An Assessment of Petroleum Technology Development Fund (Ptdf)

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Abstract
The importance of indigenous technological training and skill development in Nigeria cannot be over-emphasized. Several reforms and institutions have been established in this direction. The institutions include Petroleum Training Institute (PTI) and the Petroleum Technology and Development Fund (PTDF) established for the purpose of providing scholarships, bursaries, training or education in petroleum in any of the higher institutions in Nigeria and abroad. The objectives of the study include: to analyse the functions of PTDF in Nigeria; to find out whether the establishment of PTDF has helped in bringing technical development to oil industry; to find out if the funds for scholarships/bursaries and training have been judiciously utilized amongst others. The method adopted for the study is the historical method. In doing this, relevant documents, newspapers, internet and other related literature were utilized to elicit information for the research. The major findings are that inadequate numbers of human resources have been trained with requisite knowledge to cope with our technological problem in our oil industry and that some of those trained lack the technical know-how to manage the refineries. It is recommended that in order to enhance productivity and efficiency in our petroleum industry, technological and professional training in a real practical form should be encouraged. The number of persons offered training and scholarship award should be increased so as to enable more workers and students benefit from the fund.

Introduction
Oil exploration in Nigeria began in 1908 when the German Bitumen Corporation started exploration in the Araromi area of present Ondo State of Nigeria. This was the first attempt to search for hydrocarbons in Nigeria which terminated its operations at the outbreak of the First World War in 1914. Another major effort was embarked upon in 1937 by Shell D'Arcy (the forerunner of the present Shell Petroleum Development Company in Nigeria). This was after being awarded sole concession rights covering the whole territory of Nigeria. The Second World War interrupted its operation and exploration did not resume until 1947. In 1958, Shell started oil production and export from Oloibiri field in the present Bayelsa State at 5100 barrels per day. In 1959, the sole concession rights over the whole country

granted to Shell were reviewed. Exclusive exploration rights were extended to companies of other nationalities in line with the policy of increasing the pace of exploration, while at the same time ensuring that the country was not too dependent on one company or nation. The success of Shell however encouraged other companies to join in the exploration and in 1961 Mobil, Gulf (Chevron), Agip, Elf, Amoseas (now Texaco), had joined the explorers for oil in both on and off shore. Discovery was made by Gulf on the Okan field of former Bendel State in 1964. Many new companies also made significant discoveries. The initial interest of the Nigerian government in the oil industry was limited to collecting the royalties and other dues, which the oil companies offered to pay to it and to making laws to regulate the activities of the industry. Immediately after the Nigerian civil war in 1970, oil became predominant and more strategic to the economy of Nigeria. Nigeria joined the Organization of Oil Exporting Countries (OPEC) in 1971 as the eleventh member (Chima, Owioduokit and Ogoh (2002)).

In 1973, the Federal Military Government, headed by General Yakubu Gowon established the Petroleum Technology Development Fund (PTDF) through Decree 25. In 1990, the decree was amended as the PTDF Act. However, the PTDF did not become operational until the present Government set up the PTDF Management Committee in September, 2000 for the purpose of indigenization of manpower and technology in the oil industry. The founding of the PTDF was informed by the realization that the petroleum industry in Nigeria, which accounts for over 90% of the nation's foreign exchange earnings and over 80% of the Gross Domestic Product (GDP), had long depended almost wholly on imported technology/equipment and manpower for its activities. To reverse this trend, Government set up an organ invested with the task of developing highly skilled indigenous manpower that would participate actively in the activities of the industry, thereby overcoming foreign dominance.

The mission of the Fund is to train Nigerian students, graduates, professionals, technicians and craftsmen in the fields of engineering, geology, science and management for the oil, gas and solid minerals industry in Nigeria and abroad. This is done through scholarships and bursaries wholly or partially in universities, colleges, and petroleum institutes within and outside the country. It sponsors visits to oil-fields, refineries, petrochemical plants, and arrange necessary attachments of personnel to establishments connected with the development of the petroleum industry. It also finances workers participation in seminars, conferences and workshops connected with the petroleum industry within and outside the country.

