

defunct Organisation of African Unity (OAU) should CCM decide to nominate him as the presidential candidate for 2005.

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The Impact of Petroleum Exploration on Agricultural, Technological, and Human Resource Development in Nigeria, 1908 - 1995

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Introduction

Petroleum, *Petra Oleum*, etymologically means rock oil because of its natural deposit in subterranean sedimentary rocks. Its long history of discovery, exploration, and use from ancient world civilisations is outside the scope of our study, and need not detain us (Encyclopaedia Britannica, 165-176). It has also become such a common word in Nigeria that it does not need more definition.

However, in contemporary Nigeria, as a result of its mixed impact on the economy, some doubts have been expressed as to whether petroleum is a blessing or a curse for the country. In this article I shall join in this debate by examining the impact of petroleum exploration on three sectors of the Nigerian economy: agriculture, technology and human resources. These sectors were selected because of their fundamental contributions to the nation's economic development. Petroleum exploration is used in this article in the composite sense of exploration and exploitation because both promote each other. To achieve our objectives, we shall first outline developments in petroleum exploration since its inception in 1908. We shall then follow up with an analysis of its impact on agricultural, technological and human resource developments in Nigeria, since 1956, when petroleum was first discovered in commercial quantities triggering off a heightened pace of exploration. We shall conclude with a summary of our findings.

Outline of Petroleum Exploration in Nigeria

It was a German company, the Nigeria Bituman Corporation, which started petroleum exploration in the Araromi area of Ondo State, in 1908, as a result of oil seepages that were found in that area. But the First World War brought this pioneering effort to an end. Exploration started seriously once again in 1937, when Shell D' Arcy, a Dutch company, merged with

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British Petroleum to form an Anglo-Dutch consortium known as Shell-BP Petroleum Development Company of Nigeria, which was granted sole exploration rights over all parts of Nigeria. But the outbreak of the Second World War once again interrupted exploration, though it resumed again in 1947. Exploration efforts were rewarded by the discovery of oil in commercial quantities at Oloibiri in 1956 (Luckman, n.d.).

This discovery focussed international exploration attention on Nigeria. The need for cheap oil in developed countries, which were shifting from coal to oil as their industrial energy in an attempt to reduce environmental pollution, plus the desire to conserve their domestic oil resources, led to an influx of multinational oil companies to Nigeria after the discovery of oil at Oloibiri. By 1961, Mobil, Ashland, Esso, Chevron, American Overseas (now Texaco), Pan Ocean, Agip, Gulf, Satrap (now Elf), and others had arrived. The pace of oil exploration therefore greatly increased in the country. Exploration was concentrated in the Niger Delta and the Anambra Basins because of their sedimentary rocks of mainly marine origin in which it is believed that the bulk of Nigeria's oil reserves are located (Amu, n.d.: 5-22; Schatzl, 1969).

Exploration was interrupted during the Nigerian Civil War, 1966-70, for obvious security reasons, and picked up soon after. An unprecedented exploration boom occurred between 1971 and 1984. The operations of so many oil companies set off a great exploration competition among them. As these companies were compelled, by their licence agreements, to surrender between 50% and 80% of their oil finds to the Nigerian government, they had to greatly expand their total area of exploration, so as to increase the number of oil finds left to them, from which they could make their cumulative profits. Exploration was made easier and faster for new comer companies because they did not have to start from scratch to make geological and geophysical maps or undertake independent drilling analyses, for they were able to purchase all these from Shell-BP, the pioneers in the field (Schatzl, 1969: 42).

Also, exploration was greatly expanded with the establishment of the Nigerian National Oil Company in 1971 and the subsequent location of the NNPC (Nigerian National Petroleum Company) subsidiary, the Integrated Data Services Company (IDSC), at Benin City with the duty of providing geological, geophysical, and a full-scale data bank on petroleum

exploration, on a commercial basis for all oil companies. Because of all this initial work, interested companies only had to buy processed and integrated data from IDSC. Besides, the package of incentives granted to oil companies in 1977, such as a considerable easing of oil company tax burdens, generous financial allowances for technical costs, and substantial tax relief for off shore exploration; coupled with the unprecedented hike in the world market price of oil from \$13.33 per barrel in 1977 to \$36.56 in 1982, all encouraged a great expansion of petroleum exploration in Nigeria. For example, in the five years from 1980 to 1984 an unprecedented number of eighty fields were located, or investigated, making an annual average of sixteen fields (David-West, n.d.: 17, 22, 27, 35, 62; Lukman, n.d.: 2).

