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The Nigerian Oil Industry: Environmental Diseconomies, Management Strategies and the Need for Community Involvement

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ABSTRACT The paper advances the view that environmental diseconomies occasioned by oil industry activities in Nigeria have to a large extent contributed to the lingering crisis in the Niger Delta area, where the bulk of the country's oil and gas is produced. Against this background, the framework for environmental policy and strategies adopted by oil operators is reviewed. It is revealed that the role which communities could play towards minimising negative environmental incidents and related social crises, has been largely neglected by the various legislations and environmental management strategies adopted by petroleum operators. The authors suggest the fostering of sustainable partnerships between oil operators and host communities through appropriate memoranda of understanding, in order to address problems arising from such issues as compensation for environmental damage, impact assessment, management of spills, pipeline surveillance, information management, conflict resolution, and decentralisation of responsibility for abatement programmes.

INTRODUCTION

Although petroleum resources sustain the Nigerian economy, industrial activities in the sector have been known to be associated with substantial environmental degradation and social crises, posing a potential threat to sustainable development in the Niger Delta, where the bulk of country's petroleum resources are found. Although most of the negative environmental consequences of oil industry activities are localised and more intense in the areas of primary activities, some of the effects have transboundary implications. For example, gas flaring which is a common feature of the Nigerian petroleum industry has been known to be a factor in the problem of global warming (World Bank, 1995). In the same vein, mangrove swamp and rain forest destruction as a result of oil industry activities can have long-term consequences for both ecological and climatic balances.

Although environmental policy and management strategies have come a long way in the Nigerian petroleum industry, the allegation of involvement of communities and other local interests in the destruction of oil facilities resulting in large-scale environmental hazards in the Niger Delta, particularly in the last five years or so, adds a new dimension to the resolution of the environmental question. While the local people may suffer from the constraint of incomplete scientific knowledge about the long- term welfare implications of environmental degradation, events particularly since the 1990s indicate that environmental awareness among the people in the oil-producing communities in the Niger Delta has been on the increase (Orubu et al., 2002). For example in 1991, the Ogoni community, through a local pressure group known as Movement for the Survival of the Ogoni People (MOSOP) had sent a representation to the United Nations, demanding for the payment of US $20 million from the Federal Government of Nigeria, as compensation for environmental degradation and for over 30 years of oil exploitation in the area. In the same year, they had also made a similar representation to the European Community on the same issue, particularly on the role of Shell Petroleum Development Company (SPDC – a European multinational oil corporation, operating in the Niger Delta region).

In 1992, MOSOP had shown a film on the extent of environmental degradation of the Niger Delta as a result of oil industry activities to the Tenth Session of the United Nations Working Group on Indigenous Populations in Geneva. Between 1995 and 2000, the Niger Delta was turned into a virtual battle field in a large-scale crisis which saw the youths of the area pitched

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against the oil companies and government - shutting down oil installations, destroying oil facilities, and kidnapping employees (sometimes, expatriates) of oil companies. In 1998, youths from the oil-producing states of the Niger Delta area had threatened to declare an independent Republic, for the inability of the Federal Government to resolve the environmental question and adequately compensate the people for depriving them of their rights to land and other sources of livelihood due to oil exploration and production activities!

The developments highlighted above, no doubt represent dangerous currents in the political economy and history of petroleum resources in Nigeria, which since the early 1990s have drawn significant attention of the international community. These developments highly underscore the need for sustainable partnerships between the host-communities and oil companies in order to address the environmental, and other related problems. This is necessary in order to establish peace in the Niger Delta, which for now is the treasure base of the Nigerian economy. This paper is therefore concerned specifically with the identification of the major environmental problems and issues arising from oil industry activities in the Niger Delta, with a view to highlighting those areas in which co-operation between oil companies and their host-communities could be essential to the significant reduction of negative environmental incidents and restoration of peace in the region.

IDENTIFYING THE ENVIRONMENTAL CONSEQUENCES OF PETROLEUM OPERATIONS

The environmental consequences of oil industry activities in Nigeria have received the attention of several researchers in the past (a few examples include those by, Awobanjo, 1981; Famuyiwa, 1998; Eromosele, 1998; Chukwu et al., 1998; World Bank, 1995; Moffat and Linden, 1995; Grevy, 1995; Olomo and Omene, 1995; NDES, 1997, Onosode, 2003). The industry shares in the essential characteristics of modern industry, although at the base, it is an extractive activity. The combination of modern industry and extractive features makes its environmental consequences more pervasive in terms of immediate externality effects and their implications for sustainable development in the region of activity. Table 1 summarises the main sources of environmental diseconomies arising from oil industry activities as well as their actual/potential impacts.