This paper sets out to examine the extent to which the goals of PTDF have been realized. In order to actualize this, the paper is divided into the following sections, namely: statement of the problem; basic research questions; objectives; theoretical framework and literature review; assessment of PTDF; summary and conclusion; and recommendations.

Statement of Problem

Nigeria depends on the export of crude oil (petroleum products) for economic growth and development. Importantly, the production of oil in Nigeria has been profitable for the international oil companies. These companies initiated oil exploration and production in Nigeria and have dominated the industry for many years. Considering the role of oil in national development, the struggle for indigenous control of activities in the industry has persisted over the years. Among oil exporting countries like Mexico and Libya, this struggle has culminated in apparent revolution, which ultimately forced out foreign oil firms from the industry and made way for national control of oil operations. However, when the foreign oil firms have isolated the host country from the technology of oil operations, it has to take alternative approaches to bridge the technological vacuum. The approaches include the offer of a network of incentives and attempts to achieve economic stability through reforms. Inspite of all these, there is a critical problem in Nigerian oil industry. After the foreign firms have left the oil fields and returned to their home countries, who takes charge of future oil operations in the host country? The answer to this question brings to the fore, the issues about the acquisition, development and upgrading of technological capabilities in the oil industry, hence the establishment of Petroleum Technology Development Fund (PTDF). Technological capabilities involve the entire spectrum of technological knowledge acquired through technological learning and advanced through industrial training and work experience. The main concern of this study is to find out how much efforts the Government has put into technological and developmental training of the oil workers and the extent to which PTDF has met its set objectives.

BASIC RESEARCH QUESTIONS

Three Research Questions have been formulated as stated below –

(i) Has the establishment of Petroleum Technology and Development Fund (PTDF) brought about efficiency and effectiveness in the Nigerian Petroleum Industry?

(ii) Has the fund provided for the purpose of training being judiciously utilized to enhance staff technological development?

(iii) Is there any concrete evidence of PTDF having trained staff adequately and awarded scholarship since 2000?

The major objectives of the study includes the following –

(a) to examine the functions of Petroleum Development Fund (PTDF) in Nigeria with a view to indicating whether its functions could lead to efficiency and effectiveness in the Nigerian petroleum industry.

(b) to determine if the fund has been properly utilized to the benefit of the oil industry and the entire nation or not?

(c) to find out the extent to which the PTDF has gone in the training of staff and award of scholarship since 2000; and

(d) to make suggestions and recommendations for the improvement of proper utilization of the fund.

Theoretical Framework And Literature Review

The framework adopted in this research follows the firm level technological capabilities defined in Ernst, Mytelka and Ganiatsos (1994) and applied in Gee and Kuo (1994), Wie and Pagnestu (1994) and Poapongsakron and Tonguthai (1994). The definition of technological capabilities is based on the concept of technological learning. Technological learning comprises of formal, non-formal and informal learning. Formal learning is defined as a planned and evaluated sequential programme, leading to certificate, degree or diploma. Non-formal learning is defined as organized learning that is usually not graded, non-sequential and or part-time, characterized by on-the-job training and professional development. Informal learning is a lifelong process by which people work in foreign affiliates or in domestic companies which closely interact with transnational corporations through daily experience, observation and exposure to indoctrination. Technological learning involves the challenge of acquiring technological knowledge. Generally, it is argued that two main components of technological knowledge that firms need to acquire and absorb are the public and tacit knowledge elements of technology. The public knowledge component includes such items as engineering blue prints and designs, and the underlying genesis of scientific knowledge. It also includes management manuals, handbooks describing system features, performance requirements, material specifications and quality assurance criteria, and the organizational methods and routines required for the implementation of these codified items. Furthermore, it includes individual practitioners' knowledge of the way such scientific, engineering and organizational principles are applied or the knowledge about how things work in practice. Tacit knowledge is derived from and tied to the localized and collective learning experience of a given company through technological capabilities, into six capabilities production, investment, minor change, strategic, linkage, and major change. Production capabilities include the knowledge and skills used in plant operation, where shop floor experience and learning-by-doing, continue to play an important role, despite the growing science intensity of industrial manufacturing. Three broad types of activity are included in this category. They are production management and engineering, and repair and maintenance of physical capital. The first involves organization and control of the production process and interaction with upstream, downstream and ancillary activities. Production engineering includes raw materials' control, production scheduling, quality control and trouble-shooting. Repair and maintenance of production equipment influence the production process. Investment capabilities refer to the knowledge and skills utilized in the identification, preparation, design, and establishment and commissioning of a new industrial project, or the expansion of modernization of existing ones. This includes pre-investment capabilities and project execution capabilities. Pre-investment capabilities include all activities prior to and including feasibility studies, site selection and the scheduling of investment to the search for sources of technology, negotiation of contracts, scheduling of investment and bargaining for suitable transfer conditions.