However, exploration declined in the mid 1980's in response to the oil glut of those years and the consequent depression in its world market price. OPEC cut backs lead to a decline in the investible funds of oil companies and the dwindling financial proceeds from oil made it impossible for the Nigerian Government to sustain her package of incentives to oil companies, which dampened further oil exploration (David-West, n.d.: 27). But with oil prices improving after the oil glut, exploration picked up once again and was extended to the Chad Basin, away from the traditional Niger Delta area of operations. This was because geological and geophysical studies revealed that oil bearing sedimentary rocks were located in that area. Since the mid-1980s, about twelve wells have been drilled in Borno State with varying levels of oil and gas finds (NNPC, 1990: 6-7). The impact of this pace of oil exploration on agriculture is what we shall now examine.

Impact of Petroleum Exploration on Agriculture in Nigeria

For a long time in the economic history of Nigeria petroleum had no serious impact on agriculture (David-West, n.d.: 22). Its first noticeable effect was to dispossess the agricultural sector of an enormous area of farmland. For example, it has been estimated that over 4000 oil and gas fields were discovered in Nigeria by 1986. One oil well location covers about thirteen acres of land. There are also thousands of high-pressure oil pipelines criss-crossing various parts of Nigeria. Because of the dangers involved, and for security reasons, agricultural activities are prohibited within fifteen metres on either side of these pipelines. The total expanse of land that has thus been taken up by all these activities has been estimated at 6,267,220 hectares or 626,722,000 acres (Alakpodia, 1989: 1-10; Eddi, 2000: 20; Ayebbi,

2000: 57; Federal Ministry of Mines and Power, 1967: 10). This is an enormous loss of much needed farmland to petroleum exploration.

Petroleum retarded agricultural production in other ways. The growth rate of agriculture in Nigeria between 1975 and 1984 was 2.5%. But the population growth over the same period was 3%. Nigeria was therefore producing more people than it could feed. The natural response in an agricultural, non-oil producing country would have been to step up food production. But unfortunately, the oil boom between 1977 and 1982 misled Nigeria into solving her problem of food security by investing her massive petroleum revenue in food importation instead of effectively investing in expanded food production. Thus between 1962 and 1982, Nigeria's food import bill jumped from ₦46,698 million to 1.4 billion naira, an increase of 2,880.75% (David-West, n.d.: 22). This misapplication of investible funds away from production in favour of importation aided the down turn in agricultural production, which became evident in the decline of its contribution to the gross domestic product, as shown in table 1.

Table 1: Impact of Agriculture on the Gross Domestic Product, 1965-1983:

Year	% Impact of Agriculture
1965	54.9
1966	54.59
1967	55.04
1970	36.01
1971	31.99
1972	27.95
1973	24.72
1974	23.40
1981	12.10
1983	16.00

Sources: (1) L. A. O. Amu, *Oil Glut and the Nigerian Economy*, pp. 17-18
 (2) T. David-West, *Towards a Greater Nigeria*, pp. 22 & 52.

As can be seen in table 1, agriculture's contribution of about 55% to GDP in 1965 dropped to 16% in 1983, a decline of 343.75%, or nearly four times lower than what it was in 1965.

However, judging by the massive amounts invested in it and the conceptual brilliance of the various agricultural programmes introduced, Government, as is usually erroneously believed, did not neglect agriculture in favour of petroleum. For example, in the Third National Development Plan, 1975-1980, a total of 2.201 billion naira was allocated to agriculture, compared with 3.56 billion for petroleum and solid minerals. In the Fourth National Development Plan, 1981 - 1985, the allocation to agriculture increased to 3.4 billion, as against 5.4 billion for petroleum and other minerals (David-West, n.d.: 23). This means that while the allocation to agriculture in the third national development plan was 61.82% of that of petroleum and solid minerals, it increased to 62.96% in the fourth. But by comparison, the allocation to petroleum was 161.8% of agriculture in the third national development plan and this declined to 158.8% in the fourth.

