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Culture, Technology and Sustainable Development in Nigeria

Lukpata Victor Ikon[1], Salifu David Onu[2], John Lamba[3] &
Kalu Okechukwu Okorie[4]
Department of Political Science, Kwararafa University Wukari, Taraba State, Nigeria
Victolu123@gmail.com

Abstract
This paper explores the interconnected roles of culture and technology in advancing sustainable development in Nigeria. While technology has historically promised improved living standards through scientific innovations, it has also contributed to environmental degradation, inequality, and resource depletion. Despite the rapid global diffusion of innovations, many African societies, including Nigeria, still face persistent poverty and underdevelopment, highlighting the paradox of technological progress. The study emphasizes the need to situate technology within cultural contexts, as culture embodies values, traditions, and social systems that shape how innovations are appropriated and sustained. Sustainable development, guided by the United Nations' framework, is conceptualized through economic, social, environmental, cultural, and political dimensions. The paper argues that cultural regeneration, coupled with appropriate and context-sensitive technologies, can promote inclusive growth and ecological balance in Nigeria. It further highlights the potential of information and communication technologies, appropriate technologies, and indigenous knowledge systems to complement modern innovations. Ultimately, sustainable development in Nigeria requires integrating culture with technology, underpinned by strong governance and inclusive policy frameworks.

Keywords: Culture, Technology, Sustainable Development, Innovation, Nigeria

Introduction

The effects of technology underlie early twenty-first century global challenges. On the one hand since the enlightenment, especially science-based technology, has offered the promise of a better world through the elimination of disease and material improvements to standards of living. On the other hand, resource extraction, emissions of dangerous materials, and pollution of air, water, and soil have created irreversible damage to the biosphere. While the future might promise a vast acceleration of technological innovation "the scale and impact of environment degradation may reflect this vast acceleration as well. A related painful paradox is that despite the ongoing technological revolution, the majority of the world population still lives in abject poverty with inadequate food, housing, and energy, plagued by illness that could be easily cured if clean water and simple drugs were made available. Fortunately, a significant number of former developing countries are now on the threshold of development, helped by technology transfer and technological innovation that have benefited large parts of their population. Some countries, such as China, India, Korea, Taiwan, Singapore, and, to a certain extent, Brazil, have followed their own technological trajectories. However, for large populations in Africa, Asia, and Latin America the benefits of technology remain a dream, even if new technologies like photovoltaic cells, cellular phones, and the Internet could help them "leap-frog" towards the twenty- first century. The persisting contradictions between better lives created and supported by technology for the wealthy few, and increasing environmental degradation and understanding of the vast majority calls for a deeper exploration and understanding of the nature of technology and its relationship to society, consumption patterns, governance, business, and institution are envisaged, (Raskin et al., 2002), questions about the role culture and technology in contributing to sustainable development in the world.

Nigeria cultures are diverse in nature and like most other cultures in the world have been influenced by external factors within the context of globalization in recent times; cultural regeneration has become a central theme in Nigeria among scholars, enlightened citizens and Non-governmental organizations (NGOs) with the understanding that to harness the cultural

resources of Nigeria is the best bet to usher the country to the path of sustainable development. Therefore, the call to lay great

Conceptual Clarification

Culture, technology and sustainable development were clarified to enhance the understanding of the issues raised in this paper.

Culture: The word culture is used to describe the way of life of a people. It embodies the language of the people, their political and social organization, their belief and religion and their literature and art. It also well includes all the material things which the people produce and use and their means of obtaining food and raw materials. The materials in question is inclusive of houses, weapons, tools, utensils, clothing, crafts and ornaments, (Eluwa et al., 1988:1). Culture is taught, learned and shared as the knowledge acquired is passed on from generation to generation. This process accounts for the different cultures identifiable within Nigeria and around the globe. For purpose of emphasis, it would be necessary to reiterate that each of these cultures is defined by the values, traditions, social habits and behaviours, language, belief systems, concepts of the universe, dress, music and arts. Collaboration to this reasoning, Maulana Kyengá postulates that:

