

## Technology Inertia and Poverty Trap in Sub-Saharan Africa: The Case of Nigeria

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**Abstract:** *Since the industrial revolution, advances in science and technology have continuously accounted for most of the growth and wealth accumulation in the leading industrialized economies. In recent years, the contribution of technological progress to growth and welfare improvement has increased, especially with the globalization process which is characterized by exponential growth in export of manufactured goods. This scenario is however absent in Africa and particularly Nigeria where there is technological inertia and a poverty trap. This paper argues that despite the fact that there exists a plethora of technology policies in Nigeria full benefits have not been derived from these efforts due to the absence of a strong innovation component in the policies. Secondly, Nigeria's technological progress is flawed as a result of the underutilization of indigenous talents for technological development and the undue emphasis placed on academic credentials. The paper submits that overcoming the technology inertia in Nigeria is essential to achieving the Millennium Development Goals (MDGs). To this end the talent-based indigenous technological development approach is recommended for employment generation and poverty reduction in the country.*

### Introduction

Africans have first responsibility for their own development but the misery endured by the world's poorest people who live in Africa is not just African problem. It affects the conscience of humanity as a whole. It threatens the global environment and it impedes world trade and development everywhere (Jones, 2006)

Africa's average per capital income is lowest in the world almost half of the continent's population live well below the poverty line of one United State's dollar per day, subsisting on less than US \$0.65 per day. Despite continuing growth in population, during the 80s and 90s the number of extremely poor in East Asia fell by 265 million but in Sub-Saharan Africa they increased from 164 million to 277 million, raising its share of the world's absolute poor i.e., those without any prospect of getting themselves out of poverty from 25 to 30% (Jones, 2006). The proportion of the developing world's population in extreme economic poverty fell from 28 percent in 1990 to 21 percent in 2001. Most of this improvement has occurred in East and South Asia (Wikipedia, 2009). On the other hand, in Sub-Saharan Africa, extreme poverty went up from 41 percent in 1981 to 46 percent in 2001, which combined with growing population; increased the number of people living in poverty from 231 million to 318 million (Wikipedia, 2009). The 2007 World Bank Report predicts that in the year 2030, Africa will be home to a larger proportion of the world's poorest people than it is today.

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The Federal Office of Statistics (FOS, 2006) puts the extent of Nigeria's poverty in 1985 as 46 percent. By 2001 poverty incidence in the country has reached 66 percent in statistical terms, this means that 76.6 million Nigeria's out of the then population of 110 million were poor. With an estimation of 150 million today, about 80 million were poor. According to (FOS, 2006), "poverty permeates virtually all ramifications of Nigeria's national life. In 2003, Nigeria ranked among the ten countries which have the greatest numbers of people without access to safe water. The World Bank Report (2003) stated emphatically that the cash income of the poor in Nigeria "is insufficient to cover minimum standards of food, water, shelter, medicare and schooling".

The cumulative consequence of the foregoing is that the majority of African and Nigerian households are imprisoned in a poverty trap. They cannot get out of poverty because they do not have the cash surplus required to invest in income enhancing activities. Nigerians are also caught in the poverty trap because they are too poor to invest in infrastructure, education, health care and other developmental indicators. Finally, Nigerians are entrapped in poverty because they lack the will and tenacity of purpose to nurture and develop their indigenous skills, and technological capabilities with which to launch industrialization to usher in authentic national development. With the African population expected to grow at 2.8 per year, it will require an annual improvement in productivity of at least, twice the level achieved since the 1970s to prevent an increase in the number of absolute poor. It is in view of this factor, that the heads of state and government through the New Partnership for African Development (NEPAD) recognized the importance of technology as a tool for achieving an industrial growth rate in the continent at 6% per annum. There is no gain saying the fact that Africa is saddled with a technological inertia. Research shows that the widening income and welfare gap between Sub-Saharan Africa and the rest of the world is largely as a result of the technology inertia responsible for the poverty trap in the continent.

With respect to Nigeria specifically, Usman (2008) argued that one of those critical factors militating against sustained industrialization, rapid and balanced development of the country's economy is the complete absence of technical progress to support all the development initiatives. For him, the prolonged crises in most sectors of the Nigeria's economy are not unconnected to technology problems.

Evidently, all measures predicated on the importation of foreign technologies have always proven to be pseudo-solutions which do not last. Sooner or later, the problems always tend to resurface again. In fact, the reason why past visions of national development such as 1990, 2000, 2010 etc were doomed to fail from the word go is attributable to their failure to initiate indigenous technological development to serve as their main engine or driving force. Thus, for any serious

vision to succeed to get Nigeria out of poverty, it must make rapid technological development its focal point. This is because of the fundamental linkages between technology, industrialization and economic development.

