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Special Issue on “Africa-based Oil Exporting Companies: The Case of Nigeria”

Guest Editor: Oboreh Jacob Snapps

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The American Review of Political Economy seeks papers on a wide variety of topics within political economy, broadly defined. It welcomes high-quality articles from all perspectives in the discipline and especially is open to submissions from heterodox economists. It is a double blind peer-reviewed academic journal, which contains between 3 and 6 articles in each issue.

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Introduction: Setting the Context

The Niger Delta is located in the Atlantic Coast of southern Nigeria where River Niger divides into numerous tributaries. It is the second largest delta in the world with a coastline spanning about 450 kilometers terminating at the Imo River entrance. The region spans over 20,000 square kilometers and it has been described as the largest wetland in Africa and among the three largest in the world. About 2,370 square kilometers of the Niger Delta area consist of rivers, creeks and estuaries and while stagnant swamp covers about 8600 square kilometers. It has the largest mangrove swamps in Africa, spanning about 1900 square kilometers.

Nigeria's Niger Delta region hosts most of Nigeria's oil exploration and production activities. Since the commercial discovery of oil in 1957, the size of the industry has grown tremendously with Nigeria being the largest producer of oil in Africa until May 2008. However, the increase in exploration and production of oil has contributed to the escalation of environmental pollution. The negative effects of these environmental consequences contribute to the exacerbation of violent conflicts in the area. The discovery of oil in the Niger Delta region of Nigeria has come with mixed blessings – joy to the government and misery to the indigenous communities who have recoiled the government slogan of "*oil boom*" to their "*oil doom*".

The massive on-shore and off-shore exploitation of the oil deposits in the Niger Delta region, has inflicted an unprecedented and severe environmental degradation in the region. Incessant oil spillages, continuous gas flaring, depositing dangerous contents of crude oil into human residential environments with its attendant devastating socio-economic consequences. This region is bedeviled with series of problems which are closely associated with low human capital development interwoven with environmental degradation.

The mangrove swamps are disappearing; the spills have adverse effects on marine life and are responsible for failing crop yield, poisoned waters, dying

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forests and vanishing wildlife. Fishing, once the main occupation of the indigenous communities, is now an unprofitable occupation. Soil contamination through bioaccumulation of dangerous heavy metals has a devastating effect on both terrestrial and plant life. The once edible vegetables are now poisonous.

The disappearance of once vibrant communities is indicative of the inability of the devastated environment to support and sustain human life and human settlements. This scenario, gloomy and grim as it is, led to the desperation and restiveness of the youths of the region. In the midst of the affluence of the oil prospecting communities, the endemic poverty of the indigenous communities is glaring. The restiveness of the youths is perhaps predicated on the assumption that, if things remain the way they are now, without intervention, the future is sure to get worse.

This volume of *ARPE* journal therefore is a survey of the environmental and indigenous peoples' perspectives of the impact of oil exploration and exploitation on the residential environments of Nigeria's Niger Delta people with a view of finding a lasting solution to the problems of the area.

Guest Editor: Oboreh Jacob Snapps, PhD.
June 2011

Oil and Gas Companies and Community Crises in the Niger Delta

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Abstract

This paper examines the role of oil and gas companies in community crises in the Niger Delta. The major conclusions are that oil and gas companies have encountered various forms of community crises in their work environment. These crises have negative impact on the performance of these companies. The paper thinks that adequate community relation will significantly reduce the level of Industry/community crises in the Niger Delta region; also that oil and gas companies in the Niger Delta should adopt community relation strategy through community development projects as this would minimize the level of community crises and hence enhance the performance of oil and gas companies.

Key Words: Oil Companies, Community Crisis, Niger Delta

JEL Codes: 032, 034

INTRODUCTION

Community refers to people living in one place, district or country, people with shared interest (French and Saward, 1975). Crises in this context mean conflict. Conflict is the expression or prosecution of personal or group interest through the use of force or coercion.

In the recent past, records show between 1956 and 1996, the relationship between oil companies and their host communities was relatively cordial, individualized and isolated. Leaders of the oil producing communities were still optimistic this new found source of wealth will transform their communities into a heaven of prosperity. What they did not foresee was that much of the euphoria for a coming prosperity from the expanding oil and gas industry would not continue into the 1980s. During the 1970s contradictions in the industry/community relationship within Niger Delta manifested. It gradually dawned on the new elite of the oil producing communities that life in their communities did not really get better. The material conditions of existence were indeed becoming worse because the financial compensation being paid to oil

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producing communities was not only grossly inadequate, but was also creating a new and dangerous phenomenon in these communities, the phenomenon of inter- and intra-community conflicts/crises unknown to these communities. The sharing of compensation money was turning many communities into battle fields because many viewed their shares as inequitable. Community leaders were accused of embezzlement while villagers on whose land oil wells were located demanded the lion's share of such compensation. Similarly the young and unemployed felt they should be adequately taken care of with the oil money. Leadership tussles became frequent, causing a rupture of cherished traditions of oil bearing communities. These crises negatively affected the performance of oil and gas companies in the Niger Delta. This paper examines the role of oil companies in community crises in the Niger Delta.

THE CONCEPT OF CRISIS

From the Marxian perspective, the root of crisis in human society must be traced to the struggle for the material conditions of existence between the controllers of state wealth and power and the rest of society. Both co-exist in an unequal exchange relationship. Anikpo (1998) has explained that crisis is endemic in all human environments. Psychologists would see crises as a response to frustration. Frustration arises as a result of obstacles against the achievement of goals. For many people the only reaction to frustration is aggression directed at the perceived, real or imaginary frustrating object. Psychologists agree there will always be crisis since there will always be challenging obstacles. Similarly, radical sociologists deriving their influence from Karl Marx see the society as organized crisis between two classes based on ownership or non-ownership of the means of production, the former comprises a rich group of capitalists who appropriate more than their fair share of societal wealth. The latter is made up mainly of wage earning workers and peasants who are largely deprived, marginalized and frustrated. The relationship between the two classes is inherently antagonistic and crisis ridden (Anikpo, 1998).

TYPES OF INDUSTRY/COMMUNITY CRISES

According to Anikpo (1998), industry-community crisis occur in various forms. He classified industry-community crisis as follows:

i) *Road Blockage/Protest Demonstrations*: These are considered the mildest or least harmful types of community disturbances. Usually the youth of a community would cut down logs from nearby trees and block strategic access roads or junctions. They may also raise posters bearing their grievances and refuse passage to any persons or vehicles associated with oil companies.

ii) *Disruption/stoppage of operation:* This refers to a crisis situation in which protesting groups enter oil company's premises and interrupt the activities of the staff at work. This often leads to the closure of the facility, particularly flow stations.

iii) *Closure of flow station and Rig/Molestation of oil company* staff: Crisis of this type involves tremendous risks. As in the Ogani case, it could lead to burning down of flow stations and deaths.

iv) *Vandalism/Destruction of Facilities:* Anikpo (1998) has stated that through a protest, while a group may molest staff and force the closure of a flow station, it may not burn it down or vandalize it. In this particular type of crisis the protesters go a step further to vandalize and destroy oil company facilities in their community.

v) *Piracy/Temporary seizure of vehicles or boats*: The classification used in this analysis has separated piracy from hostage taking and regrouped it with the temporary seizure of vehicle or boats. This is to distinguish between temporary interception of vehicles and boats either for monetary extortion or dispossession of other items of property on the waterways, and the outright capture and detention of boasts and their passengers. The former is robbery while the latter is hostage taking.

iv) *Hostage Taking:* The forceful capture and detention of boat passengers, which may lead to the starvation, or murder of the captured by aggrieved youths. It is classified as the highest form of crisis between communities

and oil companies. Extreme cases of hostage taking could result to a paramilitary or military intervention to either free the hostages or avenge their killing.

CAUSES OF COMMUNITY – OIL COMPANIES CRISES

Crisis in the Niger Delta has increased in recent times. They key feature of these crises as Anikpo (1998) observed can solely be attributed to oil explorations and unequal appropriation of what accrues from oil. It could further involve the acquisition of vast acreage, clearing of sites, and introduction of new cultural patterns into host communities, which go against the traditions of the community.

CONSEQUENCES OF OIL ACTIVITIES ON HOST COMMUNITIES

The people in the Niger Delta are faced with continued flaring of gas and attendant problems on human habitat, such as acid rain, noise pollution, and intense heat due to gas flaring. Oil spillage, emanating from careless handing of oil in the process of loading, may result in mass destruction of farmland and sea water, which are the main sources of livelihood for the people of the Niger Delta. Okoko (1996) has observed that oil-bearing communities are exploited and neglected by oil prospecting companies. He also noted that oil exploration has caused social problems where communities in frustration transfer their anger to the oil companies. He concluded the seeming unequal relations, arising from the productive system, has made such conflicts intense, incessant and violent.

Another major argument against the operations of oil companies has been the issue of inadequate compensation for environmental damage. This has resulted in violent demonstration and litigation claims against these companies for environmental damages since environmental impact assessments by companies have not reflected the environmental impact of such operations on rural areas.

INADEQUATE PROVISION OF COMMUNITY ASSISTANCE PROJECTS

According to Okoko (1996) communities see the provision of capital projects as their right and the duty of oil companies to provide. They pressure and attack oil

companies that fail to assist in providing social amenities. Also, the issue of employment of youth and graduates of oil producing communities is a recurring variable in the conflict. Melford Okilo, a one-time governor of Rivers State, has said “unless oil-producing communities are provided with adequate social amenities and their indigenes are employed in these companies, the companies shall periodically dissent from the inhabitants” (National Concord, 1980, p. 3).

GOVERNMENT REACTION TO THE PROBLEMS OF OIL BEARING COMMUNITIES

Oil bearing communities have watched with dismay the attitude of government towards their plight. They have resorted to confronting oil and gas companies operating on their land. The late Harold Dappa Biriye once said that “Oil bearing communities want to be recognized as owners of the resources in their environment, they want to get a higher percentage of the resource coming out of their land” (The Pointer, March 8. 2002, p.3). He observed that unless the rights of communities to the resources that are in their land is respected, government will never get their participation, cooperation and peace that should prevail. The attitude of government is exemplified by the statement of a former governor who cited the faceoff between the people of Akure and Western Geophysical, where he noted the government reaction was one of threat and used state coercion to threaten the people by saying “hard times await those who foment trouble in oil producing areas” (The Punch, August 15.1999, p. 9). It is not a secret that the government exploits oil bearing communities by using resources to build cities elsewhere while those who bear the brunt of oil exploration and its problems have continued to live below the poverty line.

THE ECONOMIC EFFECTS OF CRISIS ON OIL COMPANIES

Community/oil company crises take the form of blockages, sabotage, and destruction of oil company installations and equipment, harassment of oil company staff, and, in some cases, the disruption of operation of oil activities or the outright closure of oil operations in the affected area. The loss to the national

economy, the oil companies and their host communities has been enormous. A leading national newspaper (The Post Express, Dec 2, 1996) reports that within the first half of 1992, there were about twenty cases of disruption of activities of oil companies affecting fourteen oil fields in the Niger Delta Basin causing a loss of 102,800 barrels of oil per day. This trend, more than anything else, now threatens not only the operation of oil and gas companies but also their reputation and future.