When oil was discovered in Nigeria, the country had very little human resource to manage and operate a sizeable modern petroleum sector. The foreign oil companies and the government played major roles in establishing the prerequisites for the establishment of linkage and minor change capabilities, especially in developing human resources for the petroleum industry. At the onset, the oil companies supported the establishment of departments and appropriate curricula for the training of Nigerians in oil-related technological, science and engineering disciplines in Nigerian Universities. Scholarships were awarded in significant numbers for overseas study and training in these disciplines. Assistance was given for relevant programmes of training in technical schools. This was also extended to in-house training programmes within the oil companies. Training centres of oil companies offered both non-technical and technical training, especially in drilling, production, transport, maintenance and repairs. The pioneering effort of Shell and British Petroleum initiated the training of mechanics, drilling and derrick men, seismic operators, rig-moving staff, crane, drivers, laboratory technicians, core sampling experts and a host of other specialists. Government decisions and policies, especially those targeted at the petroleum industry influence the strategy of human resource development in Nigeria's oil industry. Degree level courses in petroleum-related disciplines were established in Nigerian universities. The Multinational Oil Corporations (MNOCs) helped establish professorial chair in geology, while institutional cooperation in petroleum-related disciplines were undertaken between the universities of London and Nigeria. By the 1980s no fewer than eight Nigerian universities offered degree level courses in geology and allied sciences related to petroleum. The government's effort to alleviate the shortage of technicians led to the creation of an industrial training fund (ITF) to promote and encourage the acquisition of skills in the industry. Since the creation of the ITF, encouragement was given to a broad industrial training effort integrated into companies' manpower plans and work places. In addition, the Petroleum Technology Development Fund (PTDF) was established in 1973. It was an offshoot of the aid to education grant offered to Nigeria by Gulf Oil Company in 1962. The gulf scheme was subsumed into the PTDF. The fund received contributions from the petroleum inspectorate, and several personnel currently working in the oil industry at various levels, owe their training to the support from the PTDF. These efforts consolidated the establishment of minor change and linkage capabilities in the Nigerian National Petroleum Corporation (NNPC). Two important policies of government influenced the development of these capabilities in the oil industry.

There is a peculiar need in Nigeria to acquire oil technology transfer. Training is usually tailored to meet the specific technological needs of oil firms. This means that whatever training strategy is adopted by the oil industry at any time, the focus is on technological learning which forms the basis for the development of technological capabilities. Broadly, the achievement of technological development in the oil industry depends on the pattern of technological capacity building in the oil industry and the identifiable prerequisites for building up capabilities in the oil industry. It also depends on the impact of government policies on the incentive

system, and the capacity of the oil industry to acquire, develop and upgrade their technological capabilities. In this respect, the establishment of Petroleum Technology Development Fund (PTDF) along with others can be justified.

Establishment and Assessment of Petroleum Technology Development Fund (Ptdf)

Petroleum Technology Development Fund (PTDF) Act is an Act that replaced the Gulf Oil Company Training Fund (Administration) for the purposes of training and education of Nigerians in the petroleum industry (1973, No. 25). According to the Act (1973), it is a fund established as the Petroleum Technology Development Fund into which shall be paid monies comprising the balance of monetary assets outstanding in the accounts of the Gulf Oil Company Training Fund at the commencement of this Act; all further sums payable to or received by the Minister charged with responsibilities for matters relating to petroleum development in terms of any agreement made by the Government and any company in relation to petroleum oil prospecting or mining concessions; and any other sums, from time to time, freely donated or accruing to the Government or the Fund for the training and education of Nigerians in the petroleum industry as the said Minister may direct, and moneys in the said Fund together with interest (if any) payable in respect thereof shall be applied for the purposes specified in section 2 of this Act.

