Down to Earth

# TBD

Week 6: (3 hrs): Climate change impacts on cities can deteriorate the quality of life for urban residents, with especially severe impact on the urban poor. One of the major concerns is the rising urban temperatures as a consequence of the loss of green cover.

Readings:

Imam AUK, Banerjee UK. 2016. Urbanization and greening of cities: Problems, practices and policies. Ambio, 45: 442-457

Vailshery et al. 2013. Effect of street trees on microclimate and air pollution in a tropical city. Urban Forestry and Urban Greening, 12:408-415.

Week 7: (3 hrs): Air pollution has detrimental impacts both on health of urban residents as well as the economy of India. Efforts at reducing air pollution have presented a huge challenge as these are linked to the larger issues of economic development of the country and environmental justice.

Readings:

Dahiya et al 2017. Airpocalypse: Assessment of air pollution in Indian cities. Greenpeace, India.

Veron R. 2006. Remaking urban environments: the political ecology of air pollution in Delhi. Environment and Planning, 38: 2093-2109

# Week 8: (3 hrs): The issue of generation and disposal of urban solid waste raises deep concerns not just for the environment but also from the perspective of social justice. This week will analyse the disproportionate impacts of urban solid waste generated by urban residents on peri-urban communities and environments.

# Readings:

# ESG.2010. Bangalore’s toxic legacy: Investigating Bangalore’s illegal landfills. Environment Support Group

# Dahiya B. 2003. Hard struggle and soft gains: Environmental management, civil society and governance in Pammal, South India. Environment and Urbanization, 15(1): 91-100

# ASSIGNMENT: Review of the video (From the Margins, Video on the Mumbai Landfill in M Ward, Chembur within the city) along with perspectives from readings

# **UNIT III: Applying multiple methods in analyzing problems of urban ecological sustainability (3 weeks)**

# In this section students will learn about using different methods in identifying and analysing urban problems. The students will be exposed to the use of archival data collection, oral history, GIS and ecological data collection.

# Week 9: (3 hrs): In this week students will see how urban ecology can aid in addressing a larger environmental issue faced by a city. Using the example of the controversial steel flyover project that was proposed in Bengaluru, students will find out how ecology, civic action and legal recourse were all able to stop a project that could have resulted in depleted tree cover.

# Readings:

# Project documents of the steel flyover

# Newspaper articles on the protests

# Ecological report of tree census and method for carbon mapping

# Week 10: (3 hrs): In this week students will read two texts that present issues of an urban ecosystem from very different perspectives. They will appreciate the difference in presenting the complexities of an urban social-ecological system from very different perspectives

# Readings:

# Crowley T. 2105. Fractured forest: the political ecology of the Delhi Ridge. Intercultural Resources, New Delhi

# Week 11: (3 hrs): In this week the students will see how mixed methods can be applied to analyse urban problems.

# Readings:

# Unnikrishnan et al. 2016. Mapping the transition of a lake to a sports stadium in Bengaluru. International Journal of Commons, 10(1): 265-293.

# ASSIGNMENT:

# Response paper comparing the two papers Sampangi and Delhi Ridge

# Tree census and carbon assessment near the campus, and the methodology on how to do this will be done in class in Week 9. The exercise will be linked in class to the larger debate on development versus environment using the case of the controversial steel flyover proposed in Bengaluru, opposed and eventually defeated by citizen protests. Both these visits are aimed to provide experiential engagement with the linked social and ecological aspects of urban sustainability.

# **UNIT IV: Urban ecological governance (5 weeks)**

# In this section we will elaborate on the popular perceptions of how different stakeholders-- state, private and communities view nature in the city. The new models of cities proposed for example smart cities will be examined to see the environmental and linked social costs of developing such cities through public-private partnerships. The section will also critically explore an alternate model of urban ecological governance that goes beyond the state and private. It will introduce students to the possibilities of collectively managing natural spaces in cities as urban commons.

# Week 12: (3 hrs): The State has been a major actor in defining how urban natural systems are perceived. In this week students will examine how the State’s along with urban middle class views on urban nature has defined urban ecosystems, and the impacts of these on specific urban groups.

# Readings:

Desai R. 2012. Governing the urban poor: Riverfront development, slum resettlement and the politics of inclusion in Ahmedabad. Economic and Political Weekly, 47(2): 49-56

Week 13: (3 hrs): Another actor in defining the role for nature in cities are private players, who place an economic value on nature that disregards other ecosystem services accessed by a range of urban residents. In this week and the next students will engage with a critique of models of governance of urban ecosystems that are neither sustainable nor equitable

Readings:

# Gupto S. 2015. Reflection in a pond. Comic strip. Down to Earth. URL: http://www.downtoearth.org.in/classroom/reflection-in-a-pond-50828

# Zimmer et al. 2016. Of parks and politics. The production of socio-nature in a Gujarati town. Local Environment, DOI: http://dx.doi.org/10.1080/13549839.2016.1157157.

# Week 14: (3 hrs): The dominant imagination of cities among the government is presented in the ambitious 100 smart cities project. These prioritize the “smart environment”, but how much does it contribute to equity and sustainability is questionable. In this week students will critique the governments vision of a smart city from the perspective of what it means for nature in the city.

# Readings:

MoUD (2014): Draft concept note on smart city scheme. Ministry of Urban Development, Government of India, New Delhi.

Mundoli et al. 2017. The “sustainable” in smart cities: Ignoring the importance of urban ecosystems. *Decision* (Journal of the Indian Institute of Management-Calcutta), 44( 2): 103-120

# Week 15: (3 hrs): In this week students will be introduced to the idea commons as a framework for urban ecosystem management, and as a model that could bring together not just citizens but also collaborations with the state.

# Readings:

# Gidwani V, Baviskar A. Urban commons. Economic and Political Weekly, XLVI (50): 42-43.

# Murugan, P. 2017. Exclusive: Perumal Murugan on T.M. Krishna’s Song in Solidarity with Chennai’s Endangered Creek. URL: <https://thewire.in/101264/t-m-krishna-ennore-creek-permual/>

# Week 16 (6 hrs): Final presentations and wrap up of course

# **Faculty-led field visit**

# The first field visit will expose students to social and ecological methods to derive the history of one of Bengaluru’s oldest areas, Begur: via mapping and interactions with local residents, and collecting oral histories about the past and present ecosystem services of ecological resources (the Begur temple, associated lake and ashwathkatte).

1. DeFries R, Nagendra H. 2017. Ecosystem management as a wicked problem. Science, 356: 265-270 [↑](#footnote-ref-1)