

IMPACT OF TECHNOLOGY (ENGINEERING) ON BUSINESS OPERATIONS IN NIGERIA (1960 – 1998)

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ABSTRACT

Despite the low-level of Technological inputs and assimilation in Nigeria in general, Business operations have benefited considerably from Technology. Technology input have been in form of vastly improved communications, power availability, distribution, new tools of machinery for production, and health facilities.

In this paper, the situation of Transportation and Food industries are focussed on in respect of great changes that have taken place therein.

Suggestion on the practical way of having greater progress are listed to serve as guides for policy makers in the country.

1.0 INTRODUCTION

Technology is 'the scientific study and use of applied sciences for example engineering' (11). It has also been defined as 'the application of this to practical tasks in industry: recent advances in medical technology, new computer technology and communication' (11) Technology involves the development, conversion, management, and use of natural resources, such as food, water, material and energy, for the use of human life.

Before Nigeria became independent in the year 1960, the condition of the roads were bad, no good network of roads as there are today. Travelling from one location to another within the country was difficult and costly and also very risky. Then, it was a normal thing to have a single lane road linking major towns with many potholes all over the surfaces. Only very few roads were covered with asphalt thereby making transportation a herculean task.

In the area of food production, processings were done manually using available labour force within the community. As a result of low level technology input, Nigerian depended heavily on imported foods that were cheaper and more reliable. The expectation of people initially was high considering the publicity given to technology as the only way out of poverty and economic problem.

In this paper, progress will be examined, and suggestions for achieving greater progress made. Because of underdevelopment one may be tempted to ignore the progress already being made.

The input of Technology into business operations has brought changes in the styles of organisation, a wide range of products, an accelerated pace of business activities, better living standard for the Nigerians and provision of employment opportunities. New technological systems, that are technically and economically inter-related, have helped a great deal in developing the standard of business organisation in respect of Transportation and Food production. Since Nigeria got her independence in 1960 and there after, technological revolutions have led to the advent of new processes, products, services, systems and industries.

Furthermore, through Technology there is improved communication within and outside the country. Nigeria has been linked with other countries in the world making the whole world a global village. The Level of business activities within and outside Nigeria has increased, the emergence of increased food supplies, the exportation of harvest to other nations, organo-mineral fertilizer plant, pounded yam flour plant etc.

Records have shown that economic/business activities in Nigeria before independence centred mainly on agriculture and commerce. The industries that existed then were only capable of producing local implements and clothing among other things.

2.0 BRIEF HISTORY OF DEVELOPMENT IN NIGERIA: POST-COLONIAL

2.1 POST-COLONIAL

The colonialists had laid a foundation, which invariably formed the base of Nigerian economy. Consequently investment in Technological engineering had been sourced to a large extent from abroad and Nigeria has remained totally dependent on industrialized nations for technology. Also, almost all the equipment and machines in use in industries – manufacturing and extractive are imported from abroad.

The leading industries in Nigeria are Multi-national companies, which is the offspring of direct foreign investment. However, it is generally acknowledged that the Technological knowledge associated with the inflow of direct foreign investment into Nigeria, the bulk of which went into extractive industries is generally proprietary and has tended to be isolated from the rest of the economy.

To justify their presence and securely maintaining the grip over their operations in developing countries, foreign companies, particularly those manufacturing sophisticated products or possessing sophisticated processes explicitly treat the flow of technology as an integral part of direct foreign investment and effectively maintain secrecy of their technological edge by ensuring that they retain full or at least controlling equity in their subsidiary of local enterprise involved. Although the

scientific knowledge, the technical know-how necessary for its application and the capital requirement for research and development is neither readily available to Nigeria indigenous investor, public nor private, nor fully accessible for non-restrictive and non-proprietary acquisition.

3.0 IMPACT OF TECHNOLOGY (ENGINEERING) ON BUSINESS OPERATIONS

No doubt that progress has been on from Technology, unfortunately, developed countries are not stagnant, they make even more progress than Nigeria thereby still widening the gap.

3.1 FOOD PRODUCTION

With increase in population and urban centres across the country and the attendant rural-urban migration by able bodied youths, our method of food production in meeting the needs of these people had to change. The level of mechanization of agricultural practices must be improved as against the primitive agricultural practices like shifting cultivation, bush following, using of primitive tools like hoes, cutlasses, diggers, knives, sickle, etc. Technology has brought marked improvement in all the aforementioned practices, for example, in the area of seed collection, selection and storage, things are done perfectly to increase productivity. More areas are being cultivated to boost food production since the introduction of Tractor Hire Unit (THU). Also in the are of fertilizer application, harvesting and crop processing technology had proffered good and more fruitful method that has led to increased productivity in food production. Crops like cassava, rice and oil palm have had their processing standardised for improved yield.

