

RESOLVING SECURITY AND ENVIRONMENTAL PROBLEMS OF NIGERIA THROUGH SCIENCE, TECHNOLOGY AND MATHEMATICS EDUCATION

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Abstract

Our dear Country and the rest of the World are profoundly and continuously shaped by Science, Technology and Mathematics through the preservation of the Environment, reduction of poverty and Health care improvement. Each of these challenges and many more not mentioned require scientists, particularly mathematicians capable of developing effective and workable responses for them. In this paper, the major Environmental and Security Problems of Nigeria are outlined and their remedy through Scientific, Technological and Mathematical means are suggested.

Introduction

The Nigerian nation is faced with numerous natural and man-made environmental and security challenges particularly in the North and South-South geopolitical Zones. Our dear country and the rest of the world is profoundly and continuously shaped by Science, Technology and Mathematics through the preservation of the environment, reduction of poverty and health care improvement. Each of these challenges and many more not mentioned require scientists particularly mathematicians capable of developing effective and workable responses for them. In order to achieve these responses, a famous declaration on Science and Technology was made in Budapest (1999). The declaration states:

“Access to scientific knowledge for peaceful purposes for a very early age is part of the right to education belonging to all men and women. Science education is essential for human development, for creating endogenous scientific capacity and for having active and informed citizens.

Science education, in the broad sense, without discrimination and encompassing all levels and modalities is a fundamental prerequisite for democracy and for ensuring sustainable development”.

In order to achieve the dictates of the above declaration, Mathematics is indispensable. The author sincerely hopes and expects the country will be provided with the much needed Scientific and Mathematical approaches and solutions to the myriad of Environmental and Security problems it experiences.

Science, Technology and Mathematics Education (STME)

Scientific, Technological and Mathematical achievements are the major reasons for the enormous social and economic changes that impacted positively on the life of people throughout the world. These disciplines collectively contribute to make life easy, comfortable and help to develop advanced health care facilities, improved agricultural practices and high yield seeds. Above all, science, technology and Mathematics help to uncover and remove from the minds of the people, harmful superstitious beliefs. It is pertinent to note that while science is concerned with knowledge and understanding of nature, technology deals with the application of the knowledge to proffer solutions to problems that arise in our day to day life. Furthermore, the provision of healthy drinking water, nutritious food, conducive shelter, electricity, good roads, machinery for industries and so on were made possible by the collective contribution of Scientists and Mathematicians. So also are the management of agricultural production, water resources, healthcare delivery, transportation and communication.

It is pertinent to note that Countries such as China, Singapore, India, Malaysia to mention but a few have recorded huge success in scientific and technological advancement which in turn places their economy among the fastest growing in the world. Countries excluded from the creation and benefits of scientific and technological knowledge are today among the poorest and most backward in the comity of nations.

Environmental Problems of Nigeria

The Nigerian environment is continuously ravaged by nature and in most cases by the destructive actions of the inhabitants. There is huge destruction of the physical, biological and chemical aspects of our environment. These destructions are increasing daily in quantum and rate. Environmental challenges such as erosion, incursion of the sea, bush fires, floods and so on renders many Nigerians homeless with commensurate loss of millions of naira worth of belongings. Some of the environmental problems faced by this country are as outlined below:

1. **Coastal/gully erosion and desert encroachment:** The southern part of the country is bounded by a stretch of over 850km of coastal areas which are permanently ravaged by coastline erosion. The south is seriously affected by gully erosion occasioned by excessive rainfall. The northern part of Nigeria is seriously affected by desertification caused by deforestation.
2. **Population growth and Urbanization:** The current population of Nigeria is estimated at above 140 million people with a total fertility rate of 5.7 children per woman, birth rate of 42 babies per thousand and growth rate of 2.9% per annum. The population growth has led to increased urbanization over the last 50 years. The proportion of people living in the urban areas has risen from 15% in 1960 to 43.3% in 2000 and is projected to rise to 60% by 2015. The total area consumed by urbanization in Nigeria during the same period increased by 131% from 2,083km² in 1976 to 5,444km² with an average annual rate of urbanization estimated to be 3.7% per annum (National Population Commission, 2004). The negative side of rapid urbanization in Nigeria include: generation of waste, excessive use of limited facilities like electricity, water, hospitals, schools and so on.
3. **Bush Fires:** One major environmental hazard in Nigeria is the indiscriminate burning of forests by farmers, hunters and other elements. This scourge has led to the destruction and loss of hundreds of hectares of forest which ultimately means that hundreds of wild life is lost through this menace.
4. **Petroleum exploration, gas flaring and pipeline vandalization:** Extensive exploration activities in the Niger Delta have exposed the region to massive pollution of the fertile land. Gas flaring in the course of refining the crude leads to the environmental pollution of the entire Niger Delta area. The activities of crude thieves lead to the burst of pipelines which results in the flow of thousands of barrels of crude into the creeks and swamps of the region thereby polluting them.
5. **Mining activities:** Poor mining practices during the colonial era and the lack of post mining remediation measures has left hundreds of hectares of wasted land across the country. The mining sites in the Jos Plateau and areas in Riruwai, Doguwa LGA of Kano State and many other mining sites have left the inhabitants exposed to dangerous elements. The recent death of young children as a result of lead poisoning in Zamfara State as a result of gold mining is a clear example of how our environment is ravaged through mining.
6. **Deforestation:** There is the massive destruction of our forest mostly to provide agricultural land for the growing population, fire wood for energy or timber for construction. This results in the degradation of the environment and in most cases causes erosion and desertification.
7. **Desertification:** Almost 75% of the northern states of Bauchi, Borno, Gombe, Kano, Jigawa, Katsina, Kebbi, Sokoto, Zamfara and Yobe are faced with the threat of desert encroachment. The population growth and excessive deforestation and excessive felling down of trees for fuel and other uses are the major causative agents in the above listed states. The scourge is so devastating in such a way that the entire villages and major roads have been buried under sand dunes in some parts of Katsina, Sokoto, Jigawa, Borno and Yobe States.
8. **Floods:** Nigeria experiences perennial flood in the coastal areas and in some states where dams were constructed on rivers. For example, there are annual cases of floods in Niger and Kano States from the excess water released from the Kainji, Shiroro and Tiga Dams.
9. **Industrial pollution:** Most industrial areas in Nigeria expose their neighbouring communities to very toxic industrial wastes. A typical example is the emptying of industrial wastes from tanneries and other industries in Sharada and Challawa industrial areas of Kano State into adjoining Rivers. The pollution of the river is posing serious danger to the communities around these areas.