A careful analysis of Table 1 gives rise to some definite and useful observations. The first is that, every aspect of oil operations, though in varying degrees, has significant negative implications for the environment. The second, and closely related to the first, is that in most cases all of the facets of what constitute the environment are affected in one single operational line. Third, the effects of these various aspects of oil operations on the environment are not mutually exclusive, but rather reinforcing. Fourth, is that the environmental consequences impose economic effects on the people. And finally, social tension tends to result from compensation disagreements arising from environmental damage claims by host communities.

Let us examine briefly, some of the sources of environmental diseconomies listed in Table 1. Gas flaring for instance, has negative effects on the immediate environment, particularly on plant growth and wildlife (Orubu, 1999a) as well as on human life. Some of the green house gases such as methane and carbon dioxide emitted from gas flares contribute to global warming, which could accelerate the problem of climatic change and harsh living conditions on earth, if not checked. Apparently, it is this which explains the interest of the World Bank and the Global Environmental Facility (GEF) in proposing a gas flare reduction project for the oil fields of the Niger Delta in the 1990s (Moffat and Linden, 1995). It has been estimated that the total emission of carbon dioxide (CO_2) from gas flaring in Nigeria amounts to about 35 million tons per year, and it is on record that Nigeria is the highest gas flarer in the world (World Bank, 1995, 2000/2001). In Table 2 we summarise the output of natural gas produced in Nigeria in association with crude oil and the proportion flared over the period 1970 – 2000. The average rate of gas flaring in Nigeria over the period 1970 - 1979 stood at 97%, while for the period 1980 – 1989, this stood at about 72%, falling marginally to an average of 72% during the period 1990 – 2000.

Massive oil spills occurring in riverine areas in the Niger Delta have also done untold damage to the aquatic ecosystem, particularly in the mangrove swamp forest zone. Table 3 summarises

Table 1: Oil operations and their impacts on the environment

S. No.	*Activity/EventNo.*	*Actual and Potential Impact on the Environment*
1.	Exploration – including geological surveys and, geophysical investigations.	Destruction of forest land, vegetation and farm land/human settlement. Noise pollution and vibration from seismic shooting. Effects on animals and nearby settlers (on shore) and on fisheries (near/offshore) Disturbances of flora and fauna habitats. Dislocation of economic activity. Tension on the social environment due to compensation disagreements.
2.	Drilling	Accumulation of toxic materials from drilling materials, oil pollution of the sea, beaches or land. Destruction of fisheries production. Destruction of breeding ground for some marine fisheries. Alteration of the taste of fish. Killing of bottom dwellers. Pollution of underground water (waste pots). Adverse health effect on humans, social tension arising from compensation disagreements from accidental spills from locations.
3.	Production/Process	Water pollution from long term cumulative effects of produced water (with high salinity).
	(i) Plat forms and tank farms	Water pollution from salinity waste, used lubricating oil and solid waste. Main effects on marine life
	(ii) Gas flaring	Air pollution from gas and processing evaporation and flaring. Production of heat kills vegetation around the heat area. Suppresses the growth and flowering of some plants. Reduces agricultural productivity and wild life concentration in area
4.	Refining Petroleum	Air pollution and waste water impacting negatively on human health and ecosystem.
5.	Oil spillage	Destruction of farmland, fishery and aquatic resources and mangrove ecosystem. Water pollution. Creates social tension due to compensation disagreements.
6.	Tanker loading, location	Water pollution from ballast and tank washing. Deck drainage, spillage during loading operation
	(on shore and off shore)	with accompanying effects on the fauna and flora. Disruption of seabed by dredging (i.e. canalisation).
7.	Storage Depot	Land pollution from effluent water and solid waste of chemical cans and drums. Destruction of farmland for the establishment of storage depots, water pollution from effluent water. Air pollution from gaseous fumes during loading.
8.	Transportation	Disruption of the sea-bed by dredging for pipeline installation. Sedimentation along pipeline routes. Water pollution from consequences of leaks from fracturing or breaking of pipe caused by metal fatigue, trawlers and dredges or sea floor failures, and sabotage. Air pollution by transport tankers. Destruction of environmentally sensitive area e.g. lowland, where estuaries, wet lands and sand dune fields exist. Erosion and flooding of the area drastically affected.
9.	Marketing	Pollution of immediate environments from retail outlets. High hazard potential where located near residential buildings.