The use of fertilizer in the appropriate amount and condition had sent the fallow system packing, the use of mechanized tractors, harvesters, harrowers planters, sprayers and all other machines which ensure a maximum output of agricultural product are now in place.

Technology has been helpful in the area of food crops and their preservation. Portable ovens and refrigerators have been designed and constructed locally to prevent the food crops from perishing. Irrigation canals have been constructed to supply water to area that do not have enough rainfall for food production. Technology has improved the milking of cows considerably. Instead of using human hands for cow milking and processed in the local method, cow are now being milked with device called "milkers" and the milk is processed using machines.

3.2 TRANSPORTATION

Presently in Nigeria if one travels through the country it is evident that there are moderately good network of roads. To get to any part of the country before was a

difficult task because of the condition the roads were then. The improved road network has affected positively our communication systems.

The revolutionary growth of satellite communication has changed the lifestyles and affected positively the business operation in Nigeria. For example in mail delivery business services, electronic communication device are now dominating. In addition to conventional telephone system, digital phone system, fax, facsimile, E-mail are now in place for quicker access into the business world. All these facilities are now available within the reach of every citizen making it possible for organization to have a wider scope and contact with the international world. Over the years due to increased patronage, communication equipment has been made affordable to boost business operations within and outside the country.

3.3 WORKS AND HOUSING

Some years ago, specifically, in 1978 some institutes were set up and charged with the responsibility of making life more comfortable for the populace. Some of them are Nigerian Science and Technology Development Agency (NSTDA), Nigerian Building and Road Research Institute (NBRI). They have tried within the circumstances they found themselves to make significant contribution towards the development of business operations in Nigeria. The following worth mentioning:

- (i) The introduction of the indigenous brick-making machine that is capable of producing both stabilised and unstabilised bricks and blocks from locally abundant clay deposit in the country. As a result more jobs were created and more importantly less dependence on foreign materials used in the building industry.
- (ii) The development and production of durable and cheap roofing sheets. The fibre concrete roofing sheets are produced from coconut husks, cement and sand in suitable combination.
- (iii) The development of fibre-based roofs and wall tiles.

The above have contributed in no small measure towards the advancement of business operation in Nigeria because they have brought into the market new and improved product and simultaneously created better and improved living condition and employment opportunities for many.

3.4 CONTRIBUTION FROM SCHOOL OF ENGINEERING

Research institutes are not left out in making available local technology. Products in form of machines or packaged information have helped greatly in boosting business operations in Nigeria. Below are some of the innovations that have been identified:

- (i) *The pounded yam machine:* This product was designed and constructed by Addis Engineering limited from the prototype patented by a group of engineers at the Obafemi Awolowo University, Ile-Ife. The machine was patented in 1990.
- (ii) *Motorised Tricycle:* These have just been recently introduced into the market. They are powered by a 50cc petrol-engine with load capacity of 200kg. Each one

is equipped with a 3-speed gearbox and can move at an average speed of 45km/hr. Demand for these tricycles have been estimated to be 50 tricycles per-month.

- (iii) **Organo-Mineral Fertilizer Plant:** Through the Raw Material Research Council a need arose to have indigenous appropriate technology for the production of organic fertilizer for the Nigerian farmers. Recently, a ten ton capacity organo-mineral fertilizer plant was designed and built at Bodija market by group of researchers from the Mechanical Engineering Department, University of Ibadan, Ibadan.
- (iv) **Pounded Yam Flour:** This plant was designed by a Professor of mechanical Engineering, from the Department of Mechanical Engineering, University of Ibadan, Ibadan. Some years ago a plant was built in Ibadan to produce pounded yam flour using available raw materials (Yam tubers)

4.0 THE WAY FORWARD

No doubt Technology has contributed to the growth of business operations in Nigeria between 1960 and 1998, especially in the areas of Transportation and Food production. There is possibility of making more impacts in the nearest future if the policy makers are ready to consider the suggestions and recommendations put forward in this paper.

One authority write thus: "The antithesis to depression is development. It must however be related to production. Increased production will give new job, which in turn increase cash flow and so prosperity. The question one will want to ask is this: What are the Nigeria's Development Need in Industrial production. To answer this question one needs to look at the whole area of socio-environmental need of the country. It can be said straight away that the basic needs include housing, clothing, health, food, education, and transportation. Security, health and economy are dependent to a large extent on Technology.