Okoko (1996) has stated between 1988 and 1992, SPDC, lost a total of 1,263 operational days due to disturbances. Another daily (Dialogue, June 13, 1998) reported hostage taking and shutting down of flow stations at Koloama by youths. Nigerian Tide (May 3, 1993) reported on the Umuechem crisis, the Eqwe I and Eqwe 2 plant shut down by youth of Ogulaha, the Ijaw and llaye crises, and the NLNG and Bonny community crises. These crises have led to huge losses in revenue to oil companies and the government. In this regard, News Watch (November 9, 1998) reported SPDC/NNPC lost more than $1.5 billion to conflicts in oil bearing communities. Conflicts and crisis of oil-bearing communities also affected the performance of the Nigerian Petroleum Development Company (NPDC), a subsidiary of the NNPC, which reported losses in drilling locations were 40 percent more than in 1996 (NNPC monthly report, Oct 6th 2000).

The mayhem in Toru-Ndoro, which led to the dethronement of the traditional ruler due to accusations he exploited the citizens by collecting monies from SPDC in exchange for allowing them unlimited access to oil resources. This situation in the community has resulted in more crime and disrespect for traditional institutions.

Violence by the communities was also directed at oil companies. The SPDC and Ojobo crises led to the shutdown of the SPDC flow station for 30 days. The company lost about $105 million within this period. Also the SPDC and Alakiri crisis led to the loss of about $80 million within this period. (Environment Watch, September 16, 1998). At the same time many of the low stations and oil locations in Nembe communities were shut down die to clashes between oil-bearing communities and oil companies. Joshua Fumudoh, a prominent Iaw

leader, notes the federal environment protection agency sits in Port Harcourt and makes decisions and policies about the level of damage caused by oil exploration in Nembe. He argues until a member of the oil bearing community takes a leadership position the government will be insensitive to environmental devastation caused by oil exploration (Sunray, October 9, 1996).

The crisis between Agip Oil Company and Okoroma youths in Bayelsa state in November 1998 can be linked to poor handling of social responsibility issues. The people felt neglected and confronted the company, but eventually resorted to violence, causing disruptions of operations for about a month. Valuable material and equipment were looted and expatriates were taken hostage.

PREVENTION OF ANARACHY IN OIL PRODUCING COMMUNITY

According to Enyie (2000), prevention of crisis through conscious community development programs for host communities is a necessity for both the oil industry and the host communities. Crisis which could take the form of vandalism of oil industry facilities, attacks on personnel, hostage taking of oil workers, sabotage activities and destruction of lives and properties result from pent-up aggressions and restiveness could have been doused by a systematic community development strategy. Anarchy is defined as the complete absence of law and order or government utter lawlessness and complete disorder. (Preston and Post: 1975) For communities which resort to anarchy, one is reminded of the plight of the Oloibiri, people. The first commercial oil well in Nigeria was sunk in Oloibiri in 1958. Protagonists of anarchy against the oil industry and the government allege Oloibiri was abandoned to decay and wallow in wretchedness and underdevelopment after the oil deposit was exhausted. Vexed by such recollections, they assert the political and socio-economic backdrop of that historical event promotes justifiable anarchy.

COMMUNITIES RELATIONS PRACTICES

As oil companies are increasingly confronted with violence, community relations has become an attractive vocation. Oil companies have to devise strategies to

contain community-induced crises by creating community relations units charged with the responsibility of crises management and conflict resolution. Most oil and gas companies having critically studied the trend and have recruited individuals with skills in conflict resolution and management. They have trained staff to acquire professional competence in community liaison work with their host communities. The community relations units participate in various activities concerning the existence of their companies. They serve as crises officers to link the company and host communities. These units have devised conflict resolution techniques to suit the peculiarities of their environment. They employ other methods of engagement in their community relations practice. The methods range from a combination of sponsorship, targeted donations, scholarship awards, hospitality and use to facilities by host communities.

GUIDELINES FOR EFFECTIVE COMMUNIITES RELATIONS FOR OIL COMPANIES

Ajala (1993) has listed the following guidelines for effective community relations for oil companies:

(i) Know your community.

(ii) Develop an organization-community relations policy. Spell out specific objectives. Base the policy on assessment of organizational needs, resources and expertise, and on community needs and expectations.

(iii) Review your organization's policies, practices and procedures.

(iv) Consider especially the following areas: waste disposal, employee recruitment, employment policies, noise or traffic problems, maintenance of organizational facilities, marketing, energy sources and energy waste. All should be attended to within the community relations policy.

(v) Utilize all means to communicate with the community. These may include employees, local media, open houses, local clubs and organizations' newsletters, annual reports, and exhibits.

(vi) Involve the organization in local programs by sponsoring employees who wish to join civic and professional groups, providing speakers for meetings,

lending facilities for meetings or activities, sponsoring contests and programs for youths and women, and supporting fund raising activities.

(vii) Distribute corporate donations according to community relations policies and objectives. Philanthropy is an important aspect of community relations.

(viii) Use local merchants, contractors, banks, insurance agencies, lawyers and other professionals for good and services.

(ix) Offer aid to local governments, making organizational resources available by lending employees and materials.

(x) Evaluate the community relations efforts to determine the extent to which objectives have been achieved. Be prepared to develop new strategies if current programs fail to meet expectations.

Peak (1978, p. 17) has observed that community refers not only to a group of people living in the same locality, but to the interaction of those people. In the past, the tendency was to treat community as a rather simple entity, a collection of people, a hometown. Today, we are beginning to recognize each community as "a complex dynamism of diverse, constantly changing, often powerful and always important forces".

Haastrup (1997), using a series of longitudinal studies, investigated the perception characteristics and attitudes of oil bearing communities. His findings show:

(a) Perception of oil companies by oil bearing communities

The oil companies are rich.

The oil companies are uncaring.

They are supposed to be an alternative to government, providing infrastructure and facilities.

(b) Characteristics of oil bearing communities

Remote (Riverine)

Poor

Little economic activities

High unemployment
Leadership and administrative problems
Extremely poor infrastructure
Lacking in basic necessities

(c) Attitude of oil bearing communities

Hostile
Uncooperative
Always seeking avenues to make money
Sometimes disrupt oil production activities

THE ROLE OF THE STATE IN COMMUNITES CRISIS

The state is supposed to be a repressive force. It is supposed to be playing the role of moderating the crisis between various classes in society, but over time, it has served as an instrument by which the most powerful, economically dominant class becomes politically dominant and thus acquires new means of holding down and exploiting the oppressed class. The Nigerian state, during numerous communal crises in various parts of the country, has helped oil companies exploit and hold down the peoples of the various oil bearing communities in spite of the fact some of the oil companies have been accused of not abiding by environmental standards, not providing compensation in accordance with the law for damages resulting from oil exploration, in the case of Ogoni ethnic nationality and Shell Petroleum Development Company (SPDC), in spite of outstanding problems, the State Security agents escort SPDC workers to their various operation sites, much to the annoyance of the Ogoni farmers.

Over the years, the state has in several ways escalated communal crisis in society. As the biggest dispenser of national wealth and the organ responsible for providing social amenities for the people, the state is supposedly aware of the people's needs. But, as a government, it would not make these needs available to the people. The people have learned to make their demands known the way they know best, by ransoming the oil companies who are involved in the

exploration of what they call their oil. The chiefs and larders of Ogoni adopted the Ogoni Bill of Rights (OBR) in which they demanded adequate representation as a right in all Nigerian national institutions, the right to use a fair proportion of the economic resources of their land for their development, and the right to control their environment. These demands made by the Ogonis were treated with levity and from what initially looked like a demonstration to redress the marginalization of the ethnic group, in 1993, Ogoni peasant farmers began to confront SPDC workers. The government moved in state security agents to protect SPDC operations. In the encounter that followed. Saro-Wiwa and eight others were arrested and eventually executed by the state. Many Ogoni farmers were shot and wounded.

Several peaceful demonstrations by the Umuechem community in Etche local government area of Rivers State asking SPDC to provide more social amenities for them, become a showdown between the Umuechem indigenes and SPDC and by the end of that crises, the exact number of people massacred by the police in the conflict is still a matter of speculation" (Anikpo, 1998. P. 22).

In 1995, in Iko, Akwa Ibom State, a defective flare used to burn off gases released at a well head caused significant damage. SPDC contractor, Western Geophysical, asked for and got assistance from the state. Security agents were dispatched to the scene and assaulted numerous villagers from the community, beating to death a teacher who acted as an interpreter during negotiations between the company and the community (Okoko, 1996 p. 42).

From the foregoing discussions and looking at the many other crisis that have taken place in the society (though not mentioned in this paper) the Nigerian state has largely played a repressive role against its people. The role of the Nigerian state in the Niger Delta crisis is exemplified by the admission of Shell Corporation that it had "imported side arms on behalf of the Nigeria Police Force for use by the 'supernumerary police' who are on attachment to Shell and guard the company facilities against general crime" (Human Rights Watch 1999, 174).

OIL COMPANIES AND COMMUNITIES CRISIS

As the turmoil in oil bearing communities becomes discernible, oil companies have tried to increase community assistance efforts. This involved mainly the infrastructural facilities. Examples include roads, boreholes, school blocks and laboratories, scholarships and employment to some indigenes. However, oil companies saw only the manifest symptoms of a much deeper problem and responded by increasing patronage or assistance to some of the communities. It soon become obvious that the devastation created by oil production had gone too far to be ameliorated by such a relationship as the more the companies dished out compensation, particularly in direct cash, the more the communities boiled. Compensation simply tended to increase dependence of the communities on the oil companies and the peoples of the Niger Delta resented this.

It is important to mention the unfolding crisis between oil companies and host communities, Government did not help matters. One would have expected in the unequal exchange relationship, the Nigerian state would play a protective role for both groups as a neural arbiter. This was not to be. The state clearly sided with the oil companies against the communities of the Niger Delta. Enyie (2002, p. 11) has lamented the problem of oil pollution in Nigeria has been exacerbated by the absence of effective regulations and the predatory attitude of the oil companies. Existing legislation is too scattered through a number of statutes limited to specific types of pollution and lacking the backing of detailed regulations. Similarly, in a study by Okoko (1996) on the major sources of crisis between oil companies and oil producing communities, it was revealed inhabitants of the oil bearing communities have become increasingly convinced that laws on oil production in the Niger Delta are oppressive. This perception of the enabling laws, he argued, was at the root of the increasing turbulence in the oil producing communities. Ogbonna (1994, p. 6) and Okoko (1996, p. 12) both confirmed “considerable discretionary power is left in the hands of enforcement agencies and corresponding opportunity power for the oil companies to evade regulations”. The official attitude to oil company operations emboldens the companies to be

less careful than they ought to be. Oil company officials believe they can always talk to state officials and get out of any problem any time.

In 1980, there was the Texaco oil blow-out. The extensive damage to people's source of livelihood caused by the spillage was not only a significant impediment to development, but also a source of serious conflict between the inhabitants of the area and Texaco. While people who visited the area gave horrifying accounts of the damage to water and farm lands, Texaco, with the active support of the NNPC, insisted that damage was minimal.

The 1991 Umuechem crisis in Rivers State is another example of the state taking sides with oil companies. What began as a showdown between Umuechem indigenes and an oil company operating in the community suddenly turned into a riotous blood-bath between the people of Umuechem and an armed detachment of the Nigerian police. The number of people who died in the conflict is still a matter of speculation. Several families were dislocated and the scars of that tragedy are still visible in Umuechem today. What the Umuechem conflict did not gain in national publicity, the Ogoni uprising of 1993 in Rivers State adequately covered.

