SHADOW ECONOMY, CORUPTION AND ENVIRONMENTAL DEGRADATION: A STUDY OF THE NIGER DELTA REGION – NIGERIA

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Abstract

The paper highlights the interaction between the underground economy, corruption and environmental degradation, focusing on the regional dimensions of the problem in the Niger Delta. It discusses the theoretical approach to underground economic activities and corruption; and explains how these affects the environment. This study also measures the volume of spillage into the creeks as a result of this underground activity in line with Global Best Practice (GBP). Evaluation of the Standard Measure for the Examination of Waste Water (SMEWW) by the American Public Health Association (APHA) was carried out in this study. These methods were used to determine the level of chemical parameters discharged from various points of Bonkery activities to the receiving water bodies (creeks). To this end, the research focused on a flash point (Bassambiri in Nembe Local Government Area) known for bonkery activities. Chemical parameters and heavy metals concentration from the refinery along the discharge system were compared at various points with that of the DPR set standard for waste water discharge into surface waters. To identify the level of significant of pollutants entering into the creek, Principal component analysis (PCA) was used. It was discovered that: three major particles Chemical oxygen dissolved (COD), total suspended solid (TSS) and total oil and grease (TOG) were very high beyond permissible level and biological oxygen demand (BOD) was low; hence not suitable for aquatic life and discouraging agricultural practice which is the main economic activity of Niger Deltans.

Keywords: Oxygen, Gas, Environment, Waste Water, Evaluation. Chemical Parameter.
JEL: 013

Background and Problem Statement

The Niger-Delta area of Nigeria, coincides approximately to the south-south geopolitical zone of the country. Before the discovering of the black gold (crude oil), agriculture was the dominant occupation of the people in the area. Crude oil was discovered in commercial quantity in the area in 1956. Since then exploration and exploitation of crude oil has resulted in environmental degradation, soil impoverishment, pollution, loss of aquatic life and biodiversity. The Niger delta Region of Nigeria is the storehouse of Nigeria‟s crude oil, which accounts for approximately 90% of the country‟s revenue, providing more than 90% of total exports. Despite this, the people remain poor, marginalized and restive. Resort to conflicts has been taken as the only way of expressing grievances in oil-rich communities in the region. The conflict situation has been cause for alarm since 1999 with kidnapping of oil company workers, bombing of oil facilities and confrontation with state law enforcement agents, being common occurrences. These happenings have had serious implications for the economy, as it promote underground economic activities, (Tanzi-Vito 1999).

The Niger Delta is Africa‟s most important oil-producing region, and one of the most polluted places on earth. For decades oil spills have been damaging the environment and devastating lives in this part of Nigeria. Shell and Eni, two of the biggest corporations working in the Niger Delta, say that most oil spills are caused by sabotage and theft, and they are doing all they can to prevent spills and then clean them up afterwards. In 2008 and 2009, two massive oil spills in the fishing town of Bodo had a catastrophic impact. Thick black oil leaked into rivers and creeks for weeks, killing fish and robbing people of their livelihoods. Shell, the operator of the leaking pipelines, repeatedly understated the volume of oil spilled – and offered the community only a paltry amount of compensation ($4000). With the help of Amnesty International, the Bodo community took legal action. Shell admitted it had made false statements about the size of the spills and settled out of court, paying the community £55 million in compensation, (Osoba, 2010).

Since 2014 Eni has reported 820 spills in the Niger Delta, with 26,286 barrels or 4.1 million litres lost. Since 2011, Shell has reported 1,010 spills, with 110,535 barrels or 17.5 million litres lost. That‟s about seven Olympic swimming pools. These are huge numbers, but the reality may be even worse. The companies‟ figures are vastly different to those of the Nigerian government, which recorded 1369 Shell spills and 1659 ENI spills in the same timeframes. The spill volumes are also likely to be inaccurate as our research has shown how the companies underestimate the real amount, Delta-Porta, (2016).

However, the communities have accused the federal government of compromising with oil companies that is why stern measure have not been taken by government to minimize this gruesome spillage of oil into the creeks thus denying the residence of their means of livelihood, IMF Staff Papers. The result of this neglect gives way to Bonkery activities taking place in various parts of Niger Delta region as the indigenes now sees it as the only means for survival. These activities further worsen the state of the environment as oil are spilled without any form of regulation. This then generate into massive level of environmental degradation, hence causing massive level of concentration of physio chemical parameters, (Ndem, Omokaro, & Egbe, 2019).