As for brilliant agricultural programmes, there was a plethora of these.¹ For one, observers say that by 1971, after the introduction of the twelve states structure in Nigeria in 1968, twelve state Ministries of Agriculture, plus a Federal Ministry, were established to promote the development of agriculture in Nigeria. To synchronise the work of all these ministries, a Federal Agricultural Coordinating Unit (FACU) was established in 1981 to provide technical support, progress monitoring, and agricultural plan coordination. These ministries were expected to provide extension services, and support research for the improvement of soils, seeds, seedlings, techniques, volume, quality of agricultural production, and to expand the cultivation of hectares of land by various labour saving devices. In addition to these, the farm settlement scheme was also introduced in the early 1970s to reduce the incidence of school leavers' unemployment, to demonstrate improved agricultural technologies and innovations in rural areas, to stem the village-urban drift, and to tailor agricultural plans to stated yearly targets. These programmes did not meet stated objectives because of insufficient funds, inadequate supervision, and lack of a results-oriented approach to the realization of objectives.

Then, in 1972, the National Accelerated Food Production Project (NAFPP) was launched as a cooperative programme between the Federal and State Governments, on one hand, and the farmers in the field on the other. It was made up of research, extension, and agro-service units. The research institutes of Umudike, Ibadan, and Zaria were to develop new agricultural technologies and seedlings for root crops, cereals, and legumes,

respectively, for transmission by extension officers to farmers. These were to be taught and encouraged by agricultural officers to practicalise and derive maximum benefits from the new technologies and innovations. This project atrophied due to irregular funding, inadequate training of participating farmers, and poor linkage of peasants with research findings.

Then came the Operation Feed the Nation (OFN), which was designed to boost food production by mobilizing the general public. But as the peasant farmers, the centre piece of agricultural production, could not receive the necessary inputs of fertilisers and mechanical support, the scheme merely succeeded in enriching unscrupulous individuals and multinational firms, who trafficked in fertilisers to the disadvantage of small scale farmers.

To further improve agricultural production, and provide various types of inputs, the experiment of the River Basins Development Authority Scheme was initiated. By 1976 five each had been established in Northern and Southern Nigeria, and the total was increased to eighteen later. These authorities were more successful in Northern Nigeria than in the south, for in the former they developed water resources which put thousands of hectares of land under irrigation, thus making cultivation possible all the year round, rather than seasonal, as used to be the case. However, these basins, on the whole, performed below expectations. The insuperable problems they faced were political interference, land acquisition, resettlement of displaced persons, lack of necessary planning data, poor funding, inadequate supply of qualified and experienced man-power, under provision of essential and fundamental infrastructural requirements, and the absence of much needed social amenities for the families of staff.

To supplement the work of the River Basins, the Green Revolution Programme was launched in 1980 to increase local food production, and boost the export of agricultural products. But in spite of the large investments in fertilisers and pest control, through spraying; the programme failed because of the interference of politicians, who awarded the fertiliser contracts to themselves. The Green Revolution also failed due to the marginalisation of peasant farmers, who are the bedrock of Nigerian agriculture.

The Agricultural Development Project (ADP) initiated in 1976, and later extended to all the states of Nigeria, appears to have done quite well. For

example, between 1976 and 1980, the average annual growth rate of crop production in farms under its control and supervision, was 6.2%, compared with the national average of about 2.0%. Also by 1980, one ADP extension officer had an effective supervision of about 200 farmers, as compared with the national average of one extension officer to about 3000 farmers. Poor funding has, however, mitigated its rapid development. But over all, the ADP has achieved only a qualified success, for its impact has brought only minimal social transformation and human development.

A supplement to the food production drive in Nigeria was the establishment of the Directorate of Food, Roads, and Rural Infrastructures (DFRRI) in 1986. It was aimed at promoting effective food production, increasing road construction to aid the transport of produce, and accelerating the provision and upgrading of rural infrastructure to discourage the migration of rural dwellers to urban centres. The programme was to be community based with efficient grass root participation. Effective inputs, such as credit, crop storage and preservation, and marketing and distribution, and boosting facilities were to be provided. While the Directorate achieved some remarkable success in rural electrification, her poor management of allocated funds, spurious infrastructural projects, and inadequate attention to food production prevented it from becoming a success story in agricultural production.

