

Can data help decipher a science of the Indian city system?

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This talk focuses on initial explorations in how data can be applied to the task of developing a scientific understanding of the Indian city system.

The mathematician Warren Weaver argued that science had yielded significant insight in dealing with two-variable problems of simplicity, as well as problems of ‘disorganized’ complexity (very large numbers of randomly scattered variables whose mean-field behaviour is predicted using statistical mechanics). This left open a large middle ground of problems dealing with a sizable number of inter-related variables - these are problems of ‘organized’ complexity. Inspired by Weaver’s classification, journalist and urban activist Jane Jacobs, in 1961, described cities as problems of organized complexity, with several subtly interconnected variables varying simultaneously. Ever since, there has been a gradual emergence of work on studying cities as complex systems.

I will specifically discuss the application of the framework of ‘scaling’ - or, how properties of a system change with size - to cities in general, and to the Indian city system, in particular. We will explore how characteristics such as infrastructure, innovation, income, and crime in cities change with city size. Scaling behavior in India largely corresponds to expectations from urban scaling theory as well as empirical evidence from other national contexts, but there are also significant discrepancies, which possibly throw a light on the nature of socialization in Indian cities, and the persistence of pre-modern gender and caste relationships.

An important feature of the Indian urban landscape is the emergence and proliferation of slums. I will attempt to characterize the relative properties of urban slums, focusing on attributes of neighborhoods such as access to basic services like water, sanitation, and electricity. This analysis highlights two distinct kinds of urban inequity - across neighbourhoods within cities, and across city scales and levels of development.

The paucity of data at the urban level and the absence of official definitions for functional cities in India create a number of limitations and caveats to any analysis. I will discuss these shortcomings and highlight the challenge for a systematic statistical data collection relevant to cities.

The urban transformation of India is one of the most momentous social processes of this century, and a deeper understanding of this evolution will be key to a sustainable planetary urban future.