Below are the suggestions as to the way out in Nigeria.

- (i) Nigeria should not consider any aspect of Engineering too sophisticated to venture into.
- (ii) Something must be done concerning the science laboratories and Engineering workshops in our tertiary institutions. They are inadequately equipped or the equipment and other facilities are in a dilapidated state, or are affected with obsolescence (10)
- (iii) Educational Institutions and Research and Development centres must be properly funded to be able to carry out meaningful research work that will usher in the much desired development (10) (see tables 3.0 and 4.0)
- (iv) There must be political will to mobilise or harness science, engineering and Technology manpower in the pursuit of national economic objectives to be able to utilise the inputs of Nigerian Engineer in major research and Development projects.

- (v) There is need for genuine collaboration and good rapport between the academic community and industries that are expected to use the manpower they are producing (10)
- (vi) Academia and Industry should provide training facilities by organising course and seminar specially designed to ensure sufficient trained manpower for appropriate technology (10)
- (vii) Industry and Academia should collaborate to disseminate information on method and programme for achieving speedy Technological development that will eventually lead to significant improvement in our economy (10)
- (viii) This country must advance towards a position of being able to maintain its infrastructures and adapt engineering technology for the development of the nation. This is possible if effective use is made of the engineering personnel available amongst us in Nigeria.
- (ix) Total quality management (TQM) concepts in teaching research and operation must be implemented in the engineering education industry. COREN should coordinate the mobilization of funds for this programme (5)

5.0 Concluding Remark

We have seen how it all began and the present crisis we are in right now as a result of our attitude towards Technology in this country. Admittedly, significant impact have been made by Technology on business operations in Nigeria, but there is still a long way to go if we compare ourselves with other advanced countries of the world. I strongly believe that if our Universities are revitalised and good policies take root deliberately to make progress especially on autonomy and funding, we can be expected to play our role effectively.

Table 1.0: Energy: The eight (8) NEPA Generating Stations

S/No	Power plant	Capacity (MW)	Type of Plant	Supplier	Country of Origin
1.	Kainji	760	Hydro	GEC ASEA HITACHI VOEST ALPINE	U. K. Sweden Japan Austria
2.	Jebba	540	Hydro	VOEST ALPINE HITACHI	Austria Japan

3.	Shiroro	600	Hydro	Gec Voest Alpine Chastmains	U. K. Japan U. S.
4.	Egbin	1320	Steam	Hitachi	Japan
5.	Sapele	1020	Steam (720) Gas Turbine	ABB (Sea) Brown Boveri (300)	Germany Sweden Swiss
6	AFAM	700	Gas Turbine	ABB (Sea) Brown Boveri	Germany Sweden Swiss
7	Delta	876	Gas Turbine	G. E.	U. S. A
8	Ijora	60	Gas/Diesel	G. E.	U. S. A.

Total \cong 5876 = 6GW (Approximately)

Source: Proceedings of the Third Engineering Assembly (COREN) 1995.

Table 2.0: Engineering Contribution to Human Needs and Comfort

Categories	Engineering Contribution
Food and Agriculture	Tractors, Harvesters, Pump, Engines, Processing Equipment, Refrigeration
Shelter	Equipment for Manufacture of Building Materials, House Hold Appliance, lifts, air-Conditioners
Clothing	Textile Machinery, Sewing Machines, Laundry

Table 3.0: Expenditure on Science and Technology in Nigeria (1980–1992)

Year	Total Allocation (₦ million)	Recurrent (₦ million)	GDP: Current Prices (₦ million)	% of Science Allocation as Part of GDP
1980	86.21	47.71	44,257.22	0.18
1985	71.91	68.21	71,368.10	0.10
1988	134.60	102.22	142,678.26	0.09
1990	201.76	140.6	57,873.03	0.08
1992	292.06	214.67	54,433.68	0.05

Source: G. Ezekwe, 1993

Table 4.0: Country Expenditure on Science and Technology as percent of GDP

Country	1987	1990
Cameroon	0.8	1.0
Egypt	0.2	0.8
Ghana	0.9	0.4
Kenya	0.8	1.0
Nigeria	0.1	0.08
Zambia	0.5	0.4
Brazil	0.6	2.0
India	0.9	2.0
South Korea	1.7	3.0
USA	2.0	2.0
Japan	2.5	2.6
Europe	2.5	2.2

Source: UNESCO Statistical Year Book 1994

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