> Our culture provides us with an ethos we must honour in both thought and practice. By ethos, we mean a people's self-understanding as well as its self-preservation in the world through its thought and practice in the other sex areas of culture. It is above all a cultural challenge for culture is here defined as the totality of thought and practice by which a people creates itself, celebrates, sustains and develops itself and introduces itself to history and humanity (Florence 2011:1)

Technology: The word "technology" encompasses essentially three meanings: tools and instruments to enhance human ability to shape nature and solve problems (such as a hammer and nail), knowledge of how to create things or how to solve problems (such as to brew beer or to make an atomic bomb), and culture (our understanding of the world, our value systems). Historically, the emergence of human civilization has been closely connected to the development of tools for hunting, agriculture, irrigation and water management, and navigation. In the second meaning, technological knowledge becomes reflexive in that understanding of how to make and use tools and instruments becomes encoded and transmissible as technological knowledge and know-how. Related to this second meaning of technology is the development of modern scientific knowledge, based on empirical observations. Hypotheses, and generalizations on the natural laws concerning the behavior of materials and the living environment.

In the third sense, culture and technology has permeated society to such an extent that separation between technology and culture is no longer meaningful. All human activities, like housing, nutrition, transportation, work, leisure, even art and imagination become heavily enmeshed with technology. We "own" products of technology by a process of "cultural appropriation", in which the use of technologies is learned, interpreted, and given meaning in everyday life. (Hard & Jamison, 2005:17). We are living in a "culture technique" in the sense that our deepest and most private knowledge and emotions are permeated by technology.

The transition from technology as tool use to knowledge began around the emergence of the first industrial revolution, more than two centuries ago. The transition to technology as culture accelerated after the Second World War, and is closely related to the rise of information and communication technologies, biotechnology, computers and the internet. In contrast to technology, science is seen as an organized search for "truth" and "objective knowledge" about

reality and the laws of nature. Science can be characterized by a rigorous methodology and is an unending process of conjecture and falsification. In practice, the boundaries between modern science and technology have become blurred; moreover, modern philosophy of science treats scientific knowledge to a certain extent as "socially constructed". In this paper we focus primarily on technology, but science is relevant as one of the pillars of technological knowledge.

In the literature, technological innovation is generally understood as bringing a new product, process or service successfully to the market, to be sold for a profit (freeman. 1997:20). Technological innovation thus goes beyond invention, which depict the elaboration and prototyping of a new technological principle, it is related to diffusion. Which refers to the spread of new technology into the wider society. Of course, innovation is by no means identical with creating the physical conditions for a "good life" as defined above. Because of companies' profit motives, as well as unintended and unforeseen consequences, the contribution can be both positive and negative.

Sustainable Development: The most widely recognized definitions of sustainable development is that contained in the Brudtland Report released in 1987 by the United Nations. According to the Report, "sustainable development is development that meets the needs of the present without compromising the ability of the future generations to meet their own needs (World Commission on Environment and Development). In tandem with the Report, the above definition embodies two major concepts:

i. The concept of "needs particularly, the essential needs of the World's poor, which maximum priority should be given; and
ii. The concept of limitations imposed by the state of technology and social organizations on the ability of the environment to meet present and future needs.

The United Nations 2005 World Summit outcome document identified pillars of sustainable development tagged interdependent and mutually reinforcing pillars of sustainable development. These pillars are economic development, social development and environmental protection (2005 World Summit Outcome Document), Based on the triple identified pillars, people have argued through such international forums as the United Nations Permanent forum on indigenous issues and the Convention on Biological Diversity, that there exist four pillars of sustainable development with culture being the fourth pillar. The Universal Declaration on Cultural Diversity (UNESCO, 2001) further explicates the concept by stating that:

> Cultural diversity is as necessary for humankind as biodiversity is for nature. It becomes one of the roots of development understood not simply in terms of economic growth, but also as a means to achieve a more satisfactory intellectual, emotional, moral and spiritual existence. In this vision, cultural diversity is the fourth policy area of sustainable development.

