Chapter 16

Water Crises in Urban–Rural Gradients of African Drylands:
Insights into Opportunities and Constraints

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ABSTRACT

This chapter takes a critical look at the multiple dimensions of water crises in drylands of Sub-Saharan Africa. It argues that urban water crises cannot be explained in isolation of rural areas many of which have competing water needs and are the locations for dams and other critical urban water infrastructure. It uses an example of Kano region – a hydrogeological and geopolitical region of over ten million inhabitants whose lives and livelihoods are vulnerable to climate change. The study draws upon a suite of methods comprising literature review, field-based measurements and observations of wells, as well as information retrieval from people managing wells and those directly affected by water scarcity. Results reveal that basement complex aquifer found mostly in Kano State is the most overexploited compared to Jigawa State’s predominantly Chad formation system. It is evident that majority people in basement complex areas travel to a distance of 300-1000m in order to fetch water for their daily use. The current situation of current and future water crises in the region brings to the fore the role of technology, governance, and the need for active private sector participation in planning and management of water resources and services in dry land areas.

INTRODUCTION

A definite delimitation of urban areas is rather blurred in many countries and this is due to the seamless nature of urban and rural interactions in many countries. In this context, Christenson et al. (2014) have argued that it is crucial to consider urban-rural gradient in examining a wide range of social and ecological challenges such as water quality issues in developing such as Nigeria. Besides, the rapid urbanization...
being experienced in developing countries is compounding the problems of water security. According to the UN Water (2014), universal access to safe drinking water, sustainable use and governance of water resources are crucial to achieving the post-2015 development goals. As the urban population of African countries keeps increasing steadily, more pressure is exerted on the dwindling water resources. This situation is likely to be exacerbated by the prevailing climate change risks and increasing urbanization and industrialization (Cobbinah et al. 2015). Indeed, these challenges are closely related to how governments strategize to achieve water security targets as parts of the targets and indicators of sustainable development. It is important to link the challenges of water security, population pressure, urbanization and technological deficiencies. For some time now, social scientists have sought to link population, technology, resources and human wellbeing. For instance, the Ackerman’s model (1969) has identified five categories of population-technology-resource regions. These are:

1. United States type or technology-source area of low population-potential/resource ratio
2. European type or technology-source area of high population-potential/resource ratio
3. Brazilian type or technology-deficient area of low population-potential/resource ratio
4. China or Egyptian type or technology-deficient area of high population-potential/resource ratio
5. Arctic-Dessert type or technology-deficient area with few food producing resources

Most countries in Sub-Saharan Africa fall into categories (c) to (e) and as such, bring more expectations on the public sector to respond human development challenges such as public to access to portable water. Invariably, technology deficiency makes it increasingly difficult to exploit and develop good infrastructure for efficient water dispensation to population and other sectors. For instance, the much dependence on exploitation of groundwater in drylands is progressively depleting water resources (Biswas, 1991, Starr, 1992). The African drylands cover the Sahara Desert and its edges down the Sahara as well as Kalahari Desert and its fringes. The largest proportion of the Earth is covered by water, of which only a tiny fraction of about 2.5% is suitable for human consumption. Unless a swift and decisive action is taken two-third of the world’s population is exposed to serious water shortage (former UN secretary General, Kofi Annan in Kluger and Dorfman, 2003). International development organizations such as the World Health Organization (WHO) and the World Bank define access to water as community’s ability to reach its source of portable water not further than 200 meters away from the location of a household (World Bank, 2005). In this context, Biswas (1991) identified three contentious issues that make it difficult for communities to realize short distance access to water as listed below:

1. The amount of fresh water available to any country on a long-term basis is limited.
2. The population is increasing steadily while water requirements increase without one to-one relationship between water and population.
3. Human activities increase, while more and more waste products are contaminating available sources of water.

Unfortunately, available figures suggest that water debt would rise to affect more than 2.4 billion people by 2050 (World Meteorological Organization - WMO, 2004). In other words, two out of every three people will live in water stress conditions. Therefore, considering the current trends of global urbanization, more innovative strategies are needed to address the current and future water crisis. Indeed,