



In Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy
Daniel M. Nzengya

Will defend his prospectus

**Designing Institutions and Health Education Interventions for
Sustainable Water Supply in Informal Urban Settlements in Kenya**

Sub-Saharan Africa currently has the fastest growing population in the world. Most of this population growth is being absorbed in urban areas, specifically within over-crowded informal settlements, where the capacity of governments to provide basic services is being overwhelmed by the scale of growth. Centralized approaches to urban water supply have proved to be seriously deficient, and diarrheal diseases continue to kill more children in urban informal settlements in sub-Saharan Africa than in any other part of the world. In recent years, partnerships between water utilities and informal settlements have been actively promoted as new models to improve water-service provision. Although the idea of partnerships is appealing and has a lot of potential, the tendency to apply the same model of partnership as a panacea without an adequate understanding of the diversity of underlying contextual factors, their interconnectedness, and functioning can have unintended consequences.

The specific objectives of my research are to a) examine the role of different social and ecological factors -and their interactions -in shaping observed partnership models and their outcomes; b) assess these outcomes in terms of different indicators of sustainability; and c) explore options for the design of alternative intervention strategies that can lead to more sustainable outcomes. In exploring alternative pathways for a sustainability transition, I am specifically interested in examining the role that women can play in these partnership models given that they have the primary responsibility for water collection and care of sick children, and how health education interventions in middle schools can lead to greater awareness and behavioral changes within the wider community.

My proposed study is organized in three parts:

In the first part, I will use Ostrom's Social-Ecological Systems (SES) framework to examine how utility-community partnerships are developed, who are the key actors, and how do factors such as, water resource conditions, socio-demographic characteristics

and layout of the settlements, and the overarching political and economic environment - influence the institutional structure and the quality of water service.

In the second part, I will examine how far gender considerations play a role in affecting outcomes associated with utility-community partnerships. Development agencies continue to advocate for increased proportion of women water service providers in Kenya's urban informal settlements. Underlying this strong advocacy is the assumption that women's participation in water service operations enhances the quality of service and associated health outcomes.

In the third part, I will test how the participation of schoolchildren in water testing and action-oriented health education intervention affects knowledge and behavioral outcomes related to water handling, hygiene and health, among the children, their families, and their communities. This is an action-oriented and participatory approach to health education that aims to strengthen children's desire and ability to influence the conditions that impact their health in the communities they live. The intervention is motivated by the Child-to-Child approach to health education and I will use a before-after quasi-experimental design to test its effectiveness.

I visited Kisumu city in Lake Victoria region of Kenya in June-July 2012 to conduct preliminary fieldwork and establish relationships with institutions that can support my work. I collected baseline data from 28 water kiosk attendants and 108 water-users. I also carried out water safety plan surveys in four peri-urban settlements (118 participants), which combined household surveys on water collection sources, storage methods, and perceptions of health risks with testing of 200 water samples for microbial quality of water at selected households' collection and storage sources. Finally, I conducted hygiene and health education training in six schools. I plan to return to Kisumu in May 2013, to assess the impact of school intervention strategies conducted this year and to share my preliminary results on institutional design with different stakeholders.

Expected outcomes from this research include: i) enhanced understanding of functioning of water utility-community partnerships in water supply in urban informal settlements; ii) strategies for design of effective partnerships for sustainability transition, specifically with women as entrepreneurs; and iii) a model for community-based microbial testing and action-oriented health education to improve outcomes associated with poor hygiene, sanitation, and water handling in informal urban settlements.

Friday, September 14th, 2012
12:00-2:00 p.m.
WGHL 401

Faculty, students, and the general public are invited.

Supervisory Committee:

Dr. Rimjhim Aggarwal, Chair
Dr. Leland Hartwell
Christopher Boone