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## **Education, science and technology: A triadic process for promoting socio-economic skills in Nigeria**

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The present day Nigerian socio-economic plights such as unemployment, poverty and terrorism among others, could be traced to failure in education system of 19<sup>th</sup> and 20<sup>th</sup> centuries. Education system of these aforementioned centuries in Nigeria failed to give priority to self-reliance of the citizens. Consequently, the involvement of unemployed graduates in social catastrophes such as armed robberies, oil pipeline vandalisms, and kidnappings, to mention but a few are index of awareness that Nigerian education system needs urgent rehabilitation. In this regard that the paper examined various channels through which Education, Science and Technology(EST) could be amalgamated and put end to the present quandaries of the citizens using promotion of Socio-economic Skills as panacea. Interviews and multidisciplinary approaches were used simultaneously to collect data needed for the study. It was discovered that the best way to eradicate social vices from the Nigerian society is to promote self-reliance among her citizens. It was also discovered that the amalgamation of education, science and technology under a single framework increases its potency to provide sustainable remedy to self-reliance problematic and socio-economic imbalance among Nigerian ethnic groups. Based on these discoveries, the paper recommended that education, science and technology institutions in Nigeria should be adequately funded for better efficiency and the workers motivated into effectiveness. Educational administrators and teachers should be encouraged to adapt the curriculum contents to daily lives and needs of the people. This could be achieved by paying brilliant attentions to practical applications of knowledge to the needs of the people in the world of work, most especially during teaching-learning processes.

**Keywords:** SAP, modernization theory, unemployment, self-reliance, change agenda policy.

### **INTRODUCTION**

Education aims at producing balanced and well-rounded citizens, capable of developing their potentials for self-reliance and promotes socio-economic development. So, the resources provided by the government and its private partners must be directed towards providing educational experiences in order to nurture the learners into responsible citizens, conscious of their responsibilities to self, families, community and the country at large(Kabiru,2015). Education supposes to eradicate

poverty and hunger from every nation across the global world. Unfortunately, reverse is the case in the present day Nigeria where after spending huge amount of money on education, there are pronounced number of unemployed graduates. Thus; poverty continues to wallow deep and deeper in the lives of the citizens. Employment problematic in Nigeria had invoked poverty and hunger which could be said to be the precursors of social crises that have characterized Nigeria among the world danger

zones. Reacting to this, the Harmonized Nigeria living standard Survey (HNLSS, 2010), revealed that the headcount poverty in relative measure increased from 54.4% in 2004 to 69.0% in 2010 with an annual increase of 21.2%. The dynamic changes in programs and policies of successive Nigerian governments show that the menace of poverty among Nigerian citizens has been given them tough time.

Federal governments of Nigeria have put up many programmes and strategies in the past to reduce poverty. The programmes were segmented as pre-Structural Adjustment programmes (Pre-SAP), Structural Adjustment Programmes (SAP) and Post Structural Adjustment Programmes. Pre-SAP includes; Rural banking and Agricultural Credit Guarantee Scheme of 1977, Operation Feed the Nation (OFN) of 1977, Free and Compulsory Primary Education of 1977 and Green Revolution of 1980 (Benedicta 2013).

During the SAP era, the government put up many programmes such as Directorate for Food, Road and Rural infrastructure (DFRRI) of 1986, National Directorate of Employment (NDE) of 1986, Better Life Programme (BLP) of 1987, Peoples Bank of Nigeria (PBN) of 1989, Community Bank (CB) of 1990, Family support programme (FSP) of 1994, and Family Economic Advancement programme (FEAP) of 1997 (Benedicta 2013). According to Daramola (2012), the implementation of SAP further worsened the living conditions of many Nigerians especially the poor who were the most vulnerable group.

