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Strategizing For Economic Rehabilitation and Self-reliance In Nigeria: The Need For Indigenous Technology

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Introduction

Technology may be defined as modern machines, equipment, tools and associated knowledge, techniques may be defined as modern machines, equipment, tools and associated knowledge, techniques and processes involved in the making, using and maintaining these gadgets in producing goods and services for man's consumption. It is technology viewed thus, that accounts for the speed of delivery, the quantity and quality and other attributes of goods and services which a modern society enjoys. *Indigenous technology means* technology as defined above with the additional condition that it is developed by an indigenous people (in this case Nigerians) through a process that would include studying of available modern scientific technologies and adapting them to the Nigerian environment, improving upon them in the light of local conditions and eventually initiating original indigenous technologies (Ekpo-Ufot, 1990). Indigenous technologies as conceived, have to flow from modern science. The stages of their development involves, studying adapting and improving (innovation).

Technological development refers to the processes by which a nation or an organization fashions out its patterns and pace of accumulation of techniques, machines, equipment and tools, using scientific methods for the purpose of either discovering new knowledge or ways of putting knowledge to practical use. This calls for research and development management.

Research for discovering knowledge is often called basic, while research for converting knowledge to practice is applied. Development takes off from the findings of applied research to build up or develop products, processes, techniques, and services for consumption by society. Research and development management, noted Ekpo-Ufot (1990) refers to the sets of activities and behaviours characterizing basic and applied "research" and "development" activities when those activities are executed in an organizational setting, and managed to derive new products, new processes, new techniques and new services in commercial quantity and quality for society to enjoy. In this context we may substitute "innovations" for new products, new processes, new techniques and new services. These will be based on strategy or action.

Strategy refers to a comprehensive series of long-range decision plans, designed to achieve a mission, conceived goals or objectives through some creative clever options of resource allocations and utilization policies, to yield advantages over other options, and over others pursuing similar objectives, or to bring about improvement over one's current position (Ekpo-Ufot, 1988b). It involves long-range decision, plans, mission, goals, objectives, options, resources allocations, resource utilization, policies, advantages improvement.

The above components are the basic essentials of strategies. But the appreciation of these components is not easy. There is a lot of confusion in the use of concepts in practice (Ekpo-Ufot,

1990). Often one finds the components, mission, goals, objectives and policies used as if they mean the same thing, or substituted for strategy. Fig. 1 gives further clarification on the concept of strategy.

Fig. 1 shows the ultimate “mission-goal-objective” as goal area; next is an arrow indicating one of the paths to the goal area. Strategy is thought of as a vehicle moving in a selected path towards the goals. The circle at the front of the vehicle represents planned objectives to be achieved.

The solid lines are collections of long-range decision plans, while the dotted lines provides opportunities for other plans. They are all part of the vehicle. The rectangle stands for policies to steer the vehicle to course.

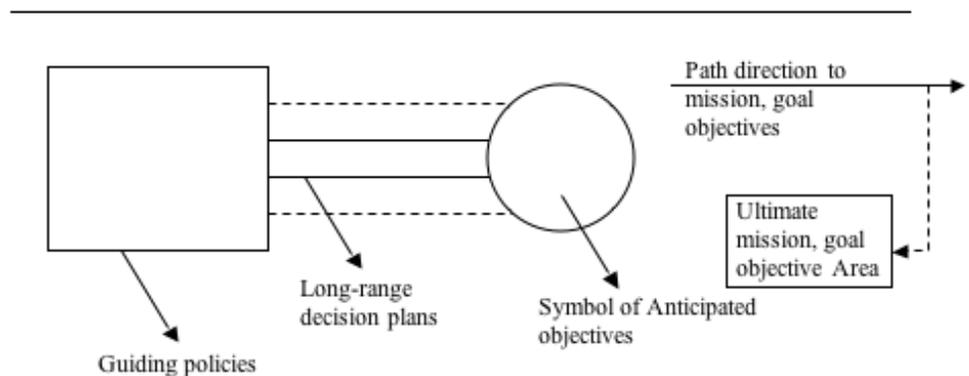


Fig. 1: Strategy as a vehicle (Source: Adeleke, A., Ogundele O.J.K. & Ovenuga, O.O. (2003) *Business Policy and Strategy*. Lagos: Concept Publications).