The fund shall be available for the purposes of training Nigerians to qualify as graduates, professionals, technicians and craftsmen, in the fields of engineering, geology, science and management in the petroleum industry in Nigeria or abroad; and in particular land without prejudice to the generality of the foregoing, the Fund shall be utilized as follows:

(a) to provide scholarships and bursaries, wholly or partially in universities, colleges, institutions and in petroleum undertakings in Nigeria or abroad;
(b) to maintain, supplement, or subsidize such training or education as specified in paragraph (a) of this section;
(c) to make suitable endowments to faculties in Nigerian universities, colleges, or institutions approved by the Minister;
(d) to make available suitable books and training equipment in the institutions specified in paragraph (c) of this section;
(e) for sponsoring regular or as necessary visits to oilfields, refineries, petro-chemical plants, and for arranging any necessary attachments of personnel to establishments connected with the development of the petroleum industry, and
(f) for financing of and participation in seminars and conferences which are connected with the petroleum industry in Nigeria or abroad.

The Act (1973) also states that disbursements from the fund shall be applied in accordance with rules made under section 23 of the Finance (Control and Management) Act.

Since 2000 when the PTDF became fully functional, it has contributed tremendously to the development of Nigerian expertise in the oil and gas sectors.

The most visible activity of the PTDF in this regard is the Overseas Scholarship Scheme (OSS). In conjunction with PTDF, OSS is managed by Univation Limited, a branch of the Robert Gordon University, United Kingdom (UK). Its objective is to award scholarships to top Nigerian graduates who would pursue postgraduate courses in the UK in areas relevant to the oil, gas and solid minerals industry.

According to Dambatta (2006), the Petroleum Technology Development Fund (PTDF), has awarded contracts worth N7.8 billion for the rehabilitation and construction of laboratories and hostels at the Petroleum Training Institute (PTI), Effurun, Delta State. And that the Federal Government is about to set up a University of Engineering of which the PTI would be one of its campuses. In his contribution, Waziri (2006) states that "the PTDF is a public institution that has been discharging its social responsibilities, and it is the duty of all Nigerians to make it work. According to him, the PTDF was started in 1964 under a different name and in a different form. It has for long worked silently for Nigerians. For instance, it recently conducted an interview for the sponsorship of Doctor of Philosophy (Ph.D) scholars in reputable overseas universities. It was renamed Petroleum Technology Development Fund (PTDF) and refocused by the Federal Government led by General Yakubu Gowon in 1973. Its establishment Act provided at section 2 that, "the fund shall be available for the purposes of training Nigerians to qualify as graduates, professionals, technicians and craftsmen, in the fields of engineering, geology, science and management in the petroleum industry in Nigeria or abroad."

Dambatta added that statistics from PTDF reveals that it has so far trained 3,598 Nigerians in various technical aspects of the Oil and Gas sector in the last four years. This translates to about 900 personnel per annum or 75 per month. Specifically, the Fund has trained 494 persons at Masters, Ph.D and other levels as indicated in the table below –

Table 1: Statistical Breakdown of PTDF Trained Personnel (Masters and Ph.D Levels) Between 2002 and 2006

S/N	COURSES/DISCIPLINES	NO. OF PERSONS BENEFITED
1.	Nigerian Doctor of Philosophy (Ph.D)	58
2.	Masters Degrees in various fields of Engineering	153
3.	Masters in Geological Sciences	79
4.	Masters in Environmental Technology	68
5.	Masters in Energy Resources	23
6.	Masters in Information Technology	40
7.	Others (unspecified)	73
	Total	494

Source: S.N. Dambata, Daily Tribune, 26th Oct., 2006, p. 1-3.

