The Possibilities of Technological Development in Africa: An Evaluation of the Role of Culture

by

Adebayo A. Ogungbure
Department of Philosophy, University of Ibadan, Nigeria.
philosopher.bayo@yahoo.com

Abstract

This paper is a philosophical attempt to examine the vital role culture plays in human scientific and technological explorations, and especially how the viable aspects of a people's culture can be explored for technological development in Africa. Indeed, the continent of Africa is a multi-cultural society that is endowed with abundance of systematic knowledge, dynamic cultural practices, human and natural resources and valuable attributes that can be used as a stepping stone towards achieving collective development. However, this cultural pluralism and dynamism has not been creatively exploited to actualize the pertinent quest for technological advancement in Africa. In this context we know that creative genius, resourceful intentions and artistic inventions of humans do not spring forth *exnihilo*. There has to be "something" fundamental that drives the conceiving and birth of mechanistic and intellectual creations – a catalyst that must spread through the total sphere of human cognition and existence. This "something" is culture; an all-breasted phenomenon that constantly propels the human instinctive attempt at technological innovation scientific explorations, and holistic development within society. This somewhat explains why this paper affirms that any group of people that is capable of evolving a culture is also capable of evolving technology; so the existence of culture within Africa is an accentuation that there is a huge possibility for the development of technology in Africa. Thus, this paper employs an analytic methodology in its conceptual analysis and contends that the viable aspects of African culture can provide the primary base for scientific and technological development.

Introduction

No nation can produce all the technology that it needs for social progress no matter the level of their civilization. Given this premise, it then follows that the critical point of view, held by some scholars, that Africa is nothing to write home about when it comes to technological innovation does not hold sway. Although there is undeniably obvious challenges in regards the evolving of sophisticated technologies for Africa, those challenges are not enough grounds to assert that Africa is on a downward slope to perdition[1] as far as technology is concerned (Bright Simons, 2010). There seems to be the general agreement that the real difference between the developed nations of America, Europe, Asia, the Far East, and the underdeveloped nations of Africa rest on their technological ability. This ability refers to the extent to which nations access, utilize, and exploit science and technology for solving socio-economic and humanistic problems.

Notwithstanding, with the prism of judgment that led to such unpromising conclusions, there is a considerable possibility of the development of technology in Africa – that is, if necessary attention is given to those aspects of culture that are forward looking. In fact, there are certain elements of Africa's rich cultural heritage that has led to the evolution and mastery of technical knowledge with respect to the textile industry, arts and craft, music technology and food technology, in which most African societies have made measurable progress, and have attracted cross-geographic exchange and interaction. This, however, refutes the critique of critics that Africa is on its way to hell, technology wise.

Hence, this emphasis on culture is based on the idea that technological advancement without the skillful exploration of a people's culture is impossible, because culture is the driving force that fuels and inspires technological accomplishments in human society. And unarguably, every technology within a social praxis is a product of culture, since culture is a phenomenon which encompasses all the material and non-material expressions of a people; it affects the way people interact with nature and therefore varies with the environment. To take advantage of science and technology for development, therefore, African societies must reconcile their traditional cultural environment with the different circumstances of the modern international environment which has so far been largely shaped by science and technology (A.A. Adegbola, 2003:124). Also, it is important to note that technology is not just a catalogue of tools and the expert demonstration of its usage. It is forthrightly, a culture mindset that ensures the acquisition and usage of techniques, methods and skills acquired as an integral part of the society. In order to grapple with this issue efficiently, it is important that we pursue a conceptual clarification of key notions forthwith. Let us begin by defining culture.

The Concept of Culture: A Cursory Look

In a most anthropological sense, culture is regarded as that complex whole and a compound phenomenon that includes all aspects of life that give definition to human membership in society. Since culture is values and norms people have which make them live in a particular way, it is therefore the sum total of all things that refer to religion, the origins of people, symbols, languages, songs, stories, celebrations, clothing, and dressing, and all expressions of life. It thus encompasses food productions, technology, architecture, kinship, the interpersonal relationships, political and economic systems and all social relationship this entails. (Obioha, 2010). From this definition, it follows that culture is fundamental to any form of human creativity. That is, human beings must exist first in a cultural setting as a culturally-enclosed being before they can begin to explore the possibilities within the environment and the productivity of human mental capabilities.