Pillars of Sustainable Development

i. **Economic Development:** This a fundamental factor in the consideration of sustainable development. Economic development is defined as the practices and meanings associated with the production, use and management of resources, where the concept of "resources" is used in the broad sense of it to refer to materials, money, services, staff, or other assets that are transformed to produce benefit and, in the process, may be consumed or made available. Benefits of resource utilization may include increased wealth, meeting needs or wants, proper functioning of a system, or enhanced wellbeing.
ii. **Social Development:** Within the context of social development, ecology is used as an analytical tool. However, this pillar has been a subject of debate because it has a social

dimension. Some researchers have argued that the environment is a combination of nature and culture. Others argue that ecology is a broader concept, that at the intersection of the social and the environment is ecology. This view allows culture to stand on its own as and Local a pillar of sustainable development. (United Cities Governments).

iii. **Cultural Development:** Culture is a fourth pillar of sustainable development. It is a product of the Agenda 21 for culture and the United Cities and Local Government Executive Bureau which lead the preparation of the policy statement "Culture: Fourth Pillar of Sustainable Development" passed on 17 November 2010, in the framework of the World Summit of Local and Regional Leaders - 3rd World Congress of United Cities and Local Government (UCLG), held in Mexico City. The cited document points to the link between culture and sustainable development through a dual approach of developing a solid cultural policy and advocating a cultural dimension in all public policies (United Cities and Local Governments).

iv. **Political Development:** The Political development is defined as the pillar of practices and meanings associated with fundamental issues of social power as they relate to the organization, authorization, legitimation and regulation of a common social life. This definition is in tandem with the view that political change is a prerequisite for responding to economic, ecological and cultural challenges.

Critique of Sustainable Development

Consequences of the Concept - John Baden views the notion of sustainable development as dangerous because the consequences have unquantifiable effects. Thus, he postulates that in economy like in ecology, the inter-dependence rule applies. Isolated actions are impossible. A policy which is not carefully enough thought will carry along various perverse and adverse effects for the ecology as much as for the economy. My suggestions to save our environment and to promote a model of sustainable development risk indeed leading to reverse effects (Baden, 1992:17).

To Baden the notion of sustainable development is so vague that politicians can act in disguise of it to project their interest.

Vagueness of the term - Jean - Marc Jancovici writes about sustainable development expressing his opinion of the term by stating thus: I know that this term is obligatory, but I find it also absurd, or rather so vague that it says nothing. Luc Ferry adds that; sustainable development has become obscured by conflicting world views: who would like to be a proponent of an untenable development. (Lue Ferry 2007:75)

Basis - Sylvie Brunel, a French geographer questions the basis of the concept of sustainable development. To her, the core ideas of sustainable development are a hidden form of protectionism by Western countries impeding the development of the Third World Countries. Thus, she asserts "I have the feeling that sustainable development is perfectly helping out capitalism."

De-growth - The apostles of the de-growth argue that the term sustainable development is a contradiction, according to them, on a planet where 20% of the population consumes 80% of the natural resources, sustainable development cannot be possible for this 20%. Stressing further, they maintain that according to the origin of the concept of sustainable development, a development which meets the needs of the present without compromising the ability of the future generations to meet their own needs, the right term for the development countries should be a sustainable de-growth (Bruno, 2008:10).

Measurability - A report for the U.S. Environmental Protection Agency in 2007 stressed the problem of measurability within the context of sustainable development and laments that:

> While much discussion and effort has gone into sustainability indicators, none of the resulting systems clearly tell us whether our society is sustainable. At best, they can tell us that we are heading in the wrong direction or that our current activities are not sustainable. More often, they simply draw our attention to the existence of problems, doing little to tell us the origin of those problems and nothing to tell us how to solve them.

How Technology and Culture could contribute to sustainable development

i. **Information and Communication technologies:** Artificial Intelligence Information and communication technologies will continue to rapidly develop. It seems certain that economically privileged people everywhere will be in more or less constant communication and interaction with each other through mobile phones, Internet, teleconferencing, and other forms of technology. The Internet and its successors will enable unprecedented exchange of information and knowledge across the globe. The Internet already is bringing together like-minded people from different cultural and economic environments. Computers will become smaller and more ubiquitous, growing from their current deployment in housing and transportation to new applications like clothing and food wrappings. In the realm of technological innovation, it is expected that the miniaturization of memory chips and microprocessors will continue to proceed at the same high speed (Moore's law). The implications of these and other developments are highly uncertain. Kurzweil (2005:30) speculates about the possibility within the next twenty to thirty years of a human-machine "singularity": the merger of human and machine computational intelligence to create something that goes far beyond human intelligence. Kurzweil bases his speculation upon the likelihood that computation will increase exponentially. Similarly, our understanding of how the human brain works is growing very fast. It is foreseeable that we will be able to implant computers in parts of the human brain to improve its functioning. We might even be able to upload the human brain function to macro computers. So, we might be able to enhance biological intelligence with non-biological and vice-versa. In 2030 we may have computer entities that seem to be conscious and claim to have feelings.