Security Challenges of Nigeria

Nigeria is faced with numerous security challenges caused by a number of factors. Several authors gave their conception of the security challenges of the country, but one of the most recent and comprehensive account of Nigeria's security problems was given by Col. Sambo Dasuki, the National Security Adviser, in a speech titled "**Nigeria's Security Challenges: The Way Forward**" delivered recently at the 3rd seminar of the National Defence College Alumni Association covered by the Leadership Newspaper of 1st February, 2013. Dasuki defined security of an environment to imply "a stable, relatively predictable environment in which an individual or group may pursue its ends or objectives without disruption, harm, danger and without fear of disturbance or injury. He further argued that no nation is free of security challenges which vary from country to country. Dasuki further classified Nigeria's security problems as follows:

- a. **Terrorism:** Which he described as the greatest and the most predominant security problem exemplified by the wave of insurgent attacks and bomb blasts in many parts of the country.

- b. **Maritime Security:** This occurs in form of piracy, illegal oil bunkering, oil theft, illegal fishing and hijacking. The illegal activities in our maritime areas is causing the country huge loss of revenue and making our ports unattractive to foreign shipping lines. It is estimated that the country loses about N105 billion to pipeline vandalization annually.
2. **Niger Delta militancy:** This is the activity of rogues to disrupt oil production in the Niger Delta. At the peak of their activities, crude production drops to as low as 700,000 bpd against over 2,000,000.00 bpd. The revenue accruable from oil revenues dwindles when such happens which adversely affected our economy that depends largely on crude export.
3. **Kidnapping:** This is the apprehension of persons for ransom which was initially used by the Niger Delta militants as a way through which they can attract attention of the Government and Oil Companies to their struggle for resource control. However, with the amnesty to militants by the Federal Government, this has now been taken over by criminal elements who imbibe the habit of kidnapping prominent Nigerians, lawmakers, traditional rulers and parents or relatives of important persons in the country.
4. **Armed Robbery:** This menace became one of the long standing security issues especially after the 1967-70 Nigeria civil war when arms became widely available in the country. It is generally believed that youth unemployment, and the culture of get-rich-quick based on greed, which pervades our society today are largely responsible.
5. **Youth Unemployment:** This is one socio-security challenge that successive governments over the years have tried without success to resolve. The unemployed youths are used as thugs during political campaigns and in time of crises.
6. **Porous Borders:** One of the main security challenges in the country is the wide expanse of Nigeria's porous borders which results in the influx of criminals across the borders and smuggling of goods and arms into the country.

Overcoming the Environmental and Security Problems of Nigeria

It is clear that the Environmental and Security problems in Nigeria are very well known, so also are the causative factors which have been studied by many. To solve the problems, Nigeria like other Nations of the world, must put Science, Technology and Mathematics in the fore front. It has been argued by many that despite the Number of Universities and Tertiary Institutions in Nigeria, the percentage number of students enrolled in Science, Technology and Mathematics programmes is insignificant. More serious, is the meagre amount that is budgeted for programmes at the State and Federal Government levels. The low number of students in these fields and the meagre resources committed clearly explains the genesis of Nigeria's Environmental and Security Problems. Investment in Science, Technology and Mathematics is required to translate knowledge to practical solutions of these problems as well as the causative factors.

Nowhere is Science, Technology and Mathematics more relevant than in the creation of industrial base that will lead to the employment of the millions of youth in Nigeria that are unemployed. Utilization of Science, Technology and Mathematics is critical for Nigeria to exploit its huge God given resources to create industry and wealth for the development of the country and to ensure employment of the teeming youths.

Today Mathematics education is critical to Science and Technology sector because it is the language of Science and Technology, yet, it is a discipline that is feared and that records the highest failure in our educational system. One of the reasons for the failure has been the poor infrastructure for teaching Mathematics and lack of qualified teachers. Therefore, Nigeria requires the necessary infrastructure and investment particularly in Mathematics which is fundamental in resolving its environmental and security problems.

Conclusion

It is clear from the foregoing that Nigeria's Environmental and security problems require more decisive measures for them to be tackled. We must therefore find Scientific and Technological methods to handle the numerous Security and Environmental challenges the country is facing.

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