This is perhaps why culture is regarded as the *ground norm* of technological and scientific development. Similarly, culture can be regarded as the pattern of behavior that allows people to live in social groups and therefore learn, create and share. Hence, culture is a distinguishing factor that distinguishes one human group from another It entails the unique mode of expression of a people and embraces all aspects of human life, past and present (C.O. Williams, 2006). This emphasis on social group, here, reveals the importance of socialization as a cultural process of learning and exchange of ideas that could give birth to creative innovations. Meanwhile, the allusion to 'past' and 'present' shows that culture is not static but dynamic – an expression not only of a people's past but also of the struggle of the present and aspirations of the future (Fadahunsi, 2004).

In the most technological sense, one can characterize culture as the totality of the way of life evolved by a people in their attempt to meet the challenges of living in their environment (Mabogunje, 1991). It is made possible by the natural instinct to question the unknown to find rational explanation for the way things are in the universe; by extension, this natural instinct is to seek a better understanding of the environment, harnessing the resources therein, making use of earth's possessions that has been the principal force in the development of humankind and the society. A fact corroborated by Solomon Maduike when he maintains that culture is essentially a set of rules which enables humankind to live, interact, learn, develop physical capabilities and adapt to any environment. Culture is a product of humanism that came out through reasoning based upon observation and experience of the physical world. From the perspective of Maduike, one thing is certain, the belief that culture ensures the contact of human mental endowments with the physical world which by critical interaction give way for the evolution of technology because humans grapples with the challenges from nature by evolving tools in order to maximize prospects for survival. Similar to this view is the notion held by Sekou Toure (1974); he asserts that:

> *By culture we man all the material and immaterial works of arts and science, plus knowledge, manners, education, a mode of thought, behaviour and attitudes accumulated by the people both through and by virtue of their struggle for freedom from the hold and domination of nature.*

A dominant feature in this notion of culture is the accentuation to the creative human spirit which finds expression in various aspects of human expression in a comprehensive manner, while foraging through effervescent and sometimes lethargic existential conditions.

Culture as a phenomenon has been discussed from three[2] main aspects of material culture, social culture and mental culture. The material aspect of culture which is technology inclined are the observable creation of humankind's skillful art in the production of material resources to sustain him and ensure holistic development in the society. Meanwhile, the material culture is only an expression of the mental or ideological social components. The mental or ideological component of culture is very necessary for scientific and technological discovery because the quality of a people's thought determines the quality of their material output in terms of resourcefulness. It includes the belief structure, values, and modes of thought, ideas and knowledge which a group shares in common. Quintessentially therefore, mental culture is the high point of cultural expression because it is the foundation upon ideas which largely determine the arts, skills and methodology employed in the process of making technological products.

The Idea of Technology

Technology, in its widest form, can be taken as the application of human intellectual ability to the task of harnessing nature in its entirety for humankind's development and sustenance. This notion is contingent on the fact that technology is seen as the intermediary between humans and the vast resources available from nature. Similarly, technology can be said to be the systematic study and development of techniques for making and doing things. Humankind is known to be the only creature that has been endowed with the capacity to think systematically and creatively about experience and environment. Hence, the human is capable of recreating and modifying the environment in line with human intellectual capacity (Avae, 2003). Etymologically, technology comes from the Greek term *technologia*, which is a combination of "techne", meaning "craft", and *logia*, which means "saying". So technology might be considered literally as the articulation of a craft. Broadly speaking, technology refers both to artifacts created by humans, such as machines, and the methods used in creating those artifacts. However, the word is also used to describe the extent to which a society can manipulate its environment. That is the motivating factor behind all technological activity is the desire to fulfill a need.