The concept of strategy has been elaborated for a number of reasons. First we are going to propose a strategy for technological development. second, based on the working definition of strategy, our conception of strategy allows for alternative options. Our suggested strategy does not treat alternatives; it is based on the concept of self-reliance. This will emphasize the packaged plans; these plans must be consistent and positively enhance objective achievement.

Self-reliance as used in this paper is related to the concept of socio-economic-development (SED) (Ekpo-Ufot, 1988a). SED is a process of growth and expansion into some new and useful forms of individual, natural, and man-made resources of a given region. The enlargement of such new and socially useful forms consists the wealth of the region. Thus SED is the process of wealth development. the crucial agents in the wealth development process are the creative individuals in the region. The process itself involves the techniques or technologies devised by the creative individuals’ agents. The most salient indicators of SED (Ekpo-Ufot, 1988) are: Creative individuals, New technologies, New products, New Services, Accumulated stock of added wealth (the 1st four elements).

All the other components of wealth, stem from the creative individuals. We should therefore define self-reliance conceptually to mean self-sufficiency in stock of wealth. A self-reliant individual is a creative person who has used his creativity to device technologies to produce the product and services that meet his needs. A self-reliant nation is the one most of whose citizens have realized their creative potentials and they use these to develop indigenous technologies for producing the goods and services for the consumption of their fellow citizens (Ekpo-Ufot, 1990). Thus, self-reliance depends absolutely on indigenous technologies.

The gap between the level of socio-economic and other development indicators, between Nigeria and her colonial master Britain, for instance, is very wide. It is a well-known fact that the wide gap in the stages of development rests squarely on modern science and technology, which are the foundations of

the development of the society. Again, we find a little gap in between the stages of socio-economic development of Britain and U.S.A. The gap between the stages of development of U.S.A. and Nigeria is the deeper of the two. The cause of the gap can also be traced to the same factors – Science and technology.

A further comparison of gap between stages of development between U.S.A. and Japan reveals that Japan is better off. The gap is however narrow. It was popularly believed that the secret of Japanese industrial leadership was in their management system, which many claimed could not be transported into other cultures. But Gregory (1982) asserted that the single most important determinant of Japan's productivity and growth is her technological powers. Gregory (1982) stated that between 1967 and 1977 Japan tapped the Western Powers through research and development expenditures.

This is no news to this audience, but it is an important reawakening. We need to be fully aware of the important of science and technology in socio-economic development. It was responsible for Japan's technological greatness, Nigeria's dependence on foreign-technologies weakens the foundation of her "Self-reliance objectives".

Our behaviour as a nation strongly indicate that Nigerians are not fully aware of the importance of science and technology in national development. what explanation do you have for the following?

- Nigeria has been producing oil for some fifty years now, yet she has not acquired indigenous oil technologies.
- Nigeria has been battling to develop her own iron and steel industry for over thirty years now, and the project is yet to be completed.
- Consider the over-dependence of Nigeria on foreign technologies in the areas of drugs, motor vehicles, communication, power and a quite endless list; and we still hang our hopes on foreign contributions to the implementation of our industrial policies.
- The budgetary allocations to science and technology as percentage of total recurrent expenditure is often less than 1.0%.

These suggest that sufficient priority has not been given to science and technology. It should re-enforce the awareness that is being created by this paper. It should stir us to match words with deeds.

Research and Development (R and D) Strategy for Economic Rehabilitation and Self-Reliance

We shall first present a general model adapted from Ekpo-Ufot (1990). The model is shown in figure 2 below. The primary goals of our approach to a self-reliant socio-economic development, is to develop science and technology graduates, as well as every citizen to be technologically competent. To achieve this, the school and manufacturing organizations in Nigeria have important roles to play.

In figure 3 below, the principal institutions of development are the school and factory. In the model, they are sandwiched together by the double-headed arrows. Ascending arrows in the school system depict academic career growth whereas descending ones emphasize the role of the higher institutions to provide instruction to the lower levels. The sandwiched institutions give students at all level opportunities to match their classroom learning with practical work experience in industry. Workers in the industry will also continue their school learning part time. This will eliminate unemployment. It will

also ensure that learning and research are made relevant to the development needs of Nigeria.

