ENGINEERING TECHNOLOGY: A KEY FOR SECURITY AND SUSTAINABLE ECONOMIC DEVELOPMENT IN NIGERIA

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ABSTRACT

Engineering is one of the most effective human resource developments that needs to be accepted completely for quick industrialization, security, and sustainable economic development of our nation, Nigeria. Engineering technology has been a component of national economic development and society because of its impacts on infrastructure, environmental conservation, and security. This paper examined the prominent role played by engineering technology in security and sustainable economic development. Its primary focus is that engineering technology is the major determinant of security and sustainable development. The paper also examined the impacts of engineering technology on sustainable economic development, such as in environmental protection, community development, agricultural mechanization, health, electricity, and automobiles and aeronautics, etc. The factors that affect engineering technology in security and sustainable economic development in Nigeria, such as corruption, lack of peace and security, lack of rule of law, lack of adequate training facilities and equipment, inadequate funding, lack of training and retraining of engineers, and government policy on engineering education were examined. Among the recommendations made by the authors as a catalyst for our nation's development and security were the following: the fight against these factors that impede sustainable development; the inclusion of more engineers in policy-making bodies; and the training and re-training of engineers.

KEYWORDS: Engineering, Sustainable Economic Development, Impact of Engineering, Security and Corruption

INTRODUCTION

Through research and innovations, engineering has been one of the major disciplines that have brought industrialization, aided security and sustainable economic development to nations like Nigeria. Engineering is the application of scientific principles to design and construct machines, structures, and other items like vehicles, bridges, buildings, roads, artificial organs, eyeballs, etc., that are aimed at the economics of operation and safety of life and properties. Many advanced products today are brought about by engineering technology, which has made life easier for mankind on earth. In the world today, every nation has the

desire to make provision for its citizens by helping them to have a reasonable level of economic prosperity and to enjoy good health, education, security, and social services, which helps them to be free from poverty and also makes sure that the activities of humans will not have any negative impact on the environment. With all these things done, there will be economic sustainability in the country.

Sustainable economic development is the challenge of meeting human needs for natural resources, induced trial products, energy, food, transportation, shelter, and effective waste management while conserving and protecting the environment for future human and capital development when they are fully harnessed to create jobs and general income for the government for the purpose of economic development and transformation (Tochukwu, 2010). This implies that a sustainable economy is a system of production that satisfies present consumption levels without comprising future needs. And economic development is the development of the economic wealth of countries or regions for the wellbeing of their citizens (inhabitants). When we talk about economic development, we are looking towards a sustainable increase in the standard of living, which implies increased per capita income, better education and health, as well as environmental protection.

Engineers will always devise methods or plans to assist in the provision of food and other resources, as well as to minimize negative environmental impacts and the risk of man-made disasters. For sustainable economic development to come about, the system must be secured. There must be security in all aspects of human endeavors. This will bring about stability in the system, and all the activities geared towards sustainable economic development will kick off smoothly just because there is security.

According to Buzan's analysis, there are five sectors of security, each defining a focal point within the security problem and a way of ordering priorities, but all are woven together in a strong web of linkage cited in Marianne, (2009). Other sectors of security are all dependent on the economic security foundation of the nation. A country with a strong economic foundation will be able to deal with other security threats both internally and externally. Hence, security is one of the factors that bring about sustainable economic development in any state or nation.

However, the only way real development and security will come is through integrating and interlinking economic, social, and environmental sustainability. This is because if the different aspects of development (economic, social, political, legal, security, and environment) are not addressed simultaneously and considered together, they may be lost and hence affect the overall development process. According to Perry (1998), "The economic wealth of any nation depends increasingly on the fruits of engineering technology." Sustainable development of a nation becomes real when there is environmental sustainability, social sustainability, security, and economic sustainability in that nation.

CONCEPT OF SECURITY

According to Nwanegbo & Odigbo (2013), the concept of security is a crosscutting and multi-dimensional concept that has, over the last century, been the subject of great debate, as cited in Nweke & Nwachukwu (2014). However, long before that, the history of mankind was interspersed by the frenzied search for the best way of ensuring the security of the people, their properties, external threats with all the necessary means at its disposal, and internal threats through the overall socio-economic well-being of its citizenry (Absolute Astronomy, 2011; Tedheke, 1998). Furthermore, Mukhtar (2012) argued that the concept of

security has always been associated with the safety and survival of the state and its citizens from harm or destruction or from dangerous threats. Hence, there is no tension in any nation that has good security. The reason being that they are already protected from both internal and external threats or attacks because their security architecture is very tight.