Technology is therefore thinking about the best way to do things while drawing inspiration from the cultural mindset within a social praxis. This is probably why S.A. Ali (2003); defines it from the perspective of culture (we must excuse the seemingly gender specificity) thus:

> *Technology, as a term is a scientific attempt by man to transform the natural world in which he finds himself. It entails the ability to create devices, tools and machines through which the threats of the society can be subdued and brought under control…Indeed; the conglomeration of technological devices available at man's disposal is best represented by the artifacts and edifices available within a given cultural terrain. In this sense, the culture of a people is symbolically the totality of both the material and non-material innovative ideas and techniques.*

From this notional explication, it would not take one much effort to recognize the crux of Ali's argument that a people's mental culture, to a large extent, determines their technology. Invariably, Eze (1986) sees technology as the systematic application of knowledge for the production of goods and provision of services for the achievement of perceived socio-economic systems. This explains why technology is often associated with the hardware of production-knowledge about machines and processes. Here, a much broader definition is adopted, which extends to all skills, aimed at producing different kinds of knowledge and procedures necessary for advancing technical capabilities. Also, technology consists of a series of techniques; hence technology available to a particular nation is a sum total of all the techniques that it knows about, and could acquire, while the technology in use is a subset of techniques it has acquired and mastered (Stewart, 1978). This probably explains why one may argue that a nation like Nigeria does not possess the technology of manufacturing cars, hi-tech equipments and other sophisticated telecommunications equipment because it does not possess the knowledge of the techniques, procedures and the enabling environment required for the advancing of such capabilities. But this may not be true when we consider things like the manufacturing of batik, Adire, Aso-Oke, and other indigenous clothing which are peculiar products of the people's cultural experience.

So far, from our definitions of technology, it is important to note that two basic tendencies are discernible; one is almost exclusively concerned with the technical aspect of the subject matter, while the other emphasizes the socio-economic and cultural dimensions. The first school of thought (technical aspect) regards technology as the systematic knowledge for the manufacture of a product, for the application of a process or for rendering of services which may include managerial marketing technologies.

In contrast, the second school (socio-economic and cultural), conceives of technology as all elements of productive knowledge needed for transformation of inputs into products; in the development and rendering of services, as well as in generational shift to further the tentacles of productive knowledge. In addition to this view, technology also includes the social and economic atmosphere in which the application takes place as well as the ways of fulfilling particular needs deriving satisfaction. Taking this position into cognizance, we shall now attempt to discuss the situation of Africa in its use of technology to meet socio-economic objectives and fulfill human needs.

Philosophy of Technology and the African Situation

The philosophy of technology entails a capacity for critical thought and deep scientific thinking to harness and exploit the resources of nature for human benefit. It is a cultural disposition of a people that expresses how they transcend their environmental limitations by radically modifying the way they interact to shape, re-shape, and make sense of their world. There is no doubt that the development of technology have largely contributed to the rapid pace of change in the world today, with an ever expanding influence and impact. Thus, this aspect of philosophical thinking entails the challenges of conquering nature by applying technical knowledge in a bid to achieve a critical understanding of the conceptual nature and practical consequences of such technologies, and consequently provide the conceptual foundations for their fruitful and sustainable developments. Although, there are innumerable benefits to the advancement of technology in today's global community, it has also raised new and pressing challenges, whose complexity and global dimensions are speedily growing and evolving, sometimes at the detriment of underdeveloped nations. In this guise, most African nations are considered technologically backward and incapable of the capacity for critical thought and critique; and not being able to grasp the philosophical foundations of technology.

Often times, the rejection of the idea of technology within Africa stems from the comparative analysis of Western technological accomplishments and the industrialization of European nations with the arbitrary efforts of Africans to solve human problems through the application of fundamental knowledge derived through the process of subduing nature. But this basis of comparison is asymmetrical and causes more harm than good to the African predicament on the practical use of technical methods and systematic knowledge in an appreciable manner. Technological capabilities in developing nations commonly differ from those in the developed world because technologies are frequently imported – and local firms must be able to master, adapt and improve upon them for maximum impact. In-house efforts also need to compensate for insufficient supplies of human capital, advanced machinery and technological knowledge often found in developing nations (Pietrobelli, 2006). But underneath this Euro-centric bias is the verity of the African situation whose technological accomplishments does not fully come to grips with aspirations of the people towards making the conditions of life better and putting the rigor of technical mindset to use.