At the wake of Post-SAP era, the government embarked on poverty Alleviation programme (PAP) which later metamorphosed into National poverty Eradication programme (NAPEP). The programme was directed at job creation, the increments of Public Servant Salaries and Minimum Wages for all Salary Earners. According to Benedicta (2013), in 2003, Chief Olusegun Obasanjo who was the then Nigerian president launched the National Economic Empowerment and Development strategy (NEEDs). The broad goals of NEEDs contained in the policy paper included; Wealth creation, employment generation, poverty reduction and value re-orientation (National planning Commission, 2004). NEEDs particularly seeks to reduce poverty and inequality through several fronts namely; Offering farmers improved irrigation, machinery and crop varieties to help boost agricultural productivity since half of Nigeria's poor people work in Agriculture; Improving the educational system to enhance academic and socio-economic development of Nigerian Child; Improving the system of health care delivery with emphasis on HIV/AIDs and other preventable diseases such as malaria, tuberculosis and reproductive health related illness. It also replaced the pension Scheme with a contribution Scheme to reduce pensioner's vulnerability to economic poverty (Benedicta, 2013).

The recent past President Goodluck Ebele Jonathan did not leave any stone unturned in the struggle against poverty in the country. Among his numerous strategies to

combat poverty and hunger is the introduction of Subsidy Re-investment Programme (SURE-P) in 2012. This is a policy and Programme directed at reducing poverty and creation of employment for Nigerians. The present Nigerian president; Muhammadu Buhari emerged the Nigerian presidential villa with his change agenda policy (CAP). He believes that with corruption in Nigerian society, poverty cannot be eradicated from the society. He thereby focuses his attention on fighting corruption to ensure evenly distribution of resources and creation of employment for the unemployed citizens. His amicable travelling and meeting to foreign presidents that can help him realized this great deals shows his zeal in trying to eradicate poverty and create employment for Nigerians through partnership approach and foreign investors.

### **Theoretical Frame-Work**

The modernization theory maintains that rich societies produce wealth through technological innovation (Rostow, 1978). Accordingly, as poor nations adopted pro-growth altitudes and more productive technology, they, too, will prosper (Rostow, 1978). Modernization theory holds that the door to affluence is opened to all. Indeed, as technological advances diffuse around the world, all societies should gradually industrialize.

Walt Whitman Rostow in 1978 stated that Modernization occurs in four stages as shown in the Figure 1. These stages could be explained further as follow.

#### **Traditional stage**

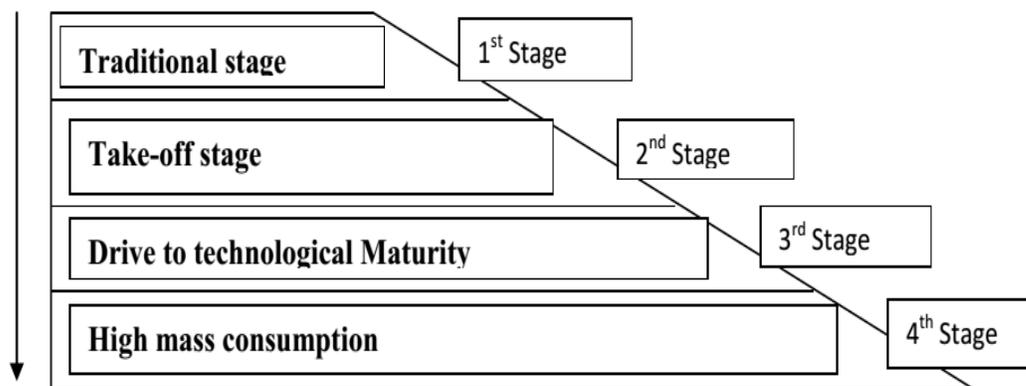
This is the first stage of social development in which People build their lives around their families and local communities. Life is often spiritually rich, but lacking in material abundance. A century ago, much of the world was in this initial stage of economic development. Nations such as Bangladesh, Niger and Somalia are still at this traditional stage and remain impoverished to this day.

#### **Take-off stage**

This is the second stage of social development at which societies shake off the grip on traditional stage and people start to use their talents and imaginations, sparking economic growth. A market emerges as people produce goods not just for their own consumption but to trade with others for profit. Paralleling these developments, greater individualism and strong achievement orientation take hold.