Frustrated more by the hardships arising from the Structural Adjustment Program (SAP) and propelled by the bandwagon effect of earlier protests, oil bearing communities all over the Niger Delta adopted a confrontational stance to enforce their demand for more attention in the sharing of the oil wealth.

Throughout the 1990s, the relationship between the oil industry and oil bearing communities suffered unprecedented damage. The communities were unanimous in their view that the oil industry has destroyed their communal lift. They accused the oil companies of bad faith and a catalogue of other offences including: (i) unfulfilled promises, (ii) spillage problems, (iii) inadequate compensation, (iv) exploitation and neglect, (v) inability to provide employment, (vi) slow response to community complaints, (vii) oil company staff corruption, (viii) desecration of community sacred sites, (ix) expatriate insult, and (x) non-recognition of traditional rulers.

CONCLUSION

Oil companies have encountered various forms of community crises in their work environment and these crises have significant impact on oil and gas companies operating in the Niger Delta. Adequate community relations will significantly reduce the level of community crises and enhance workers' performance. Government policies can be significant in industry-community crises. Efforts should be made by oil companies to establish a good relationship with oil bearing communities by embarking on community development programs. Community youth should exercise restraint in vandalizing oil installations and facilities as this will only lead to lower revenue for oil companies and the government.

Oil companies should also open up channels of communication between them and their host communities. As Grunig and Hunt (1994) said, communication is the biggest tool mankind has as a potential way of overcoming difficulties.

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Youth Restiveness and Industrial Disruption in the Niger Delta

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Abstract

We examine the incidence of youth restiveness in the Niger Delta and how this restiveness has affected industrial productivity. It is our opinion that the high rate of unemployment, environmental degradation, dislocation of the traditional economy and unfair revenue allocation are some of the factors that have given rise to youth restiveness in the Niger Delta. Government needs to pay special attention to the developmental needs of the Niger Delta through job creation and the enactment of environmentally friendly policies that will preserve its fragile ecology.

Key Words: Youth Restiveness, Industrial Disruption, Niger Delta

JEL Codes: 051, 052

INTRODUCTION

Development, as a process of growth and expansion, requires an enabling socio-economic environment to guarantee the safety of personnel and materials and the unmitigated cordially between host communities and corporate bodies operating within them. Development would certainly not take place without a harmonious interchange and co-existence among stakeholders. This can be seen in a popular slogan “peace and progress” which is one of the most commonly used amongst communities and social organizations aimed at community development. A look at that motto shows profound appreciation of the fact peace is a fundamental pre-requisite for progress. It therefore follows just as peace precedes progress in the motto, so also must peace be achieved in a community before development can take place.

Third world nations have recently become more wary of the nature and role of capital investment in their societies. Since the publication of Walter Rodney’s (1982) classic contribution on how Europe underdeveloped Africa, developing

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nations particularly in Africa, are responding to the challenges of economic dominance by evolving various programs.

The concept of sustainable development has become the cornerstone of worldwide socio-economic and environmental movements. In Nigeria, there has been incessant demand to evolve comprehensive rural development plans which bring about general welfare and instigate lasting national development.

Sustainable development is a concept that attempts to harmonize the benefits of development with minimal destabilization of the environment. This is done by harnessing and mobilizing natural resources and human skills to produce goods and services to satisfy man's needs. Sustainable development can be described as a prolonged gradual unfolding of overall growth and the environment.

Multinationals and other industrial establishments play a significant role in the development of the society and host communities. They require a peaceful and conducive environment for industrial harmony, which rests with national disposition and psycho-physiological temperament of their host communities.

The case of the Niger Delta is a case of injustice and neglect by multinationals which repatriate natural resources of the region with their allies to the detriment of the environment and its people. This development has produced significant and far-reaching consequences in which industrial establishments and their assets have become the targets of youths. The oil and gas industry is the most vulnerable. This paper examines the causes of youth restiveness in the Niger Delta, and how this affects industrial productivity in the oil and gas Industry.

THE NIGER DELTA

The Niger Delta has been of historic significance. It was the hub of the trans-Atlantic slave trade. In 1956, crude oil was struck in commercial quantity at Oloibiri, in Bayelsa State, and in 1960, in Obagi in Rivers State. Today, crude oil contributes about 90 percent of the Gross Domestic Product (GDP) and national income of Nigeria. The Niger Delta is the center of crude oil production, which sustains the Nigerian nation (Alagoa, 1999). The Niger Delta covers a total area of 70,000 square kilometers comprising a mix of swamp and luxuriant rain forest

with lush vegetation. The Niger Delta lies between latitude 4^{o} 14' and 5^{o} 33' North, longitude 5^{o} 48' and 7^{o} 4' East. The location extends to the Atlantic coastline from Benin River West of River Niger to Bonny River East of the River Niger, all in the southern geographical zone of Nigeria.

The northern fringes begin from the Orashi River springs off the Niger River, subsequently augmenting waters from Lake Oguta (Ogbuide) and flows south through the Sombreiro Valley to the tidal seawater of the Degema River. The Niger Delta flows southwards and breaks up into the Forcados and Num Rivers and to the Atlantic coast precisely at the northern extremity of the present Bayelsa State (Ossai, 2002). The Niger Delta sub-region is subdivided into four typical and broad identifiable physical and vegetation characteristics. The fresh water swamp with rain forest vegetation is found at the extreme north, the salt water swamp with predominantly mangrove vegetation, the coastal sand beach ridges with rain forest vegetation and the off-shore zone (Scott, 1966). The area is very rich in natural endowments: marine resources such as fish from coastal waters of the Atlantic Ocean as well as petroleum and natural gas. The geomorphology comprises the coastal belt of consolidated sedimentary rocks while the soils are sandy loam and day loam, which facilitate drainage. Average monthly temperatures are constantly high, between 24^{o}c and 32^{o}c. (Ossai, 2002).

These environmental features have had great implications for its economic, social and political history. While the predominant occupation is farming for the fresh water swamp inhabitant, fishing and trading is for salt-water dwellers; the latter group relies on fresh water and hinterland neighbors for vegetable and staple foods (Atee, 1993).

According to Saro-Wiwa (1989), many ethnic groups inhabit the Niger Delta. The majority are sub-groups of the Ijaw stock. He outlined the people of the Niger Delta as follows: Ijaws of western Brass and Degema Divisions, Ogonis and Elemes of Ogoni Division, Ikwerre and other tribes in Port Harcourt Division, Etches, Ekpayas, Ogbas, Egbemas, and Abuas of Ahoada Division and Obow and Opobians of Opobo Division.

Tare-Out (1992), in his revolutionary and prophetic book “Waking up the Sleeping Giants”, draws the map of the Niger Delta to include more of the above fatherland. The Niger Delta is an aggregation of hitherto independent nation states, whose leadership had developed international relationships long before British imperialists were in the nation named Nigeria.

A linguistic map of the region indicates various communities of the Niger Delta can be grouped into several ethnic nationalities and language groups or tribes. These are the Ijaw dominated tribes (Nembe-Akassa, Kalabari, Wakirike, Ibani, Nkoro, Obod, Isoko, Kwale, Ishekhiri) and the Ibo influenced languages (Ogba, Etche, Ikwerre, etc.). There are obvious relationships in the economic and socio-political institutions and organizations, partly due to cultural similarity.

Apart from their geographical contiguity, the communities share similar environmental problems such as flood and erosion, scarcity of dry and variable land and reliance on external sources for vegetables (Atei, 1993). The Niger Delta histography is very responsive to the needs and aspirations of the time and people. Franz Fanon (1986) says, each generation must, out of relative obscurity discover its mission, fulfill it or betray it!

The Niger Delta has largely become a cynosure became of widespread social unrest generated by neglect, environmental degradation and mindless spoliation among others. Alagoa (1993), Saro Wiwa (1990) and Idumange (1999), all agreed social unrest and pervasive youth restiveness in the area is the result of criminal neglect, inequity in resource allocation and deliberate underdevelopment spanning over three decades. The grim picture of injustice has been aggravated by the role of multinational companies whose primary aim is to exploit resources of host communities, meddle in domestic or local politics, degrade the environment and precipitate crises which sometimes leads to the death of prominent indigenes. Today the Niger Delta is characterized by almost complete absence of socio-economic and educational infrastructure, a physical environment rendered hostile by industrial activities, seismic genocide, widespread poverty and unemployment. Other features are absolute neglect of the environment, a lack of communication network, an absence of well-

articulated development plans, and pervasive youth restiveness. These negative manifestations have often resulted in disruption of industrial activities in the area.

Youth constitute about 40 percent of the Nigerian population and are burdened with social responsibilities of our fast developing world. They live under the burden of material impoverishment. The Willink Commission (1958) stated the Niger Delta requires special attention because of fragile ecology and monumental development challenges. Although several cosmetic attempts had been made in the past to develop the Niger Delta, the area has remained the most undeveloped part of Nigeria. Paradoxically, it produces more than 90 percent of the national income accruing to the country through oil and gas.

Activities of multinational companies have impaired and attenuated the value of aquatic resources for recreation, fishing and transportation. The continuous discharge of domestic sewage, industrial effluents, petroleum hydrocarbons, dredge materials and garbage has aggravated problems of the Niger Delta. The indigenes have reacted to neglect in various ways ranging from disruption of industrial activities, violent demonstrations, hostage taking, and vandalism of assets and communal clashes. Companies operating in the Niger Delta are extremely vulnerable to youth irredentism, violence and restiveness. This phenomenon has reached an alarming proportion, placing the society and economy at risk. Youths are denied social amenities, infrastructure, job opportunities and the opportunity to develop; hence, they are aggrieved. The manifestation of the frustration is youth restiveness and other aggressive behavior. Youth restiveness is the only means by which they extract short-term concessions and benefits from a majority-dominated federal state like Nigeria.

CAUSES OF YOUTH RESTIVENESS IN THE NIGER DELTA

Development scholars have advanced several reasons for youth restiveness in the Niger Delta. Some of the causes of youth restiveness are discussed below.

Economic Causes

The Niger Delta, the oil rich region of Nigeria, is like the preverbal goose that lays the golden egg when it comes to the economic well-being of the nation. In recent years, however, the area has witnessed so much crises that people are beginning to express concern about the effect on the country's economy. A disturbing aspect is the involvement of youths. The Million-Man March of 1998 that tried to woo the late General Sani Abacha into transforming himself into a civilian president is partly responsible for sparking the flame of youth restiveness. The March offered many youths an opportunity to come to Abuja where they saw what the federal government was doing with the revenue generated from their area. The youths felt that areas that were not contributing as much as the Niger Delta to the national economy enjoyed better facilities in the country. When compared with the poor state of roads, poor communication, education, and health facilities as well as lack of potable water and even arable land, the youths of the Niger Delta felt that they had suffered a lot of deprivation over the years.

Oil spillages, which pollutes water and destroys marine life in such a way as to affect the economic well-being of the people, is of serious consequence. Oil companies operating in the area are often held responsible for the plight of the people of the Niger Delta and therefore suffer attacks, which results in abduction of staff and vandalization of facilities. The sharp contrast in the standard of living between the indigenes and staff of oil companies is a source of envy.