However, it is no secret that Africa has not achieved much progress in the development of technology, especially in the areas of machine mechanics, hydraulics, metallurgy, etc., and the reason for this situation may not be unconnected to the vagaries of the African historic experience (colonization, enslavement, resource depletion, etc.), especially the process of culture contact within the global community and the downside of Westernization. While some scholars traced the root of this problem of African cultural loss on technology to the colonial and to the post-colonial era, others are of the view that African people are solely liable to the paths taken to growth and development which has seriously marginalized its attempt at mechanistic expressions of aspects of its cultural identity. Olusegun Oladipo for instance, tells us that:

> *A careful look at the African situation, since the period of the continent's encounter with Europe, is likely to show that the African predicament can be attributed to a major gap in the African development process. Whether our reference is to the slave trade, to the colonial era or even to the post-colonial era, it is clear that African oppression and exploitation by others have been a function of her technological underdevelopment. In other words, the possibility of slave trade and colonialism was largely due to the underdevelopment of the African technological capacity (2009:32)*

It is evident from Oladipo's comments above that if the early Western explorers had not interfered with the traditional or cultural practices and ways of doing things within Africa at the time they did, it is possible that Africa will not be backward in the development of technology. A disturbing fact of this scenario is that up till today, Africa is yet to measure up with the West in terms of technological advancement. This is probably why Oladipo (2009) further maintains that in post-colonial times, the evidence of the gap created by the cross-cultural interference is that of a yawning technological gap that has made it impossible for Africans to record any appreciable advancement in the competitive sectors of culture, which include things like military strength, industrial capacity, economic viability and technological prowess. But what are the steps being taken to address this situation? African nations have responded to the challenges of sustainable growth and technological development collectively through creation of regional or sub-regional schemes, strategies and robust home-grown economic groupings and advancing frontiers for the flourishing of conceptual foundations on the philosophy of technology. Although, these schemes were intended to put African nations in the path of growth and technological development, the results have been abysmal and disappointing (Obuah, 2010).

In some African nations like Ghana, Nigeria, Malawi and Zaire, attempts by government to include the teaching of science and technology in both primary and post-primary educational curricula has yield little or low results; such policies where they exist are mostly far-reaching and lacks the connection between the technically viable aspects of African culture and the realization of a salient fact that science and technology is not all about amassing theorems and statistical formulas but a phenomenon that is defined by the attitudes and the philosophical disposition towards creativity. Even in tertiary institutions within Africa, research on science and technology are poorly funded by government, coupled with the fact that there is the dearth of necessary facilities, which makes it near impossible to advance new frontiers in knowledge. But this grim picture does not and should not rule out the possibility of developing a technology culture in Africa, because there are aspects of African culture that encourages social learning, dynamism and the mind-set of inquiry which are crucial for any scientific exploration. So what is important is for African people to realize where they are now in regards to technology, and what they wish to go in a movement to advance new technology (Alozie, 2008).

Exploring Aspects of African Culture for Technological Development

Without doubt, culture creates an enabling environment necessary for human growth and adaptation within society. It is a phenomenon that plays an important role in the humanistic quest for scientific and technological development through the shaping and reshaping of the scope of research. Since culture is a dynamic phenomenon, it encourages progress in research in the sense that it is quick to render certain forms of technical knowledge moribund and give way for the emergence of new mental culture that would be used in the production of innovative technologies. Worthy of note here, is the fact that every technological product is produced in the hope that it will suffice in combating a social problem or aid an aspect of human existence. Although, the challenges of Africa in this regard have been highlighted, there are still other notable aspects of the African culture that can be exploited for technological advancement. Prior to the oil boom and industrialization of the early 1970's Africa was prospering on the gains from agriculture – agriculture at this time occupied the central part of economies of African nations but today, the reverse is the case, because now agriculture plays a secondary role.