The School: Factor Intermediate Outcome Ultimate Outcome

(Science & Tech. Graduate)

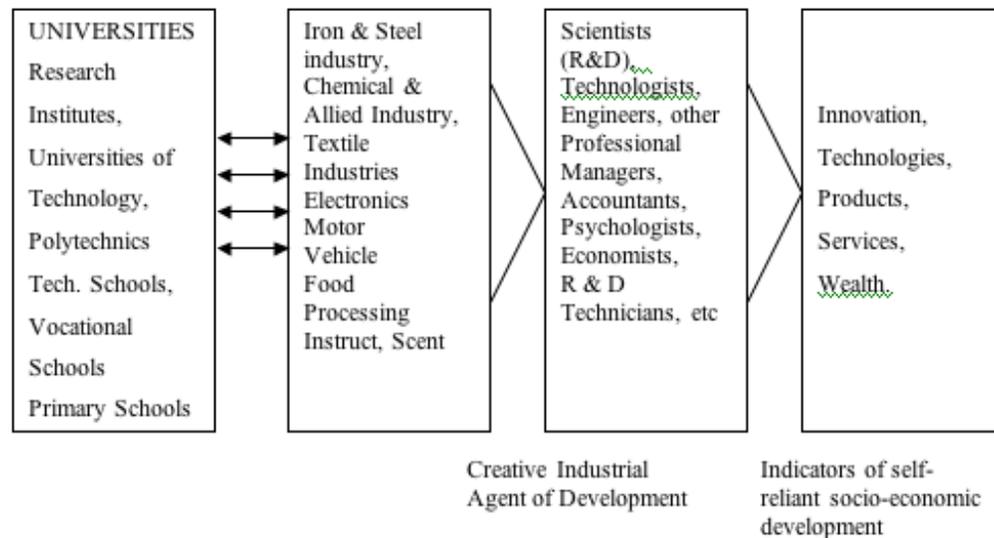


Fig. 2: A general model of self-reliant socio-economic development.

Source: Adapted from Ekpo-Ufot (1990) *Research and development management strategy for developing indigenous technology for self-reliance*. Seminar Paper, Ministry of Science and Technology, Federal Department of Fisheries, Victoria Island, Lagos, 20th June.

In the factory column, seven main sectors are listed to define the structure of manufacturing industry. The ordering reflects our preferred order to attack. The instructional and scientific equipment first. Food processing and motor vehicle could be taken simultaneously. The sub-goal is to attain prevailing status of technology in a five to ten-year period. The next pairs of industrial sectors will be attacked in a subsequent ten-year period if the first plan is successfully implemented. This will take about thirty years for the nation to catch up in the acquisition of modern technologies. Is this possible? This question can be answered by research to take stock of indigenous scientists, engineers, etc.

The intermediate outcome reflects graduates from the twin development institutions. Their dominant functions after graduation are in the areas of research and development, R and D. There is no obvious hierarchy with scientists as the top and craftsmen at the bottom. But each is engaged in R and D activities, though in varying degrees of preoccupation. The capital symbols show the predominant concern while the small letters, show subsidiary functions. Therefore scientists are expected to be dominantly engaged in basic research, applied research and exploratory development research. They are also to be in touch with developmental activities. Craftsmen are on the other hand concerned mainly with development activities in the “production line”. But they must have a questioning attitude and continually search for new knowledge and new ways of doing things. They are expected to move up in the hierarchy where their experience and ideas will be refined as they grow. The technologists, engineers and other professionals have to divide their time equally between the important functions of R and D; therefore, it is shown in capitals for them.

The question is, how do we implement this general model for Nigerian economic rehabilitation and self-reliance? We again will like to apply a modified proposal by Ekpo-Ufot (1990). This is shown in figure 3 below.