Since oil was discovered in the Niger Delta decades ago, the people of Bayelsa, Delta, Edo, Rivers, and Cross Rivers have not known peace. Traditional occupations of the people of the Niger Delta are fishing, farming and petty trading. With the advent of multinational oil companies, land, which people hitherto used for subsistence farming has been acquired by government parastatals, multinationals companies, and other big industrial establishments thus dispossessing the people of their farmlands – their means of livelihood. In 1970, the federal government promulgated Decree No 13 to appropriate all federally allocated revenue. Decree No 9 of 1971, gave the federal government

all rights to offshore rents and royalties. In 1978, the Land Use Act of Nigeria vested ownership of all lands on the federal government. The result was land of the Niger Deltans was acquired with little or no compensation. A good example is the land Elf Petroleum Nig. Ltd acquired for the gas cluster popularly known as IBEWA cluster, where about 2,500m^2 was taken without compensating the owners of the land (Anikpo, 1998). Several other examples abound in the Niger Delta.

Land left for the people has also been polluted by activities of multinational companies and the marine ecology has been degraded. Pollution of the rivers, streams and creeks has severally debased the fishing occupation, which is the economic live wire of more that 70 percent of rural dwellers in the Niger Delta (Yomere, 2006). A sad example is where more than one million assorted fishes were seen dead in the swamp near the flow station of Elf Petroleum (Nig) Limited recently (Idumu, 2004, P. 8). With the economic livelihood of the people snuffed out, multinational companies prefer to pay youths paltry sums of money on standby or stay-at-home program, rather than train them to acquire relevant skills for self-reliance. Although multinationals repatriate fantastic profits, they do not reinvest surplus capital and do not create job opportunities for youths. Most of the time, they do not implement MOUs (memorandum of understandings). This was graphically illustrated by Idumange (2001, p. 17) who argued

> Allegations abound that some senior staff in the Management cadre [of oil companies] collaborates with the youths in oil-bearing communities to either vandalize pipelines or deliberately cause delays in the implementations of MOU's [sic].

While government is not doing enough to create job opportunities for youths, the companies most often employ a handful of youths on casual basis. These casual employees are subjected to the worst form of dehumanization and servitude. Since they could not steal or engage in robbery, they sometimes protest violently against both government and companies operating in their communities. A good example as cited by Anikpo (1998) is the destruction and loot of properties of Elf Petroleum Nigeria Ltd by the Eg youths Federation (E.Y.F.) in Ogbogu and Obagi in October 4, 1994. On December 11, 1998, the

Ijaw youth council (I.Y.C.) made the case for resource control. This has become known as “Kiama Declaration”, which states *inter alia* first, that the quality of life of the Ijaw people is deteriorating as a result of utter neglect (Idumu, 2004). Suppression and marginalization has been visited on the Ijaws by an alliance of Nigerian state and transnational oil companies.

Political Factors

The Nigerian political superstructure has inadvertently contributed to youth restiveness. The Nigeria economy was severely plundered for about two and a half decades by public office holders. Most sectors of the economy collapsed as a result of cumulative mismanagement, unbridled corruption and opulence on the part of public office holders. Anam-Ndu (1990) has decried a situation where political power holders and the bureaucratic elite see their position as leverage to wealth at the expense of the masses. Even the present civilian administration has perpetuated the balkanization of the economy. Commenting on the unacceptable situation Idumange (2001, p. 8) has said:

> It is sad to note that most of the problems we inherited from the military are still persistent. Some are even magnified. The problems of inflation, unemployment and poverty have continued unabated. Corruption and ostentatious living of elected representatives have exacerbated this.

Politicians impose candidates on the people against the will of the majority. Therefore, politicians go into office and engage in embezzlement and corrupt enrichment in order to pacify their political godfathers. Another dimension is, once in power, they use the machinery of the state to coerce and intimidate perceived political opposition. Because of the unemployment rate, youths take to thuggery as a means of livelihood. Some youths support candidates who promise to create jobs for them, so during electioneering campaigns, such youths are prepared to fight to ensure success of favored candidates. Issues concerning the development of the Niger Delta are usually politicized, such as the principles used for revenue allocation, the onshore offshore dichotomy, and the Petroleum

Act of 1969. These issues have brought to the limelight the marginalization of the Niger Delta, which in turn has affected the living standards of the youths.

Socio-cultural Factors

Generally, the technological wave and rapid industrialization have combined to change the value orientation of Nigerians. Today, the value system is skewed in favor of materialism. The get-rich-quick mania has been accentuated by the opulence and splendor displayed by public office holders. The value flux has negatively affected orientation of the youths that want to be rich at all costs. Okowa (1989) has subscribed to the view that government officials systematically loot the Nigerian national treasury. He also contended that politics is the primary source of capital accumulated in Nigeria. This materialistic orientation has made some youths resort to violence and intimidation to acquire wealth.

Another major socio-cultural factor that has accentuated the tempo of youth restiveness is chieftaincy squabbles and incessant internecine wars. The Niger Delta is replete with causes of chieftaincy wranglings especially in oil bearing communities. People struggle to be made chiefs (no matter how unpopular) in order to corner oil royalties of their communities. This has enthroned factional fighting, bloodletting, and crises in which youths play a significant role under the rubrics of Community Development Committees (CDCs). Because of the divide-and-rule policy adopted by the multinational corporations, chiefs and CDC chairmen are given recognition. They hijack community development contracts and cause confusion. They even instigate youths to disrupt industrial operations and precipitate communal clashes, which lead to wanton destruction of lives and property. Idumange (2000) asserted even when oil spillage occurs, domestic politics and the rush for materialism have always precipitated chaos. The youths in Nigeria are also victims of cultural clash. They have been sandwiched between the ideational and sensate permissive culture which, for lack of a suitable euphemism, is often referred to as the western culture. Meads (1970) believed the culture confusion occasioned by the generation gap could only be resolved within the matrix of post-figuration, configuration and pre-figuration. Post-

figuration occurs when children learn from elders, while in a configurative culture, both adults and children learn from their peers. Pre-figurative culture, on the other hand, is one in which the adults and the youths must be willing to learn from one another. Where this is not possible, youths will tend to rebel against antiquated dogma, beliefs and traditions, making youth restiveness an inevitable corollary.

Youth restiveness can also result from blatant refusal on the part of companies to obey traditions and customs of host communities. For example, if a company acquires a parcel of land where there is a deity, the community may insist on the performance of certain rituals to appease the deity. But if such demands are not met, it may result in violent protests, demonstrations and youth restiveness.

SELECTED INCIDENTS OF YOUTH RESTIVENESS IN NIGER DELTA

The Niger Delta is a flash point of youth restiveness and industrial disharmony. Most reported incidents are between oil companies and host communities.

In August 1990, the Movement for the Survival of the Ogoni People (MOSOP) adopted the Ogoni Bill of Rights, - listed the grievances and demanded " political autonomy to participate in the affairs of the Nigerian State as a distinct and separate unit, including the right to the control and use of a fair proportion of Ogoni economic resources for Ogoni development. MOSOP's political demands were targeted at the Nigerian federal government, but it also accused SPDC of "full responsibility for the genocide in Ogoni land" (Guardian, August, 6th 2000, P. 11). In October 1990, MOSOP sent the Ogoni Bill of Rights to the then head of state, Gen. I.B. Babangida, but received no response. The same demand was sent to Shell, Chevron and NNPC (the joint venture partners) in December 1992 with an ultimatum to pay back royalties and compensation within thirty days or quit Ogoni land.

On January 4, 1993, MOSOP held a mass rally which was attended by hundreds of thousands of people –one half or more of the total Ogoni population.(Oru, 199) This demonstration of organized political opposition to both government and oil companies resulted in a military crackdown in Ogoni

and led to the arrest and detention of Ken Saro-Wiwa and other MOSOP leaders several times in the same year. In May 1994, following the brutal murder by a mob of youths of four prominent Ogoni leaders who were regarded as government collaborators, repression of MOSOP activities intensified. Sixteen members of the MOSOP leadership were put on trial in May 1994, and nine, including Ken Saro-Wiwa, were eventually convicted and sentenced to death by a special tribunal established for the case.

Without the right to appeal, the "Ogoni Nine" were executed on November 10, 1995. On October 30 and 31, 1990 a protest took place at Shell's facility at Umuechem, east of Port Harcourt, Rivers state, that led to the police killing some eighty unarmed demonstrators and destroying or badly damaging 495 houses (Guardian, April 8. 2000). This incident was the first to bring the situation in the Niger Delta to international attention, and remain the most serious loss of life directly involving oil company activities. Youths from Umuechem community demanded provision of electricity, water, roads, and other compensation for oil pollution of lands and water supplies. On October 29, 1990 the divisional manager of SPDC'S eastern division had written to the Rivers state commissioner of police to request security protection with a preference for the paramilitary mobile police in anticipation of an impending attack' on SPDC'S facilities in Umuechem allegedly planned for the following morning. Following peaceful protest by village youths on SPDC'S premises on October 30, SPDC again made a written request to the governor of Rivers state, a copy of which was sent to the commissioner of police. On October 31, mobile police attacked peaceful demonstrators with teargas and gunfire. They returned at 5 am the next day shooting indiscriminately, in a purported attempt to locate three of their members who had not returned the previous evening. A judicial commission of inquiring established by the government found no evidence of a threat by the villagers and concluded that the Mobile Police had displayed a reckless disregard for life and property. No compensation was awarded for the attack to those whose relatives were killed or homes destroyed; nor have the perpetrators been brought to justice (Guardian, April 8. 2000).

The Choba Macabre, which led to the shameful raping of women by Nigerian soldiers, can hardly be forgotten in the annals of the history of that community (Guardian, April 8. 2000). Wilbros (Nig). Limited is a transnational oil service company that started operation in the late 1960's. Regrettably, from 1970 to 1999, the company did not respond to the employment needs of youths or provide any popular assistance program. This is despite the fact the company occupies the fertile and strategic land of the community. The youth protest led to a serious reprisal from the state. Military tanks backing stern looking soldiers raided the community and occupied it for days. More than two people were killed and thrown into the Choba River. The women who constituted the soft target were raped and maltreated. Today, Choba is wailing and weeping like the Umuechem and Ogoni people.

All over the Niger Delta, youth induced crises have become a common phenomenon. The Warri-Ilaja war was sustained by youths. It led to the deaths of more than two thousand five hundred Ilajes. In 1993, the youths of Egi raided the premises of Elf Petroleum (Nig) Limited (The Nigerian Observer August 18 1999 p. 7). The clash between youths of Ikebiri Southern Ijaw local government area and Agip Oil led to the deaths of eight people (Guardian, July 11 p. 6, 2002). The same gruesome treatment took place in January 1999 in Opia and Ikenya communities in Warri North local government area where sixty-one people died in a clash with security operatives of Chevron Nig. Limited.

In April 2001, eight youths were shot in Bayelsa state for attempting to close down an Agip flow station in Brass. Recently, some women in Bayelsa State embarked on a peaceful demonstration and laid siege of the terminal of Chevron (Nig) Limited and disrupted operations for ten days (Guardian, July 11 p. 6, 2002). Umu-uboh women stopped Saipem (Nig) Limited from drilling at 1B2B for eleven days. (Guardian, July 11 p. 6, 2002).

The Niger Delta is characterized by a lack of needed socio-economic and educational infrastructure; environments rendered hostile by seismic and oil exploratory activities; and insensitivity on the part of government.

STRATEGIES FOR CURBING YOUTH RESTIVENESS

The phenomenon of youth restiveness has attracted tremendous interest and attention especially as it affects industrial harmony and peace in the Niger Delta. Allagoa (2000) contended since crude oil is the sustainer of the Nigerian economy, the people of the Niger Delta would be best served by the multinationals who should lay the foundation for development of self-reliant communities and a sustainable environment, Restoration of community land, and environment-friendly policies are some of the things that can stem the tide of frustration, youth restiveness and violence.