Source: Orubu et al. (2002).

the legend of oil spills in the oil industry over the period 1976 – 1996. As shown in the table, over the period, the total number of reported spills is put at 4,835, resulting in a cumulative spill volume of 2,382,373.7 barrels of crude oil. Of this amount only about 15.91 percent was recovered, on the average, implying that about 84.09 percent of the cumulative spill was lost to the environment! A number of these spills have been attributed to corrosion of ageing facilities (SPDC, 1995), and relative disregard for good oil field practices (Nwankwo et al., 1998; Ndifon, 1998).

Transportation of petroleum products through the system of pipelines has been one of the most visible sources of environmental hazards in the industry. More than 3,000 kilometres network of pipeline links different parts of the country. Without effective monitoring by the appropriate authorities, this system of transportation has continued to be a source of environmental hazard, when pipelines are either accidentally damaged, or give way due to old age, or through sheer sabotage. One environmental incident of extensively hazardous dimension was a fire incident resulting from a burst pipeline carrying petrol in Delta State in 1998. More than 1000 persons were reported to have died in the inferno! The authorities had attributed the incident to the activities of saboteurs and vandals. In the most recent incidents of massive oil spills and leakages, it has been very difficult to differentiate cases of sabotage from accidental cases. Between January and June 2000 for example, the Pipelines and Products Marketing Company (PPMC) recorded about 800 cases of pipelines rupture in different parts of the country. Out of this number, 764 were attributed to sabotage (FGN, 2000), indicating that sabotage accounted for about 96 percent of cases of

Table 2: Gas production and utilisation in Nigeria (Million Cubic Meters)

Year	*Outputs*	*Utilisation*	*Quanlity flared*	*% Flared*
1970	8,039	72	7,957	99
1971	12,975	185	12,790	99
1972	17,122	274	16,848	98
1973	21,882	295	21,487	98
1974	27,882	323	26,776	99
1975	18,656	659	15,333	98
1976	21,276	972	20,617	97
1977	21,924	1,866	20,952	96
1978	2,306	1,546	19,440	91
1979	27,619	2,951	26,073	94
1980	24,551	3,442	22,904	93
1981	17,113	3,244	14,817	83
1982	15,382	3,438	11,940	78
1983	15,192	3,723	11,946	79
1984	16,255	4,822	12,817	79
1985	18,569	4,794	14,846	80
1986	17,085	5,516	13,917	74
1987	20,253	6,323	12,291	72
1988	25,053	6,343	14,737	73
1989	28,163	7,000	18,730	75
1990	28,163	7,058	21,820	77
1991	31,587	7,536	24,588	78
1992	32,465	7,058	25,406	78
1993	33,445	7,536	25,908	77
1994	32,793	6,577	26,216	80
1995	32,980	6,910	26,070	79
1996	36,970	10,150	26,820	73
1997	36,755	10,207	26,548	72
1998	35,937	10,877	25,050	70
1999	37,613	17,904	19,709	52.4
2000	44,233	20,303	23,930	54.1

Source: Central Bank of Nigeria, Statistical Bulletin 1998, and Annual Report and Statement of Accounts, 2000

Table 3: Oil spills in the petroleum industry (1976 – 1996) in Barrels

Year	*Number of spills*	*Quantity spilled*	*Quantity recovered*	*Net quantity lost to environment*	*Percentage of quantity lost to environment*
1976	128	26157.00	7135.05	19021.50	72.72
1977	104	32879.25	1703.01	31176.24	94.82
1978	154	489294.75	391445.00	97849.75	20.00
1979	157	694117.13	63481.20	630635.93	90.85
1980	241	600511.02	42416.83	558094.19	92.94
1981	238	42722.50	5470.20	37252.30	87.72
1982	257	42841.00	2171.40	40669.60	94.03
1983	173	48351.30	6355.90	41995.40	86.85
1984	151	40209.00	1644.80	38564.20	95.91
1985	187	11876.60	1719.30	10157.30	85.52
1986	155	12905.00	552.00	12353.00	95.72
1987	129	31866.00	6109.00	25757.00	80.83
1988	208	9172.00	1955.00	7217.00	78.69
1989	228	5956.00	2153.00	3803.00	63.85
1990	166	14150.35	2092.55	12057.80	85.21
1991	258	108367.01	2785.96	105581.05	97.43
1992	378	51187.90	1476.70	49711.20	97.12
1993	453	8105.32	2937.08	5168.24	63.76
1994	495	35123.71	2335.93	32787.78	93.35
1995	417	36677.17	3110.02	33567.15	91.52
1996	158	39903.67	1183.81	38719.86	97.03
Total	4835	2382373.7	550234.19	1832189.49	

Source: Niger Delta Environmental Survey, *Phase 1 Report* (1997), Vol. I. NNPC (1997) – *Annual Statistical Bulletin*

pipeline ruptures in the period of six months! And yet, as noted by Nwankwo et al. (1998), many of these pipelines have been overdue for replacement for a long time. Many oil companies did not start replacing some of these pipelines, some of which are as old as thirty years, until the mid-1990s. The environmental consequences of oil industry activities have definite economic impact on the people in the areas of primary activities.