#### **Drive to technological maturity**

In this third stage of social development, a diversified economy drives a population eager to enjoy the benefits of industrial technology. However, people begin to realize and sometimes lament that industrialization is eroding traditional family and community life. Mexico and South



**Figure1:** Model of Four Stages of Modernization. Source: Adapted from Rostow (1978)

Korea are among the nations driving to technological maturity.

### High mass consumption

This is the fourth and final stage of social development in which Economic development driven by industrial technology steadily raises living standards as mass production stimulates mass consumption. Simply put, people soon learn to need the expanding array of goods that their society produces.

There is no doubt that Nigeria is driving towards the Take-off Stage at which socio-economic skills promotion is needed to foster the needed development. Nigerians must use their talents and imagination in direction of Education, Science and Technology to spark individualized economic growth. This will eventually result in National development.

### Conceptual clarifications

Technology is the Science of industrial arts (Kranzbergs, 1977). It is the systematic application of various branches of knowledge to practical tasks. Science assumes greater practical values to mankind in Technology (Reading, 1978). It can be viewed as the knowledge that people apply to the task of living in their surroundings (John, 2000). The more complex a society's Technology, the more its members are able to shape the world for themselves. Gerhard and Jean Lenski (1995) commented that a society's level of technology is crucial in determining what Cultural ideas and artifacts emerge or are even possible. Any new technology tends to create a new human environment. Technology affects not just how we work, but it shapes and colors our entire way of life. In today's world of exotic materials, high technology and agile manufacturing enterprises, technology is constantly changing and growing. New production methods and new technology comes online. Kranzbergs (1977) refers to technology as all the ways man uses his inventions and

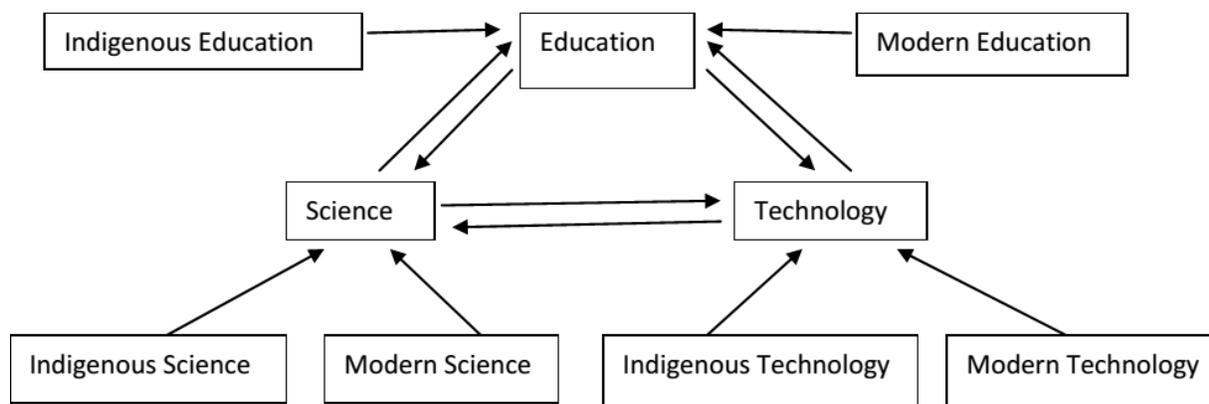
discoveries to satisfy his needs and desires. Reading (1978) too, noted that technology could be regarded as: The body of knowledge concerning manufacturing and extractive processes; the whole or an organized sector of industrial application of Science; a society's set of techniques for obtaining sustenance and all existing means for achieving organizational goals. Adeniyi (2013) stated that the process of technology includes the ability to manage, maintain, replicate and improve such hardware without assistance from outside. Technology could be taken as that methodical utilization of available materials within an environment to satisfy the needs and desires of man.

### Education, science and technology: The Nexus

The number of research possibilities in Science education is uncountable. Also, the complementarities of science and technology were adequately documented (Hurd et al., 2003). However, the number of researches where education, science and technology has been combined as it is done in this study is rare. In this world of technodynamism, education, science and technology have intermingled to the extent that is becoming difficult to separate them.