Idumange (2001) identified neglect as the main cause of youth restiveness and the cardinal issue is the uneven distribution of revenues accruing from crude oil. He suggested oil-bearing communities should not only be entitled to compensation arising from ecological genocide, but also a depletion allowance because oil is a non-renewable resource. Furthermore, oil companies should train youths in skills relevant to operations, as this will enhance employability.

Another effective way of curbing youth restiveness is to evolve dialogue as an efficient paradigm for conflict resolution. Any potential conflict–prone situation should be nipped in the bud through collaborative efforts and involvement of all segments of the population: opinion leaders, chiefs, youth, women, etc.

Government should also embark on youth empowerment programs to enable youths to engage in meaningful activities. Job creation for youths is essential while skills acquisition programs are a *sine qua non*. Skills acquisition programs should emphasize the non-formal factor. Youths should be trained as vulcanizers, welders, carpenters, mechanics, etc. to be self-employed. School-to-land and poverty eradication programs should be vigorously pursued to enable youths to advance their chosen career for survival and self-actualization.

Fubara (2000) has provided guidelines for developing youth projects which include a clear understanding of the constraints impairing the development and success of youths in the region, developing industry-specific guidelines for improving and strengthening managerial skills of youths, and providing financial grants for youths to establish small-scale industries.

This research also advocates ethical re-orientation, as it is necessary to realign the value system, which has made most of our youths go astray. Measures could be added by the award of scholarships and bursary allowances, sports development and other creative activities that would engage youths.

There can be no solution to the simmering conflict in the oil producing areas of the Delta until its people gain the right to participate in their own governance and until the protection of the rule of law is extended to their communities. The injustices facing the people of the Delta are in many ways the same as those facing all Nigerians after decades of misrule by oligarchs. In the oil producing regions, suppression of political activities, lack of legal redress for damages to the environment and the resulting loss of livelihood, and sheer ubiquity of human rights abuses by regional security forces have generated unnecessary tension.

The first responsibility for resolving these injustices lies with the Nigerian government. Yet multinational oil companies operating in Nigeria cannot avoid their own share of responsibility. While the political environment in Nigeria is as difficult for the oil companies as it is for anyone else, and that the oil industry does not have the power to alter government policy towards the oil regions, oil companies in many respects contribute towards discontent in the Niger Delta and to the conflict within and between communities that results in repressive government responses. Oil companies must take steps to ensure oil production does not continue at a cost to host communities. There is an ever-growing likelihood, unless corrective actions are taken, protest in the Niger Delta will become violent in an organized and concerted way, with consequent reprisals and worsening of the security situation that will harm all those with interests in the Delta region, whether residents or companies.

CONCLUSION

The federal government must pay special attention to development needs and challenges of the Niger Delta. This could be through job creation, initiation of schemes aimed at improving the lot of the people in the oil bearing communities, the introduction of environmentally friendly measures to preserve the fragile

ecology, and making it possible for Niger Delta states to control their own resources.

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Dynamics of Poverty among Niger Delta Women: An Empirical Assessment

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Abstract
This study examines the dynamics of poverty among the Niger Delta women of Nigeria with particular reference to the Isoko's, Ijaws, and the Itsekeri ethnic nationalities. The data for the study were obtained from field survey of 450 households from three Local Government Areas of the study. The results obtained from the study shows that there is the existence of a widespread of poverty among the women of the area even when there is obvious oil companies' economic activities. The study also shows that despite the various government policies and programs aimed at alleviating poverty, a greater proportion of women in the area do not benefit from such programs. The paper concluded by suggesting that the government should pursue a policy aimed at targeting the women of the study area and that the establishment of empowerment programs/ skill acquisition centers for women will be of immense benefit.

Keywords: Niger Delta, poverty, women

JEL Codes: Q28, P36

INTRODUCTION

Nigeria is the sixth largest oil-producing country in the world, and the largest and potentially richest country in Africa. It has the largest number of black people in the world – with a land area of close to one million square kilometres, and a population of well over 140 million. Nigeria is blessed with rich human and mineral resources. Its oil nourishes the world – Western and Southern. Its natural resources generate billions of dollars to its coffers on a daily basis. Nigeria is situated along the eastern coast of the Gulf of Guinea, and just north of the equator. It is bordered on the west by Benin, on the north by Niger and Chad, and on the east by Cameroon. The country's coastline spans more than 800 km along the Niger Delta, the home of oil.

The Niger Delta is made of nine states, six of which are coastal. The only source of potable water in the coastal states is from groundwater extraction. However, the increase in population and industrial development has brought about high and heavy construction activities and the peculiar location of the

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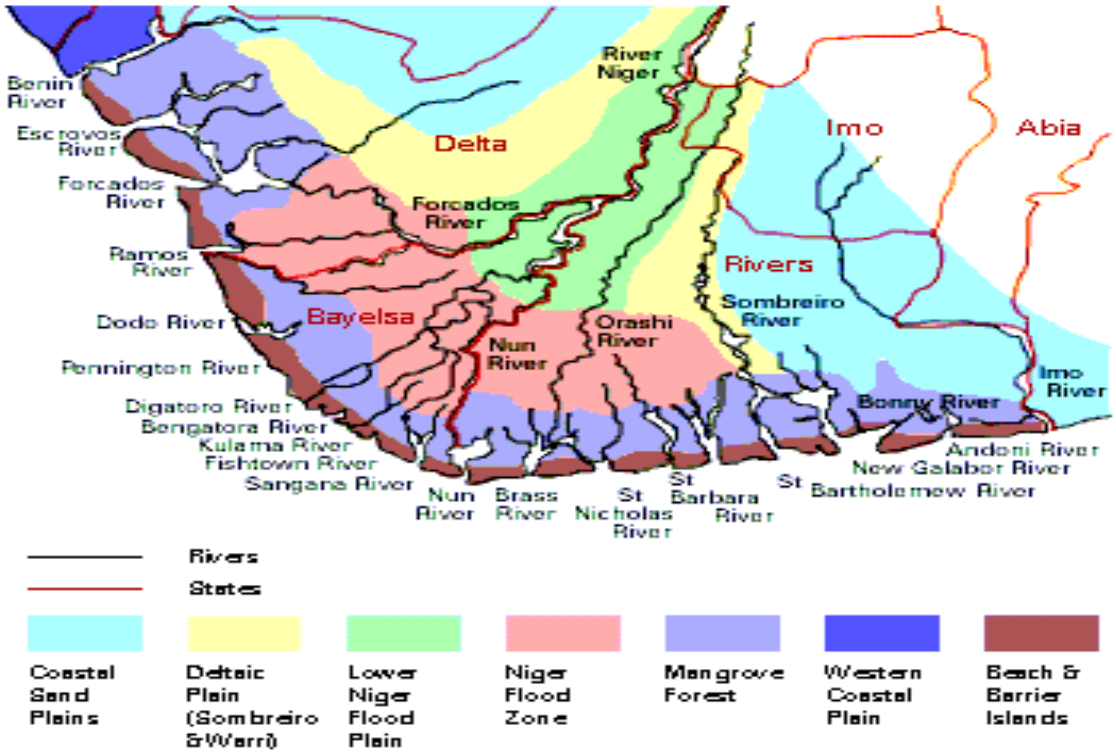
coastal states have affected the life of the people adversely. The tributaries of the River Niger traverse through these states and empty into the Atlantic Ocean. It is one of the largest wetlands in the world (NDES, 1998).

Figure 1: Map of Niger Delta



Source: Atubi, A. O. 2008.

The discovery of oil in the Niger Delta region in the early 50s has come with mixed blessings – joy to the government and misery to the indigenous communities who have recoined the government slogan of "oil boom" to their "oil doom". The massive on-shore and off-shore exploitation of oil deposits in the Niger Delta area has inflicted an unprecedented and severe environmental degradation. Incessant oil spills, continuous gas flaring, and depositing of dangerous contents of crude oil into human residential environments with its attendant devastating socio-economic consequences have combined to aggravate environmental degradation of coastal Nigeria (Jamabo and Ibim, 2006). The mangrove swamps are disappearing; the spills have an adverse

effect on marine life and are responsible for failing crop yield, poisoned waters, dying forests, and vanishing wildlife.

Fishing, once the main occupation of the indigenous communities, is now an unprofitable one. Soil contamination through bioaccumulation of dangerous heavy metals has a devastating effect on both terrestrial and plant life. Once edible vegetables are now poisonous. The disappearance of once vibrant communities is indicative of the inability of the devastated environment to support and sustain human life and human settlements (Koziell, 2004).

This scenario, gloomy and grim as it is, led to desperation and restiveness of the youths of the region. In the midst of the affluence of the oil prospecting communities, the endemic poverty of indigenous communities is glaring. Most generally suffer from socio-economic and political marginalization based on historical colonization as well as present day economic and political processes, which now must be rectified if objectives of sustainable development are to be realized at the local level.

The environment is under increasing demand to provide resources for human activity and absorb waste in an era of increasing *per capita* consumption and astronomical increase in population. Of serious concern to indigenous communities is the devastating environmental degradation caused by oil spillages and gas flaring (Oboreh, 1998). Profit has always been the driving force controlling activities of oil companies. While oil companies have profited from oil resources, local communities are subjected to the excruciating agony of non-stop emissions that cause stratospheric ozone depletion, skin cancer, severe mucosal irritation, nausea, and vomiting, leaving an environment practically unable to sustain human life (Peters, 2006). The ethnic groups living in the Niger Delta are the Isokos, Ijaws, Itshekiris, Urhobos, and Kalabaris. They are forced to keep their villages small due to lack of dry land. They live among creeks, lagoons and salt marshes, making fishing and the salt trade part of everyday business.

This paper is a survey of the environment and the level of poverty among indigenous women in the Niger Delta.

CONCEPTUAL FRAMEWORK

The livelihood framework focuses on resource base and people's capacities to act within specific social, economic, political, ecological and cultural contexts. It starts with an analysis of local resources and skills available for constructing livelihood activities. The canons of the framework include people's strengths and potentials which may lie in social networks. This framework shows livelihoods can largely be understood in the process of scanning local knowledge within locally specific contexts where they occur. Therefore, understanding livelihood analysis with the interplay of different processes operating at different levels is essential. Livelihoods analysis stems from mapping out different resources at people's disposal. These resources include tangible assets such as land and properties as well as non-tangible assets such as law and policies. These resources are socially constructed. Thus, people's negotiation for, and utilization of resources is a product of local and global processes in construction of social reality. This assumption and the beliefs that local capacities and voices should be brought forward in research and development planning gained popularity in the 1980s especially through the adoption of participatory approaches in rural development (Akeredolu, 1986).

This line of thinking was impregnated by a gradual shift in social change paradigm from the primacy of centralized development planning to increasing emphasis on people's own activities. It is in this context that democratization of rural development practice and power of people's agency can be understood. Agency implies capacity to manage thought processes, regulate behavior, and produce changes through actions. Ability to navigate within social networks is a component of livelihood territory, strengthening their cultural identity and creating a more secure base for future negotiations. This approach is at the root of the restiveness of the oil producing states of Nigeria, where indigenous communities, organizations and NGOs have focused their attention on achieving formal recognition of indigenous communities' land rights and the right to control the resources on their land in an effort to manage different land pressures and

maintain an economic base that is sustainable and beneficial to future generations of indigenous communities (Onosode, 1998).

