

Recession to Recovery: Essentials of Education and The Role of Petroleum Technology Development Fund (PTDF) in the Development of the Petroleum Industry in Nigeria.

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ABSTRACT

This paper presents an insight into over two decades of impactful educational intervention and other Oil and Gas related programmes of PTDF that have enhanced capacity building for the petroleum industry; the strong collaboration network between the PTDF and the Institute of Petroleum Studies, University of Port Harcourt, (IPS) and the resulting impacts capable of militating recession when fully deployed and given the commensurate political will for national development. Key Performance Indicators (KPI's) and achievements of PTDF and the outcome of its implication on education and recession are highlighted. Critical challenges to programme and project implementation strategies and possible prospects are equally discussed. Expansion and commercialization strategies as new frontiers of the Fund is highlighted. The paper is useful for planning, research and good decision making for both the petroleum industry and the educational sector.

Keywords: Recession, Intervention, Education, National Planning, Collaboration, Decision-making.

INTRODUCTION

“Recession” is the period generally characterized by temporary economic decline during which trade and industrial activities are reduced, generally identified by a fall in Gross Domestic Products (GDP) in two successive quarters, marked by high unemployment, stagnant wages and fall in retail sales¹. A recession does not last longer than one year and is much milder than depression². According to the Cambridge Dictionary, “recovery is the time during which an economy improves after a difficult period of recession”. This assertion reflects a recent World Bank reports which states that “over sixty percent of developing economies would require external funding and foreign direct investments to attain rapid transformation devoid of recession by the year 2020”. It is on this premise that the paper is hinged to explore, dissect, analyze, and present an update on the role of education in the economic recovery of a nation and the PTDF experiences in the 21st Century strategic and sustainable educational funding for capacity building in Nigeria. It is pertinent to state that the IPS model of education in Nigeria is quite unique because of its quality products and relevance to the modern day educational systems comparable to what is obtainable in developed economies. High impact graduates that are fit and proper for the industry are hallmarks of the IPS. PTDF has establish strong collaboration and linkage programmes with the IPS.

There are global and indeed national concerns on the dearth of quality education in Nigeria and its implication on the economic strength for development. This assertion is relevant in the face

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¹ Oxford Contemporary English Dictionary: Available online; <http://www.oed.com>. Oxford University Press's Dictionary.

² World Bank Report on Education in Nigeria (1995) in Darma R. 2011: The Role of PTDF in Youth Education and Career Development. Ghana Youth Week Annual Lecture, pp 12- 17. GYW 2011.

of recent National Bureau of Statistics (NBS) prediction of the nation's economy in recession.³ Consequently, the educational programmes of institutions of tertiary institutions like IPS are designed to serve as a panacea in addressing the challenges of the petroleum industry in Nigeria. Similarly, PTDF's historic vision to serve as a vessel for the development of indigenous manpower and the domestication of oil and gas technology in-country as to make Nigeria a human resource center for the West African sub-region are also designed to actuate skills-based economy to stimulate growth from recession. PTDF skills gap audit 2015 indicated that 85% compliance standard required to actualize the government policy on local content development by 2020 must be structured on intensive stimulation of technology transfer in science and engineering, infrastructural upgrades, quality education and training, and applied research to drive the vision for economic growth⁴. The IPS education model linked with the PTDF vision on capacity building is a unique bridge for rapid economic recovery from recession through forecast planning, and good policy formulation in Nigeria.

WHY DO COUNTRIES GO INTO RECESSION?

Global survey has indicated that countries all over the world would experience rapid recession in the face of two or more of the following:

- (a) Inconsistent/ inappropriate policy and strategy of government
- (b) Mismanagement of natural endowment
- (c) Effect of nature and war
- (d) constant migration of the best brains (brain-drain) and inadequate manpower
- (e) External factors and inconsistent economic policies
- (f) Unfavorable Trade policy of world bank and African Development Bank (AfDB) and other investors and entrepreneurs
- (g) Inadequate Foreign Direct Investment (FDI) etc.

HOW DO WE RECOVER FROM THE IMPACT OF RECESSION?