   Kurzweil's projections exemplify the technological determinism approach and tech-fix thinking. He even claims that hunger and poverty may be eliminated by these new technologies. His overarching view sees technology itself as an exponential evolutionary process, the continuation of the biological evolution that created humanity.

   These speculations (some say extrapolations) raise provocative questions about the nature of Artificial intelligence (AI). Recent literature has documented a renewed interest in Al. Anderson (2005:40) cites Thomas Georges "Digital Soul" (2003:50) in which he investigates the implications of intelligent machines outside human control. He not only asks the obvious questions, such as "What does it mean to be intelligent?" and "How different will machine intelligence be from human intelligence?" but also less obvious ones such as "Will it be morally allowable to make intelligent, autonomous machines work for us? Of course, AI raises questions about human intelligence, human identity, human consciousness, and ultimately, what constitutes a human being. If we understand the human brain well enough to replicate its functions and combine cells from separate brains, we might ultimately be able to speed up human intelligence processes. This is Kurzweil's speculative prediction. Questions remain: Will this really

be possible and what would, we achieve by doing it? Would we be able to control its development and would it be desirable to do so? Might the value of such unbound

ii. **Appropriate Technologies:** In contrast to the areas of so-called high-tech innovation and development we have considered so far, there is a very different strand of technologies, often called intermediate (Schumacher, 1973:14) or appropriate technologies. At present, these are found primarily in the rural Third World, but also in pockets of the "developed" countries (Vergragt, 2003:18). Appropriate technology is small scale, energy efficient, environmentally sOund, labor intensive, and controlled by the local community. The breadth of the paradigm of appropriate technology is suggested by the many terms used to describe it: Intermediate, progressive. alternative, light-capital, labour-intensive, indigenous, low-cost, community, soft, radical, liberatory, and convivial (Akubue, 2000:10). Schumacher envisioned a intelligence be that human beings do not control it? (Kurzwail, 2005:50) make intelligent, autonomous machines work for us? Of course, Al raises questions about human intelligence, human identity, human consciousness, and ultimately, what constitutes a human being, If we understand the human brain well enough to replicate its functions and combine cells from separate brains, we might ultimately be able to speed up human intelligence processes. This is Kurzweil's speculative prediction. Questions remain: Will this really be possible and what would, we achieve by doing it? Would we be able to control its development and would it be desirable to do so? Might the value of such unbound intelligence be that human beings do not control it? (Kurzwail, 2005:50)

Appropriate technology has been advocated as a solution for rural development problems, but has also gained support as a direction for sustainable technologies. However, it has often been identified as "cheap", "second hand", or "second best" by adherents of massive Western technology transfer to developing countries and by ideologues who believe in modernization by technological innovation. Many elements of intermediate or appropriate technology could be used in the development of technologies for a sustainable society, especially when used in synergy with high-tech developments. These elements include an orientation toward human needs, control by and empowerment of local communities, small scale and distributed energy. Efficient and environmentally sound, low cost or cost effective, and labor intensive. The renewable energy movement in the USA and Western Europe emphasizes some of these elements. The challenge going forward is to learn from past mistakes, and to combine elements of appropriate technology with some aspects of high-technology into a new paradigm of sustainable technology (Schumacher, 1973:70)

iii. **Health care in Asian Societies:** There is a close relationship between appropriate technology and traditional or "indigenous" knowledge. Healthcare in Asian societies is a good example. In Asian societies, and perhaps increasingly even in societies in developed Western countries 1like Australia and the United States, the organization of healthcare services has been characterized by a pluralism that is not reflected in the official policy-making institutions. Healthcare, where it is driven by official policy-making institutions, is dominated by "modern" medicine developed largely in the West. This modern medical system was transposed to the colonies during the earlier part of the last century. In many Asian societies, the introduction of modern medicine through the hospitals and other institutions established by colonial administrations meant the marginalization and even erasure of indigenous medical traditions that had been in use for hundreds if not thousands of years.