These three homogeneous components of developed nations of the world often become great and powerful by gradual modernization of their indigenous form. This could be seen in Figure 2.

The importance of EST in Nigerian socio-economic skills promotion is gradually becoming as inevitable as death. Without technology in any nation, effectiveness of socio-economic skills promotions will be negligible. This is evident in the fact that poor technological development is a good characteristic of under-developed and developing nations of the world. Nigeria remains Socio-economically stagnant today due to her poor educational system, poor scientific researches and slow technological development. Therefore, if Nigeria wishes to promote and sustain socio-economic skills as a panacea to her socio-economic



**Figure 2:** A triadic Model of Education, Science and Technology(EST)

problems, EST must be gainfully employed.

### **Roles of EST towards socio-economic development in Nigeria**

#### **Modernization of inherited vocations**

Traditional education has been an epitome of pride to Nigerians from the time immemorial. It is distinguished in areas like functionalism, pragmatism, naturalism, cultural relativism, moral training, vocation training and community participation (Fafunwa, 1974). As indigenous Education deals with the transmission of cultural values, norms, skills, morals and attitudes which are of positive value to the life of an individual and the society at large. Male children learn socio-economic skills such as farming, fishing, hunting, blacksmithing, wood carving, metal sculpturing, drumming, animal rearing, and traditional medicine from their fathers or an expert in that field which could either be family-friends or relatives (Fafunwa,1974). Females learn socio-economic skills needed to support and complement their husbands' income. Some of these skills include; child-rearing, Fashion making, hair dressing, knitting, pot making, bead making, poultry keeping and a few were trained in animal rearing as it appears among the Fulani ethnic group in Nigeria.

One of the major demerits of African Indigenous Education (AIE) was lack of documentation and modernization of inherited vocations. A stroke patient interviewed by one of the researchers in 2014 lamented on how he lost his inherited vocation which should have saved him from his present health conditions and socio-economic predicaments. But due to lack of documentation and modernization, all is gone and now he is a patient begging for death on a sickness that his late father use to treat without collecting a penny. In this regard, it is very germane to modernize, document, conserve and propagate our inherited vocations from one generation to another specifically for the future benefits and sustainable socio-

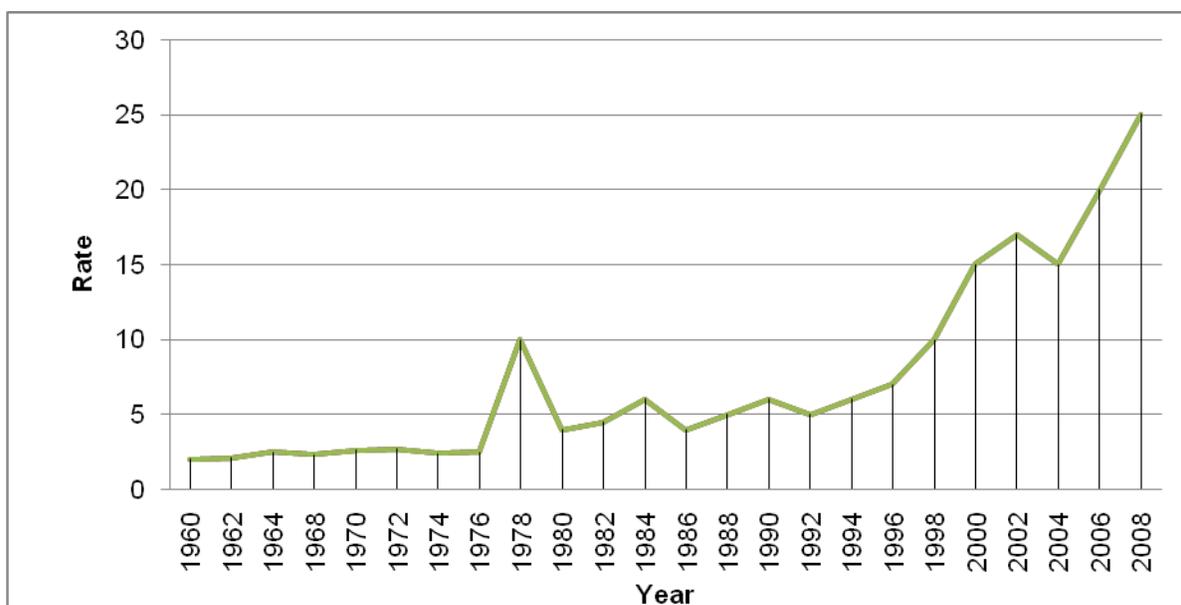
economic development of the citizens.