Despite the effects of this historical condition, there is hope for Africa in the exploration of agricultural technology in the 21st century. It is important to note that the agricultural culture of most African societies which includes the regulation and management of farm and animal produce for consumption, the understanding of soil chemistry necessary for good farm yield and income earnings, is been explored to achieve measurable and sustainable developments in agro science. This is probably why the Economic Commission for Africa (1998), observes that African agriculture has witnessed considerable transformation in several respects. Crops that were formally alien to the continent such as wheat, barley, rice, maize, tomatoes and apples have been successfully introduced and adopted to different nations in Africa.

Hence, the advancement in agro-science within Africa has a lot of benefits for its quest towards the development of technology; for instance, the continued existence of all agro-based industries within this region largely depends on the supply of agro-allied raw materials like rubber, cotton, cocoa, palm-oil, etc (some of these are also consumed by foreign industries), however, this scheme of things has been counter-productive to Africa's quest for technological advancement and social, because most of these raw materials are transformed into finished goods that would in turn be sold to the African populous at exorbitant prices.

Therefore, there is an urgent need by governments and policy makers in Africa to heed the advice of the World Conference on Science to build or strengthen indigenous industries that can utilize agro-allied raw materials for social change because:

> *The overall economic and social development of the African nations can easily and beneficially be accelerated through the adaptation, assimilation, internalization, innovation and invention of new technologies*.[3]

Such internalization and adaptation of pristine technology in the areas of agro-science would indeed ensure and secure the production of food and at the same time prevent famine drought and poverty within Africa. Hence, modern research at institutions of higher education in regards to agro-science within Africa is now mostly focused at shaping the future of agriculture and pest management through innovation in areas like crop and animal science, animal health, food production and nutrition, and agricultural engineering and mechanization. In fact, there is now evidence of a consolidation of research efforts such that many research results from the agricultural research institutions on the continent have been successfully disseminated to farmers. This dissemination has thus transformed plant breeding, agronomy, physiology and horticulture. The impact of these results has been manifested in higher yields; the introduction of disease and pest-resistant varieties; and the production of crops of higher nutritional value (E.C.A., 1998).

Biotechnology is another aspect of technology that that can be richly explored within African culture for development. Literally, biotechnology entails the use of living organisms or their products to modify human health and human environment; such knowledge is made possible by culture which embodies the totality of human experience and the tendency for survival within a social environment. In this respect, knowledge is the means by which human beings master and control their environment (Oladipo, 2006) and the process of seeking to understand the conditions and meanings of existence. Within the purview of African cultural societies, there are knowledge-processes that have been mastered to preserve or utilize raw food and manufacture various other products.

In Nigeria, for instance, biological processes have been used to make various products like alcoholic beverages, gin from palm-wine, soap from palm-oil, and bacteria cells that feed on goat milk in order to make cheese; and among the Hausa's meat are preserved by extreme heat in different forms to produce varieties like *suya*, *killichi*, and other local delicacies. Also among the Yoruba of the south western region, smoked fish, meat, roasted beef and sea foods, fried melon seeds, fried cassava flakes are common. These are elementary food technological capacities and skills that can be improved upon and concretized by food scientists to enhance this unique African knowledge in food preservation and biotechnology.

Yet, there is also a need for African nations to surpass the rudimentary aspects of scientific knowledge acquisition to more towards the intricate aspects as obtainable in the advanced nations, where constant improvement are being made in combining the genetic elements of two or more living cells (functioning DNA) taken from one organism to another organism, especially as used in plant and animal research and production for increased productivity. Here, the enormous possibilities of this type scientific research can be made possible in Africa through the critique of ideology, especially in examining the out-dated aspects of cultural particulars. The point of emphasis here is that a critical engagement with cultural ideology will help to expose the strengths and weaknesses of attempts and aspirations in the quest for scientific and technological development from an African perspective.