There are fundamental indicators that must be consciously put in place by authorities in power if rapid recovery and growth processes must sufficiently and effectively occur. These recovery indicators are anchored on collective efforts of key players in policy and strategy based on planned programmes with actual datelines on targets for implementation and evaluations. Thus, recovery from recession must be centered on the following:

- ❖ Human capital development. The skills pool and strength of a workforce determines the expected quality output of the workforce and its contributions to national development including the educational sector.
- ❖ Facility upgrade and knowledge management. The existence of functional facilities such as power, road network, housing, telecommunication, internet facilities, modern

³ National Bureau of Statistics Quarterly Bulletin, Vol 1 April 2017. A publication of the National Bureau of Statistics, Federal Ministry of Planning and National Development, Abuja. Pp 15- 23.

⁴ PTDF Website: Available online: The new vision of the Petroleum Technology Development Fund by Femi Ajayi (2016): Training and Capacity Building for the Nigeria Petroleum Sector, being a paper delivered at the Society of Petroleum Engineers (SPE) Round table Dinner, Abuja Nigeria.

laboratories, virtual libraries etc. are instrumental to quick and effective recovery plan for techno-economic and educational development.

- ❖ Protection of intellectual property and patent. The huge research breakthroughs, innovations and inventions recorded in the country must be harnessed and synthesized for the needed recovery strategy of the government. No country can afford to downplay new discoveries and innovations if the desire is to consciously recover from recession. The education sector is huge and capital intensive, and depends largely (as a circle of development) on the functionality of other sectors. Intellectual properties and patents must be protected and transformed into finished products for the market so that gross domestic products and earning powers increased subsequently.
- ❖ Technology acquisition and transfer. Recession drains the economy and technology but, structured plans to acquire new technology and adopted processes to have the new technology transferred becomes the reality of development. Until and unless such developmental plans are put in place backed up by the political will to ensure full implementation, recovery becomes a mirage in a developing economy.
- ❖ Incentivization for germane innovation and invention of goods and services. There must be deliberate policy to incentivize and provide motivational incentives to innovators and inventors of products and services including germane ideas that could transform the economy and drive away recession. Such incentives could be in the form of tax holidays and loans for companies which, will be the needed enablers for rapid industrialization⁵. These indicators and much more form the crux of what PTDF was established for and has been doing in the last twenty years. Some of these recovery drivers are listed hereunder.

EDUCATION AS THE BRIDGE BETWEEN RECESSION AND RECOVERY.

Nigerian educational systems that will serve as the bridge between recession and recovery must have the tripod of policy, technology, and industry. The government policy must shift from paper qualification to technical and vocational education capable of producing innovations and inventions at all strata of the schooling year. The emphasis must be on product based education so that graduates at all levels will develop the culture of self-reliance and productivity. Acquisition of modern technology and its application into the educational system remain paramount in view of the impact of technology on national growth. Technology in this context goes beyond the use of computer and series of educational software developed in the USA or UK or China or Russia etc. It includes the integration of the Nigerian language system into developing indigenous software for education and training in our schools (primary, secondary, and tertiary education systems), the compulsory introduction of information and communication technology in to the curriculum development of the country and the immediate deployment of same for teaching and learning.

Teachers at all levels must embrace and accept the use of modern teaching and communication gadgets as a means of living so that quality products would emerge from quality education in the country. When education is driven by the quest for technology development, all sectors of the economy will be impacted positively. The industry in this context include the way of living and doing business for the growth and sustainable development of the country. The quality of education that challenge thinking and is solution driven would equally stimulate solutions to economic problems. Thus, a knowledge based economy would enhance quick recovery from

⁵ Jide Adebulehin (2017): Recession to Recovery: The Importance of Education being a paper delivered at the 14th Inaugural Lecture of the Institute of Petroleum Studies, University of Port Harcourt 2017.

economic recession and thus improve the gross domestic product of the country to citizenship participation in economic growth.

PTDF EDUCATIONAL AND INTELLECTUAL INTERVENTION MODELS IN NIGERIA.

Recession and economic downturn induced infrastructural decay and its adverse effect on the development of education in Nigeria would be discussed with reference to the role of PTDF in ameliorating the situation in about a decade of its establishment as an agency of government.

Firstly, the law that established PTDF according to its mandate, vision and mission statements makes it the fulcrum on which technical and sustainable education would revolve especially for the petroleum (oil and gas) industry.

Secondly, PTDF is an agency of Government saddled with the responsibility to build capacity, capabilities and competences as well as acquire, adapt, and indigenize innovative technology for rapid development in the oil and gas sector. There is therefore no dispute in the fact that sustainable and quality education either for the petroleum sector or the other sectors of the economy is significant for the development of the country.