However, security is freedom from, or resilience against, potential harm (or other unwanted coercive change) caused by others. Beneficiaries of security may be people and social groups, objects and institutions, ecosystems, or any other entity or phenomenon vulnerable to unwanted change by its environment. Security mostly refers to protection from hostile forces (https://en.wikipedia.org). Again, security is the state of being free from danger or injury, freedom from anxiety or fear. For instance, your watch dog in your home may give you a feeling of security, and this will make you relax and not worry about any threat because you feel secured with the presence of the dog. Above all, the concept of security has been seen as a situation where a person or thing is not exposed to any form of danger or risk of physical or moral aggression, accident, theft, or deterioration (Nweke & Nwachukwu 2014). Security is a situation where one, state, or nation is at peace without any threat from within or outside and all the operational activities are going on smoothly without any interruption from anywhere.

ECONOMIC SUSTAINABILITY

Sustainable economic growth is economic development that attempts to satisfy the needs of humans but in a way that sustains the natural resources and the environment for future generations to meet their own needs. For a nation to have a sustainable economy, all the needs of its citizens must be met, thereby alleviating poverty (a social problem) and wrong practices or activities that might harm the environment. For instance, a poor man without any job can engage himself in harmful activities like deforestation (which is the cutting down of trees) that can cause the leaching of important minerals from the soil, which can lead to low food production. But the poor man has succeeded in making money for food from the firewood he made from the trees he cut down. Hence, alleviating poverty in the nation will help to slow down the activities that affect the environment, thereby preserving the soil and sustaining increased productivity.

The above definition tells us that the present practices or activities of humans should not pollute or threaten the living standards of society. The only way sustainability can be achieved is by balancing the tradeoffs among the various goals across environmental, economic, and social systems.

ENGINEERING IN SECURITY AND ECONOMIC DEVELOPMENT

Engineering is the foundation for a nation's security and long-term economic development. Hence, the development of any nation depends on the social and economic contributions of its citizens, and engineering training plays a major role in promoting security and economic development. Engineering as a profession promotes and facilitates the acquisition of applied skills and basic scientific knowledge to solve nation-wide and human needs. It cannot be overemphasized that engineering technology is the engine of sustainable economic growth and the security of a nation. Nigeria cannot develop without well-equipped high institutions for quality training of engineers. Unfortunately, Nigeria seems not to give its engineering technology programme the attention it deserves.

Engineering plays an important role in dictating the stability of security and sustainable national economic development. These have been the concerns of the people and the nation.

Security and sustainable national economic development have become challenges for the entire world, especially in Nigeria. A security threat is giving Nigerians night-mares. Security involves surveillance and assessment, protection of assets and infrastructure, and the use of weapons for defending and defeating our enemies. However, due to inadequate training and inefficient and ineffective institutions such as security agencies, much could not be done to adequately secure our nation. Hence, Nigeria suffers from low productivity in all aspects of economic and technological endeavors. This appears to be one of the reasons for the rising rates of unemployment, insecurity, poverty and criminality in society.

The growing problem of unemployment in Nigeria has contributed enormously to the worsening problem of poverty among the citizens. The root cause of this is that most engineering graduates from tertiary institutions lack the necessary skills to exploit the natural resources that God has blessed us with in Nigeria. Unemployment, most of the time, leads to frustration and disillusionment, which may result in crime or drug abuse in a futile attempt to escape from humiliation and insults associated with poverty (Olaitan, 1996). This is also one of the reasons Nigeria is under the siege of the Boko Haram insurgency and banditry. Many people have lost their lives, many have been injured, and properties worth millions have been wasted. The graduates of tertiary institutions that don't get employed cannot be self-employed because they lack the skills required to function effectively. These issues are threats to the security and sustainable economic development of a nation like Nigeria. It has negatively impacted our nation. The government of the day should fund the engineering profession to enable them develop new materials that will assist in tackling the security challenges and improve the sustainable economic growth of the nation. This new material and equipment will benefit people of all ages and will be primarily concerned with the citizens' growth, prosperity, security, and quality of life.