This led to the establishment of the National Agricultural Land Development Authority (NALDA) in 1992. It was designed to utilise the abundant farmland and rural labour resources of Nigeria through support for small scale farming communities and the augmentation of their agricultural capacity to achieve stated production targets. It was believed that this approach would remove the major structural and organisational impediments to rapid agricultural production in Nigeria. By the effective provision of such inputs as fertilisers, agro-chemicals, seeds and seedlings, credit, insurance, extension officers, harvest processing and storage, marketing, and on-farm infrastructural development NALDA, by 1994, had succeeded in putting a total of 14,500 hectares of land under cultivation in thirty states of Nigeria. Also, the recorded annual crop production in NALDA farms increased by 176.36% from 40,800 tonnes in 1993 to 112,756 tonnes in 1994. But in spite of its successes, NALDA has not achieved two main objectives, namely, solving Nigeria's food shortage and unemployment problems.

From the above outline of Nigeria's agricultural history, one observes that in spite of the varieties of well-thought-out programmes and the huge investments in men, money, materials, and ideas; the desired results of boosting and innovating agricultural production and modernising its technology were largely unrealised. The main reason was the country's over reliance on petroleum. For example, investments in the petroleum industry were closely supervised and results oriented, and so, the expected enormous financial yield from it was often realised. For example, in the 1958/59 fiscal year, revenue from petroleum amounted to only 0.122 million naira. But in 1990, it increased to 47 billion and 657 million, an increase of 39,057,277.05%, or nearly 40 billion times what it was in 1959.

But Nigeria did not adopt the same attitude of effective supervision of her agricultural investments; nor did it insist on a results oriented agricultural policy. Instead, it relied, as already noted, on using her petro-dollars to fund food importation in times of scarcity. It therefore follows that if Nigeria did not have petroleum, she would have been more judicious, zealous, and results oriented in the management of her agricultural investments (David-West, [n.d.: 23]).² It is in this respect that petroleum has had a negative effect on agriculture.

Petroleum exploration had other deleterious effects on agriculture. Firstly, there are discharges from the exhausts of diesel engines supplying power for drilling and other exploration necessities; blow outs and gas discharges; effluents and emissions during drilling operations; and the flaring of unwanted gases discharging into the atmosphere considerable quantities of sulphur dioxide, hydrocarbons, carbon monoxide, oxides of nitrogen and other gases. These coalesced into a big slow moving blanket in the sky. At night, when dew or some drizzle of rainwater interacted with it, it turned into a corrosive liquid which came down on agricultural ecosystems as acid rain. This not only destroyed vegetation, plantations, and growing plants in farms, it also polluted the soil, making germination of seeds difficult and stunting plant growth. The result was that many crops dried up without coming to harvest – with cassava and yam plants forming smaller tubers than before. Many rubber trees dried up, and some palm trees died off without producing fruits (Enitame, 2000: 35-36). From table 2, one can see how petroleum exploration has adversely affected agricultural productivity in an oil producing area, the Niger Delta. This shows that over half the volume of the staple foods and cash crops (cassava, rubber, and palm nuts), on which the people of this area depended for their sustenance and economic well-being, were destroyed by petroleum exploration.

Table 2: Agricultural Productivity Before and after Petroleum Exploration in the Niger Delta 1993.

A Products	B Before Exploration	C After Exploration	D %Production Decrease $B - C \times 100B$
Cassava	12 tonnes	5 tonnes	58.33
Yam	10 tonnes	6 tonnes	40.00
Maize	5 tonnes	3 tonnes	40.00
Okro	5 tonnes	3 tonnes	40.00
Rubber	5 tonnes	2 tonnes	60.00
Palm nuts	5 tonnes	2 tonnes	60.00

Source: Adapted from P. U. Kragha and O. J. Adepoju, "Community Problems and 3D seismic operations in the Niger Delta," 1993, unpublished occasional paper in author's possession.