INTERACTION BETWEEN ENVIRONMENTAL DEGRADATION AND THE IMMEDIATE ECONOMY

The ultimate economic effect of environmental impacts of oil production activities is to catalyse a reduction in the standard of living of people in the area of primary activities. The economic effects are extensive, and include dislocation of traditional economic activities and associated livelihood pursuits as well as danger to human health. Expectedly, all of the economic effects translate to pecuniary effects, which can be measured in terms of reduced real incomes and the loss of alternative uses of resources consumed by oil companies (Ekuerhare and Orubu, 1996).

We can refer to the effects described above as *first round effects*. There are also the *second round effects*, with longer-term welfare implications. Each round of environment–degrading activity tends not only to increase the incidence of poverty among vulnerable groups such as farmers and fishermen and their dependants, but also involves intensified exploitation of existing natural resources, such as timber and non-timber forest resources. For example, pollution of major fishing waters leads to massive exploitation of marginal fishing waters. The pressure on land as a result of pollutive oil industry activities also leads to the exploitation of marginal farmlands, over-farming and deforestation, all of which result in a new wave of environmental degradation. In this way, a kind of vicious circle relationship between environmental degradation and poverty incidence is created, particularly in the face of inappropriate compensation programmes of oil companies, which do not provide for alternative sources of livelihood for deprived land owners.

In many rural oil-producing communities, individuals displaced from their land and water resources, including their dependants often migrate to the urban centres in the hope of securing paid employment in the oil industry or other sectors of the urban economy. Unfortunately production in the petroleum industry is largely skill – and technology–intensive, thereby reducing the ability of oil companies to absorb the largely unskilled migrant-labour from the rural oil-producing communities. Two definite effects are observed here. First is the depletion of the active labour force in rural oil-producing communities. Then there is the second effect of population pressure on the "oil city", swelling the pool of the unemployed.

In the most recent years, the major oil companies operating in the Niger Delta have stepped up their corporate social responsibility development efforts as evidenced in the implementation of several community development projects such as the building of classrooms, health centres, introduction of youth empowerment schemes, construction of access roads, etc. Such efforts may be seen as one way of compensating the people for environmental damage resulting from oil industry activities, apart from the desire of the oil companies to improve the living conditions of their host-communities and create good will. However, oil companies and host-communities continue to live in mutual suspicion, and the situation seems to have heightened since the advent of democratic administration in 1999. To the extent that oil operations require a peaceful and secure social environment, the need for oil operators and communities as important co-stakeholders to foster good relationships through sustainable partnerships or memoranda of understanding cannot be overemphasised. However, evolving such partnerships must be based on an understanding of the current framework for environmental management in the petroleum industry. This is therefore the subject of brief review in the next section.

ENVIRONMENTAL POLICY AND MANAGEMENT STRATEGIES IN THE PETROLEUM INDUSTRY

The evolution of environmental policy in the Nigerian Petroleum industry dates back to 1914 when the *Minerals Ordinance* was enacted by the colonial administration. The main objective of the ordinance was to prohibit the pollution of watercourses in the process of mining and pros-

pecting for any mineral, including petroleum. The *Mineral Oils (Safety) Regulations*, 1963, *Petroleum Regulations*, 1967, as well as the *Oil in Navigable Waters Act* 1968 (among others) are also examples of post-independence statutory efforts directed at environmental protection in the petroleum industry. Environmental policy in the industry did not however enter into an active phase until the enactment of the *Petroleum Act*, 1969 which gave the Minister in charge of petroleum matters, vast powers to make regulations relating to all aspects of petroleum operations, including protection of the environment. The statutory framework for environmental policy in the Nigerian petroleum industry is depicted in Figure 1, while some of the relevant legislations on environmental policy relevant to the petroleum industry are summarised in Table 4.