Concerns about security in our homeland and sustainable economic development, engineering plays a major role in augmenting these concerns. Engineering technology has made significant contributions to the safety of people and property in our country. But it seems as if nothing has been done due to security threats all over the country. There are so many engineering technologies and innovations that have made the security of life and properties possible and effective in the global world today. Sophisticated weapons and other security gadgets have been invented for the security of life and our environment. Bullet proof doors, keys, windows, security cameras, and electrical devices that set off an alarm when someone tries to break in, are all products of engineering technology, invented for security measures. In other sectors of security like food security, environmental security, infrastructure security, etc., engineering technology has contributed and played a vital role in these areas for sustainable economic development. A nation can boast security when other areas of human endeavor are secured. Thus, if all the sectors had security, there would be sustainable economic development and the standard of living of the citizens would be improved.

Robots and drones are innovations in engineering technology as security devices used to curb threats and insecurity in a nation and in the global world today. Materials science and engineering (MSE) have contributed immensely in the areas of security and economic sustainability through research, synthesis, processing of materials, and manufacturing of products that have helped in securing humans and nations and sustaining economic growth. Several categories of different materials have been developed through engineering technology to meet the needs of this all-important aspect of human endeavors: surveillance and assessment, protection of assets and infrastructure, etc. For instance, for surveillance and

threat assessment, key micromechanical analytical systems have been developed to meet some security needs. Materials for such systems exhibit multifunctional capability, with roles to play in communications, chemical and biological sensors as well as surveillance equipment. In fact, if engineering is given the required attention, it can alone transform our nation into one of the leading nations in security and economic sustainable development. Thus, engineering technology is the major determinant of security and sustainable economic development.

IMPACTS OF ENGINEERING TECHNOLOGY IN SUSTAINABLE ECONOMIC DEVELOPMENT

The fields of engineering professions are as follows: materials and metallurgical, petroleum, agricultural, mechanical, chemical, computer, civil, industrial, environmental, and mining engineering. According to Roseline (2014), the role of engineers in sustainable economic development refers to the application of the knowledge of the mathematical and natural sciences, gained by study, experience, and practice, in the provision of social amenities like good education, infrastructure, medical care, and social services.

Basic human needs, such as housing, water, food, sanitation, power, transportation, communication, resource development, and industrial processing, are designed and built by engineers to enhance their lives and bring about economic sustainability to the nation. The engineers have showcased the importance of their roles for sustainable economic development in the following ways:

1. **Engineering Environmental Protection:** Environmental protection is the practice of protecting the natural environment by individuals, organizations, and governments. Its objectives are to conserve natural resources and the existing natural environment and, where possible, to repair damage and reverse trends (from https://en.m.wikipedia.org). According to Sonia (2019), "natural resources refer to the things that exist freely in nature for human use and don't necessarily need the action of mankind for their generation or production." Land, rocks, forest (vegetation), water, fossil fuel, animals (fish, wildlife, and domesticated animals), minerals, sunlight, and air are among these resources."

The activities of man on earth generate waste that pollutes the environment, thereby endangering human life and other natural resources in the environment. For instance, the activities of oil companies in Ogoni land in Rivers State and other oil producing areas of Nigeria have damaged most of these above-mentioned natural resources, which help to sustain communities and bring development to the nation. Due to human activities and a lack of waste management by most of the companies operating in the area, the Ogoni people are being deprived of the use of these natural resources on their land. However, this area cannot make a significant contribution to our country's long-term economic development. Moreover, hunger and poverty will deal with them because they cannot farm on their land or engage in fishing, which is mostly their occupation.

Therefore, the government of Nigeria should play their own role in ensuring that the Ogoni land is cleaned. This kind of issue is solved by engineers. Hence, it is the engineers that will come up with a means of solving the life-threatening situations by creating waste treatment facilities, recycling resources, cleaning up and restoring polluted areas, and also protecting or restoring natural ecosystems and reclaiming and restoring eroded or damaged farmlands. Engineers are involved in improving land planning to protect the best farmland and natural resources from the impact of the operations of these oil companies. In this case, an engineer

is involved who will use his or her engineering experience to make sure that the ecological system is protected in a way that will not affect the future. Therefore, engineers must be the key players in sustainable development.