This study however, seeks to investigate the role of institutions on underground economic activities and how this affects the level of degradation and to determine the volume of spillage measured in terms of physio-chemical parameters such as heavy metal and micro nutrient especially pH, TSS, etc discharged into the creek water contain in spilled oil; and to determine the level permissible by DPR to sustain aquatic life and how to boost economic activities in the Niger Delta Region of Nigeria.

Research Objectives

The following research objectives are stated for the study:

1. To check the effect of corruption on underground economic activities in the Niger Delta Region
2. To investigate how shadow economy affects the level of environmental degradation in the Niger Delta Region
3. To determine the volume of oil spillage (physio-chemical parameters) to standard quality water required by DPR for consumption in the Niger Delta Region

2.1 Conceptual framework of the Study

Conflicts in the Niger Delta started in the early 1990s over tensions between foreign oil corporations and a number of the Niger Delta's minority ethnic groups who felt they were being exploited, particularly the Ogoni and the Ijaw. Ethnic and political unrest has continued throughout the 1990s despite government attempt to curtail this. Competition for oil wealth has fueled violence between ethnic groups, causing the militarization of nearly the entire region by ethnic militia groups, Nigerian military and police forces, notably the Nigerian Mobile Police. The violence has contributed to Nigeria's ongoing energy supply crisis by discouraging foreign investment in new power generation plants in the region, Ostrom, (1996).

From 2004 on, violence also hit the oil industry with piracy and kidnappings. In 2009, a presidential amnesty program accompanied with support and training of ex-militants proved to be a success. Thus until 2011, victims of crimes were fearful of seeking justice for crimes committed against them because of a failure to prosecute those responsible for human rights abuses, Carvalho V. A. & Eduardo, L. 2012. However, Ndem, Egbe and Evoh, (2019) oncludes that The Niger Delta crisis has been a very critical issue in Nigeria, although the underlining factors holding back the peaceful resolution of the Niger Delta conflicts is greed of Nigeria‟s leaders.

3.1 Literature Review:

These are some current related literature connecting to the study:

Carrol, and Howell, (2018) examines the environmental impact of oil exploration and exploitation in Niger Delta of Nigeria using tabular analysis of data obtained from secondary sources. The study finds that the oil industry sited within this region has contributed enormously to the economic growth of the country, but unsustainable oil exploration activities have rendered the Niger Delta region one of the five most severely damaged ecosystems in the World. Nevertheless, Adatia, (2012) assessed oil exploration and spillage in the Niger Delta region of the country, using comparative analysis of secondary data covering periods from 1976 to 2000 on descriptive techniques such as line and bargraphs and found a decrease in oil Effects of oil spills on fish production in the Niger Delta.

Ojimba, (2012) estimates the effects of oil pollution on crop production in Rivers State, Nigeria on a sample of 296 respondents drawn from 17 out of 23 Local Government Areas, applied a stochas-tictrans-log production function in a multi-stage sampling technique. The results indicate that the effect of crude oil pollution on crop farms reduced the size of farmland, significantly at 1%, reducing marginal physical product (MPP), while in non-polluted farms output increased. Physical inputs, crudeoil pollution variables and their interactions show strong negative (diminishing) returns to scale in oil polluted farms, but in non-polluted farmlands result indicate strong positive returns to scale. The technical efficiency results show that less than 22% of crop farmers were over 80% efficient in their use of resources in oil polluted farmlands, while technical efficiency in non-polluted farmlands indicates a high efficiency of 33%. This result indicates that environmental degradation poses a serious threat to farmers by diminishing both physical ability and psychological desires to farm. The goal of farming may be defeated before the proper exercise, especially when the individual has no hope of any compensation when the crops are destroyed, or the waters are polluted, as always, the case in the Niger delta region.

Ndem, Unuaefe, Egbe, (2018); on a research titled "Economic Impacts of Effluent Composition of a Process Industry on the Receiving Environment: A Study of Port Harcourt Refining Company". Effluent variables were carried out using a two way analysis of variance (ANOVA). It was discovered that total oil, grease, and dissolved oxygen were far above permissible limits, hence causing a slow down on economic activities as fishes are being suffocated due to oil content in water; even causing the crops to wither as a result of dust covering the leaves and denying them from photosynthesis.