### **Conceptual Clarifications**

Poverty is a most conveniently expressed as a shortfall in consumption (or income) from some poverty line. The most commonly used poverty line is an income of US \$1 per day. However, this statistics does not adequately convey the full impact or implication of poverty. According to Wikipedia (2009), poverty is a shortage of such necessities as food, clothing, shelter and safe drinking water, all of which determine man's quality of life. It may also include the lack of access to opportunities such as education and employment which aid the escape from poverty and/ or allow one to enjoy the respect of fellow citizens. In addition to being unable to buy necessities of life, poverty affects a person's freedom to live a valued life and undertake critically important functions. Poverty excludes individuals and groups wholly or particularly from full participation in the societies in which they live [IFAD, 2001]. In the United States, according to Wikipedia (2009), "to be poor is to be deprived of those goods and services and pleasures which others around us take for granted".

Poverty is usually measured in either absolute or relative terms (the latter being actually an index of income inequality). Relative poverty views poverty as socially defined and dependent on social context. Absolute poverty refers to a set standard which is consistent over time and between countries. An example of an absolute poverty measurement is the percentage of a population eating less food than is required to sustain the human body (approximately 2000-2500 calories per day for an adult) (Wikipedia, 2009).

The World Bank (2006) defines extreme poverty as living on less than US \$1 per day, and moderate poverty as less than \$2 per day, estimating that "in 2001, 1.1 billion people had consumption levels below \$1 a day and 2.7 billion lived on less than \$2 a day".

Technology on the other hand, is any practical art which utilizes scientific knowledge to enhance human society and conditions. Technology has also been defined by Kalu (2000) as the study and utilization of manufacturing and industrial methods. Technology is central to manufacturing and consequently to an economy. It is therefore critical to the development and utilization of local resource endowment.

Technological capabilities according to Chambua (1996) are the capabilities needed to acquire, assimilate, use, adapt, and change or create technology. Technological capabilities include the

skills of persons in various economic sectors who have acquired technical knowledge about production process through formal training and learning by doing. It involves the following:

- (i) The search for available alternative technologies and the selection of the most appropriate.
- (ii) The successful use of the technology in the transformation of inputs into outputs.
- (iii) The further development of the technology as result of some innovation.
- (iv) The institutionalized search for more important innovation through research and development (Chambua, 1996).

### **Nigeria's Capability for Technological Innovations**

History reveals that Nigeria had well established technologies before the advent of the Europeans as evident in the sophistication which the country developed iron smelting, gun making, carving and pottery. It is therefore surprising that Nigeria is currently lagging behind in technological advancements.

In the 1950s and 80s, Nigeria spent enormous resources training her students in all areas of technology and arts. In this regard, professors Awojobi, Chike Obi, Wole Soyinka, Chinua Achebe to mention but a few immediately came to mind. All the five universities in the country then were centres of excellence, with the state-of-the-art equipment, outstanding educational system, outstanding professors, and highly competitive students. The students that excelled were given overseas scholarships in-order to advance in their fields of endeavour and interact with their colleagues in Europe and the Americas. This situation has deteriorated in the country. Nigeria has articulated science and technology policies in very critical areas, full benefits have not been derived from these efforts due to the sheer absence of a strong innovation component in the policies. For example, Nigeria's manufacturing over the years has been dependent highly on foreign equipment and machinery due technological backwardness and industrialization policy. This is the bane of Nigeria's economic development as a nation. This explains partly the low performance of manufacturing in the country. According to Okonkwo and Akpa (2004), the manufacturing sector in Nigeria between 1980-1985 during the pre-structural adjustment period experienced downward trend with average capacity utilization of 44%. Between 1986-1993, during the structural adjustment period (SAP) capacity utilization was an average of 40.8% from 1993-1998 during post SAP period, manufacturing index fell from 185 to 133 while capacity utilizations dropped to 32%. The point being made here is that the absence of indigenous technological innovation hampers development in the country.

Innovation is often confused with research and measured in terms of scientific or technological outputs. However, according to Yisa (2009), innovation is neither research nor science and technology, but rather the application of knowledge in production. This knowledge might be acquired through learning, research or experience, but until it is applied in the production of goods or services, it cannot be considered innovation (Yisa, 2009). Simply put, innovative technology is a body of knowledge available to a civilization that is of use in fashioning implements, arts, skills, and extracting or collecting materials (Odetunde, 2000). Technological innovation requires mavericks who are willing to go where no others have gone before, leaders who are willing, ready and capable of committing resources in order to achieve common goals and shared vision, and a workforce that is trainable and ready to accept challenges. Presently, Nigeria's capacity for technological innovations is very low. This accounts for the technological inertia and poverty trap in the country.