2. **Engineering for Sustainable Community Development:** The engineer deals with the creation of infrastructure within the community and around the globe. Engineers play a vital role in sustainable community development in that they use their wealth of knowledge and experience for the creation, improvement, and protection of the communal environment, providing social amenities for good living and transportation, which include buildings, roads, railways, bridges, tunnels, and airports, etc., that will meet human needs. It is also the duty of the engineers to clean up the environmental problems (waste). Again, for sustainable development, engineering professionals will plan and build projects that will preserve natural resources that are cost-efficient and support human and natural environments. The engineers will, as well, play an important role in securing these facilities or infrastructures, with the view of ensuring adherence to standards and ethics of usage. With this, engineers have made a significant impact on progress towards sustainable economic development, through extracting and developing natural resources, processing and modifying resources, designing and building transportation infrastructure, meeting the needs of consumers, and production and distribution of electricity, etc.

3. **Agricultural mechanization:** Engineering technology has played a significant role in the development of the agricultural sector in Nigeria. With the help of engineering today, there is the existence of machineries for farming, such as tractors, cultivators, etc., just to make farming easier and faster. This also helps to produce, in a large quantity, farming products which could be used for food and also offered for sale, thus improving sustainable economic development. However, through the existence of mechanized farming equipment, many will be offered jobs, and with this, poverty and criminality will be reduced in the country.

4. **Health and Technologies:** One of the desires of sustainable economic development in a country like Nigeria is to make sure that her citizens are in good health. Engineering activities have made available medical diagnostics and treatment to medical professionals. Today, artificial organs, replaceable joints and eyeballs, and even bio-materials such as metals, ceramics, etc., are just a few of the engineering products or products that have improved the quality of life of many in the country. A bio-material is a natural or synthetic material that is used in medical applications to support, enhance, or replace damaged tissue. Engineering technology has contributed a lot in the area of health technology.

5. **Petroleum and gas technologies:** Many countries like Nigeria today depend on the products of petroleum and gas to survive. This is also a result of engineering knowledge. Engineering activities resulted in the fuel for cars, generators, and the fuel used in industries to run their daily operations. Without engineering, this would not exist. Today, the engineers working in oil exploration and processing of petroleum products have really impacted enormously on Nigeria's economy, people, environment, politics, and even the global world. Apart from this, there are other petrochemical materials used to produce products that we use today, which have added value to our economy.

6. **Automobiles and Aeronautics:** With the help of engineering technology, the existence of automobile and aeronautics products makes our movement and transportation of goods and services easy. This helps to speed up the improvement of our culture and interaction with other countries, which will in turn attract foreign investment that will sustain

the economic development of the country. It is unfortunate that Nigeria is not into the production of automobile and aeronautics products. The government of Nigeria should invest in this area by reviving the Ajuokuta steel company, which was established for the production of automobiles and aeronautics products. The raw materials and manpower (engineers) needed to complete this work are available in the country in order to improve the sustainable economic development and security of our country.

7. **Engineering and meeting up the needs of citizens in the country:** The number of people in Nigeria is increasing daily, and also globally. As they increase, their needs to survive increase daily too. According to the World Federation of Engineering Organizations Committee on Technology, "the engineer's profession will be under continuing pressure to help provide food and other resources to this growing population and the traditional roles of engineers will be stretched to satisfy the future needs." Engineers design, create, innovate, and implement plans to minimize the negative environmental impacts and reduce the risk of damage to man from natural hazards. They provide or construct infrastructures such as buildings (to accommodate the increasing population of people); roads, bridges, railways, airports (for easy transportation); canals and dams (for irrigation of our farms); harbours, tunnels and other engineered constructions within a country that produce high economic values and sustainability. With all these roles played by engineers, they have contributed enormously towards sustainable economic development in Nigeria.

8. **Engineering and Politics:** In Nigeria, the highest decisions for sustainable economic development and security are made by the federal government of Nigeria. The involvement of engineers in politics gives them the privilege of being among the policy and decision-making bodies aimed at making decisions that will sustain economic development and create new materials for the security of the nation. The engineers use their professional experience and knowledge to attract and defend important infrastructural development projects. According to Funmi (2018), China has 15 high policy makers, 9 of whom are engineers. This means that 60 percent of China's policymakers are engineers. This accounts for the reason China is one of the world's economic powers, having been named among the best two economies in the world since 2014. The Nigerian government can copy the same approach and even do better.