Oil spillages had even a more devastating effect than acid rain on agriculture. These often occurred as a result of excessive corrosion and pressure in pipe lines, accidental blow out of oil wells due to malfunctioning valves, or through natural causes such as rainstorms, and lightening. Whatever their causes, the impact on agriculture has been devastating. For example, it was estimated that about 2.34 million barrels of crude oil was spilled in the Niger Delta between 1976 and 1996, a period of twenty years. Of this amount, about 1.82 million barrels, or 77.79% i.e. over three quarters of the oil spilled, could not be recovered and was, therefore, absorbed by Niger Delta soils and waters (Eddi, 2000: 21-22; Enitame, 2000: 38-39; Egborage, 1998: 10).

This has adversely affected fishing activities in this area. For both underground and surface water, i.e. wells, ponds, and rivers were polluted by oil spillage. While some dissolved into the water, the remaining floated on the surface. Fish, very sensitive to petroleum toxicity, were doped out of the deep by the discharged petroleum and trapped by the petroleum floating on the surface. The aquatic colonies of rivers and ponds were thus destroyed by oil spills. Fish traps, nets, and cages were tainted by oil, and thereafter, repelled, rather than caught, fish. Very often the creeks and waterways were blocked by oil spills. This made the movement of fishing canoes impossible. Also, seismic operations necessary for oil

exploration often required shooting with powerful explosives. Local people complained that these explosions often destroyed fishing lakes and ponds, and their aquatic colonies (Enitame, 2000: 39-46).

Petroleum exploration was also hazardous to hunting in oil producing areas. Explosions in seismic operations and the heat and flame of gas flares scared away game. Also, the acid rain and oil spills often destroyed the forest and other vegetation habitats of wild life. Many animals either died off or migrated to safe non-oil producing areas, thus greatly reducing the yield from hunting in oil producing areas (Enitame, 2000: 45).

Oil spills have a direct destructive effect on arable farming, for soil nutrients and micro organisms that are useful for crop production are completely destroyed. It has been estimated that it takes thirty years for arable land affected by oil spillage to recover its fertility, if no further spills occur (Ayebebi, 2000: 57). The incalculable damage to agriculture by the destroyed soil fertility explains the observed decline in agricultural productivity in oil producing areas, as illustrated in table 2, above.

Petroleum exploration has reduced the number of local farmers engaged in agriculture and sapped the productive energy of those still engaged in it. The poor yield from agriculture, as a result of petroleum exploration and deficiencies in arable farming, tree crop exploitation, fishing and hunting, as discussed above, discouraged the youths in oil producing areas from engaging in agriculture. Instead, they sought employment in unskilled jobs in oil companies as labourers, gate men, security men, contractors and so on. The high salaries paid by these companies encouraged these youth to wait endlessly for employment, rather than occupying their time with agriculture. The result was that farming was left largely for the elderly. But, their ageing conditions and the lassitude impacted by the atmospheric pollution caused by petroleum exploration in their area, made them less capable of enduring the rigors of farm work. The result, of course, was reduced agricultural production in oil producing areas (Enitame, 2000: 45).

Finally, agriculture also suffered because the compensation paid by oil companies for crops and economic trees destroyed was always inadequate, as can be seen from table 3.

Table 3: Compensation Paid by Oil Companies for Crops and Economic Trees in the Niger Delta, 1993.

<i>Crops/Trees</i>	<i>Old Rate (₦)</i>	<i>New Rate (₦)</i>
Maize cob	0.25	2.50
Bean plant	0.15	1.00
Yam Tuber	0.80	10.00
Cocoyam	0.15	2.00
Cassava Tuber	0.15	5.00
Sugar Cane	0.10	0.50
Onion Bulb	0.20	0.50
Pineapple	1.00	5.00
Bitter leaf plant	0.50	5.00
Okro Plant	0.20	2.00
Rubber Tree	0.30	100.00
Raffia Palm Tree	10.00	80.00
Banana Tree	2.00	80.00
Plantain Tree	15.00	100.00
Kolanut Tree	15.00	150.00
Cocoa Tree	6.00	250.00
Coconut Tree	12.00	150.00
Orange Tree	20.00	150.00

Source: P. U. Kragha and O. J. Adepaju, A. "Community Problems and 3D Seismic Operations in the Niger Delta, 1993" An Occasional Paper in author's possession.