There are several programmes and activities of the Fund geared towards a dynamic but sustainable transformation in the educational sector in Nigeria. These are⁶:

- (a) *Catch Them Young Programme*: The petroleum industry was for about three decades largely dominated by foreign experts. The Catch Them Young Programme was PTDF's first step at creating awareness and guiding students at secondary school levels towards oil and gas career path through keen orientation in core science subjects. Quiz, Essay, and Debate competitions are organized for the students at the State, Zonal and National levels annually.
- (b) *University Upgrade Programme*: PTDF Upgrade Programme is an intended strategy to accelerate the acquisition of indigenous manpower and technology that could drive the nation's oil and gas sector and by implication, the entire economy. The Universities and the various Departments selected under the first phase are as follows:
 - University of Ibadan - Petroleum Engineering
 - University of Port Harcourt - Gas Engineering
 - University of Benin - Renewable Energy
 - Ahmadu Bello University Zaria – Chemical Engineering
 - University of Nigeria Nsukka - Petroleum Geology
 - University of Maiduguri - Basinal Studies
 - University of Jos - Geology and Mining science
 - Usman Dan Fodio University Sokoto – Petroleum Chemistry.

The second and third phases of the upgrade programmes are robust with the sole aim of making them meet national and international standards as centers of excellence. They are:

- Bayero University Kano - Chemical Engineering
- University of Uyo – Chemical/Petroleum Engineering
- University of Ilorin - Geology and Mineral Science
- University of Calabar – Applied Chemistry.

⁶ New Direction for PTDF being a policy development plan (2016); in PTDF Digest: A quarterly publication of the Petroleum Technology Development Fund, page 10.

- Abubarka Tafawa Balewa University Bauchi – Chemical Engineering
 - Obafemi Awolowo University Ile-Ife - Geological Science.
 - Federal University of Technology - Chemical Engineering
 - Federal University of Technology Owerri – Petroleum Engineering
 - Benue State University – Analytical Chemistry
 - Katsina State University – Renewable Energy
 - Nigerian Defence Academy – Mechanical Engineering
 - Federal University of Technology Yola – Mechanical Engineering
 - University of Abuja – Physics
 - University of Lagos- Chemical Engineering
 - Nnamdi Azikiwe University – Production Engineering
 - Rivers State University of Science and Technology –Chemical/Petro-Chemical Engineering
 - Niger Delta University – Chemical-Petrochemical Engineering.
 - Enugu State University of Science and Tech - Metallurgical/Materials Engineering.
 - Petroleum Training Institutes, Effurun - Infrastructure, facility, education, training, and organizational restructuring.
 - National Institute for Petroleum Policy and Strategy, Kaduna - Infrastructure, facility, education, training, and curriculum development.
 - Bayelsa Polytechnic, Ekowe; Infrastructure, facility, education, training, and organizational restructuring.
- (c) *Information and Communication Technology Centres (ICT)*: This is borne out of the mandate to build capacities and improve learning facilities in selected tertiary institutions. PTDF have built 24 ICT centers in various universities, 20 in Federal Colleges of education and Polytechnics and 102 in Unity Schools⁷ across the country. Below is the list of benefitting institutions across the country.
- Zone A- North Central Comprising of 23 Unity Schools, 3 colleges of education and 4 Universities.
 - Zone B- North East Comprising of 15 Unity Schools, 3 Colleges of Educations and 4 Universities.
 - Zone C- North West Comprising of 17 Unity Schools, 4 Colleges of Education and 4 Universities.
 - Zone D – South East Comprising of 12 Unity Schools, 2 colleges of Educations and 4 Universities.
 - Zone E – South –South Comprising of 17 Unity Schools, 3 colleges of educations and 4 Universities.
 - Zone F – South West Comprising of 18 Unity Schools, 5 colleges of Educations and 4 Universities.
- (d) *PTDF Endowment Programme*. The main aim of PTDF Endowment Programme is to enhance indigenous research and training, facilitate the exploration and exploitation of petroleum and other mineral resources in-country, encourage large scale development of interdisciplinary teaching and research, facilitate the provision of pertinent solutions to practical industry problems as well as serve as an interface between the industry and academia. Under the arrangement, eight Universities have been endowed as shown in the Phase 1 of the upgrade programme.

⁷ Unity Schools are Federal Government Junior and Senior secondary schools located all over the country.