9. **Electricity:** Engineering contributes enormously to the development of any nation. We cannot even explain the impact of electricity on our society today. Power energy (electricity) plays an important role in all the developments that happen to a nation. Hence, a stable and sustainable power source brings about a stable and sustainable economy. This can only be achieved by engineering technology through functional and stable policies in a country. The existence of power has impacted countlessly on our daily lives and activities, such as food production and preservation, communication, health care, and computers, etc. We enjoy all these things because there is electricity to power them. Engineers have made a contribution in this regard by providing and developing facilities (such as solar power, industrial fans for renewable energy, wind turbines, nuclear power, hydroelectric power, and so on) that generate electricity, which is one of a country's social responsibilities to its citizens. Electricity (power) plays a vital role in the development of a country. Stable and sustainable electricity brings about a stable and sustainable economy and also security. Hence, one of the greatest engineering challenges for the future will be to develop less environmentally damaging sources of energy while reducing total energy consumption at the same time. Engineers do this by designing energy-efficient buildings, using low-energy lighting bulbs and designing industrial processes that are more energy-efficient.

10. **Processing and Modifying Resources:** Over the years, and till now, toxic waste that is not easily degraded under natural conditions is being generated by many industries in Nigeria and all over the world. This has led to environmental pollution, and new laws and regulations to protect the environment have been established. The invention of new technologies has assisted in monitoring and identifying the pollution and developing means of reducing and preventing the waste. This has led to increased profits and sustainable economic growth through the activities of engineering technology.

FACTORS THAT AFFECT ENGINEERING TECHNOLOGY IN SECURITY AND SUSTAINABLE ECONOMIC DEVELOPMENT IN NIGERIA

The desire of the Nigerian government is to find a way to reduce poverty and create jobs and security for its citizens. It is very obvious that despite the huge benefits that come with engineering in security and sustainable national development, we are still having problems bringing them to light as a result of poor national policies and corrupt leaders in the system. For a nation to move forward and develop like other developed nations, efforts must be made to address all the factors that affect engineering technology. The following are some of the factors militating against engineering technology's contribution towards security and sustainable economic development.

1. **Corruption:** The United States of America has identified corruption as one of the factors hampering the development of the African continent, adding that it is the belief of the government that a solution can only come from among the people. Corruption hampers the lasting solution to sustainable economic development problems and the security of the nation. According to Nnenna (2017), corruption and economic development are two parallel lines; they can never meet. In any society, the presence of one implies the absence of the other. The corruption means changing the original form of something so that it is damaged or spoiled in some way. Corruption is simply the misuse of public power for private gain. In any nation where there is corruption, there are always the fruits of corruption, such as retardation in development, poverty, political instability, insecurity, low investment, unemployment, etc. In such a corrupt situation, engineering would not contribute much towards the sustainable development and security of the nation. Corruption retards the functions of engineering activities towards sustainable economic development and contributing towards security. Corrupt citizens always sabotage engineering projects with their fraudulent activities. Also, where there is interference in the activities of engineering by corrupt leaders, they (engineers) cannot give their best towards achieving successful sustainable development.

The President of North Korea, Kim Jong Un, recently described Nigeria and Ghana as the backbone of Africa because they have all the natural resources in abundance to make them the most important and sought-after countries in the world, but corruption is a major problem and a curse for them. Corruption has eaten deep into the lives of many people in Nigeria, especially our leaders, and it will only take the grace of God to uproot them from our land.

Despite all the efforts made by President Buhari's administration to stop corruption through the activities of the EFCC and ICPC, the improvement that should come through engineering for sustainable development and security is still being hampered by corruption. Therefore, for the positive impact of engineering towards sustainable economic development to take place, the issue of corruption must be dealt with. That is, the misallocation of resources as well as the mismanagement of them should stop if we desire to have security and sustainable development in the country.