Association (APHA) (1998).

However, it is difficult to get accurate information about underground (shadow) economic activities because those who engaged in these activities want to remain unidentified. Therefore, there is a very slim agreement about the real size of the underground economy relative to total economy; and any attempts at measurement may be regarded impossible. Though, estimates suggest that the scope of unreported economic activity ranges from 10-15% of total GDP in certain OECD countries to over 60% of total GDP in Nigeria, Transparency International Annual Report 2017.

The measurement of pollution level will be carried out using the following model:
The total suspended solids of the samples were determined using the standard method for water and waste water analysis (APHA 2540D).

4.1 Research Methodology:
This study is going to adopt the principle component analysis (PCA) method to identify and discover the significant pollutants entering into the creeks. Measurement of pollutant variable will be carried out according the standard method of examination of waste water by the American Public Health Association (APHA). And the physiochemical parameters and concentration of heavy metals in the bonkery area will be compared with that of Department of Petroleum Resources (DPR) set limits for waste water discharge, American Public Health

$$\text{Total suspended solid, mg/l} = \frac{A\text{--}B \times M \times 1000}{\text{Volume of sample mg/l}} \quad \text{.........................(Equation 4.1)}$$

Where: A = weight of filter + residue, mg B = weight of filter, mg

Biological oxygen demand represents the amounts of oxygen consumed by bacteria and other microorganisms while they decompose organic matter under aerobic conditions at specified temperature. It is determined using the following equations:

$$BODs = \frac{DOi - DOf}{P} \quad \text{(Equation 4.2)}$$

DOi = initial DO of diluted seeded sample

DOf = final DO of diluted seeded sample

P = diluted factor (volume of waste water/volume of dilution water plus waste water)

The Chemical oxygen demand of the samples was determined by closed reflux, titrimetric method. The procedure followed the modification as suggested in the standard methods for chemical analysis of water and waste water (APHA 5220C).

It is calculated thus:

$$COD\ mg/l = \frac{(A - B) \times N \times 8000}{SV} \quad \text{(Equation 4.3)}$$

Where:

A = Sample titre value B = Blank titre value

N = Normality of the titrant (0.25N) SV = Volume sample used

Oil and grease in water samples was determined following standard procedures of water and waste water analysis method ASTM D3921-09.

It is determined as:

$$\text{Oil and grease concentration in mg/l} = \frac{A_1 - V_1 \times B}{V_2} \quad \text{(Equation 4.4)}$$

$$\text{Petroleum Hydrocarbon} = \frac{A2 \times V1 \times V4 \times B}{V_2 \times V_3} \quad \text{(Equation 4.5)}$$

Where;

A1 = Absorbance value of oil and grease extract A2 = Absorbance value of petroleum hydrocarbon

B = Coefficient of X in the line equation relating absorbance to concentration. V1 = Volume of solvent sample used for extraction 50ml

V2 = Volume of water sample used for extraction as measured in the cylinder for chromatography, 25ml.

V4 = Final diluted volume of petroleum hydrocarbon, 50ml”

Discussion of findings

Mean values of physico-chemical parameters obtained from statistical analysis are shown in figure 5.1 and 5.2

Total suspended solids (TSS).

Total suspended solid levels (Figure 5.1 and 5.2) were above the permissible limit at both the untreated discharge and the creek entry point of discharge. The mean TSS values recorded at these points were 63.00±4.57mg/l and 62.00±2.48mg/l. At the remaining sample stations, observed TSS values were below the permissible limits. Mean Values in these stations ranged from 43.00±1.31mg/l to 21.00±1.57mg/l, with the treated effluent recording the lowest mean value. Statistically using turkeys multiple comparison at ($P<0.05$) showed that the mean values were significant. The higher levels recorded at 1500m downstream of the creek, could be due to persistent discharge of effluent into the creek and it accumulation therein. Turkey‟s multiple comparison at ($P<0.05$) revealed that mean values of refinery effluent and the river water were significantly different which could have been due to higher levels recorded in the river water. At creek entry point of discharge the mean TSS value was higher than the permissible limits. Presence of TSS in limits above those specified, can lead to depletion of oxygen level.