The operations depicted in the model is through the Ministries of Education and Science and Technology which have the most important responsibility to discharge. These are in planning and executing the experiment. The operations are:

- (1) The school system as depicted in the general model.
- (2) Existing business sector of the economy. They will contribute funds to the national R and D, which must be compulsory.
- (3) National, State and Local Governments will also contribute which will be used to establish R and D corporations, with three major divisions, for developing indigenous technology for self-reliance, scientific equipment, and motor vehicle and food processing.

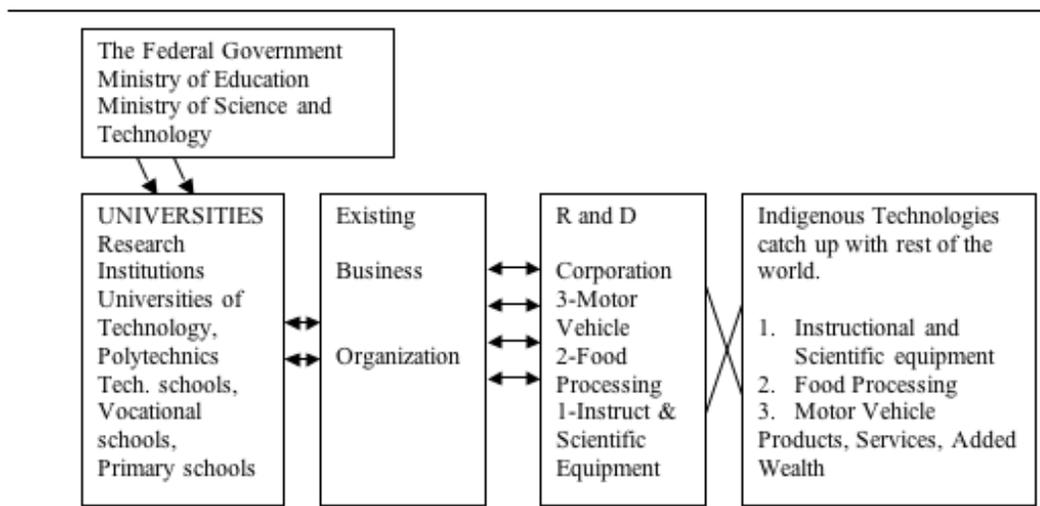


Figure 3: The R and D Corporation Experiment Model
 (Source: Adopted from Ekpo-Ufot (1990): *Research and Development Strategy*, Cited in Ogundele O. J. K. Ojodu, H. O. (2003).

- (4) Home markets and sub-regional markets are large enough in each case.
- (5) In case of Nigeria the 6-3-3-4 education system cannot afford to depend on import of scientific apparatus.
- (6) There are enough local raw materials for the food processing and a good base for developing indigenous technology (Ogundele, 2000).
- (7) The 6-3-3-4 national education into the corporations with all its defects, for example had been producing graduates to be recruited into the corporations.
- (8) Our Iron and Steel and Chemical Industries will grow to provide materials for the specialized industries.

The lesson that we have learnt from the West is that R and D management is the only sure path to technological development. Equally the East, for instance South Korea and Japan, have confirmed the effectiveness of this path. Japan most importantly has shown the centrality of cooperative R and D management and its ability to produce major changes within a decade. The R and D corporation, therefore, should borrow a leaf from the Japanese practice. The cooperation, the governments (National, State, Local), the science and technology school system, and the seven component of the business sector, all come together to form the corporation. The responsibilities of the Ministry of Science and Technology in this respect are:

- (1) Research and identify pools of indigenous scientists, engineer educationists, technicians, etc., and craftsman from which recruits will be drawn to man the corporation.
- (2) Commission feasibility studies for establishing the three projects listed on model 3 and produce a five-year plan for the industries.
- (3) Get operators to negotiate how to implement, monitor, control and evaluate the projects.
- (4) Recruits high-level management staff and other staff need for the corporation.
- (5) Launches the corporation, sits back, watch and monitor and contribute in the evaluation process.

Fubara (1988) had proposed a collaborative model of industrial and technological innovation in Nigeria. Therefore, the school and factory concept in the model is not new. The “work-study” concept is also not new. The general model is an expression of what is happening in Nigeria. There is no doubt that R and D is a necessary condition for technological development. There are various institutions of higher learning in Nigeria for example. Project Development Agency (PRODA) has developed over 42 items; machines, equipment and products. Information on the “market-start-up” stage of R and D is lacking. The R and D cooperation is to mop up the existing resources and rework them under one roof to complete the R and D activity in commercialization.