From what is known of the Niger Delta and the oil business in Nigeria today, a lot seem not to have been achieved. Pipeline explosions (from time to time) where hundreds of lives are lost with lots of buildings razed and the entire earth surface burnt no longer make news in Nigeria.

The multinational oil companies and all stakeholders have not devised ways of protecting, securing and avoiding such incidences which impoverish the naturally rich region. Past efforts by all the stakeholders have not achieved desired goals. The rich alluvia soil for farming have been devastated and left the people in absolute poverty (Orubu, 1999a).

Livelihood is a process by which people make a living through specific assets, capabilities, and activities (Carney, 1998; Ellis, 2000). Earlier anthropological study showed that livelihood extends beyond basic life necessities to social relationships management and identity maintenance (Render, 2005). Obviously, with an overlap of different layers of social life based on resources and their utilization livelihood is a holistic phenomenon. Essentially, the discourse of livelihood cannot be disconnected from understanding the level of poverty in the environment. Uncontrolled extraction of oil and gas has led to mismanagement of resources and depletion of valuable biodiversity, which encompasses all species of plants, animals, micro-organisms and their ecosystems, and ecological recesses (Zylicz, 2000). Over-exploitation of fishing resources followed by agriculture, transport sources/routes, and poorly planned and managed coastal developments have led to rapid degradation of vulnerable coastal and offshore habitats (Orubu, 1999b).

The study of livelihood is essential for understanding people-environment interaction, and its implications for poverty alleviation. Situations in which some people live in absolute poverty and some live in prosperity can be linked to political economy of environmental differences. Normally, people in resource-endowed environments will be more prosperous than counterparts in disadvantaged areas. This model does not fit the Nigerian paradox of poverty in

the midst of plenty resources. People in disadvantaged areas seem to be at higher advantage than counterparts in resource-endowed areas in Nigeria.

Beyond erroneous assumptions that oil equals an abundance of wealth, the Nigerian situation has remained largely a case of frustration, lamentation, and macabre irony. The discovery of the mineral resource has been blamed for ecological degradation of the Niger Delta region, as much as for the public office holder's reckless quest for business, and resulting corruption scandals, military coups, prolonged dictatorships, privatization of public resources, militarism, electoral fraud and unruly behavior, among military and civilian alike (Hill, 1999).

Unfortunately, the most tragic manifestation of the actual situation of the region is growing underdevelopment. In spite of occasional windfalls resulting from soaring prices in the international oil market, Nigeria's macroeconomic performance has been anything but outstanding. Actual present global reports ranked Nigeria as one of the poorest countries in the world with some states in the Niger Delta region ranking the poorest in the country. Poverty among indigenous women is so glaring to the extent some resorted to miniature jobs such as picking palm kennel shell for selling as a means of gas for cooking (UNDP, 2006).

EFFORTS AT TACKLING THE PROBLEMS OF THE NIGER DELTA

Various efforts are being made towards tackling the problems of the Niger Delta region and general poverty situation in the country. To take care of the region, the Niger Delta Development Commission (NDDC) was established to provide a lasting solution to the socio-economic difficulties of the area which successive governments have grappled with even before independence. The NDDC has a clear mandate and vision to facilitate the rapid, even, and sustainable development of the Niger Delta region into an area that is economically prosperous, socially stable, ecologically regenerative, and politically peaceful. In order to achieve its mandate, the NDDC board identified its areas of focus to include: development of social and physical infrastructure, technology, economic revival and prosperity, ecological/environmental remediation and stability, human

development, pursuit of a peaceful environment under which tourism will thrive, and a buoyant culture that will be facilitated with economic activities.

THE NATIONAL POVERTY ERADICATION PROGRAM

In the year 2000, the National Poverty Eradication Program (NAPEP) was established to provide for eradication of absolute poverty in Nigeria by streamlining existing poverty alleviation institutions and coordinating implementation and monitoring of relevant schemes and programs at all levels of government (NAPEP Blue Print, 2001). NAPEP partners with state governments (including Niger Delta states) to fight poverty. The proposed mandates and targets for NAPEP as contained in the Blue Print (2001, p. 4) span the following:

- Youth Empowerment Scheme (YES)
- Rural Infrastructures Development Scheme (RIDS)
- Social Welfare Services Scheme (SQWESS)
- Natural Resource Development and Construction Scheme (NRDCS)

NAPEP collaborates with state governments and has diversified its projects from the proposed mandate to involve other interest groups and programs that were not initially mentioned in its interjectory activities like the Village Economic Development Solutions (VEDS) scheme (NAPEP Blue Print, 2001; VEDS NAPEP publication, 2007). Other poverty alleviation programs by federal and state governments are commercial bank poverty alleviation agencies such as the former People's Bank and the Family Economic Advancement Programs.

METHODOLOGY

The study was conducted in Isoko, Ijaw and Itsekeri ethnic nationalities of Delta State of Nigeria. The sample of the study was randomly drawn from local government areas of the three ethnic nationalities. From each local government, 150 households were interviewed with the aid of an interview schedule. A wide range of information on socio-economic background was obtained. Descriptive statistics were used in analyzing responses.

RESULTS AND DISCUSSIONS

The results of the study are presented in tables below. The responses in Table 1 provide answers to a question on educational background of the respondents.

Table 1: Education

Educational System	Frequency	Percentage (%)
Informal Western School	338	75.11
Formal Western System	90	20
Formal Primary Education	22	4.88
Formal Secondary Education	0	-
Tertiary	0	-
Total	**450**	**100**

Source: Field Survey, 2010.

Out of 450 respondents, 338 (75.11%) attended the informal Western education system, which is very common in the study area. About 20% attended the formalized Western system of education which is becoming popular, while only 4.86% attended primary education. The bulk of women in the study area interviewed were married. This is shown by the responses in Table 2 below.

Table 2: Marital Status

Marital Status	Frequency	Percentage (%)
Single	80	17.78
Married	305	67.78
Widow	65	14.44
Total	**450**	**100**

Source: Field Survey, 2010.

Table 2 indicates most respondents (305, or 67.77%) are married. This is a typical characteristic of women in native societies in which marital bonds are encouraged in line with custom. Only 80 respondents (17.77%) are single, while the remaining 14.44% are widows. Family sizes are large in the study area. In a related question on the structure or family set-up of respondents, the following responses were obtained.

Table 3: Family Set-up

Family Types	Frequency	Percentage (%)
Extended Family	373	82.89
Nucleus Family	77	17.11
Total	**450**	**100**

Source: Field Survey, 2010.

Out of 450 respondents, 373 (82.89%) live in an extended family environment, while the remaining 77 (17.11%) are in a nucleus family. The traditional family set-up with large family size is predominant. Respondents involvement in economic activities to supplement family income is presented in Table 4.

Table 4: Involvement in Economic Activities

Economic Ventures	Frequency	Percentage (%)
Palm kennel	31	6.88
Weaving mart	120	26.66
Oil milling	133	29.55
Petty trading	110	24.44
Others	35	7.78
None	21	4.67
Total	**450**	**100**

Source: Field Survey, 2010.

Table 4 shows 95.33% of respondents are involved in either production or distribution of local palm kennel oil, weaving of traditional mart, bedspreads, oil milling, petty trading and others like hair plaiting, pot making, etc. All the above mentioned economic practices are undertaken within the home, while marketing is sometimes done outside the home. Only a negligible percentage (4.67%) of respondents reported they do not engage in any economic activity in the family.

No respondents collected loans from commercial banks or poverty alleviation agencies. The bulk (360, or 80%) reported their main source of capital is their husband/relatives, while 90 respondents (20%) said they finance ventures through personal savings. None benefitted from poverty alleviation schemes of the federal and state governments (Table 5). Reasons for not patronizing commercial banks and poverty alleviation agencies are given in Table 6.

Table 5: Sources of Capital of Respondents

Source of Capital Frequency	Frequency	Percentage (%)
Husband/Relatives	360	80
Commercial Banks	-	-
Co-operative Societies	-	-
Poverty Alleviation Agencies	-	-
Personal Savings	90	20
Total	**400**	**100**

Source: Field Survey, 2010.

Table 6: Reasons for Non Patronage of Commercial Banks/Poverty Alleviation Agencies

Reasons	Responses	Percentage (%)
No information	331	73.56
Collateral requirements	30	6.67
Interest (Riba)	76	16.67
Lack of confidence	13	2.89
Unspecified	-	
Total	**450**	**100**

Source: Field Survey, 2010.

Table 6 shows the bulk of the respondents (331) representing 73.56% had no information on the existence or the credit facilities granted by commercial banks and poverty alleviation agencies. This response is not surprising considering the high rate of illiteracy in the study area. About 17.75% of our respondents reported it is because of interest charged by the financial institutions that they could not approach them. Respondents were also asked whether the income earned is sufficient to sustain them. Their responses are presented in Table 7.

Table 7: Income Earned from Domestic Economic Activities

Responses	Frequency	Percentage (%)
Much sufficient	23	5.11
Sufficient	59	13.11
Not at all	368	81.77
Total	**450**	**100**

Source: Field Survey, 2010.

Table 7 shows 81.77% of the respondents believe the income generated from domestic economic enterprises is not enough to supplement the family's income.

Only 5.11% are of the opinion the income generated is much sufficient to cater for the family's welfare.

CONCLUSION AND RECOMMENDATIONS

This study attempted to analyze the dynamics of poverty among the Niger Delta women in Isoko, Ijaw and Itsetkiri ethnic Nationality of Delta State. The study revealed that most of the Niger Delta women are engaged in economic activity. However, most women later submitted that their earnings from such ventures are not enough to supplement their domestic consumption requirements. This shows the existence of widespread poverty among women in the study area.

The study revealed the activities of poverty alleviation agencies have not been felt by women in the study area. This was demonstrated by the large number of respondents (331) who reported they had no information on the existence of these agencies. Hence, they could not benefit from any packages. There is an urgent need for government to target policies directed at alleviating the poverty situation of women. Extra resources should be channeled into poor urban areas in order to help break the cycle of transmitted deprivation. Neighborhood-based action to work with local people should be implemented. The few educated women in such neighborhoods should be actively involved in such programs.

Government should encourage self-help projects among women. More cooperative associations should be formed among women to economically empower them. Educational and skill acquisition centers should be established in neighborhoods. Such centers should take care of the sensitivities of the local women population and adequate working tools and materials should be sold at subsidized rates to women's groups, while marketing outlets should be provided to easily dispose the output of such centers at favorable prices.

If the above recommendations are adequately taken into consideration, the level of poverty among the Niger Delta women in Delta State will be drastically reduced and their economic well-being greatly enhanced.

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Effects of Warri Refinery Effluents on Water Quality from the Iffie River, Delta State, Nigeria

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Abstract
This study examines the effects of Warri refinery effluent on the Iffie river and its environs. It asserts the nature of effluent released into the water body and also the effect of effluent on water quality. The data that were used in this research where generated from direct field measurement of pH, Conductivity, Total Hardness, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Turbidity, and heavy metal profiles (Mg, Zn, Cr, Ni, Cl, Cu, H_2S, P) from the Iffie, Ubeji and Ughoton Rivers respectively. However, the Turbidity, Hydrogen Sulphide, Total Suspended Solids (TSS), Copper, Chromium records in Iffie and Ubeji Rivers were found to be higher than the WHO and FEPA standards, thereby making the water in these areas not suitable for consumption. Based on the findings, recommendations were proffered.