Biological oxygen demand (BOD5)

The mean Biological Oxygen Demand in all the sampling stations as shown ranged from 72.00±3.39(mg/l) to 10.8±0.55(mg/l). Untreated effluent recorded the highest value of Biological Oxygen Demand with mean 72.00±3.39(mg/l) followed by 1500m creek entry, 1000m downstream, creek entry point, observation pond and treated effluent water, with mean values of43.2±2.62(mg/l), 38.4±1.90(mg/l), 36.00±2.35(mg/l), 13.20±(mg/l) and 10.80±0.55(mg/l),
respectively. However, the mean values in all stations were above permissible limit as specified by DPR as can be seen from Figure 5.1 and 5.2; comparison of the mean values were also significant ($P<0.05$) using turkey‟s multiple comparison. This may be as a result of escape of organic matter from the biological treatment plant, and the untreated discharge which flowed into the Observation pond, the most important of which outside the refinery could be the faecal waste deposition into the creek by the surrounding communities

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Chemical Oxygen Demand

The observed mean values for the Chemical Oxygen Demand in all the sampling points ranged from 120.00±(mg/l) to 18.00±(mg/l). Untreated effluent recorded the highest level of Chemical Oxygen Demand with mean value 120.00±(mg/l). At 1500m and 1000m creek entry distance, mean recorded values for COD were 72.00±(mg/l) and 64.00±(mg/l), while creek entry point, observation pond and treated effluent had observed mean values of 60.00±(mg/l), 22.00±(mg/l) and18.00±24.36(mg/l) respectively.

Figure 5.1 generated by the researcher

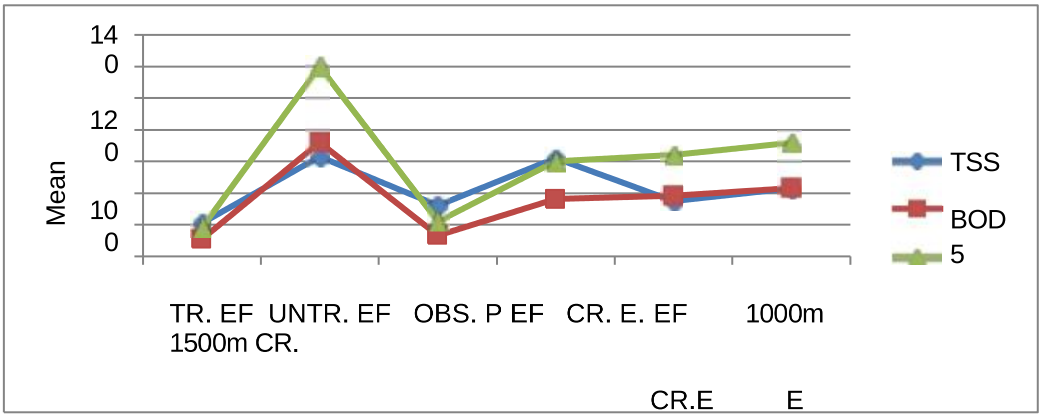

Figure 5.1 Graph showing Mean TSS, BOD5 & COD Values along sample points

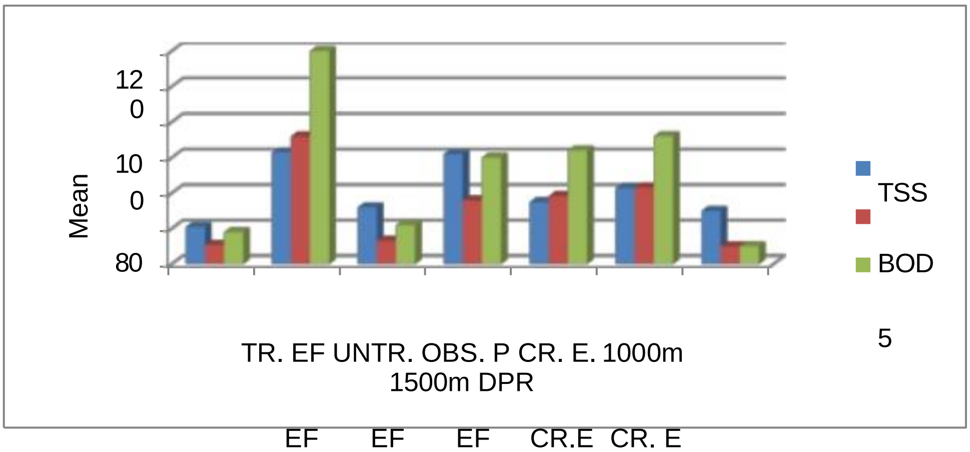

Figure 5.2 Comparing TSS, BOD5 & COD mean values with DPR limits

Figure 3.2 generated by the researcher

Total Oil and Grease

The total oil and grease concentration (TOG) in all the sampling sites in Figure 5.3 ranged from 25.86±0.96 (mg/l) to 0.28±0.30(mg/l). Untreated effluent recorded the highest concentration of oil and grease with mean value 25.86±0.96(mg/l) followed by ~~creek entry point of discharge, 1500m downstream, 1000m downstream, Observation~~

