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Architecture As Ecology: Systems-Based Sustainability Approaches in Shrinking First-Suburbs in the Mississippi River Watershed

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Position Statement

Sustainability has become a central issue in architectural theory and practice as evidenced through the rise of policy and metric actions such as the U.S. Green Building Council's (USGBC) [Leadership in Energy and Environmental Design](#) (LEED) rating system, the [International Green Construction Code](#), Green Building Initiative's [Green Globes](#), and the [Living Building Challenge](#). However, as these diverse approaches suggest, architecture continues to address sustainability through pluralistic goals, contested frameworks, and diverse sets of tools. Yet, sustainability is not simply an architectural issue about energy efficiency, materials economy, or authenticity in dwelling. Sustainability is a debate on our way of life and how we, humans, inhabit the world. It transcends individual disciplines as an issue of health, well-being, and ethics.

In the contemporary era of intense globalization and urbanization, it is impossible to divorce architecture (typically operating at a micro scale) from the larger context (meso- and macro-scales) in which it manifests. Architecture exists as a moment in a context characterized by multi-layered and multi-scalar infrastructural systems. To address this context, my current research engages ecological considerations through disciplinary priorities of tradition, technology, and urbanism. The ecological model, framing architectural sustainability, introduces distribution and interaction between organisms and their natural environment as the fundamental priority. In reference to classical works, I define the notion of sustainable development as a process connecting natural systems (soil, climate, hydrology), human systems (social ethics and values), and economic systems (allocation, distribution, and management of resources). Thus, architecture shifts from its tradition of being object-based to being a system of dynamic connective processes.

Inspired by McHarg's and Odum's system-based notion of sustainability, my ecological definition of sustainability defines sustainable development through categorical priorities based on ecological needs, which transcend familiar disciplinary boundaries of form, open space, policy, and implementation. It introduces two categories as core issues within architecture: human-nature integration and human well-being. These categories construct a challenge framework to test against questions of architectural sustainability. My objective is to use my challenge framework of architectural sustainability through ecology to define, develop, and implement systems-based sustainability metrics to evaluate urban conditions and implement sustainable approaches in first suburban counties in the Mississippi River Watershed (MRW).

First suburbs are complex and heterogeneous, often neglected and less studied. Neither fully urban nor completely suburban or rural, America's older, inner-ring “first” suburbs, especially in the Midwest, have a unique set of challenges—such as concentrations of elderly and immigrant populations as well as outmoded housing and commercial buildings—very different from those of the center city and fast-growing newer places (Brookings Institute). These present a challenging context with serious issues for sustainable development. Inner-ring communities just outside central cities, first suburbs are defined as current counties which were 1950 standard metropolitan areas containing or adjacent to one of the top 100 cities in 1950 and with a minimum population of 120,000. Based on this definition, there are 64 first suburban counties identified in the United States, out of which 16 are within the MRW boundary.

MRW first-suburb counties (highlighted in red) in the context of the MRW and 64 first-suburban communities in the United States.

Focusing on some of these first suburbs in the MRW as case studies, I intend to engage in a meso-level (city and community) documentation, analysis, and evaluation of three ecological layers and their interactions:

1. physical and social access to community resources;

2. extent of human-nature integration; and
3. ecological well-being.

Specific methods will involve defining and measuring independent variables (such as performance of green infrastructure, carbon sequestration, social mobility, non-human species distribution, etc.) toward developing sustainability metrics. The correlation study among these variables will provide an evaluative context for sustainability in each case. Possible outcomes include:

1. generating an evaluative framework to understand types of first suburbs; and
2. developing a sustainable urbanism framework for first suburbs in the MRW for planning and development.

My teaching, writing, and service, focuses on these theoretical, conceptual, methodological, and systemic dimensions of architecture in the city. My work builds upon, connects, and extends, the domains of urban ecology, critical regionalism, everyday urbanism, and placemaking. Major research foci include: processes of metropolitan restructuring and design responses to uneven spatial development; comparative principles and practices of urbanism; and the problem of publicness in architecture and urban studies with particular reference to critical questions of the public realm. I have conducted extensive research on architecture and urbanism in the American urban context. My 2017 book, [*Shrinking Cities and First Suburbs: The Case of Detroit and Warren, Michigan*](#), captures my interest in the evolving dynamics of the Detroit Metropolitan Area and regional planning. My research and writing have been published in [*Sustainability and the City: Urban Poetics and Politics*](#) (2017), [*Architecture and Sustainability: Critical Perspectives*](#) (2015), *Michigan Historic Review* (2016), *Community Development Journal* (2015), [*Inhabiting Everyday Monuments*](#) (2014), [*Terrain Vague: Interstices at the Edge of the Pale*](#) (2013), [*Urban Design International*](#) (2013), [*The Urban Wisdom of Jane Jacobs*](#) (2012), and *Volume Magazine* (2009). My research has been funded by the European Union Erasmus+ grant, Global Initiative of Academic Network (GIAN), India grant, the American Institute of Architects (AIA) Research Funding Program, and the Coleman Foundation.

I also have professional practice experience in several city, county, and regional urban design and planning projects in India, in the United States (especially in Buffalo, NY and Detroit, MI). As an Urban Design Associate at the Urban Design Project, University at Buffalo, I received the 2005 national APA outstanding plan award for the [*Queen City Hub: Regional Action Plan for Downtown Buffalo*](#), in which I made critical contribution in urban analysis and visualization. I also have diverse international

experience in collaborative transdisciplinary teaching and research with architects, planners, urban designers, and community organizations (U.S.A., Costa Rica, Italy, India). With my academic background and research context, I am interested in this opportunity to deliberate on the nature and value of sustainable urban systems in the context of urban-rural interface within the MRW.

Developing a Sustainable Urban Systems (SUS) agenda for the urban-rural interface is a groundbreaking opportunity to consider architecture and environmental sustainability within the critical framework of National Science Foundation. To this end, I hope to contribute with my research in philosophies, methods, and tactics to integrate evidence-based scientific approaches with human-focused priorities of architecture and design. Given this opportunity, I am keen to engage with academic researchers, practitioners, and multiple stakeholders in the first-suburban communities across the MRW. The workshop is a collaborative platform to develop research agenda, protocol outlines, and possible outcomes to define, understand, measure, evaluate, and question implications of sustainable systems in our metropolitan communities.

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