The persistence of the practice of Chinese medicine and other medical traditions is not surprising once the status of colonial the status of colonial health care and other social

provisions is understood. While colonial forces disparaged Asian medical traditions, they did not succeed in making their Western alternatives widely available. Traditional health care providers continued to provide migrant groups with their only source of health care.

Chinese medicine is an example of a medical tradition that has seen fast changing fortunes in the colonies of Southeast Asia and in China as well, particularly in the earlier period of the twentieth century, medical traditions like Chinese medicine have continued to thrive and actively contribute to modern healthcare in Southeast Asian countries like Malaysia, Singapore, and Thailand. Certainly, in China, traditional medicine has been endorsed as part of the communist ideology of walking on two legs"; Eastern and Western, or modern and traditional. In societies in Southeast Asia, Chinese medicine is supported solely by the private sector, since it receives little endorsement from the State. Patients who consult with the practitioners of Chinese medicine may pay more than if they had gone to a doctor trained in modern medicine, yet Chinese medicine continues to draw patients who trust this tradition and its practitioners. To a large extent, healthcare beliefs are handed down through the generations.

The continued patronage of traditional medicine in spite of the existence of a well-developed modern healthcare infrastructure strongly argues against a single perspective of health and medicine dominated by modern medicine. Healthcare pluralism can prove to be sustainable in the long term if the delivery of services is organized to be far more inclusive than it has been of established medical traditions with which people are familiar, particularly in developing countries like Nigeria (Ling Giok, 2000:13)

Concluding Remarks

For several decades now, theorists of steady state economy and ecological economy have been asserting that reduction in population growth or even negative population growth is required for the human commodity not to destroy its planetary support system. A set of well-defined and harmonized indicators is as well required to make sustainable development tangible. Those indicators are expected to be identified and adjusted through empirical observations. Sonia Bueno, a Cuban-born researcher made a valid suggestion which should be adhered to. He suggested an alternative approach that is based upon the integral, long-term cost-benefit relationship as a measure and monitoring tool for the sustainability of every project, activity or enterprise. This concept aims to be a practical guideline towards sustainable development following the principle of conservation and increment of value rather than restricting the consumption of resources.

The improvement of environment quality depends on the market economy and the existence of legitimate and protected property rights. They promote the effective practice of personal responsibility and the development of mechanisms to protect the environment. Well designed and managed tourism can create decent jobs and generate trade opportunities necessary for a realistic sustainable development. Investment in sustainable tourism, including eco-tourism and cultural tourism, which may include creating small and medium sized enterprises will impact positively on the sustainable development of Nigeria. Facilitating access to finance, through micro-credit initiatives for the poor, indigenous peoples and local communities in areas with high eco-tourism potential also a worthy prerequisite for sustainable development. Every planning aimed at achieving sustainable development in Nigeria should recognize the local cultural values, equal rights and cultural logic of the respective communities in policy planning and decision-making.

Conclusion

Arising from the assessment of critics, sustainable development is a noble dream. Its attainment requires discipline and a deep sense of patriotism on the part of the political class. This is a critical point that should not be relegated to the background because in a society like Nigeria where corruption is endemic and pervasive, conscious effort is needed to pursue and attain the goal of sustainable development. Necessary legislations at both state and national level would be required as pre-condition to attaining sustainable development is attained in Nigeria in addition to the resolve by individuals to sacrifice personally to see that the goal of sustainable development is attained.

If the goal of sustainable development is achieved, poverty would either be eradicated or reduced to a manageable proportion. Since independence, successive governments have bandied so-called development plans but continuity is totally lacking. Each government always seeks to establish its own imprint on the national landscape and in the main, these attempts have been unsuccessful. The problem of poverty has remained a cancerous mailaise. President Goodluck Jonathan's administration did not succeed in tackling it, though it recorded modest economic milestones. The focus is now on General Mohammadu Buhari who is expected to build on the successes of the Jonathan tenure but also develop and implement a template that will only not only eradicate poverty and underdevelopment but also generate prosperity.

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