pond effluent and treated effluent water with mean values of 14.03±1.01(mg/l), 3.80±3.00(mg/l), 2.80±0.36(mg/l), 2.04±0.15(mg/l) and 0.28±0.30(mg/l) respectively. On comparing with the DPR permissible limits, it was seen that mean values for Total oil and grease of effluent samples taken from the creek entry point of discharge and untreated effluent water, were above the specified or permissible limits, while the observation pond effluent, treated effluent, 1000m and 1500m creek entry had mean TOG values that were lower than the permissible limits. The lower value of the TOG at 1000m and 1500m creek entry may be attributed to the tidal nature of the creek, which can encourage proper effluent dilution. Rate of biodegradation also depends on the oil concentration and dispersion. At low concentration and high dispersion, micro-organisms are able to break down the oil in the effluent and render it harmless. Turkey‟s multiple comparison at (P<0.05) showed that the values were significantly different. Excess oil and grease reduces the amount of DO (Dissolve Oxygen) which depending on the degree affects both higher aquatic life forms, aerobic microbial activities which are more favourable for oil breakdown, pollution of breeding ground for some species of fish, and deprive these organisms of oxygen. (Koons, 1997).

Figure 5.3 Line graph comparing mean TOG values with DPR limits

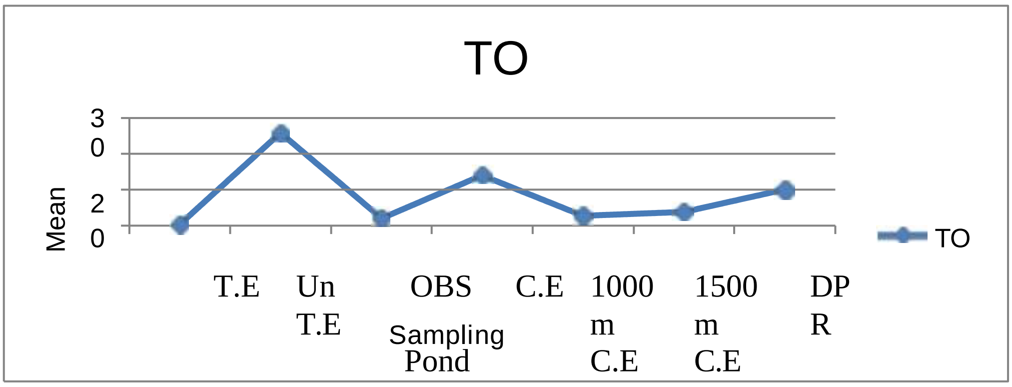

Figure 5.3 generated by the Researcher

This lower value in treated effluent as compared to 1000m and 1500m downstream could be attributed to the presence of degradable organic matter. Decrease in DO concentration could be attributed to breakdown of organic matter by aerobic microbes. The oxygen required for this process is taken from the surrounding water thus reducing its total oxygen content. This may be partly due to the displacement of dissolved oxygen by dissolved solids within the effluent Obire, & Amusan, (2003).

Results obtained for the microbial analysis reveals that the microbial quality of Bassambiri creek is poor and total and faecal coliform pollution is widespread. This implies that the water is not fit for domestic uses or applications without proper treatment. This poor microbial quality of the creek might be due to consistent discharge of bonkery effluent into the creek.

Creek sediment analysis

Results obtained from the physico- chemical analysis at 1000m creek entry and 1500m creek entry are shown in table 4.2 below.