More so, in manufacturing of textiles, African countries have discovered, developed and displayed a rich cultural knowledge that can be gainfully explored for both technological advancement and socio-economic impact. In spite of this fact, most technological capabilities in Africa (especially south of the Sahara) are constrained by bad government policies and poor conditions of infrastructure. But beyond this constraint, noticeable progress is being made in the textile industry which makes it viable for the development of technology. For instance, among the Yoruba of Nigeria, *Adire* is locally made hand-dyed clothes, and batik is made with indigenous material, with hundreds of different identifiable patterns. In fact, *Adire* is an integral part of the Yoruba culture which expresses the intricacies and dynamics of culture, hence an art mastered by Yoruba women and used for expressing cultural identity. Undeniably, *Adire* is also a well known fabric around the world today, a thriving technological export of the Yoruba, with respect to textile manufacturing. In Ghana, the *Kente* is another culturally developed textile that has gained universal recognition; other countries like Kenya and Mauritius have also built their capacities in terms of manufacturing, to reach a level of relative technical efficiency. Mauritius deserves a special mentioning because it is described as probably the most impressive newly industrialized country in Africa which has continued to record remarkable growth in its manufacturing industry with rising indices from those of previous years. This action show that, when technology is considered from the perspective of culture, Africa may not be on the way to hell after all.

Apart from these areas, there has also been measurable progress in building technology. In terms of building, Africans in their rich cultural knowledge of trees and forestry have used bamboo to build houses that not only provide shelter for many but also help to cushion the effect of climate change. Even though it is now being ignored as a viable potential, humankind has been using bamboo, one of the most versatile, durable and sustainable building materials available for centuries. Not only is bamboo light and flexible as a building material, it's also has a very high potential as a sustainable building material especially in east African nations, because they are earthquake prone areas. It has been observed by the United Nations habitat forum, bamboo houses are very useful in such areas, because of their durability.

But it is quite unfortunate that most of the nations in east Africa import building materials from China, India, America, amongst other nations, while the huge bamboo resources in the countries are being wasted without much commercial use. For instance, Ethiopia has abundant bamboo resources, approximately one-million hectares, but they import most of their building materials from other nations. This sort of explains the importance of our advocacy on the viable aspects of the African cultural experience as the basis for technological development.

Meanwhile, bamboo houses have become very fashionable as they are used to build very plush and exceptionally strong houses, different from the thatched roofed houses common in many African societies, several years ago. For instance, in South Africa there are beautifully constructed resorts, private relaxation centers and houses that have been built with the use of only bamboo; and even locally made bricks are now being used to build modern houses with the finest aesthetic appeal and lush comfort. Often times, these unique edifices are customized with the cryptic designs of African art and cultural symbols depicting various aspects of African life. More so, this dynamic building technology can be gainfully employed to solve Kenya’s current housing problem where the demand for houses supersedes the production of new houses. The modern-bamboo houses can provide a sustainable housing solution with low financial implications, using alternative, affordable and sustainable building materials, and also making use of indigenous technology. The modern-bamboo house is an indigenous technology amenable to African culture that can be promoted in Africa today as a way of protecting the environment from the dangers of climate change.

The point then is that although Africa may not be able to produce technological machines like speed moving cars, gigantic ships, intimidating bulldozers, microchips, and hyper-technical equipments, it is still capable of evolving its own technology as far as its cultural understanding and intellectual horizon permits. The African focusing on the battle for survival will have to be dogged on this singular issue (Alozie, 2008). We have thus argued that technology is a product of culture, and in so far as Africans have their own unique culture, they are capable of producing their own technology which would help to solve the immediate problems of social existence and the challenges of survival. This by no means suggests that Africa is capable of producing all the technology it needs for human flourishing; no nation can be that autonomous, but not all the technology that is imported is actually needed, when some of it can be developed in Africa, given the enabling conditions.