Keywords: Effluents, water quality, effects, Warri Refinery, Delta State, Nigeria

JEL Codes: 051, 053

INTRODUCTION

While the petroleum refinery and petrochemical industries are most desirable for national development and improved quality of life, the unwholesome and environmentally unacceptable pollution effects of the waste from these industries are cause for worry. This is because in the process of converting crude oil into petroleum products (liquefied petroleum gas, naphtha, kerosene, diesel oil and residual oil) and petrochemical products (polypropylene, polyethylene), wastes of different kinds are generated. The wastes can be broadly categorized into oily materials, spent chemicals, spent catalyst and other residuals. These wastes are released to the environment in the form of gases, particles, and liquid effluent (liquid consisting of surface runoff water, sanitary wastewater, solid waste and sludge) (World Bank, 1998).

The waste water released from the refineries are characterized by the presence of large quantity of crude oil products, polycyclic and aromatic hydrocarbon, phenols, metal derivatives, surface active substances, sulfides, naphthalene acids and other chemicals (Suleimanov, 1995). As a result of

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ineffectiveness of purification systems, waste water may become seriously dangerous, leading to the accumulation of toxic products in the receiving waster bodies with potentially serious consequences on the ecosystem (Beg et al, 2003; Aghalino and Eyinla, 2009).

The uncontrolled disposal of waste into water renders water unsafe for economic use, recreational use and poses a threat to human life and it is also against the principle of sustainable development. Water borne diseases and water caused health problems are mostly due to incompetent management of water resources. Safe water for all can only be assured when access, sustainability and equality can be guaranteed. Urban areas generally have a higher coverage of safe water than rural areas. Even within the urban area, there are variations in the quality of water as much of the water get contaminated in many different ways, through industrial effluent and untreated municipal sewage (Oluwande et al, 1993; Atubi, 2009a).

Kuehn et al (1995) observed that refinery effluent contaminated with aromatic hydrocarbons produces poor health and lethal toxicity in fishes and two species of tilapia. Onwumere and Oladimeji (1990) earlier demonstrated accumulation of heavy metals with accompanying histopathology in *oreochromnis niloticus* exposed to treated petroleum refinery effluent from the Kaduna refining and petrochemical company. These and other studies agree petroleum refinery effluents pose a serious problem to both aquatic and human life form.

Drinking contaminated water can cause various diseases such as typhoid fever, dysentery, cholera and other intestinal disease (Udoh, 1987; Adeyemi, 2004). According to Gore (1993), human beings are made up of water, in roughly the same percentage as water in the surface of the earth. Our tissues and membranes, brains, and hearts, our sweat and tears, all reflect the same recipe for life. Water is essential for the development and maintenance of the dynamics of every ramification of the society (United Nations Development Program, 2006). Water is indeed life and thus is the most important natural resource, without which life would be non-existent. Availability of safe and reliable source of water is an essential prerequisite for sustained development (Asonye et al, 2007).

Nigeria is regarded as the greatest gas flaring country in the world and in the process of flaring carbon dioxide, sulfur dioxide and nitrous oxides are released into the atmosphere which mix with rain to produce toxic acid rain causing damage to vegetation and aquatic life (Egborge, 1991; Atubi, 2009b). Oil prospecting in Nigeria has brought with it untold hardship to the environment. Dwellers of oil producing areas generally suffer from scarcity of farmlands as their lands has been made unproductive due to constant oil spillages and waste dump (FEPA, 1991).

One of the most visible consequences of numerous oil spills had been the loss of mangrove trees. The mangrove was a source of both fuel for the indigenous people and a habitat for the area's biodiversity, but is now unable to be sourced due to the oil toxicity of its habitat. Oil spills pose serious health risks to people when they consume contaminated seafood (Bogardy, 2004; Onuoha, 2007).

Nigeria has experienced increased pipeline vandalism, kidnapping, and militant take-over of oil facilities in the Niger Delta. As of April 2007, an estimated 587,000bbl/d of crude production was shut-in. Since December 2005, Nigeria has lost an estimated 16 billion dollars in export revenues due to shut-in oil production. Shell has incurred the majority of shut-in oil production (477,000bbl/d), followed by Chevron (70,000bbl/d), and Agip (40,000bbl/d) (Energy Information Administration, 2007).

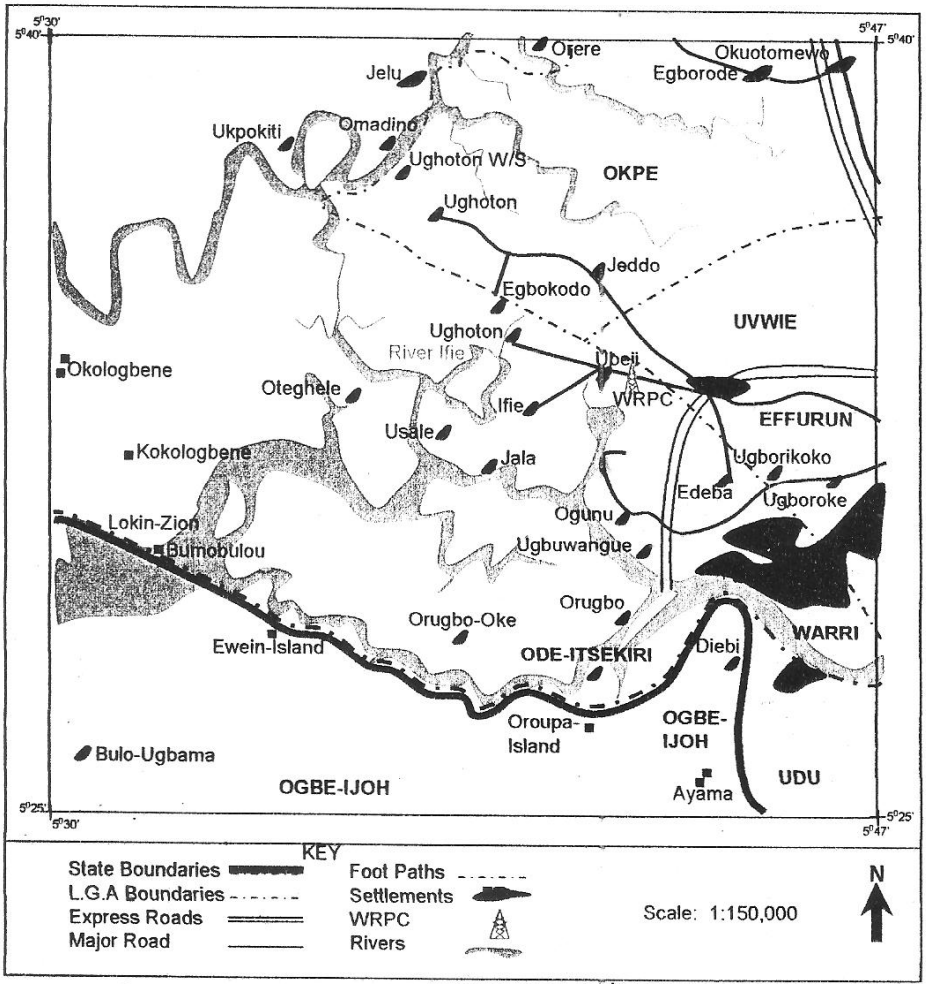
Oil in the aquatic environment may be damaging in a variety of ways. These may involve changes in the composition of aquatic communities that affect their ability to survive, permanent damage and, in some cases, massive mortalities. Odor, taste and color are present in oil polluted water. Oil pollution of water also constitute a potential health risk to humans who use water for domestic and drinking purposes and consume fish found therein (Nwilo and Badejo, 2001; Helmer, 2006; Atubi, 2009b).

THE STUDY AREA

Warri refining and petrochemical company Ekpan, located in Delta State, is a subsidiary of the Nigerian National Petroleum Cooperation (NNPC), an oil

company involved in refining crude into fuel, kerosene and other by-products. The refinery is bounded by three communities Ekpan, Jeddo and Ubeji. Iffie is next to Ubeji (Fig. 1). The study area is located around latitude $5^0$31'N and $6^0$11'N and between longitude $5^0$44'E and $5^0$47'E. The area is approximately 100 square kilometers and it is bounded by other communities. Human activities are mainly primary occupations such as fishing, crop farming, vegetable farming and a little of petty trading. The economy is agriculturally based.

FIG 1: MAP OF WARRI SOUTH SHOWING STUDY AREA



Source: Atubi ,A. O. 2010

RESEARCH METHODOLOGY

This research work is experimental with a survey of river water samples in Iffie, Ubeji and Ughoton. It involves laboratory analysis of the water samples collected from the rivers in these areas. Water samples were collected at three (3) locations equi-distance from the discharge point. Samples were collected from Ughoton River as a control point. Under the primary source of data collected, an empirical study on the effect of refinery effluent was carried out. Water samples were collected from study site to test for various parameters of water quality that is the physical and chemical composition. Thirty water samples were collected from three locations (equi-distance from the polluted point) with containers. From these containers, samples were collected using sterilized glassware, fitter and with information tags for identification. All samples were allowed to settle down before any laboratory analysis. This is to eliminate any form of turbidity influences on the tests. One dependent control source at Ughoton was established. The control sample served as standard characteristics of the nature of river water in the neighborhood and from which variations was identified.

DATA ANALYSIS

Data collected was by direct field collection of water samples from Iffie, Ubeji and Ughoton Rivers. These stations were established to cover possible affected area along the river course based on an earlier field reconnaissance survey. The locations of the various sampling points are; Iffie River, Ubeji River and Ughoton River. Iffie River and Ubeji River were divided into ten sites and Ughoton River into three sites. Running water from the three (3) rivers was carefully collected with plastic containers that had earlier been sterilized. These were assessed immediately for physical characteristics such as pH, conductivity and turbidity.

INSTRUMENTATION

The instrument used in this study includes Bulk Scientific Atomic Absorption Spectrophotometer (AAS) Computerized Model 210VGP with Epson Printer LX300+ and replaceable lamp holder. This was used to measure the heavy

metals. Level of pH was measured with H tester 1 Tm, Model Cole Planner (R), conductivity was measured with the suntex conductivity meter, Total Dissolved Solids (TDS) was measured with the Hatch TDS meter, model CO20, Total Suspended Solids (TSS) was determined using weight loss technique and turbidity was measured with hatch spectrophometer, model DR2010.

DISCUSSION OF RESULTS/FINDINGS

From the water analysis (see Tables 1, 2, 3 and 4 in the Appendix), chemicals such as chloride, phosphate, oil and grease, chromium, hydrogen sulphide, magnesium, copper, zinc, nickel are released into the river and the major ones are heavy metals, such as chromium, phosphate, chloride, copper, zinc and nickel. The effect of these effluents released in the river makes the water unsafe for domestic consumption purposes, recreational purposes, and agricultural purposes.

In Table 1, the pH values recorded in Iffie River are generally within the WHO acceptable limits of 6.5 – 92 thresholds. This is evident from 6.53 mean pH value that is within the 6.5 – 92 WHO threshold. However, the lowest pH value of 6.21 and 6.29 was recorded in Iffie 5 and Iffie 6 respectively which fall outside the WHO acceptable limit. The low pH values recorded in Iffie 5 and 6 could be attributed to the effluents that enter the river from the Warri petrochemical company. This low pH values increase concentrations of some dissolved metals in the water and increase the toxicity of these metals.