This compensation was grossly below the market prices of the crops. A random selection from the list above will prove the point. For example, the minimum cost of a maize cob in the Niger Delta was ₦5.00, but only half of this was offered. A small tuber of yam was not less than ₦40.00, and one-quarter of this was offered. Pineapple was not less than ₦25.00, and yet ₦5.00 was paid. A coconut tree, in one season alone, could bear at least thirty nuts. At ₦20.00 a nut, it could fetch not less than ₦600.00 per season for many years. Yet only ₦150.00 was paid as an all-time settlement. An orange tree could bear a hundred fruits a season. At ₦5.00 each, this amounted to ₦500.00 per season for many years. Yet a once-and-for-all settlement of ₦150.00 was paid. Thus, not only were farming resources destroyed in oil producing areas, the farmers themselves were grossly

exploited in the compensation offered them, which could not buy the equivalent of the crops destroyed and were insufficient to raise the produce again. Besides, the grossly poor compensation, farmers lost a good proportion of their economic worth because of the undue delay in paying them (Enitame, 2000: 56-57).

However, the impact of petroleum exploration on agriculture is not all gloom and doom. Let us now examine some of its beneficial effects. For example, petroleum provided the ingredients for the manufacture of fertilizers. These have become a *sine qua non* in revitalising the soil denuded of nutrients by decades of field/forest agriculture and soil pollutions from petroleum exploration. Petroleum thus became an asset to agriculture, since it promoted bumper harvests by its enrichment of the soil through fertilisers. It also assisted agricultural production through the petrochemical content of pesticides, fungicides, and herbicides used to control crop destroying insects, fungi and weeds. More crops thus came to harvest through the protective courtesy of petroleum (David West, n.d.: 23). Also petroleum promoted agriculture because it helped in the manufacture of such equipment as plastic containers, polyethylene bags, and irrigation pipes, made from petroleum products, such a polyvinyl chloride and high-density polyethylene (Adams, n.d.: 5).

Some petroleum companies have also contributed directly to agricultural development. For example, Shell Petroleum Development Company has supplied improved varieties of cassava stems, maize seeds, and cocoa seedlings to farmers in the Niger Delta. Shell has promoted the cultivation of swamp rice through its demonstration programs and allowed rice farmers to process their harvests in rice mills owned by the company. Shell has also established fish farms, from which it provided fingerlings and transferred modern fish pond management skills to fish farmers in the Niger Delta (Ayebbi, 2000: 58).

Thus, in spite of the ogre face of petroleum exploration, it also had a human complexion. But let us now examine its impact on technology development in Nigeria.

Impact of Petroleum on the Transfer of Technology to Nigerians

The greatest problem encountered in the transfer of petroleum technology to Nigerians was that nearly all the machines and equipment used in the petroleum industry were calibrated in foreign standards, and so had to be

imported, along with the skills for operating them. The result was that domestic technology could not be developed. It was also only much later, after Nigeria entered the petroleum industry, as a direct operator and in joint ventures with multinational companies, that the state began to insist that Nigerians be trained in skills and technology. The long period of gestation militated against technology transfer. Also the industry was dominated by two groups of companies. One was made up of operating companies that provided drilling, logging and cementing services, supplied materials, and acquired and processed seismic data. The other consisted of the specialised service firms who were the principal custodians of the highly sophisticated petroleum technologies. But what was common to both was that they were reluctant to develop domestic technology, which might lead to their services being dispensed with. This once again militated against technology transfer (David-West, n.d.: 33, 55; John, 1990: 7-9).

The NNPC has, however, done much to expand the horizon of technology acquisition in Nigeria. For example, its research and development laboratories provide such services as core analysis, crude oil assays, and geological and pollution studies. NNPC's Integrated Data Services Company Limited engages in seismic data acquisition, processing, and reservoir studies. Also, Nigerian engineering companies are encouraged to enter into joint ventures with internationally renowned engineering, procurement, and construction companies. This is to make sure that technology transfer to Nigerians does not end with the operation of plants and equipment, but so that it will also extended to processing, fabricating, adapting, and maintaining them (John, 1990: 10).

The transfer of technology is important both for the petroleum industry and other sectors of the Nigerian economy. Thus, the tools and techniques used in the petroleum industry have been adapted to tapping deep-seated water reservoirs in such arid areas as the Chad basin. Also, as noted above, various petroleum companies are transferring technical skills to Nigerians in such areas as crop processing, production of improved seeds and seedlings, and fishpond management. The Nigerian Gas Company, a subsidiary of NNPC has successfully demonstrated the technical feasibility of using compressed natural gas as a vehicular fuel and established a prototype natural gas filling station in Nigeria (NAPETCOR, 1990: 6-7; Osezua, 1991: 14-17).

