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Editorial overview: System dynamics and sustainability: Context and scale matter: harnessing the power of place-based innovations through university-community partnerships for sustainability

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Cities have always been sites of experimentation; consider Garden Cities and New Towns from a previous century, the innovative capital cities like Chandigarh and Brasilia, or even Frank Lloyd Wright's utopian and unbuilt Broadacre city. Each of these grand experiments were largely products of individual thinkers and visionaries (mostly men) and they attempted to create and plan for orderly growth and change. Sustainability was on the minds of these innovators — even if the concept was not developed or articulated as it is now. Each experiment, although futuristic, responded to the dominant challenges of their time and used the new technologies of the day to address those challenges. Simultaneously, these experiments also provided a rule book for living and working — providing the public with guiding principles and frameworks to maximize the benefits of living in these experimental cities. In so doing, these visionaries recognized the need to couple socio-behavioral adaptation along with technological innovation to change conventional ways of thinking.

In the first half of the 21st century, as we prepare for a future dominated by the need to adapt to human induced climate change impacts, the experimentation continues. Evans and Karvonen [1] describe Masdar City, a planned city being developed in the United Arab Emirates that is innovating by developing a carbon free, clean tech hub that can also a potential home for about 40,000 to 50,000 people (about the population size of an average NYC neighborhood) by 2025. The price tag for the project is currently estimated at approximately USD 16 Billion. With the need to make cities more sustainable, to reduce their impacts on the planet and to begin to remediate their own pollution, there has been a proliferation of similar small-scale natural experiments across the globe. Many of these experiments are supported by government and industry, while other experiments are sponsored by the nonprofit and philanthropic sector. The C 40 cities, a network of city leaders that collaborate to tackle climate challenges like reducing Greenhouse Gas Emissions is supported by Bloomberg Philanthropies, the Clinton Foundation, and the Ford Foundation among others. Individual groups and communities are also taking action at an incremental scale under the umbrella of movements such as the Transition Towns movement which is vibrant in the United Kingdom and growing rapidly in the United States. This movement emphasizes citizen-led education and action and emphasizes self-reliance and community resilience. However, we concluded that these changes may be taking place more autochtonically than previously thought, escaping academic involvement or analysis.

This special issue attempts to address these knowledge gaps by critically examining experiments and actions that bring academic expertise and knowledge into the conversation about creating and sustaining these experiments to better understand the short and long term impacts of innovative interventions. Our goal is to spur a meaningful debate about the role of universities in providing scientific data and knowledge to spur experimentation in the urban fabric in order to achieve greater urban sustainability. We also seek to understand how colleges and universities develop and implement policies and frameworks to formalize and institutionalize innovative practices and therefore solicited articles that critically examine the role of the university in creating social and infrastructure changes in the built environment.

Although the articles assembled in this special issue exemplify some diversity — our authors work at colleges and universities in the United States, Canada, Ireland, the United Kingdom, the United Arab Emirates, Spain, and Columbia, we found it difficult to recruit manuscripts from the developing world. Our efforts to reach scholars working within universities on partnership projects from India, China, South Africa, and Brazil, for instance yielded initial interest but did not result in actual submissions. Most of the sites of innovation described in this issue are US cities — Milwaukee, New York, Portland, and San Jose, although international locations such as Dublin, Ljubljana and Medellin are also represented. Most importantly, it is useful to note that the first authors were almost always educated in North America and there is an inherent first world bias that permeates this special issue despite our best efforts.

Hilary Nixon and Dayana Salazar from San José State University explicitly describe how university community partnerships can be structured and managed to ensure that community priorities remain front and center in the design and implementation of partnership projects and agendas. The authors describe the impetus being driven by the University's Board of Trustees who emphasized community service and service learning. Nixon and Salazar, as do all the authors featured in this issue make a strong case for long-term engagement. Yet, such long term engagement cannot be accomplished merely with goodwill and volunteerism — funding is critical to establishing and preserving these partnerships. The San José *CommUniverCity* partnership is funded in equal parts by the city of San José, the University, and private philanthropy. From across the pond, Zorica Nedovic-Budic and her colleagues from University College, Dublin describe a robust European Union funded project 'Transitioning towards Urban Resilience and Sustainability (TURaS)' that helped to create partnerships between decision-makers in local governments, small and medium-sized business enterprises and academic institutions in eleven European cities over a five year period. (This paper will be published in a forthcoming issue of Current Opinion in Environmental Sustainability.) The tight coupling between industry and government facilitated demonstration projects that directly improved the quality of life for citizens while facilitating the testing of innovative ideas that advanced the creation of new research/academic knowledge. We did not receive any comparable submissions that described such a robust and well-funded partnership in the North American context.

Authors Miller and De Sousa describe long term partnerships in the cities of Portand, Oregon and Milwaukee, Wisconsin, each nurtured over an extended time period. Miller and his co-authors describe the Community Watershed Stewardship Program (CWSP) as a long-running city-university partnership between the City of Portland's Bureau of Environmental Services and Portland State University. Their robust case study demonstrates how the program partnership enabled the CWSP to serve more under-represented groups by setting measurable equity goals and increasing participation using targeted outreach materials and messages. They conclude that universities have the resources and talents to help city agencies and community organizations with the specific technical skills including the use of spatial mapping and analysis, needs assessment and program evaluation methods to accomplish shared project goals.

Christopher De Sousa's personal and reflective account of a ten-year partnership called the Menomonee Valley Benchmarking Initiative (MVBI) describes the many challenges that make university-community partnerships quite fragile. In the case of the MVBI, De Sousa found that high-level leadership transitions at the university revealed that the project's institutional home within a university-based research center was not as secure as it may have been perceived initially. Highly competitive and fluid funding regimes, and the difficulty in finding staff with a robust mix of skills and expertise are only two of the many challenges discussed in this paper. De Sousa's summary discussing guidelines for individual researchers seeking to get involved in sustainability projects and advice regarding project identification and framing make very useful reading for any educator aspiring to become involved in doing 'community-oriented' projects about sustainability issues.

George Smith along with several collaborating authors reports on Town+Gown, an initiative of the City of New York's Department of Design and Construction (NYCDDC) that encourages action research about the built environment. The paper describes a collaboration between the City College of New York (CCNY) and the NYCDDC in the area of urban sustainability. The Town + Gown program highlights the concern that many cities have — the need to find actionable knowledge to improve their everyday practices and policies. By anchoring