#### **Production of sophisticated political leaders**

Observation shows that the major challenges facing Nigeria, such as political instability, bad leadership, electoral malpractices, insecurity, government policies, bribery and corruptions, armed and pen robbery, poor education system, epileptic power supply, economic strangulations, unemployment, poverty, injustice, violation of human rights, social unrest, communal conflicts, tribalism and nepotism, poor goods and services, and the like, have roots in the political system (Babalola, 2013a). Bad leaders are products of poor education system. This is perhaps good education is characterized with moral training and scientific methods of solving social problems. Scientific attitudes entails; identification, observation, description, hypothesis, testing, theory and/law. If political leaders are groomed under these scientific attitudes, such political leaders are expected to observe the problems of the people, identify the problems, describe it, and construct hypothesis that may fabricate the techniques which could be used to solve the problems.

#### **Job creation and employment opportunities**

As show in Figure 3 since the euphoria of independence that greeted Nigerian in 1960, unemployment has been growing like a seed planted in a fertile land. Many efforts have been made to stop the growth of this social maladjustment but all efforts seem abortive. In this era of change agenda of the present administration which has employment creation as a component of its strategic plan, education science and technology as a triadic process will be needed in the promotion and sustainability of socio-economic skills among Nigerians. This is realizable in the areas such as; in-service training programs to teach new methods as high priority for manufacturers, students of materials and manufacturing processes in the high-



**Figure 3:** Trend analysis of unemployment rate in Nigeria (1960-2008)

Source: NBS (2010)

technology world will need hands on experience in the application, operation and support of new manufacturing systems.

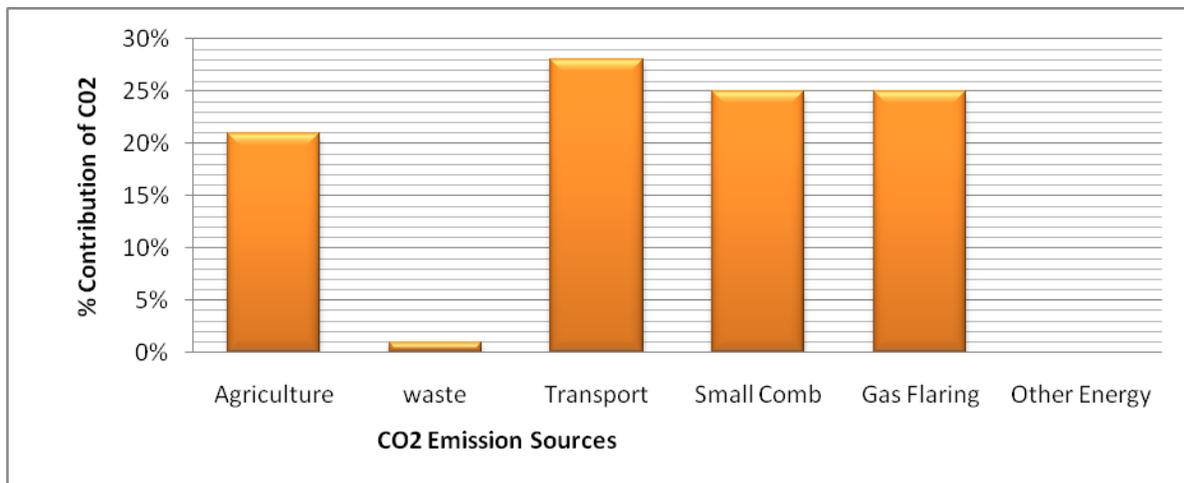
In the pre-independent era in Nigeria, the major occupation of Nigerians was farming. Craftsmen that were mainly socio-economic workers make use of some of the agricultural products and bi-products as raw materials. For instance, brooms were made from palm fronds, statues were made from stems of trees, ceramic plates and pots were made from clay soils. Immediately after independence, Nigerians started leaving farming for white collar jobs. As years go by, the population of Nigerians was increasing and the probability of getting job was also reducing.