From the above table, the statistics indicate that the Fund has sponsored the training of 468 Nigerians at the Masters degree level between 2002 and 2006 under its Overseas Scholarship Scheme (OSS). It also sponsored 58 Nigerian Doctor of Philosophy (Ph.D) scholars in the last three years under the same scheme. This scheme was initiated by the Government of Chief Olusegun Obasanjo "to meet the long-term capacity requirement of the Oil and Gas Industry through the training of qualified Nigerians in Oil and Gas fields in Engineering, Geological Sciences, Environmental and Energy studies at the postgraduate level."

The statistics indicate that 153 scholars studied for Masters degrees in various fields of engineering relevant to the Oil and Gas sector, 79 studied Geological Sciences and 68 participated in courses leading to awards of Master degrees in Environmental Technology. Other fields were Offshore-related courses 23, Energy courses 32, Information Technology 40 and others, 73. Similarly, the Fund has trained 431 personnel under its Overseas Training for Stakeholders in the Oil and Gas Sector Programme drawn from the Ministry of Petroleum Resources, the Petroleum Equalization Fund, the Department of Petroleum Resources, the Office of the Accountant General of the Federation and the Office of the Auditor-General for the Federation. Other beneficiaries were from the NUPENG, Office of the Attorney General of the Federation, Office of the Secretary to the Government of the Federation and the Petroleum Training Institute (PTI).

The largest number of stakeholder staff, 122 in all, was sent overseas for various training programmes in 2004. Some 112 other staff benefited from the scheme in 2005. Only 15 personnel of stakeholders in the Oil and Gas sector were trained abroad as at July 27, 2006 but 78 of them were trained in 2002 and 2003 respectively. The lowest number of stakeholder staff trained in a full year was 26 for 2001.

The Petroleum Technology Development Fund had trained 2,540 staff of the Department of Petroleum Resources and four Federal Government Ministries and Extra-Ministerial Departments and Agencies locally to enhance their computer proficiency.

The PTDF has, in what could be a novel exercise, trained 101 members of the National Assembly serving on various petroleum-related committees in several workshops, seminars and conferences between 2000 and 2006, "in order to enhance legislators capacity to address more effectively issues affecting Nigeria Oil and Gas sector."

The PTDF document indicates that President Olusegun Obasanjo has approved funding the upgrading of relevant earth sciences and petroleum-studies related departments in eight Federal Universities by the Fund. The benefiting universities are the University of Port Harcourt for Gas Engineering, University of Ibadan for Petroleum Engineering, University of Benin, Chemical Engineering and the University of Nigeria, Nsukka, for Geology. Others are the University of

Maiduguri, Geology, University of Jos, Geology and Mining, Ahmadu Bello University, Zaria, Chemical Engineering and the Usmanu Danfodio University, Sokoto Pure and Applied Chemistry. The PTI upgrade project was necessitated as a result of the shortage of indigenous middle level technical manpower for the Oil and Gas industry.

Infrastructural facilities, laboratory and workshop equipment, furniture and information Technology equipment were procured and installed under the project. Other items needed to enhance the performance of the departments in producing indigenous manpower for the Oil and Gas Industry include specialized libraries, textbooks and journals, electricity generators, power distribution transformers, boreholes, Information Technology software and audio-visua teaching aids.

In its efforts to train graduates in the fields of engineering and geology in the 2007/2008 session through scholarship, the Petroleum Technology Development Fund (PTDF) has conducted an Aptitude Test for potential candidates on 10th February, 2007, at various centres nationwide under its overseas scholarship scheme. Sequel to this, the PTDF recently released the list of successful candidates that have been adjudged successful and therefore worthy of the 2007/2008 M.Sc. Overseas Scholarship Award. Specifically, they are to be trained in the United Kingdom (UK).

Table 2 below shows the number of candidates that were successful in the Aptitude Test. It is arranged in order of geo-political zones and states respectively.