As a solution, some people consider technology transfer from the West as a way out of the technological inertia in Africa. However, experiences from India, Japan, Malaysia, south-Korea, Hong Kong, Singapore, Brazil and others show that technology is not restricted to wholesale transfer of foreign technology. They looked inwards. Thus, the critical point is the acquisition and strengthening of domestic technological capability to produce indigenous goods and services for employment generation and poverty alleviation. The points being made here is that indigenous technological capability is quite weak in Nigeria presently.

### **Factors Militating Against Technological Development in Nigeria**

Since independence, Nigeria's policy makers have tended to think of technology erroneously in the context of finished products rather than as a set of ideas rooted in the local culture with the set purpose of serving the basic needs of the people. This perception of technology focuses attention on the importance of finished products. Again, the problem of technological development in Nigeria reveals factors such as poor funding for science and technology education, inadequate infrastructure for research and development (R & D), poor staffing and lack of linkage between (R & D), and industries [Usman, 2008]. According to Usman (2008), Nigerian universities limit their roles to teaching and manpower production at the total exclusion of research in order to advance and improve society.

Other identifiable problem hindering the launch of Nigeria's technical progress is the failure to correctly exploit the naturally endowed talents in Nigeria. Thus, there is the underutilization of talent in Nigeria. This is due to the tendency to confuse academic intelligence with technological potentials. Thus, while the industrially advanced economics of North America, and Western Europe or the rapidly developing Asian countries respect the utilization of natural talents in

everyday endeavour, especially science and technology, and tend to attract talents from other countries, African countries including Nigeria only utilize talents from other countries. African countries, including Nigeria, only utilize talents in sports and entertainments. That is why they are mostly successful in those areas. In most other activities, including science and technology, Nigeria recognizes only paper qualifications. This is a problem because existing educational training systems are designed to usher in technical progress in Nigeria, but academic credentials are inaccurate indicators of the technological potentials of Nigeria. In fact even in developed countries, there is no clear correlation between academic intelligence and inventive talents. For instance, while there are some individuals who are good in both theory and practice of technology; there are many others who are academically sound but have problems using tools; just as there are many who are inventive geniuses even though they do not have high credentials [Usman, 2008]. Inventors such as Thomas Edison, Gutenberg, the Wright Brothers and Bill Gates etc. are people that have changed the course of human history, but they do not even have a University degree. Using academic performance only, to anchor technological development is faulty and can only produce poor quality and quantity technology output that cannot compete favourably with the high tech goods produced by inventive geniuses in the advanced economics.

Given the high level of today's global competition in the technological sector, it is inappropriate to anchor all our programme of technological development solely on academic performance, hence the need to adopt the talent-based approach to correctly select those who have the right aptitude. This approach de-emphasizes academic credentials, and instead, focuses on the inventive talents in some people. The talent-based approach to technological development (TBITD) goes beyond the mere acquisition of skills for operating or servicing imported machines as presently handled by the Polytechnics and other vocation training centres in Nigeria. This would involve the introduction of a special programme on adoptive technology in some selected universities in Nigeria; with separate units having well equipped workshops and laboratories to those who possess the acquired inventive flair, such a scheme should be designed to re-awaken and nurture the spirit of inventiveness which is almost dead in Nigeria. It should focus on imparting the skills for conducting extra-ordinary research required for the adaptation and advancement of technologies to create employment and reduce poverty in Nigeria.

In Nigeria today, there are several universities, polytechnics and colleges of technologies duplicating research efforts. Most oftentimes, the researchers' efforts are not mindful of the end-users needs when the research output do not meet the yearnings of the people, the whole effort ends in colossal waste of the little resources available to us.

Other problems militating against technological breakthrough in Nigeria include:

- (1) Inconsistent, uncoordinated and inappropriate policies.
- (2) Fragmented and overlapping institutions.
- (3) Low productivity.
- (4) Private sector under investment.
- (5) Unfavourable business climate.
- (6) Infrastructural deficiencies.
- (7) Limited access and use of long-term business credit.
- (8) High risk of investment.
- (10) Insecurity of lives and properties.
- (11) Inflationary trends.
- (12) Presence of sub-standard materials.
- (13) Paucity of funds for research.

It is necessary at this point to underscore the problems of deficient infrastructure with particular reference to power and energy. It is an understatement that without adequate power and energy, the economy and technology in particular cannot thrive.

### Conclusion

To achieve economic independence, the need for technological breakthrough becomes imperative. In this regard, an institutional framework that focuses government policies on the provision of basic infrastructures is a *sine qua non* for technological development in Nigeria. This is to facilitate and encourage the development of ideas rather than the consumption of already developed ideas and their consequent useable products which will also institutionalize the development of appropriate indigenous technology in Nigeria. To this end, sustainable technology in Nigeria should be based on building a stable institutional framework that reinforces the acquisition of ideas about technology. With this in place poverty will be drastically reduced in Nigeria.

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