Looking at Figure 3; in 1976, there was a noticeable shoot up of unemployment. This is conceivably due to the national Universal primary education of 1976 organized by Chief Olusegun Obasanjo who was the then Nigerian first citizen. The larger percentage of Nigerians both young and adults left their socio-economic activities for schools and so the rate of unemployed citizens significantly increased. However, in the modern industrial revolution, civilization has improved employers' tastes. In this regard, Gregg et al, (2010) posited that the Working knowledge of the newest skills in the world of high technology will to a greater extent; determine who will be employable at adequate pay levels in the manufacturing organizations of the future. Progressive manufacturing industries, Schools, Colleges, and Universities will be responsible for a continuing supply of adequately prepared technicians, technologies and engineers to meet the needs of the technology age.

EST has gone a long way, to creating employments and job opportunities for the self-reliant Nigerians. Educated elites with vocational skills stand better chances to secure good jobs in the world of work as they possess both practical and theoretical expertise. Hence, in the absence of government jobs, they are always self employed at adequate pay levels. Therefore, vocational skilled workers can now be proud of having high standard of living while graduates without vocational skills are wandering on the street unemployed.

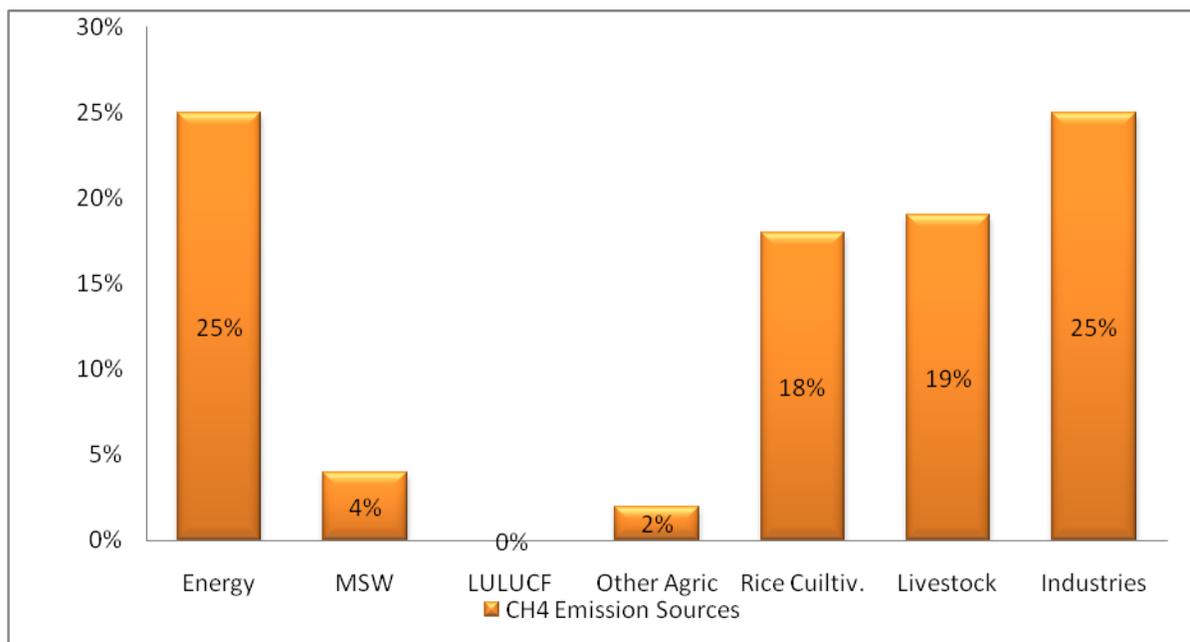
### **Impending climatic change disasters control and adaptations**