Table 2: 2007 M.SC OVERSEAS SCHOLARSHIP AWARD LIST

S/N	STATE	NO OF CANDIDATES QUALIFIED FOR THE AWARD	PROPOSED COUNTRY OF STUDY
1.	**NORTH-WEST**		
	(a) Kano	2	Uk
	(b) Zamfara	2	Uk
	(c) Sokoto	2	Uk
	(d) Kaduna	3	Uk
	(e) Jigawa	2	Uk
	(f) Kebi	2	Uk
	(g) Katsina	2	Uk
	Total	**15 Candidates**	
2.	**NORTH-EAST**		
	(a) Adamawa	2	Uk
	(b) Bono	2	Uk
	(c) Bauchi	2	Uk
	(d) Yobe	2	Uk
	(e) Taraba	2	Uk

	(f) Gombe	3	Uk
	Total	**13 Candidates**	
3.	**NORTH CENTRAL**		
	(a) Kwara	2	UK
	(b) Kogi	2	Uk
	(c) Benue	3	Uk
	(d) Nasarawa	2	Uk
	(e) Niger	2	Uk
	(f) Plateau	2	Uk
	(g) FCT	1	Uk
	Total	**14 Candidates**	
4.	**SOUTH-EAST**		
	(a) Abia	3	UK
	(b) Anambra	2	Uk
	(c) Ebonyi	2	Uk
	(d) Enugu	2	Uk
	(e) Imo	3	Uk
	Total	**12 Candidates**	
5.	**SOUTH-SOUTH**		
	(a) Edo	4	UK
	(b) Cross River	3	Uk
	(c) Delta	3	Uk
	(d) Rivers	3	Uk
	(e) Bayelsa	3	Uk
	(f) Akwa Ibom	3	Uk
	Total	**19 Candidates**	
6.	**SOUTH WEST**		
	(a) Oyo	**3**	UK
	(b) Ogun	**2**	Uk
	(c) Osun	**2**	Uk
	(d) Lagos	**2**	Uk
	(e) Ondo	**3**	Uk
	(f) Ekiti	**2**	Uk
	Total	**14 Candidates**	
	GRAND TOTAL	**88**	

Source: PTDF 2007 Overseas Scholarship Award List in the Vanguard Newspapers, Wed., 7th March 2007, p. 37.

From the above table, it is obvious that the PTDF has decided to train a total number of 88 candidates under its 2007 M.Sc Overseas Scholarship Award. In the selection of candidates for the programme, the PTDF appears to have given a fair share to the six geo-political zones in Nigeria with the impression that the candidates were chosen in order of performance in the Aptitude Test.

Out of the total number of 88 candidates that passed the test, the North-West got 15, North Central got 13, North-East 12, while the South-South got 19 and the South-West was given.

It should be noted that the PTDF has not only awarded scholarship to the candidates but also seeking admissions for them on their behalf into various Universities in the United Kingdom (UK).

In another development, the Petroleum Technology Development Fund (PTDF)(2007) in conjunction with the Nigerian National Petroleum Corporation (NNPC) has commenced the training of engineers to boost capacity for engineering design in the Oil and Gas Industry. According to PTDF, this initiative involves the training of Nigerian engineers in the use of specified design software application.

The training is designed for indigenous engineering graduates currently practicing in Oil and Gas Engineering Companies, graduate engineers in other engineering consulting firms, COREN/NSE members, PTDF trained engineers and fresh (but unemployed) Engineering Graduates. A pilot phase of the programme was undertaken during the third and fourth quarters of 2006. the main phase of the programme scheduled to train a total number of 2,350 Engineers over a 3 years period is now set to commence. The PTDF therefore solicits applications from suitably qualified Nigerians for training in its various engineering design programmes, such as PIPENET, INTOOLS, PIPESIM, FLARENET Engineering design tools and so on.

The requirements for the training are as follows:

- Below 40 years of age for employed engineers and a maximum of 35 years for unemployed engineers.
- Graduate of any Engineering discipline with a minimum graduating grade of second class or its equivalent.
- Completed the NYSC Programme.
- Proficient in the use of all known office software applications.
- Previous design experience and or proficiency in AutoCAD are an added advantage.

The question now is that if all these are true, why are we still having critical problems in our oil industry, especially in the area of repair and maintenance of our refineries. The government therefore needs to have a re-think of how to face the reality of our problem and face it in a reasonable manner.