Conclusion

This paper is essentially of the opinion that culture plays a germane role in the scientific and technological transformation of any society. This is in recognition of the fact that any significant intellectual or ideological creation of an individual thinker is derived broadly from a broad spectrum of societal legacies, which is engineered by culture (Iweriebor, 2004). Consequently, African people cannot make much progress in a quest for technological advancement if the dynamism of culture is not used. In addition, there is the need for self-reawakening and re-orientation that will place more value on the technological products of local industries. Thus, there is also a need to pursue an agenda in Africa that will encourage the sophistication of cultural practices that would bring about the development of culture of technology. In this process, policy makers and governments in Africa must promote a culture of technology via the eyes of African culture, and take as crucial look at the limited technological developments of industries in the continent and therefore adopt an African centered agenda to build and strengthen technological capabilities in Africa, which can assist critical social change.

Notes

1. Bright Simmons supposition is premised on the ill-fortune of Africa on Information Communication Technology (ICT). He believes that the success story on the telecomm sector within Africa is nothing but a mirage which offers Africa no relief from its chronic state of technological pathology. But ICT is just one aspect of technology which means that there is hope for Africa.

2. Although, culture can be viewed from broad angles like the philosophical aspect, institutional aspect, material and immaterial and so on, we have decided to concentrate on these three aspects for our purpose

3. The World Conference on Science held in Budapest Hungary (1999) with the theme: "Science for The Twenty-First Century"; recognizes among other things, that the application of science is one of the most effective weapons in the struggle towards the reduction and eventually the elimination of poverty in the society. See: www.unesco.org/science/WCS/meetings/afr_hammanet_99.htm.

References

Adegbola, A. A. (2003) "Science, Technology and Culture in Africa: Challenges and Prospects" in Ayo Fadahunsi (ed.) *Philosophy, Science and Technology*, Ibadan: Hope Publications.

Ali, Ade S. (2003) "Culture, Technology and Society" In Ayo Fadahunsi (ed.) *Philosophy, Science and Technology. Sic.*

Alozie, Princewill (2008) "African Philosophy for Survival in the 21st Century" in M.F. Asiegbu et.al. (ed.) *Four Decades of African Philosophy: Issues and Perspectives*, Ibadan: Hope Publications.

Economic Commission for Africa (1998) "The Contribution of Science and Technology to African Development" A paper delivered to the African Business Round Table, 1998 General Meeting. www.uneca.org/eca_resources/major.african

Eze, Osita (1986) Transfer of Technology to Developing Countries, Lagos; Nigerian Institute of International Affairs.

Fadahunsi, Ayo et.al. (2004) Philosophy and the African Prospect: Selected Essays of Professors J.O. Sodipo on Philosophy, Culture & Society, Ibadan: Hope publications.

Iweriebor, E.G. (2004) Nigerian Technology Development since Independence, Ibadan: Book Builders.

Mabogunje, A, et.al. (ed.) (1991) Elements of Development, Abeokuta: ALF Publications.

Madubuike, S.C. (2003) Culture, Man, Society and Development, Ibadan: Demyax Books.

Obioha, Precious (2010) "Globalization and the Future of African Culture" Philosophical Papers and Reviews, vol.2 (1). http:// www.academic journals.org/PPR

Obuah, Emmanuel (2010) "Moving Africa Toward Sustainable Growth & Technological Development" International Academy of African Business Development, Proceedings of the 11th Annual International Conference.

Okah-Avae, B.E. (2003) Everyday Technology, Ibadan: Spectrum Books Ltd.

Oladipo, Olusegun (2009) Philosophy and Social Reconstruction in Africa, Ibadan: Hope Publications.

Pietrobelli, Carlo (2006) "Science and Innovation Policy: Fostering Technological Capabilities in Sub-Saharan Africa" http:// www.scidev.net/en/scienec-and-innovation-policy/r-d-in-africa/policy-briefs/fostering-technologiccal-capabilities-in-sub-sahara.html

Stewart, Francis (1978) Technology and Underdevelopment, London: The Macmillan Press Ltd.

Toure, Sekou (1974) "A Dialectical Approach to Culture" in Chrisman & Hare, Pan-Africanism.

Williams, C.O. (2006) "Culture Contact and Global Development: An African Experience" Oye: Ogun Journal of Arts, Vol.XII.