- (e) *Annual Oil and Gas Research Grant Competition*. The objective of this programme is to enhance the capacity of locally based researchers to conduct researches that are relevant to the petroleum industry, promote the retention of such capacity and encourage its application in the industry and other sectors of the economy. The long-term expectation from the programme is the rapid transformation of the oil and gas sector through research and publication. There are nine awardees so far sponsored in the current statistics.
- (f) *PTDF Scholarship Scheme*: Between 2001 and 2017, PTDF awarded 4,652 scholarships to Nigerians of various disciplines under the Overseas Scholarship Scheme (OSS) to study in different Universities in the United Kingdom and 941 under the Local Scholarship Scheme (LSS) to Universities in Nigeria.
- (g) *University Lecturers Skills Enhancement Training Programme (ULSETP)*. The programme is designed to enhance continuing education for excellent practice in training to enrich the act of teaching and research. The programme impacts directly on the quality of graduates being produced.
- (h) *Engineering Design and Training Programme (EDTP)*. The aim of this programme is to up-skill graduates of engineering, geology, and environmental technology to acquire proficiency in the use of engineering design software. The training packages are in different models and software, which promote and enhance local content initiative of the Federal Government. It is complemented with a six months post training attachment in relevant oil and gas companies
- (i) *Publications and Distributions of Books and Journals*. PTDF currently produce and publish an international journal; the Petroleum Technology Development Journal (PTDJ) with high intellectual input from seasoned researchers and industry experts. Research results under the Annual Oil and Gas research Grant Competition and Professorial Endowment Research are also published as ‘PTDF Compendium on Oil and Gas Research’ and ‘Professorial Endowment Research Reports’ respectively.
- (j) *Collaboration with relevant Stakeholders*. PTDF collaborates with relevant stakeholders such as other government institutions and professional bodies and association in engineering and the petroleum industry for the purposes of training, building effective and strong work force enhancing information dissemination as well as strengthening efficient technical education in Nigeria. In fact, the list is endless as PTDF is exploring new frontiers in developing and retaining knowledge in-country.

THE PTDF ROLE IN SCHOLARSHIP, RESEARCH, AND DEVELOPMENT OF THE PETROLEUM INDUSTRY IN NIGERIA.

PTDF in 2002, pioneered the first Professorial Chair in Gas Engineering in any Federal University in Nigeria. The Chair in Gas Engineering was among the pioneer Professorial Chair of the Fund in Nigeria. It was among other things mandated to ensure the domestication of gas utilization within the university and its environs by connecting to the gas to power projects, gas to liquid, gas to mini industrial parks for petrochemicals, fertilizer and Liquefied Natural Gas LNG⁸ etc. The gas engineering Chair was also expected to initiate the process of gas commercialization through export promotion models from the mini LNG plant and network of gas pipelines to replicate the Trans-Nigerian Gas pipeline project, Trans-Sahara Gas pipeline projects and the West African Gas pipeline projects most of which could best serve the purpose

⁸ Neeka Jacob Biragbara (2015): The Impact of Oil on Nigerian’s Economic Policy Formulation. PTDF Digest – A quarterly Publication of the Petroleum Technology Development Fund (PTDF) Vol.3 (2) April 2015. P.70

of teaching and research. The chair was charged with the responsibility of researching into, and making proposals for lasting and sustainable solution to gas flaring in the Niger Delta.

PTDF has consistently awarded local scholarships to IPS and some other students of the University of Port Harcourt for several years and such students have excelled⁹. Local and Overseas scholarships is one flagship programme of the Fund that enhances quality education which will liberate the country from recession. Under this scheme, gas pipeline economics, oil and gas engineering, gas engineering and management, energy economics, petroleum marketing, petroleum accounting, petroleum law and policy etc. are covered. Also, about seven beneficiaries of the *Annual Oil and Gas Research Grant Competitions* are from the University of Port Harcourt. Two intellectual property rights and patents have been recorded from the efforts.

The combination of Total and the University of Port Harcourt has produced a system at IPS which every Nigerian concerned about human capital development in the Oil and Gas industry should be proud of. These contribution to education as a single tool for recovery cannot be overemphasized. Furthermore, there has been sponsorship of staff of the University to Conferences and programmes related to gas education and infrastructural development in the past. The PTDF will continue to stand out strategically on the promotion of education and education related programmes to build and strengthen economic growth to curb recession and enthrone rapid socio-educational development.

CHALLENGES AND PROSPECTS OF THE PTDF MODEL IN NIGERIA.