While explaining the source of revenue to PTDF, Atiku (2006) states that the PTDF is a "Fund" which comprises of money that has been set aside for a special purpose. The PTDF does not operate like a Federal Ministry or a government parastatal that has funds allocated to it for its activities. The PTDF is its own financier in that its funds already exist and reside with it. It funds its activities primarily from income earned from investing the money comprised in its fund. Until July, 2004, when Mr. President directed that all government ministries, agencies and departments should return their accounts to the Central Bank of

Nigeria (CBN), most of the PTDF's funds were in the custody of several Nigerian commercial banks (including, for example, First Bank, Union Bank, City Express Bank, Hallmark Bank, Trade Bank, Platinum Bank, Bank of the North, among others), earning varying sums as interest on these investments. It is the interest income derived from these investments that the PTDF utilizes in funding its various day-to-day activities. According to him, the PTDF has always engaged in the investment of funds in the normal course of its activities.

SUMMARY AND CONCLUSION

It has been noted that for some years now Nigeria has solely depended on crude oil (petroleum products) at the neglect of other products such as Cassava, Rubbers, Cocoa and other domestic products. In the past, the country had to rely on foreign oil firms for its technological development and maintenance of oil industry but when they eventually left, we now began to think of technological transfer to our country by training and developing our indigenous human resources.

Towards this, several reforms and institutions were established. This include Petroleum Training Institute (PTI) and the Petroleum Technology Development Fund (PTDF) with the intention of providing adequate technical and professional training at Diploma, Degree Masters and PhD in petroleum in any of the higher institutions in Nigeria and abroad and also provide scholarships and bursaries.
In order to imbibe the spirit of technological transfer and to actualize the aim of replacing foreigners with indigenous experts, some oil workers and other Nigeria indigenes were encouraged to avail themselves of the opportunity of PTDF training fund to enable them train as Engineers, Geologists and technicians at various levels and fields of Engineering and Geology. In this direction, the PTDF has trained about 3,598 personnel through approval for training and scholarship in the period under review, that is, between 2000 and 2006.. Out of this number, 494 were trained at Masters and Ph.D levels. Also, the PTDF has recently approved scholarship for eighty-eight graduates in engineering and geology in various Universities in the United Kingdom (UK) under the 2007 M.Sc. Overseas Scholarship Award. In a recent development, the PTDF in conjunction with NNPC announced the commencement of a training programme for indigenous engineers to boost capacity for engineering design in the Oil and Gas industry which involves the training of Nigerian engineers in the use of specified software applications.

The Petroleum Technology Development Fund (PTDF) has no doubt assisted in no small measure towards the achievement of development in Nigeria. For instance, many of those trained with the fund and those that benefited from the scholarship and bursary scheme are working in various oil sectors with their support in the management of oil in the country and that they have since taken over the functions of foreigners in our oil industry. It has been observed that the major problem with Nigerian Government today is that it has not given priority to national development as some of the trained personnel have not been adequately utilized and motivated towards the development of our oil industry. Generally, it can be said that

(i) Nigeria Government through PTDF and other means has succeeded to a large extent in developing its indigenous manpower to participate in the activities of the oil industry in order to overcome foreign dominance.

(ii) inspite of the various reforms and training put in place to enhance professional and technical development of human resources in the oil industry, there is still technological problem evidenced by their inability to repair and improve on our existing petroleum refineries in Nigeria.

(iii) inadequate number of human resources have been trained with requisite knowledge to cope with the technological problem in our oil industry.

RECOMMENDATIONS

It is therefore our recommendations that to enhance productivity and efficiency in our petroleum industry, there is the need to encourage technological and professional training in a real practical form not training based on qualifications without being able to carry out practical or technical work after training.

There is also need to de-emphasized formulation of several policies without proper implementation. Rather few concrete policies should be promulgated backed with full implementation and follow-up action.

The number of workers offered training opportunity every year should be increased so as to enable more people with technological and professional potentials to benefit from the PTDF fund and that the number of students offered scholarships and bursaries be increased as this will encourage our geology, petrochemical and other engineering students to benefit from the scheme.

Finally, since it is a well known fact that there is no end to research, scholars and researchers are therefore encouraged to carry out further research on technological transfer and improvement on the services rendered by PTDF, PTI and other related organizations.

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