The total hardness values of water samples analyzed were within the maximum limits of WHO standards of 100mg/L. This is seen from the mean of 36.49 total hardness recorded in Iffie river with Iffie 9 (48) and Iffie 7 (42) being the highest and lowest total hardness being recorded in Iffie 1, Iffie 2, Iffie 3, Iffie 4, Iffie 6, Iffie 8 and Iffie 10. The magnesium hardness values of the water samples collected from Iffie River were within the WHO acceptable limit of WHO standards 250 mg/L. This is seen from the mean value of 15.72 magnesium hardness recorded in Iffie 1, Iffie 2, Iffie 3, Iffie 4, Iffie 6, Iffie 7, Iffie 8 and Iffie 10.

The turbidity values of the water samples collected from Iffie River are generally higher than maximum limits of WHO acceptable standard of 25NTV. This is evident from the mean turbidity value 144.2NTU recorded in Iffie River with the highest being recorded in Iffie 5(282) and Iffie 9 and the lowest turbidity was recorded in Iffie 1 (109), Iffie 2 (124), Iffie 3 (118), Iffie 4 (76), Iffie 6 (129), Iffie 7 (116), Iffie 8 (78) and Iffie 10 (130).

Total Dissolved Solids (TDS) concentration in Iffie River had a mean of 60.09 which is within maximum limits of 1000 mg/L acceptable by WHO. However, the highest concentration of total dissolved solids value of 98 was recorded in Iffie 1. Iffie 6 (87.8) had the second highest concentration of total dissolved solids.

Water samples analyzed in Ubeji River showed the conductivity level in the ten points were below the 500 µs/cm limits of WHO standards. This is evident from the mean of 63 µs/cm recorded in Ubeji. The highest conductivity of 85.8 µs/cm was recorded in Ubeji 1 and 62 µs/cm in Ubeji 10, and the lowest conductivity values in Ubeji 2 (57.4 µs/cm), Ubeji 3 (60.8 µs/cm), Ubeji 8 (59.8 µs/cm), Ubeji 9 (59.3 µs/cm) and Ubeji 6 (61.6 µs/cm).

Total hardness concentrations in Ubeji River were generally within the maximum 100mg limits of WHO standards. This is seen from the mean of 31.1 mg recorded in Ubeji River. The highest total hardness concentration of 34.1 mg and 32.9 was recorded in Ubeji 6 and Ubeji 8 respectively and the lowest total hardness concentration of 31.7mg was recorded in Ubeji 1, Ubeji 2 (25 mg), Ubeji 3 (31 mg) and Ubeji 10 (30.3mg).

Turbidity recorded in Ubeji river ranges between 29NTU-115NTU with a mean of 85.9NTU with the highest turbidity duty of 115NTU and 110 being recorded in Ubeji 1 and Ubeji 10 respectively while the lowest turbidity were recorded in Ubeji 2, Ubeji 3, Ubeji 4, Ubeji 5, Ubeji 6, Ubeji 7, Ubeji 8 and Ubeji 9. Turbidity recorded in Ubeji River was generally higher than the 25 NTU maximum limits of WHO and Federal Environmental Protection Agency (FEPA) standards.

Total suspended solids concentration in Ubeji river was higher than the maximum limits of <30 mg/L and FEPA standards. This is seen from the mean of 60.64 mg/L total suspended solids recorded in Ubeji River. The highest total

suspended solids of 93 mg/L was recorded in Ubeji 1 and the lowest total suspended solids of 20 mg/L was recorded in Ubeji 3.

In Table 3, pH concentration in Ughoton River was generally below 6.5 – 9.2 maximum limits of WHO and FEPA standards. This is evident from the mean of 5.74 observed in Ughoton River during the period of observation. The highest pH concentration of 5.98 was observed in Ughoton 3 and Ughoton 2 (9.95) respectively and the lowest pH concentration of 5.31 in Ughoton 1.

Turbidity values in Ughoton River were generally higher than the maximum 25 NTU limits of WHO and FEPA standards. This is evident from a mean of 66.33 NTU recorded in Ughoton River. The highest turbidity value was recorded in Ughoton 2 and the lowest in Ughoton 1 (61).

Total suspended solids concentration in Ughoton river was generally higher than maximum limits of <30 mg/L WHO standards. This is evident from the mean of 53.33 mg/L observed in Ughoton River. The highest total suspended solids concentration of 58 was recorded in Ughoton 2 and the lowest total suspended solids concentration of 48 mg/L was recorded in Ughoton 1.

In Table 4, the calculated F-value of 153.463 at 0.05 significant level is greater that the critical F-value of 2.21. It can be concluded that the quality of water from river Iffie is significantly dependent on effluent from the Warri petrochemical company. The effluent (waste water) from the refinery has a significant effect on the water, lives, and economic activities of the people of Iffie and its environs.

POLICY IMPLICATIONS/RECOMMENDATIONS

Based on the findings of this study, the following recommendations are proffered:

1 Warri petrochemical refinery should adhere to remediation policies.

2 Warri petrochemical refinery company should ensure effluent is properly treated before discharge into the river. Federal government agencies responsible for proper discharge of this effluent must monitor them properly without compromise. The government of Delta State must provide pipe born water in these communities and revive the state of water board.

3 There is also the need for rural dwellers to be educated on the danger of using contaminated water, which clearly affects their lives, their health, and their economic (primary) activities.

CONCLUSION

This study has shown that the higher values of metals obtained at the effluent zones implicate the industry adjacent to the area as one of the sources of heavy metals in the river Iffie and Ubeji.

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APPENDIX

Table 1: Physiochemical Characteristics and Some Metals in River Iffie

Parameters	Iffie 1	Iffie 2	Iffie 3	Iffie 4	Iffie 5	Iffie 6	Iffie 7	Iffie 8	Iffie 9	Iffie 10	Mean	Range	
												+	-
pH	6.7	5.59	6.53	6.55	6.21	6.71	6.52	6.5	6.29	6.7	6.53	6.7	6.2
Conductivity	196	85.5	84.5	112	91	177.8	84.1	110	96	178	121.49	196	84
Total Hardness	40.8	41	41.2	40.9	0	32	40	42	48	39	36.49	48	0
Magnesium Hardness	15.8	16.2	16.3	15.9	0	22	17	17	28	9	15.72	16.3	9
Chloride (mg/L)	23.1	23	23.4	23.09	16.89	19.55	22.4	23.01	17	19.12	21.06	23.4	17
Turbidity	109	124	118	76	282	129	116	78	280	130	144.2	28.2	76
Phosphate	3.46	4.43	4.05	2.43	6.48	5.61	5.01	4.98	4.56	5.12	5.61	16.5	2.4
Hydrogen Sulphide (H_2S)	2.89	2.62	2.07	0.19	9.46	0.13	2.11	2.2	1.99	2.5	2.01	3.5	0.13
Total Dissolved Solid (TDS)	98	41.9	41.1	54.6	44.8	87.8	78	50	55.2	49.5	60.09	98	41.1
Total Suspended Solid (TSS)	91	96	98	52	72.8	106	98.4	76	97	94	88.12	106	52
Zinc (mg/L)	0.054	0.041	0.018	0.04	0.023	0.06	0.84	0.03	0.054	0.034	0.043	0.08	0.018
Nickel (mg/L)	0.055	0.014	0.008	0	0.02	0.019	0.021	0.024	0.023	0.026	0.021	0.06	0
Copper (mg/L)	0.29	0.017	0	0	0.001	0	0.014	0.016	0.018	0.017	0.037	0.04	0
Chromium	0.074	0.061	0.078	0.045	0.057	0.045	0.046	0.048	0.058	0.049	0.056	0.08	0.05

Source: Field Survey, 2009.

Table 2: Physiochemical Characteristics and Some Metals in River Ubeji

Parameters	Ubeji 1	Ubeji 2	Ubeji 3	Ubeji 4	Ubeji 5	Ubeji 6	Ubeji 7	Ubeji 8	Ubeji 9	Ubeji 10	Mean	Range	
												+	-
pH	6.5	5.93	5.93	5.96	5.8	6.3	6.9	6.82	5.94	6.87	6.19	6.9	5.8
Conductivity	85.8	57.4	60.8	61.4	60.7	61.6	60.8	59.8	59.3	62.1	62.97	85.8	57.4
Total Hardness	31.7	25	31	31.9	31.1	34.1	3.19	32.9	30.1	30.3	31.1	32.9	25
Magnesium Hardness	22.7	9.8	21	22	20	23	21.1	20.3	19.9	20.6	20.04	23	9.8
Chloride (mg/L)	19.5	10.67	19.5	19.4	16.9	18.2	17.9	19.2	18.6	19.6	17.94	19.6	10.7
Turbidity	115	50	29	87	79	89	99	95	106	110	85.9	115	29
Phosphate	5.62	1.56	2.04	2.92	2.56	2.45	2.67	1.98	2.01	2.1	2.59	5.6	1.6
Hydrogen Sulphide (H_2S)	0.16	0.11	0.18	2.42	0.68	0.59	0.55	0.43	0.4	0.2	0.57	0.68	0.2
Total Dissolved Solid (TDS)	41.6	69.3	28.2	29.5	40.2	39.8	45.7	45.6	45.9	50.3	43.57	50.3	6.9
Total Suspended Solid (TSS)	93	54	20	61	69	70	57	58.4	61	63	60.64	93	20
Zinc (mg/L)	0.017	0.013	0.017	0.025	0.024	0.021	0.029	0.019	0.02	0.023	0.02	0.029	0.02
Nickel (mg/L)	0.029	0.0029	0.019	0.041	0.034	0.028	0.035	0.036	0.032	0.031	0.031	0.036	0.019
Copper (mg/L)	0	0	0	0	0.013	0.017	0.012	0.01	0.011	0.014	0.007	0.017	0
Chromium	0.05	0.043	0.039	0.04	0.053	0.049	0.049	0.051	0.038	0.042	0.045	0.053	0.04

Source: Field Survey, 2009.

Table 3: Physiochemical Characteristics and Some Metals in Ughoton River

PARAMETERS	CONTROL 1	CONTROL 2	CONTROL 3	MEANS	WHO LIMIT
pH	5.31	5.95	5.98	5.74	6.5-9.2
Conductivity	60.1	61.2	62	61.1	500
Total Hardness	41	40	39	40	100
Magnesium Hardness	25	23	21	23	250
Chloride (mg/L)	19.49	19.3	19.48	19.42	250
Turbidity	51	70	68	66.33	5.82
Phosphate	2.52	2.49	2.46	2.49	5.82
Hydrogen Sulphide (H_2S)	1.88	1.98	1.89	1.91	0.1
Total Dissolved Solid (TDS)	30	36.6	40.1	35.56	100
Total Suspended Solid (TSS)	48	58	54	53.33	30.
Zinc (mg/L)	0.041	0.044	0.023	0.036	0.05
Nickel (Mg/L)	0.054	0.045	0.05	0.049	0.61
Copper (Mg/L)	0	0.015	0.041	0.009	0.02
Chromium	0.048	0.043	0.041	0.044	0.05

Source: Field Survey, 2009.

Table 4: Summary of ANOVA Explaining the Quality of Water from the River

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	7693.813	2	3846.906	2.21	0.05
Residual	275.741	11	25.067		
Total	7969.553	13			

a. Predictors (constant) Ubeji, Iffie
b. Dependent variable, Ughoton.