According to Intergovernmental Panel on Climate Change (IPCC, 2001), "Climate System" can be defined as a non-interactive system consisting of five major components: atmosphere, hydrosphere, cryosphere, land surface and biosphere. It is continuously being influenced by various external forcing mechanisms (EFM) The earth's climate is driven by a continuous flow of energy from the sun at the rate of 342 Mm<sup>2</sup> annually at the top of the Atmosphere. Earth's climate has been stable for about 10,000years (means T is not >1<sup>0</sup> per Century). The UNFCCC defines climate change as a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. IPCC (2001) defines it more broadly as any change in climate over time whether due to natural variability or as a result of human activities. This human activities release Greenhouse Gases (GHGs) such as



**Figure 4:** CO<sub>2</sub> Emission Sources and their % contribution to CO<sub>2</sub> of GHGs

Source: Olukayode & John (2010)



**Figure 5:** CH<sub>4</sub> Emission Sources and their % contribution to CH<sub>4</sub> in GHGs

Source: Olukayode & John (2010)

Carbon dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), Nitrogen Oxide (N<sub>2</sub>O) and Ozone (O<sub>3</sub>) in addition to a natural GHG; water vapour (H<sub>2</sub>O). All of these absorb and emit infrared radiation by the Earth, the result of which is Global Warming otherwise called Greenhouse Effect. For about 1000years before the industrial Revolution, the amount of Carbon dioxide (CO<sub>2</sub>) has increased by more than 30% since pre-industrial times and is still increasing at an unprecedented rate of an average of 0.4% per year, mainly due to the combustion of fossil fuels and deforestation. Other sources of CO<sub>2</sub> include; Agriculture, Waste

Management, Transportation, Small Comb and Gas Flaring(Figure 4).

Methane (CH<sub>4</sub>) concentration in the atmosphere increased from 700ppb in preindustrial time to about 1700ppb today due to Waste treatment, Energy, Industries, Land Use Land-Use Change and Forestry (LULUCF), Municipal Solid Waste(MSW) and agricultural activities such as Rice Cultivation, Livestock Rearing, and others.(Figure 5)

This climate change is therefore a natural mystic blowing in the air in which many will be affected, many

more will suffer and much more will have to die. According to Olukayode and John (2010), developing countries such as Nigeria are the most vulnerable to climate change impacts because they have fewer resources to adapt: Socially, technologically and financially. Climate change is anticipated to have far reaching effects on the sustainable socio-economic development of developing countries including their ability to attain the United Nations Millennium Development Goals by 2015 (UN, 2007).

Nigeria is one of the countries expected to be mostly affected by the impacts of climate change through Sea Level Rise (SLR) along her coast line, intensified desertification, erosion, flooding disasters and General Land Degradation (GLD). According to a recent report, Nigeria will lose close to \$9 billion as a result of the catastrophe while at least, 80% of the inhabitants of the Niger Delta will be displaced due to the low level of the oil-rich region. As Nigerians economy improves, its per capital GHGs emissions may approach those of the developed Nations of the world. Socio-economic skills workers will be seriously affected as many imported business goods shall be lost into the sea, there shall be disease outbreak in Nigerian communities. Poultry flu and Ebola virus is an index of awareness. Also animal farms is likely to experience diseases attack, there shall be flooding to displace fishermen from fishing sites, excessive temperature of the aquatic habitat will result to death/migration of aquatic organism, thereby render fishermen jobless. Flooding like that of Sunami may destroy and take away the tools, customers' works, investments and the investors themselves. EST should collaborate to prepare and provide facilities and invention which could help socio-economic workers to control and adapt to climate change disasters, as a means of promoting socio-economic skills among Nigerian citizens.

