Chapter 22
Technological Innovations and Africa's Quest for Development in the 21st Century

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ABSTRACT

Technology is generally seen as a significant tool for development while technological innovations connote better ways of achieving results. This chapter assesses different areas countries can experience technological innovations and notes that most African countries are lagging below expectations in this regards using secondary data sourced from International Telecommunication Union (ITU), United Nations Statistical Divisions (UNSTAT), among others. From the analytical perspective, the chapter established that the low levels of technological innovations in Africa is one of the major reasons why the continent remains in the low developmental echelon compared to other regions of the world. Thus, this chapter submits that adequate efforts should be placed on functional education, health system and technology related innovation programs. Besides, Africa and indeed all developing world must revamp their infrastructures, especially transportation, power and communication towards development in the 21st century.

INTRODUCTION

Technologies have been seen as key tools for economic growth and development across the countries of the world especially the developed ones (UNDP, 2008). Technology is simply viewed as the techniques of doing things, while technological innovations imply better ways of getting any task done. Technological innovations are often conceptualized in a general parlance as getting higher level of output with same inputs or same level of output with lower level of inputs. This denotes a better management/utilization of scarce resources in the most efficient manner (Córdova, 2009). There are several areas that a country can experience technological innovations such as education, health, security and governance, banking, transport and communication, among others.

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There are various forms of technological innovations (development) such as: Nanotechnology, Biotechnology, Bioinformatics, Information and Communication Technology (ICT), and so on. One of the standpoints of development has been the need for developing countries to improve their technological innovations (Ekekwe, 2009). This viewpoint is usually supported by the fact that most countries that have attained some measures of development followed the path of technological innovations, *inter alia,* as one of the vital tools. However, the situation in Africa has not been as desired. For example, the average growth rate of total phone per 1000 population in Africa was 6.6 between 2001 and 2006 (African Development Bank- AfDB, 2008). While the number of internet users per 100 inhabitants in Sub-Saharan Africa (SSA) increased from 1 in 2000 to 3 in 2006 compared to world average that increased from 7 to 18 (UNDP, 2008; World Bank, 2008a).

In many African countries, most of the technological development indicators have not been impressive. As at 2005, the total number of telephone (mainline and mobile) subscribers per 1000 persons was 2.8 in Liberia, 7.9 in Guinea-Bissau, and 14.4 in Chad. Access to mobile lines per 1000 persons was as 5.8 for Ethiopia and 9.2 for Eritrea. While that of access to the internet per 1000 persons was 2.1 for Niger, 2.4 in Democratic Republic of Congo (DRC) and 2.7 for Central African Republic-CAR (World Bank, 2008b). Access to electricity, which is paramount for any meaningful technological innovation, is not given serious attention in most African countries. The highest recorded figure on access to electricity as percentage of total population in 2006 was about 75.2% in Gabon. It was as low as 4.3% in Chad and 5.7% in Rwanda. For the rural area there is very little access. It was 0.3% in Chad, 0.8% in Burkina Faso and Lesotho (World Bank, 2008b). This is a great challenge to technological development given the role of power supply in technological revolutions.

Another issue of concern for Africa in this 21st century, especially given the global meltdown where most of the countries in Africa that are primary export dependent are being further 'wounded', is the low level of human capital formation. This is usually witnessed from the low priorities education and health sectors are given in Africa. For example, the total expenditure as percentage of gross national income (GNI) on education was 4.4% in 1980 and did not significantly change as it remains at 4.9% in 2005. While the total health expenditure as percentage of gross domestic product (GDP) was 5.6% from 2003 to 2005, and the average proportion of population with access to sanitation was 45% between 2004 and 2006 (AfDB, 2008; World Bank, 2008b).

Based on the above backdrops, this chapter explored the level of technological innovations and development in Africa. The specific objectives include: to document the extent of technological innovation in Africa; to relate some development indicators to technological innovations. The above objectives were achieved using descriptive analysis with secondary data sourced from, among others, International Telecommunication Union (ITU), United Nations Statistical Divisions (UNSTAT), World Bank Trade Indicators, and International Financial Statistics (IFS). Ten (10) countries were selected across Africa- two (2) from five of the regions. They include: Cameroon and DRC (Central Africa); Ethiopia and Tanzania (East Africa); Egypt and Morocco (North Africa); Lesotho and South Africa (Southern Africa); and Ghana and Nigeria (West Africa). The countries were selected based on the two most populated countries in each of the regions in order to have a fair representation. The selected countries represent over 56% of the continent's population (UNCTAD, 2008; UNSTAT, 2008).

The rest of the chapter is organized as follows: next to this introductory part is technology and technological innovations. Development and its indicators are in part III, relevance of technological