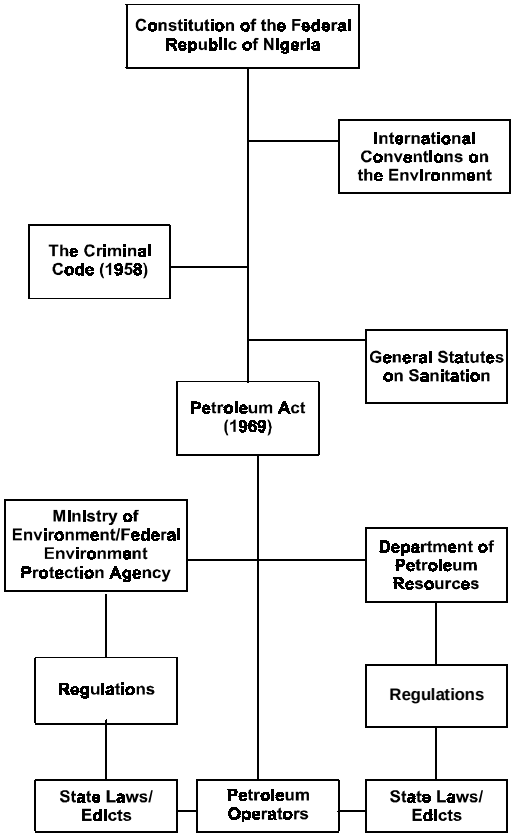

Fig. 1. Statutory framework for environmental policy in the petroleum industry
Source: Orubu et al. (2002)

More specifically as from 1988 after the establishment of the Federal Environmental Protection Agency (FEPA), the Department of Petroleum Resources (DPR) became more aggressive in its role as environmental watch-dog of the petroleum industry, with its activities closely guided within the framework of the National Policy on the Environment (NPE), which was launched in 1989. Drawing its authority from the numerous statutes and regulations, which conferred on the Director of Petroleum Resources the power to set up strict environmental standards for the petroleum industry, in 1991, DPR came up with the *Environmental Guidelines and Standards for the Petroleum Industry* (EGSPI). The EGSPI were reviewed late in 1998, and a draft of the review was ready by the end of 1999.

A critical examination of the various legislations and regulations however reveals one flaw, namely that no explicit provision is made to incorporate the host communities of oil companies in the process of implementing environmental protection and management strategies – except for the institution of a Joint Investigation Team (JIT) in the management of spills. Even at that, experience has shown that most oil companies have not generally complied with this statutory requirement in the EGSPI to report all cases of spills within 24 hours, with the JIT being responsible at all stages for abatement efforts. There is no doubt that if the oil companies have confidence in their host-

communities, and carry them along in JITs for the purpose of clean – ups and educating the local people, a number of community level crises arising from oil industry – related environmental incidents in the country, particularly in the Niger Delta area could have been avoided. The need to involve the local people in environmental matters in the oil industry is further justified by the fact that the people have become very sensitive to issues of environmental degradation in the most recent years.

THE LEVEL OF COMMUNITY AWARENESS OF ENVIRONMENTAL ISSUES

There is some evidence that since the 1990s, oil-producing communities particularly in the Niger Delta have been very sensitive to oil-related pollution problems, and have tended to develop a common framework of response to the

problem through a well-established system of traditional flow of information/authority in which traditional rulers and chiefs, councils of elders and community development committees (CDCs) play a significant role (see Fig. 2). Within this context of the traditional society, actions taken by the youths (and sometimes women associations) are not to be considered as isolated actions. Rather, the youths are to be seen as expressing views that receive the blessing and support of the whole community. Consequently, the traditional organisational structure is one in which consultation is mutually reinforcing, with explicit support from all subsystems, including the religio-cultural. It turns out that the recognition of this intricate system of authority flow is fundamental to the resolution of any crisis arising from the exploitation of the country's petroleum resources in general, and particularly from environmental diseconomies, which specifically affect the people living in the oil-bearing communities.

