

Chapter 11

Population Dynamics, Economic Growth, and Energy Consumption in Kenya

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ABSTRACT

Kenya is a small open economy that depends on energy for growth. Since independence in 1963, it has experienced tremendous urban and rural population growth, placing an increasing strain on energy resources and economic development. Therefore, in this chapter the relationship between urban and rural populations, economic development, and energy use is studied. The empirical analysis uses a vector autoregression framework. The Granger Causality test results suggest unidirectional causality running from urban population to GDP. The vector error decomposition results imply that urban growth will continue to play a major role in energy consumption in Kenya.

1. INTRODUCTION

Numerous studies have shown that energy consumption is positively related to economic growth (International Energy Agency IEA 2004; Jumbe 2004). Energy fuels systems enhance the efficiency of production and open up more domestic consumption opportunities. Thus, growth impulses occur on both the production and the consumption side. Energy can also improve the

quality and delivery of basic goods, such as food and shelter. Finally, the contributions of energy to improved educational and public health services also advance social development. Because of the central role of energy in economic development, this chapter examines the role of population in the energy-economic growth nexus in Kenya. Kenya is chosen because of the availability of data and because the country shares many characteristics with other developing economies.

DOI: 10.4018/978-1-4666-4329-1.ch011

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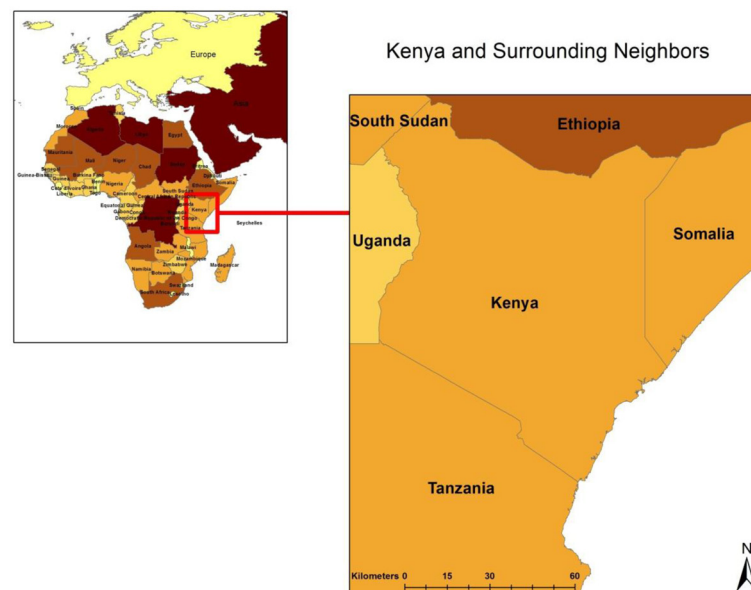
Kenya is located in East Africa. The Indian Ocean constitutes its southeastern border. Tanzania is its southern, Uganda the western, and South Sudan and Ethiopia its northern neighbors. In the east, it shares a border with Somalia. This is illustrated in Figure 1. Kenya's territory measures 582,650 sq km, with a total land area of 569,250 sq km. The current population is 43 million, with 22 percent living in urban areas. The gross domestic product (GDP) in 2011 was 36.1 billion dollars. Agriculture and services accounted for 19 and 65 percent of GDP, respectively¹ (Central Intelligence Agency, 2012).

The last three decades were characterized by large rural-to-urban migrations, a process that is not yet completed, but has already caused significant labor market changes and increased demand for goods and services. As urbanization gathers pace, the demand for modern forms of energy will further increase. Urbanization is closely linked to economic growth, population concentration, and increased rates of consumption relative to traditional rural or agricultural lifestyles (Clement and Schultz, 2011). Successful urban-

ization requires the expansion of the industrial and service sectors, more housing, infrastructure, and land (Deng, Huang et al., 2010). Urbanization and industrialization are separate but strongly correlated processes, and both influence energy use (York, 2007).

The rapid pace of change is illustrated by the growth of Kenya's urban population which increased from 11.4 percent in 1972 to 21.9 percent in 2009 (World Bank, 2010). The impact on energy use is almost immediate because urban residents rely on electricity for most of their needs while rural inhabitants depend mostly on unprocessed biomass. Economic reforms are also likely to contribute to increased energy demand in rural and urban areas. For example, the liberalization of cash crop marketing in sub-Saharan countries is likely to increase the income of rural farmers, triggering an increase in demand for electricity (Karekezi, 2002). In Kenya, electricity is produced from hydroelectric and oil-fired plants, as well as from generating plants that use renewable energy sources. In 2009, hydroelectric sources produced 31.5 percent of all electricity, while 44.1 percent

Figure 1. Kenya and surrounding neighbors



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