2. **Lack of Peace and Security:** According to Baruch Spinoza, one of the greatest philosophers, "peace" is not the absence of war, but the presence of justice. Justice is tied to matters of economic and social development. It can lead to an advancement in technology, as cited in Maria (2003). For instance, China's advancement in technology is increasing daily due to the existence of peace, security, and justice in the country. Peace and security are the key pillars of the economic development of any nation. Engineering contributions to any nation (Nigeria inclusive) that has peace and security is bound to have sustainable economic development, which will affect its citizens positively by improving their standard of living. The lack of peace and security in Nigeria today, especially in the northern part of the country, is hampering the economic growth of the nation. The killings in the north are seriously affecting the economic sustainability and stability of the country. In addition, this hinders investors that would have come in to invest in the development of the nation.

The presence of peace and security in a country entails protecting and defending people and their properties as well as ensuring socio-economic development. Engineering is key to ensuring the sustainable economic development and security of Nigeria. The challenge here is to see how poverty can be reduced and jobs be created for the citizens. Without unity, security, and working together, we cannot build a progressive nation. According to the German Federal Ministry for Economic Cooperation and Development (2017), "the underlying economic conditions for growth that are inclusive of employment creation are the basic prerequisite for generating income and bringing about a permanent reduction in poverty. A conducive environment for innovation and business in the country will always help sustain economic development.

3. **Lack of Rule Law:** According to Naomi (2019), the rule of law implies that the creation of laws, their enforcement, and the relationships among legal rules are themselves legally regulated, so that no one, including the most highly placed official, is above the law. Also, Robert & Andrew (2017), stated that, "rule of law is a stable and predictable process by which laws implemented, enforced, and changed- as a cornerstone of good governance and a key factor supporting economic growth". Without the rule of law, engineering technology innovations will not have any impact that will bring about sustainable economic development and security in a country. Engineering activities aimed at national development, will only have positive impact in a country, when both individuals and government obey the rule of law. Sustainable economic development of a nation depends on a functional rule of law. Engineering will always contribute effectively for the sustainable development if there is a drive towards ensuring the rule of law in the system. Until the government of Nigeria, stop imposing of dictatorship, impunity, abuse of power, complete abdication of constitutional and statutory responsibilities, infidelity to the rule law and constitutionalism, there will be no sustainable economic development and security in Nigeria. Until, there is rule of law in Nigeria, there will be no sustainable economic growth. If there is to be sustainable development and security in Nigeria, the rule of law is a must obey factor. Rule of law means, transparency, fairness, enforceable contracts which attract business promotion and commerce, existence of basic security for the citizens- protection of life and properties.

The existence of the rule of law in Nigeria is questionable and must be addressed to foster sustainable economic development. Sustainable economic development is a dependent variable that depends on the existence of the rule of law, peace and security, a corruption-free nation, and a stable government. According to Knack and Keefer (1995, 1997), the measures of the rule of law are robustly correlated with levels of wealth and rates of economic growth.

4. **Lack of Adequate Training Facilities and Equipment:** High institutions in Nigeria do not have good laboratories or workshops, let alone modern equipment and facilities. Where they exist, they are inadequate and obsolete, as the laboratories only have the equipment that started with the institutions when they were established. The majority of universities, polytechnics, and colleges of education lack adequate functional workshops and laboratories. There are also some cases where machines or equipment were supplied but there was no workshop to install them. This certainly leads to frustration on the part of the student for not utilizing the equipment. This will definitely affect our system because no practical knowledge that will impact and boost our nation's economy has been acquired by the students due to a lack of training equipment.

5. **Lack of training and re-training of Engineers:** Most engineers have poor training backgrounds because of the lack of training equipment and facilities encountered during their training process. This exercise is a continuous process to ensure consistent improvement in the quality of their output. Most engineers have not gone for training and re-training to keep them abreast with the new innovations that will help to end the problems of society since they graduated from school. The training can be done here or abroad, but because of a lack of equipment, it is preferably done abroad with a bond signed by the trainees that will make them come back after the training if the government is afraid that they may send them out and they will not come back. Training of engineers in various specialized fields geared towards sustainable development is neglected totally by the Nigerian government. Nigerian government policymakers should make a policy to carry out a campaign or orientation aimed at enlightening their citizens on the need for most of them to be trained in light of the prevailing economic setbacks in the country. By so doing, poverty and unemployment will be reduced or eradicated. It will interest us to know that most of the multinational companies in Nigeria, after employment, still send their employees abroad for training in various specialized fields. On returning, they will have an enormous impact on the success of these companies.