However, as the transfer of technology is very closely related to education, or human resource development, which is the necessary bedrock for the acquisition of complex skills and techniques necessary for organising all

other economic factors into desired production ends, let us now discuss the impact that petroleum has had on human resource development in Nigeria.

The Impact of Petroleum on Human Resource Development

We shall approach human resources or manpower development from two perspectives. One is the development, or training, of prospective employees in secondary or tertiary institutions, and the other is the in-service development of those already employed in the petroleum industry.

To achieve the first objective, the Nigerian Government established, in 1973, the Petroleum Technology Development Fund for the training of Nigerians in professions and skills needed in the oil industry. Also, under joint-venture agreements with various oil companies, Nigerians, especially those from oil producing areas, were to be trained in various educational institutions. The Nigerian Government greatly promoted human resource development in the oil industry by establishing the Petroleum Training Institute (PTI) to produce technicians and skilled personnel for the petroleum industry. The government's efforts were complemented by some joint-venture companies, which donated electronic laboratory equipment and a petroleum analysis laboratory, both worth ₦3,092,000.00, to PTI. Since 1986, these companies have also committed millions of naira to provide school furniture, blocks of classrooms, and junior and senior secondary school science equipment in many schools in oil producing areas (John, 1990: 7).

An outline of the individual contributions to human resources development shows that Shell, by 1990, had awarded scholarships worth about 2.9 million naira to students from all parts of Nigeria and endowed professorial chairs in five universities with 3.7 million naira (Khama, 1997: 74). Table 4 summarises the contributions of other major oil companies to manpower development in Nigeria.

Table 4: Contributions of Major Companies to Human Resources Development in Nigeria by 1990.

Oil Company	Contributions	Between 1970 and 1990
The Nigeria Agip Oil Company	Scholarships worth more than ₦3 million	"
Mobil	(a) 250 higher institution annual scholarships.	

	(b) Endowed a Mobil/NNPC Chair of Petroleum Geology, University of Calabar. (c) 600,000.00 to Unical to employ a Professor of Petroleum Geology.	"
Chevron	(i) ₦ 2, 500 to Uniben Faculty of Law. (ii) ₦ 92,000.00 electronic & laboratory equipment for PTI. (iii) ₦50,000.00 to Rivers State University of Science and Technology endowment fund. (iv) ₦ 2.841 million for scholarships to indigenes of her area of operations.	"
Elf	Twelve secondary school classroom blocks at Ahabuka.	"
Ashland	(a) ₦ 40,000.00 to Izombe Secondary Commercial School. (b) ₦ 25,000.00 to Izombe Education Board. (c) ₦ 2,000.00 to Anambra State University (d) ₦ 100,000.00 to University of Calabar.	"

Source: Adapted from NNPC Public Affairs Department, Contributions of Federal Military Government and Oil Companies to Oil Producing Areas, (Lagos, SCANN Publications [n.d]).

From the information supplied by the National Investment and Management Services of the NNPC we have summarized the use of our oil money for scholarships for manpower development in Nigeria from 1968 to 1989 in table 5.

Table 5: Manpower Training Through Scholarships from the Petroleum Proceeds from 1968-1989.

Year	Number	Value in Naira
1988/89	987	284,000.00
1987/88	977	285,000.00
1986/87	1025	302,000.00
1985/86	845	250,000.00
1984/85	801	235,413.00
1983/84	587	204,000.00
1982/83	574	200,000.00
1981/82	574	200,000.00
1980/81	491	172,000.00
1979/80	445	156,000.00
1978/79	405	142,000.00
1977/78	365	123,000.00
1976/77	325	123,000.00
1975/76	280	79,000.00
1974/75	240	65,000.00
1973/74	200	51,000.00
1972/73	160	40,000.00
1971/72	125	32,000.00
1970/71	75	19,000.00
1969/70	50	12,500.00
1968/69	25	6,250.00
Total 21 years	9,556	2,981,163.00