In the past, a number of other pro-community non-governmental organisations (NGOs) and community-based organisations (CBOs) have also been active in Nigeria's oil – bearing communities, publicising their expe-riences and encouraging the people to demand for their rights. Some of these NGOs, whose activities are focused primarily on the Niger Delta area include the Environmental Rights Action (ERA), Niger Delta Human and Environmental Rights Organisation (ND-HERO), the Rivers Chiefs and Peoples Confe-rence, Wetlands Environmental Protection Association, etc. Some of these non-govern-mental efforts, working with the media,

Table 4: Some relevant statutory instruments of environmental policy and their objectives

S.No.	*Statutory Instrument*	*Objective / Remark*
1.	Minerals Ordinance (1914), amended 1925, 1950, 1958	To prohibit the pollution of water courses in the process of mining and prospecting for any mineral, including petroleum.
2.	Oil Pipeline Act (1956), amended 1965.	Provides among others for the prevention of pollution of land and water resources as a result of petroleum and production activities.
3.	Public Health Act (1958)	Provides legal framework for the preservation and management of public health.
4.	Criminal Code (1958)	Provides legal framework for seeking redress from environmental diseconomies, among others.
5.	Mineral Oils (Safety) Regulations (1963)	Provide framework for health, safety and environmental – friendly exploration and production activities.
6.	Petroleum Regulations (1967)	Provide framework for safe petroleum operations, including environmental protection
7.	Oil in Navigable Waters Act (1968)	Prohibits discharge of oil into navigable water courses and other areas.
8.	Petroleum Act (1969) and Related Regulations	Major legislation on petroleum industry to date. Provides encompassing framework for the regulation of upstream and downstream petroleum activities so as to protect the environment.
9.	Land Use Act (1978)	To reform existing land ownership rights through nationalisation. Adequate and fair compensation to be paid for loss of surface rights.
10.	Associated Gas Re-injection Act (1979), amended 1984, 1985.	Provides statutory basis for the regulation of gas flaring in Nigeria.
11.	Harmful and Toxic Wastes (Criminal Provisions) Decree No. 42 (1988)	Provides legal anchor for redressing the dumping of toxic and hazardous wastes.
12.	Federal Environmental Protection Agency (Decree No. 58, 1988), and related legislations.	Provides a quasi legal framework for checking environmental crimes, and to set environmental standards for different pollutants
13.	Industrial Pollution Abatement Regulations (1991)	To regulate the generation and disposal of industrial waste through the principle of environmental permits.
14.	Effluent Limitations Regulations (1991)	Provision of standards for industrial effluent discharge and emissions into the atmosphere.
15	Environmental Impact Assessment Act (1992)	Provides statutory basis for EIAs, as part of project development authorisation process.
16	Environmental Guidelines and Standards for the Petroleum Industry (DPR), 1991, 1999.	Most comprehensive framework for environmental policy and management in the petroleum industry.

Source: Lagos Chamber of Commerce and Industry, (OPTS), SPDC and DPR records. See also L.F.N. (1990)

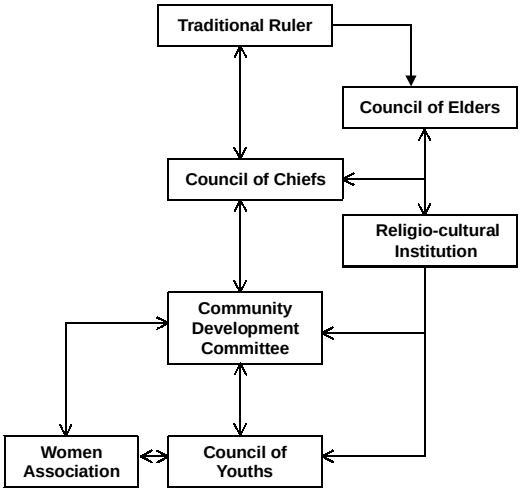

Fig. 2. Structure of traditional authority and information flows in oil-producing communities

have over the years been able to sensitise the people to the negative environmental consequences of oil industry activities. The Rivers Chief and Peoples Conference had discussed the environ-mental and social issues of the oil-bearing Niger Delta at the Indigenous Peoples Conference under the auspices of the United Nations Conference on Environment and Development (UNCED) in 1992, and also prepared the first regional assessment of the major environmental and social problems of the Niger Delta (World Bank, 1995). In a recent study, Orubu et al. (2002) also found that communities in the Niger Delta are well informed about the environmental consequences of oil industry activities. Table 5 summarises communities' knowledge of environmental problems associated with the oil industry.

It can be strongly argued that the crisis that has bedevilled the Niger Delta area since the 1990s has been closely associated with the environmental question. There are also the twin issues of neglect and inadequate compensation programmes (Orubu, 1999b, 2001). As noted by the World Bank (1995);

"*The current compen-sation programs aggravate community relations, and reinforce the perception that oil activities cause most of the problems of the Delta. Riverine people feel that the oil companies do not consider themselves accountable to the local people. Resentment of their marginalisation in contrast to the value of the oil reserves has resulted in clashes with oil company personnel and federal police/military forces…*"

During the early 1990s, the military administration had created the Oil Mineral Producing Areas Development Commission (OMPADEC) to take care of some of the resultant issues. In retrospect, it could be said that OMPA-DEC did not achieve much in the area of sustainable development projects in the oil producing areas. Indeed, it never paid any serious attention to its environmental mandate before it was wound up, and implicitly replaced by the Niger Delta Development Commission (NDDC). One of the reasons why OMPADEC failed as an interventionist body was that its policies and programmes were not based on appropriate consultation and addressed to the problems of the Niger Delta (Ekuerhare 2002). This again underscores the need to always get the people involved in development matters that concern them.