Training and re-training of engineers in Nigeria annually will have a positive impact on sustainable development and boost our security outfits through innovations. This appears to be one of the reasons developed nations are developed. The neglect of training and re-training of engineers is socially and economically injurious because it is robbing the country of the contribution of this profession towards security and sustainable national development. Training and re-training them will keep them up to date on the new innovative technology required for the nation's progress and success.

6. **Inadequate Funding:** The funding of the universities, polytechnics, and colleges of education programmes is very poor and inadequate to have all it takes to train the students well. Financial sustainability facilitates the development of knowledge, which requires innovative measures so as to ensure that public vocational and technical education colleges and institutions are not deprived of the much-needed resources for their future expansion (Amoor, 2008). Lack of or inadequate funding for engineering technology research and innovations has greatly affected Nigeria in the areas of technological development, security and economic growth.

7. **Inconsistent Government Policy on Engineering Education:** No nation moves forward without a good policy on engineering education, because engineering is the bedrock of sustainable economic development and security. Developed countries are where they are today in terms of security and sustainability because of their functional policies in

engineering technology. Lack of good policies has been a major setback to the advancement of engineering in the country. Lack of follow-up and continuity in government and its ministers or commissioners of education is a result of selfishness among our leaders.

CONCLUSION

Engineering holds the key to security and sustainable economic development in the whole world, Nigeria inclusive. Engineering in Nigeria has not attained its maximum potential as regards its role in sustainable economic development and security. There are factors responsible for this, and there is a need to tackle them to enable the achievement of sustainable development and the security needed for the nation to progress. These factors are corruption, insecurity, lack of adequate training facilities and equipment, inadequate funding, lack of the rule of law, and lack of training and re-training of engineers in Nigeria. The neglect of the above factors by the government hinders development and security in the country.

To achieve a sustainable economy through engineering technology in Nigeria, corruption, insecurity, lack of rule of law, lack of training and re-training of engineers, etc., must be tackled totally for a stable sustainable economy to be actualized.

Lack of training of more engineers in special fields reduces their productivity towards sustainable economic development and their contributions to the security of the nation. The greater the number of specialized engineers, the greater their productivity toward long-term growth. And Nigeria's desire to achieve sustainable economic development and a secure environment for business activities, unshakeable security, will always remain unfulfilled in the absence of engineering technology inputs into the system. Every economic activity has a role for engineering, whether it is mining, refining of raw materials, manufacturing, or distribution of finished products.

Finally, engineers should be involved in national policy making to provide the right decisions for industry that will benefit the nation. Engineers being involved in national decision-making will make provision for security and environmental sustainability that provides for ecological conservation and preservation. Most Nigerian environments are messed up by the activities of humans. Almost all the drainages in Nigeria are filled up with man-made waste. Thus, while the needs of humans (citizens) are satisfied, the environment will also be preserved for future generations' use, and security will then be provided for all the sectors of the economy and for all aspects of human endeavors.

RECOMMENDATIONS

In view of the factors highlighted in this paper that hamper the progress of engineering towards sustainable economic development, the authors hereby recommend the following:

1. The federal government and all the crime fighting agencies in the country, such as EFCC and ICPC, should compulsorily work together to fight corruption in the Nigerian system, which has hindered the full contribution of engineering technology towards national economic development and security.

2. The Nigerian government should engage engineers in good numbers in its policy-making bodies. This will help to make decisions that will lead the country to engage in harnessing more of the natural resources God blessed this nation with and use them to work towards sustainability of the economy.

3. For sustainable economic development to have its stand in Nigeria through engineering technology, peace, security, and rule of law, are paramount. Therefore, the government should provide all these to create a conducive and enabling environment for smooth working activities.

4. Training and re-training of engineers keeps them abreast with the new innovative technology needed to improve on the existing technology. The government should try annually to engage the engineers in training to improve in their productivity towards a sustainable development and security of the nation.

5. It is not over statement by saying that all technological development programs depend on engineering. It is therefore, advisable for the Nigerian government to campaign for more of its citizens to engage in studying engineering courses to help reposition the country as one of the world's economic powers with functional security sectors.

6. The engineers need to develop and have broad fundamental understanding of their professional responsibilities in the nation to enable them to break even and be most important and sought after in the global world.

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