

Networking for Environmental Sustainability in Arid Region Urban Communities

A summary of a Workshop held at Texas Tech University August 14-16, 2019

Small- to mid-sized urban centers (“secondary cities”) are much more common in the U.S. than the megacities that receive most attention, and cumulatively serve as home for more people. The sustainability of these communities is increasingly under threat and they often lack the financial, technical and human resources to adequately address those threats. In addition, rural America depends upon the small urban center to meet important basic needs, such as health services and consumer goods, as well as the means to sustain the rural economy. Because of this close interdependence, small and mid-cities might also be called “hub” cities, a term that emphasizes the steady and two-way interactions between them and rural “spoke” communities. A workshop was conducted August 14-16, 2019 at Texas Tech University with an overarching goal to conceptualize the sustainability challenges facing the many urban centers that serve as the backbone of rural communities, particularly agricultural communities. The focus of the workshop was on arid and semi-arid regions, where water of adequate quality and quantity is a defining environmental need. The workshop was built around a conceptual framework of “One Health,” which posits that environmental, human, and wildlife health are closely intertwined, and that the path to a sustainable future requires meeting human, economic and environmental needs.

75 people registered for the workshop and approximately 50 were able to participate throughout the sessions. The Workshop began with a welcome from Dr. Joseph Heppert, Vice President of Research at Texas Tech University, and Dr. Barron Orr from the United Nations Convention to Combat Desertification. These speakers charged the audience with the importance of addressing the problems that were the focus of the workshop deliberations. This was followed by a presentation by Dr. Katharine Hayhoe, Professor of Public Administration and Director of the Climate Science Center at Texas Tech University, part of the Department of the Interior's South-Central Climate Science Center, and a member of the Intergovernmental Panel on Climate Change. Dr. Hayhoe outlined the potential challenges associated with the increasing frequency of climate extremes for small and mid-sized communities in arid areas that already suffer from limited resilience.

The Workshop then turned to a series of presentations on international perspectives, recognizing that secondary cities in many other countries face similar problems. After presentations outlining the role of the State Department and USAID in managing the challenges of international cities, and the help they hope to receive in identifying and addressing future ones, a presentation from Dr. Amanda Shores of Colorado State University identified the usefulness of “mapping” in identifying and responding to sustainability challenges in secondary cities. Following these introductory talks, the Workshop ensued with featured sessions in each of the four key themes that challenge the “one health” of small cities in arid environments:

- **Public Health:** How do we promote community health and well-being in the face of the challenges these communities face?
- **Water:** How do secondary cities and their surrounding rural, often agricultural, communities in arid environments sustain a water supply of adequate quality and quantity?
- **Urban Design:** What does green infrastructure, particularly ecologically-informed infrastructure to conserve and maximize water, look like in a brown landscape?

- **Urban Biodiversity:** How can satisfying human needs in secondary cities harmonize with conservation of regional biodiversity?

Presentations were followed by interdisciplinary breakout sessions to allow discussions in smaller, more interactive, groups. On the third day, these topics were addressed in a more integrated fashion by the group as a whole, in an effort to identify the primary conclusions and take-home lessons. We summarize these conclusions below.

Key Lessons from the Workshop on Environmental Sustainability in Arid Region Urban Communities:

- *The critical nature of secondary cities*
 - o These cities collectively have a majority of the world's population and are closely connected to the economy and ecology of the surrounding rural, often agricultural, area, serving as regional "hub" cities.
 - o They rarely have the resources to identify the fundamental knowledge necessary to guide actions toward sustainability and thus are heavily dependent upon external input
- *The interconnectedness and intersectionality of sustainability issues*
 - o The four themes of our workshop (public health, water, urban design, and urban conservation) are all interconnected: one community means one health, one water, one air
 - o Secondary cities should not be studied in isolation, but rather as part of a matrix that includes surrounding areas that are more rural, agricultural, or natural
- *The city- and area-specific nature of appropriate and acceptable actions to address sustainability*
 - o "Sustainability" may mean different things in different locations. Different priorities and different challenges require different solutions
 - o Fundamental knowledge and extensive data collection is required to provide the scientific understanding necessary to address sustainability issues in the different regions, environments, and communities in the nation and the world
 - o International perspectives greatly extend the range of social, cultural, and physical settings that can be explored and provide insights not easily available in domestic settings
- *Rapidly growing secondary cities provide an opportunity for demonstration and testing of new paradigms* for addressing sustainability without trying to apply untested concepts to remake existing cities
- *The critical importance of the human dimension* in understanding and addressing the problems of secondary cities
 - o This requires two-way community involvement to identify and shape the goals and objectives of any research or action, as well as education and outreach to disseminate research findings and products
 - o The importance of effectively engaging all components of the community, including diverse cultures within that community, different socio-economic groups, as well as decision and policymakers
 - o The importance of mapping to better understand the components of the community and their interactions, to visualize relationships, and to disseminate findings
- *The importance of having measurable outcomes of actions* toward sustainability
 - o Appropriate metrics will have to be interactively defined by community-shaped goals and objectives and are part of the study
- *The need for development and training of a diverse, interdisciplinary student body* that will be the thought- and action-leaders of the communities of tomorrow.