IDENTIFYING AREAS OF COOPERATION AND SUSTAINABLE PARTNERSHIPS

One critical flaw observed in the environmental management strategies adopted by oil companies in Nigeria is the tendency to view such strategies mechanistically. The existing strategies do not put the environmental impacts of oil development activities squarely within the domain of man as the ultimate victim, and who as a sentient being must desire the maintenance of a qualitative and sustainable environment. Since the 1980s, there has been a paradigm shift, originating at the international level in favour of sustainable development, which accords man and his condition of living a central focus in development policy debates. A key feature of the sustainable development approach is that it recognises the principle of consultation in policy formulation and implementation. Given the extent of knowledge about the nature of the environmental consequences of oil industry activities in Nigeria's oil communities, and the role, which the local population can play in environmental protection and safe-guarding oil facilities, it could be useful, if communities are recognised as partners in development by petroleum operators. If this happens, then there might be fewer cases of environmental incidents

attributed to sabotage. This should also help to build confidence in the relationship between oil companies and host-communities. Specifically, sustainable partnerships between oil companies and host communities directed at reducing environmental hazards and related crises in the Niger Delta could be fostered to take care of the following areas:

- Compensation programmes for pollution and the use of natural resources
- Environmental impact assessment of petroleum development projects, including impact evaluations
- Management of spills
- Surveillance of pipelines and other oil facilities
- Resolution of environment – related social conflict
- Information flows and management, and environmental education
- Identification, implementation and monitoring of oil-related community development projects, and
- Recognising the *subsidiary* principle in activities directed at pollution abatement.

The sustainable partnership framework (SPF) should be regarded as a veritable instrument for fostering better working relationships between intrinsically – opposing parties. Three critical stakeholders are recognised in the petroleum industry – the Government, oil companies and the host communities. Among these three, the communities are the most disadvantaged in terms of the power to control the petroleum resource. In one vein therefore, we can indirectly assess the most recent social outbursts in the Niger Delta as a response meant to increase the bargaining power of a minority and less muscled party at the negotiation table. In practice, the SPF should take the form of implementable Memoranda of Understanding (MOUs) between oil companies and host communities, in which opposing views are equitably balanced towards the resolution of the environmental and other related crises.

It has been shown that disagreements arising from compensation rates paid by oil companies for the use of natural resources such as land acquired during the process of oil exploration, and when the environment is polluted by oil spills and other wastes disposed have been one of the most virulent sources of crisis in the Niger Delta (Onosode, 1997). In the past, particularly during the 1960s and 1970s, oil companies

Table 5: Community awareness of environmental problems in the Niger Delta

S. No.	*Environmental Problems Identified*	*Perceived Effects of EnvironmentalProblems*
1.	Oil spillage	(a) loss of soil fertility (b) pollution of fishing waters, leading to loss of fish population and other aquatic organisms (c) pollution of drinking water affect health of the people (d) associated with social strife (e) negative effect on mangrove ecosystem.
2.	Land acquisition	(a) reduction of arable land (b) deforestation and land degradation (c) floods due to blockage of natural water courses as a result of construction of access roads and other facilities.
3.	Gas flaring	(a) air pollution (b) loss of safe habitat (c) land becoming arid in near areas of gas flares (d) reduction of animal population in areas near gas flares (e) extinction of natural herbs and other non-timber forest products in areas near gas flares.
4.	Environmental Impact Assessment Studies	Communities are generally ignorant about EIA activities. They seem not to be aware of public forum for the discussion of the EIA report.
5.	Other environment-related problems and general problems of the oil industry (such as poor compensation, rural-urban migration, increasing city population, etc.	(a) pressure on existing resources (b) high cost of living (c) reduction of rural population (d) social vices and crime (e) corroding roofing sheets of buildings (f) population pressure on the 'oil city'

Source: Orubu et al. (2002), field work in selected Niger Delta States (Delta, Bayelsa, and Ondo).

consulted directly with communities before compensation was paid. This function has been taken over by compensation consultants, who as attorneys, negotiate on behalf of affected communities. Several crises have resulted from the current arrangement, with the allegation that victims of environmental pollution do not get full worth for environmental damage, after the consultants have taken their fees. It is therefore necessary to build into the new SPF a mechanism that enables victims of environmental pollution or any other permanent or injurious use of resources by oil companies to be part of the assessment process.