There are essential indices for the actualization of set goals including but not limited to¹⁰:

- i. *Adequate planning and policy*: Strategic planning and consistent policy of both government and institutions like IPS and PTDF are fundamental in combating recession and reposition the economy.
- ii. *Funding*: Lack of adequate funding of both programmes and projects essentially slowed down development processes and to a large extent affects the outcome and quality of education in-country.
- iii. *Available expertise*: According to experts “there is need to open up upgrade facilities and engage professionals in technical education and economic development policy strictly designed for the oil and gas industry¹¹”, who will proffer solutions to hydrocarbon recovery and stem out recession through surplus income.
- iv. *Environment*: There must be favorable business environment to the government, industry operators, and the citizens for expanded economic growth and development.

Closely related to the factors above are determinants that play fundamental roles in generating better prospects for sustainable achievements in the society. For PTDF, and by extension other government agencies, the extant laws that established and defined its mandate play key roles in its programme implementation. Accordingly, the following areas are crucial in this paper:

⁹ Neeka Jacob 2013: The Role of Petroleum Technology Development Fund (PTDF) in Sustainable Technical Education in Nigeria, being a paper delivered at the 10th Nigerian Oil and Gas Conference and Exhibition, International Conference centre Abuja, Nigeria.

¹⁰ Jan Horst Keppler et al (2007): The Econometrics of Energy Systems; Palgrave Macmillan pp 1-27.

¹¹ Ebenezer O. Ojo and Lawrence C. Edomwonyi-Otu (2017); Process Safety Education Framework: Lessons Learned from Safety and Chemical Engineering Education (SACHE) Faculty Workshop. PTDJ Vol.7 (1), January 2017, pp 50 – 61.

- (i) *Extant Law and Enforcement Clause*: There is need to review the extant law that establish PTDF and include the enforcement clause because of changing time and need of the society. Possible sources of income and expected growth rate must have changed with time and the global market forces are also subject to change, yet there remains the strong need for the Fund to deliver on its mandate.
- (ii) *Expansion and Commercialization*: It is expedient for the PTDF to expand its scope and explore new frontiers in its operations and funding strategies for it to remain relevant in the national sphere. Commercialization of some of its brands of achieved goals and research products should be encouraged.
- (iii) *Robust Budgeting and Funding*. Budget and budgetary processes need to be expanded to accommodate new innovations and inventions¹² – products of years of intervention programmes. Early and timely releases of funds to implementation of programmes could serve as a panacea to enhance the quality of education products and hence curb recession

CONCLUSIONS.

1. It is pertinent to reiterate the need for all hands to be on deck in fostering strong effective and robust collaboration that will ensure the attainment of quality technological and technical education in Nigeria.
2. Government policies and programmes need to be constantly reviewed to introduce curriculum that have technology based initiatives from the secondary school up to the tertiary levels.
3. Adequate and sustained funding of teaching and learning programmes is fundamental to the actualization of these goals.
4. PTDF should ensure sustenance of its demonstrated commitment to the actualization of the said goals as enumerated in the foregoing¹³.
5. Nigeria and indeed Nigerians need an effective educational transformation and now is the right time. Consequently, the convocation of regular stakeholder's forum to share knowledge and clearly define the way forward for the nation's educational system is highly recommended.
6. The policy focus of government and the PTDF's Management drive to upgrade and transform institutions such as the National Institute for Petroleum Policy and strategy (NIPPS), Kaduna, and the Centre for Skills Development and Training (CSDT) Port Harcourt into global centers of excellence is highly commendable.
7. Over eight research intellectual property rights and patents from PTDF funded researches could be harnessed and developed into a start-up companies for the effectual take-up of industrial parks in-country.
8. Finally, adequate, and proper placement of beneficiaries of various training programmes of PTDF to key government and industrial projects (both ongoing and future planned projects) should serve as a strong panacea to capital flight and economic recession, and thus enhance rapid recovery of revenue for strategic funding need in other sectors of the economy.

¹² Daniel Yergin (2009): From Shortage to Surplus: the age of gasoline in The Prize; the quest for oil, money, and power. Free Press New York USA.PP190 - 212

¹³ Agboola Olayinka in Bello Aliyu Gusau (2017): Nigerian Content Achievements through capacity building: The PTDF Experience. 47th Annual Conference of the Nigerian Society of Chemical Engineers. Port Harcourt.