### **Modernizations of culture and tourism**

Through education and scientific researches cultural norms and traditions of the societies are conserving and transfer from one generation to another. Educators always research into local history of the society in order to eradicate erroneous beliefs and taboo from the society, good traditions were retained. Some of these elements of culture were scientifically researched and technologically modernized to become culture and tourism. Nigerian carves and sculptures such as Ile-Ife and Benin bronze heads are uncontestable monuments. Nigerians celebrations such as Osun-Festiva, Olundole mascurade-Festiva at Supare-Akoko in Ondo State, to cite a few, have become an epitome of beauty which attracts foreign investors from across the global world. The richness and diversity of Nigeria's tourism resources coupled with economic liberalization through EST will provide investments opportunities in various areas such as; Heritage tourism resources and development of Slave relics. Establishment of museums and preservation of monuments; wildlife tourism resources; development of

picnic and camping sites at strategic locations within the trail circuit system in the national parks; Building of reception centers at Natural Physical Attractions; Establishment of hotels and resorts near waterfalls, springs, caves and temperate climate areas such as Obudu, Jos and Mambila plateau; beach tourism potentials, establishment of boating and sport fishing facilities; development of water transportation and provision of educational facilities. Establishment of holiday resorts along the coasts; development of arts and crafts which constitute symbol of the peoples cultural values and love for nature, etc (selected among others from tourism in Nigeria).

All these activities and investments attract large numbers of people to tourism centers in the country and patronize Nigerians Socio-economic skilled products. This is an enormous motivations, encouragements and promotions to Socio-economic Skills in this 21<sup>st</sup> Century Nigeria.

### **Modernization of Indigenous Technology**

When science and technology is mentioned, immediate places that most people think of, is the developed countries like America, China, Europe, Japan, and Russia to cite a few. No doubt, these developed Nations of the world are well endowed with Modern High Technology (MHT). However, this is not to say that science and technology begin and end in the developed Nations. Rather, science and technology exists in various forms in the Nigerian communities (Babalola et al., 2014). Nigeria has a history of science and technology which dates back to a very early period. Practical skills and techniques in Nigeria grew up with the people and became part and parcel of their culture such as soap making, wood carving, metal sculpture, textile making, local distillation of palm wine, folk medicine and entertainment instruments such as drums and gong, to mention but a few. Science and technology has few impart in Socio-economic skills of Nigerian due to many reasons such as colonial military conquest. Abubakar (2009) commented in this regard that the first professional and economic group that felt the immediate adverse impact of Colonial military conquest was the smiths. The special position of privilege occupied by blacksmiths was due to their monopoly of the most crucial technical competence in the society. In this regard, the farmers depended upon them for implements and the aristocracy for weapons. The whitesmiths often accompanied the army on campaigns effecting on the spot repairs...Colonial conquest executed with superior technology. The superiority exhibited by the conquest did not only change the nature, but also the means of waging wars. It does effectively remove the need for the manufacture of weapons by the blacksmiths (Abubakar, 2009).

The Nigeria blacksmiths were unable to compete favorably with their whitesmith counterparts because their product was not scientifically researched and

technological modernized to suit the needs of the era. However, with EST, Products of socio-economic skilled Nigerians will compete favorably with that of developed nations (Babalola, 2013b).

### Recommendations

This work, thereby recommends that;

1. More funds should be invested into Education, Science and Technology to ensure adequate facilities in the schools, science laboratories and technological workshops.

2. Educators should focus more on psychomotor rather than Cognitive and affective aspects of learning, during teaching and learning processes.

3. Certificate of Socio-Economic Skills should be made an important criterion for admission of students into Nigerian tertiary institutions.

4. More attentions should be paid to Vocational training as a Subject in Nigerian school's Curricula and Technical Institutions.

5. Governments should encourage, motivate and invest on Inventions and Discoveries in Nigerian Tertiary institutions.

### Conclusions

Promotion of Socio-Economic Skills with Education Science and Technology triadic approach is an inevitable paradigm shift of the 21<sup>st</sup> Century. This is because Education, Science and Technology triadic approach is a one small step for a man, one giant leap for Nigerians' Socio-economic development. Modernization takes hold, individualized income increased and the National Economy improves.

### Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of the paper

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