At present, the citizens of oil-producing communities are hardly aware of environmental impact assessment (EIA) studies being carried out in their communities for petroleum development projects – apart from the occasional engagement of local personnel as data collectors by environmental consultants. This is apart from the fact that the EIA methodology adopted in the petroleum industry generally pays less attention to human and social factors (Ikporukpo, 1998). It has been shown that community participation in the environmental assessment of projects that affect them has several advantages (Odusola, 1996). Consequently, an approach which gives definite recognition to the local people in the process of conducting the EIA study, would therefore go a long way in allaying their fears and help to reduce social tension. The same should apply to environmental evaluation (post-impact) studies, which are usually commissioned after major environmental incidents have occurred.

Communities directly affected by spills, particularly those of catastrophic dimension should be allowed to have a say in remediation plans as well as efforts to reduce attendant social tension. The SPF must therefore address the issue of confidence building, so that all stakeholders can be actively involved in pollution damage and compensation assessment. The SPF should incorporate an arrangement whereby communities can be directly involved in the surveillance of pipelines and other oil facilities, by making them have a sense of "co-ownership". It is interesting to note that a number of oil companies and communities have already gone into such arrangements. In all probability, the cost of maintaining such relationships with communities in which oil facilities are located will be less than the cost of pollution damage, and attendant social tension, including the effect of adverse publicity on corporate image of oil companies.

Alternative conflict resolution (ACR) measures for resolving environment-related social conflict are preferable within the SPF – as opposed to unilateral actions such as going to the court or kidnapping of oil company staff! Again, this requires confidence building, in order to create the proper environment for negotiation between oil companies and the local people. The flow of information and how it is managed are also crucial to the social effects that environmental hazards generate. The SPF will therefore recognise the need for all parties to be cautious in making public statements. Specifically, the SPF will prohibit the making of defensive press statements. If there is the need for a press statement, it should be jointly made. A framework for environmental education of the people will also be an important aspect of the SPF. Following increased tension in the Niger Delta area in the 1990s, SPDC, the largest oil company operating in Nigeria had sponsored the Niger Delta Environmental Survey (NDES) in 1995. The report of the Survey has since been published and Government would benefit from the result of the Survey's participatory sub-models in designing a development master plan for the oil–producing communities, and educating the populace on strategies of environmental management.

As already noted, projects of community development embarked upon by oil companies in their areas of operation implicitly compensate the people for depriving them of the use of their resources, and the damage imposed on the environment. In doing this, what is being provided for them must be based on what they need. This therefore underscores the need for the SPF to recognise the need to adopt a "bottom-up" approach in the identification of projects for the communities, if such projects are to be sustainable. The right of communities to monitor such projects should also be recognised by the SPF, in order to ensure that implementation proceeds as predetermined. It is important to note that a number of oil companies, notably Shell Petroleum Development Company (SPDC) and Chevron are already doing this in certain areas.

The *subsidiary* principle in environmental policy analysis is based on the need to decen-

tralise responsibility for some kinds of environmental action for impacts that are unquestionably local (see for example Zylicz, 2000). The SPF should explicitly recognise this principle, and apply it with some care to the solution of local environmental problems. For example, the local people can be made to be responsible for minor clean-ups without sending distress and tension calls to the headquarter-offices of oil companies. This would be one way of creating responsibility for local groups, and allowing them to take part at some level of decision-making and action.

CONCLUSION

In this paper, we have made an attempt to identify the nature of the environmental problems associated with oil industry activities particularly in the Niger Delta where the bulk of Nigeria's oil and gas is produced. We observed that the role, which the oil-producing communities can play in the resolution of the environmental problems has not been explicitly recognised by the existing statutory regulations relating to environmental policy and management in the industry.

The authors therefore suggest putting in place a sustainable partnership framework (SPF) which explicitly recognises the role which communities can play in the resolution of environment-related problems, EIA studies, surveillance of oil pipelines and other oil facilities, the management of spills (both of catastrophic and local dimensions), information management, etc. The adoption of the SPF will help significantly in reducing oil-induced environmental diseconomies in the Niger Delta, including second-round consequences that undermine peace in the region.

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