The idea of specialization is not view. It is here being suggested that the Ministry of Science and Technology should specialize in instructional and scientific equipment, food processing and motor vehicle production. Using these as take off the nation will borrow old ideas from outcomes of Japanese specialization in electronics. All that can be done model is to reinforce what others have said. The experiment is a proposal to match words with action. The Government says the 6-3-3-4 education system in Nigeria will prepare Nigerians for technological take off. But when will the government match words with deeds, by equipping adequately the laboratories, workshops and other facilities needed for effective implementation of this scheme?

Recommendations

- (1) There should be emphasis on self-reliance as a practice in all our educational levels.
- (2) There should be practical emphasis on pure science and science related areas in our secondary and tertiary educational institutions.
- (3) Specific time framework should be set for Nigeria to be self-sufficient in the areas of basic

needs.

(4) The Government should give more support to indigenous organizations who are in the forefront of Research and Development.

(5) Creation of an enabling environment by the government, which will promote development of needed equipment and products.

Conclusion

We call on the Ministry of Education to ensure that in the running of the 6-3-3-4 education system, workshops, laboratories, pilot plants, equipment, tools, etc, must be adequately supplied from indigenous sources to maintain the system. The implementation of the proposals must be monitored to ensure that deviation from course are corrected and set target met. There is hope for Nigeria today, especially since science and technology have become open knowledge. If the pre-requisite conditions highlighted in this paper are followed R and D. Management will accelerate the acquisition of science and technology. To achieve sustainable development in Nigeria, and for economic rehabilitation and self-reliance, it is strongly recommended that development of indigenous technology is a better alternative to transfer of technology and this should involve cooperative action by all stakeholders.

References

Adeleke, A. Ogundele, O.J.K. & Oyenuga O. O. (2003). *Business policy and strategy*. Lagos: Concept Publication.

Ekpo-Ufot, A. (1988a). the role Akwa Ibom State indigene polytechnic graduates in the socio-economic development of the state. A Discussion paper for the launching of Akwa Ibom State indigene Polytechnic graduates in the socio-economic development of the State. *A Discussion Paper for the Launching of Akwa Ibom State Students*, Federal Polytechnic Ilaro.

Ekpo-Ufot, A. (1988b). Indigenous technology, disciplined organization and Akwa Ibom development, *Seminar Paper for the Development of Akwa Ibom State*, University of Cross Rivers State, Uyo.

Ekpo-Ufot, A. (1988c). How to develop the technologically innovative entrepreneur and his planning skill. Lagos. *Frederick Ebert Foundation Seminar on Entrepreneurship Development*, University of Lagos.

Ekpo-Ufot, A. (1990). Research and development management: A strategy for developing indigenous technology for self-reliance. *Discuss Paper, Monthly Technical Seminar Series*, Federal Ministry of Science and Technology, 9 Kofo Abayomi Street, Lagos.

Fubara, B. A. (1988). University and industry research: A strategy for mobilizing national research. *Nigerian Journal of Management Science*, 1, 90 – 107.

Gregory, G. (1982). The Japanese propensity for innovation: Electronics. *Business Series, No. 86*, Sophia University, Institute of Comparative Culture, Tokyo.

Ogundele, O. J. K. (2000). *Determinants of entrepreneurial emergency, behaviour and performance*

in Nigeria. Unpublished Doctorial Dissertation. Lagos: University of Lagos.

Ogundele, O. J. K. & Ojodu, H.O. (2002). *Technology transfer: Technological development and New Partnership for Africa's Development (NEPAD)*. Conference Paper 2nd National Conference Lagos State Polytechnic, Ikorodu, 9th October.

Ogundele, O. J. K. & Ojodu, H.O. (2003) Technology transfer: Technological Development and New Partnership for Africa's Development (NEPAD), *Business Education Focus: A Journal of Business Education and Management* 4(1), 171-188.

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