Source: Adapted from Contributions of Federal Military Government and Oil Companies to Oil Producing Areas. NNPC Brochure, [n.d]

This shows that petroleum scholarships awarded by the Government grew, by 3,848%, from 25 in 1968 to 987 in 1989. But while the total number of people trained and the total amount committed looks impressive, at 9,556 and N2,981,163.00 respectively, they pale into insignificance when we

realise that they are for 21 years, and when the amount committed is compared with the revenue generated from petroleum. For example in 1968/69, fiscal year, scholarships for manpower development cost ₦6,250.00, or 0.02% of petroleum revenue, which was ₦29,582,000.00. In 1988/89, while petroleum revenue stood at ₦41,334,400.00, the amount committed to scholarships was only ₦284,000.00, or 0.69%. Government thus committed only a paltry percentage of receipts to manpower development (NNPC, n.d.). The neglect was, however, mitigated by the scholarships awarded by the joint venture companies, as indicated in table 4.

The second approach to human resources development was by in-service training. For this, several statutory and contractual obligations now exist for the on-the-job manpower development of Nigerians in oil company employment. For example, the Manpower Planning and Development Unit of the NNPC organises in-house training, local courses, seminars, and workshops for employees. Staffs are also sent on training programmes and attachments, within and outside the country. Before the construction of refineries, petrochemical plants, installations of various pipelines, and in many joint venture oil and gas field development projects; engineers, scientists and other professionals are sent abroad to acquire experience through working with contractors, consultants, and experts in the home offices of the NNPC joint venture partners. In ways like the above, the NNPC has developed a core of professionals who have mastered the most current developments and technologies in the petroleum industry (John, 1990: 9-10).

Conclusion

From the analysis in this article, it is possible to conclude that petroleum exploration and exploitation were not an unmitigated evil. Their deleterious impact on agriculture included the destruction of the agricultural ecosystem in oil producing areas, and an attempt to solve Nigeria's food security problems by converting her petrodollars into massive food importation - instead of results oriented attention to expanded productivity. The result, of course, was the decline of agriculture's contribution to the gross domestic product. But exploration was also useful to agriculture for its products provided the necessary ingredients for the manufacture of fertilisers and various inputs and accessories, which improved agricultural productivity.

In the area of technology transfer, after an early period of nonchalance by the Nigerian Government and the deliberate obstructionist tactics of the multinational oil companies, some measure of progress was made. Human resource development has also taken some giant steps. For example, millions of naira of petroleum income was spent in training Nigerians in various educational institutions. Many have also mastered the most current developments, skills, and techniques in the petroleum industry through various levels of in-service training.

Notes

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1. For the agricultural programme, I drew copiously on the following sources: (Ugbomeh, n.d.; Ayinmodu, n.d.; Mould, 1984; Olatunbosun, 1957).
2. For an outline of the revenue from Petroleum see: (NNPC Public Affairs Department Information Bulletin, 1992: 3). Note that the pound sterling of the early years was converted to naira, which is now the Nigerian currency.

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The Problem of Family Break-up Among Refugees in Eastern and Central Africa

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Introduction

The social, economic, and demographic functions of the family all over the world are well-known. However, in eastern and central Africa, the family is particularly important because institutions of the state and civil society are weak. We do not have here, for example, a welfare system that guarantees basic education, shelter, food, and medical care. The state cannot provide these necessities of life when one's basic or extended family fail to do so. In other societies, like Western Europe, the state is able to intervene effectively and provide these necessities of life when the family fails to do so. Some African states did adopt welfarist philosophies and policies but economic reality dictated otherwise.

When the individual is separated from his nuclear and extended families in this part of the world, it is obvious that there are serious consequences. Family break-up is common among refugees especially when large numbers of people are on the move in a short period of time, as is the case with Rwandese and Burundi refugees. Recently, a Rwandan national told me of the case of a young Rwandan boy who was found in Nairobi, and when international organizations tried to locate his family an older brother was found in Cameroon, and the parents were found somewhere in Rwanda. The Rwandan national (name withheld) further said that there were thousands of cases of members of basic and extended families losing contact, and even getting lost from each other for good in the Rwandan and Burundian refugee crisis.

The Family

The family is the oldest human institution. The advantages of the family especially the nuclear family are many and important especially in socializing and formally educating children. For some people, the family

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