



**Chibulu Luo**

**Supervisor:** Wei Liu  
**Co-Supervisor:** Brian Fath (ASA)

**Research Project:** Diagnosing urban resilience in Africa – a socio-ecological system approach

**Abstract:** Africa’s cities and urban areas are facing an unprecedented rise in their populations. Communities in the region are experiencing dramatic shifts in living and placing ever-increasing pressure on infrastructure networks and other urban system components. In many countries, the rate of urban growth has exceeded the capacity for city authorities to ensure adequate and equitable provision of services, as cities are often poorly planned and growing in the context of increasing environmental and climate risks, and socio-economic vulnerabilities. In this regard, a more nuanced assessment of the resilience of African cities to the drivers of rapid urbanization is needed to understand the region’s urbanization challenges and future infrastructure needs.

In response, this research aims to take a socio-ecological system (SES) approach to conceptualize and understand, in a more holistic manner, Africa’s urbanization process and the interdependencies between different system components, focusing on the infrastructure dimension. While the SES study of urbanization has been recently established and applied in several western societies, its relevance and applicability to developing countries remains unclear. Therefore, the research approach is twofold: to apply existing SES frameworks to a selected group of African cities; and to develop a more specific framework that can be better utilized in the region. This is also coupled with an assessment of resource use and economic development patterns for key infrastructure sectors and socio-economic variables. Fundamentally, the specific framework will be founded on the “socio-techno-ecological” approach that recognizes technology as an important influence on urban resilience in the region.

**Biographical Sketch:** Chibulu Luo is a 1<sup>st</sup> year PhD Student in Civil Engineering at the University of Toronto. She is also affiliated with the Centre for Resilience of Critical Infrastructure (CRCI) and the Centre for Global Engineering (CGEN). She is currently conducting research to explore infrastructure resilience strategies for high-density populations. Her specific research interests include urban resilience, metabolism and climate change adaptation approaches. She is keen to explore these interests in the context of developing countries.