Table 4.2: Physico-Chemical properties of sediments at sample sites

Parameter	1000m Creek Entry	1500m Creek Entry
GPS Location	N04$_{o}$ 45’ 00. 2” E007$_{0}$ 06’ 08.4”	N04$_{0}$ 44’ 55.3” E007$_{0}$ 06’ 10.1”

Physico-chemical			
1	Ph	6.10	5.89
2	TOC (%)	1.80	1.14
Petroleum Hydrocarbons			
3	TPH(mg/Kg)	6.51	11.56
4	PAH (mg/kg)	<0.01	1.28
5	TOG (mg/kg)	15.86	22.38
Nutrients			
6	Phosphate		215.00
7	Sulphate		700.00
8	Nitrate		235.00
Heavy Metals			
9	Iron (mg/kg)	2.85	3.16
10	Copper (mg/kg)	0.10	0.13

Table 4.2: Generated by the researcher

The pH values from the two sampling sites were 6.10 and 5.89 at 1000m creek entry and 1500m creek entry respectively. Total organic carbon values were 1.80% at 1000m creek entry and 1.14% at 1500m creek entry. Sediment at 1000m creek entry had a higher concentration of TPH (total petroleum hydrocarbon) of 11.56mg/kg than TPH at 1000m creek entry. This implies that the TPH increases as the effluent moves downstream. Polycyclic aromatic hydrocarbon (PAH), at 1000 m was undetected while at 1500m PAH value was 1.28 mg/kg, this value was greater than DPR target value of 1. Total oil and grease (TOG) was 15.86 at 1000m creek entry while further down at 1500 m creek entry it was 22.38. This may not be due entirely to the effluent being discharged from the refinery, as residents around the creek deposit some of their household wastes into the stream. Creek entry at 1500m had a higher phosphate concentration of 215mg/kg than 1000m creek entry which recorded a phosphate value of 200mg/kg. Sulphate at both 1000m and 1500m creek entry were of the same value of 700 mg/kg, while nitrate increased from 215mg/kg to 235mg/kg at 1000m and 1500m creek entries respectively. "It is safe to assume that this high level of nitrate and phosphate in the sediment does not emanate from effluent discharge

but probably as a result of poor sanitations and leaches from nearby pit latrines and other industrial waste." (Moughalu. L.N & Omocho V. (2000)). Iron at 1000m creek entry was 2.85mg/kg, while at 1500m creek entry it was 3.16mg/kg. Copper was also detected as 0.10mg/kg and 0.13mg/kg at both 1000m and 1500m downstream. It is important to note that although copper was not found in the effluent water sample, it was detected in the creek sediment. Other metals like Lead, Barium, Arsenic, Cadmium, Zinc and Nickel were undetected in the sediment samples.

Conclusion

It was discovered that Total Suspended Solid (TSS) was above permissible level; thus causing the depletion of oxygen in water within the estuaries. The effects are; most aquatic animal will lost their lives and many others will navigate away from areas of low oxygen availability. Fishermen will be sacked from their means of livelihood. Plants and animals living within this area will be struggling for oxygen thus reducing their life expectancy level. The effect is that there will be massive migration away from the area living behind only adolescence and aged population who cannot drive the economy.

Also Biological Oxygen Demand (BOD) was found to be below permissible level causing escape of organic matter. Of course this will mean lack of soil nutrient and plants within the adjourning area will not survive. Hence, food and other agricultural produce will be scarce; causing hunger and lack of economic activities relating agricultural produce; meanwhile that is the major stay of the economy of the Niger Deltans.

Chemical Oxygen Demand (COD) is seen also to be very high causing biodegradation. Every living organism around the creek may not survive the harsh condition posed by this pollution. It is an extreme weather condition that even higher organism hardly survive. The consequence is that it will be difficult for economic activities to take place in this kind of environment.

From the study, it was also discovered that Total Oil and Grease (TOG) presence in the creek where bonkery activity takes place is very high. Hence water around the creek will be very poor and not fit for domestic use not to talk of drinking. Consequence to this dilemma is a drastic reduction of healthy people living around the creek; as it is certain that there will be constant breakout of diseases such as cholera, dysentery, diarrhea, etc

Recommendations

Due to the findings above, as a result hidden economic activities within Bassambiri community in Nembe Local Government Area, the following recommendations are drawn for policy issues:

1. Government should engage the youth in Niger Delta through skill acquisition training and re-training; because it is only through this that they will be distracted from this underground economic activity.

2. Bonkery activities causes total suspended solid to be above permissible level causing a depletion of oxygen along the estuaries. This activity should be regulated by government through the introduction of maritime police to check mate illicit activities within the creeks.

3. Increase in chemical oxygen demand scares away aquatic animals causing biological oxygen demand to be very low due to escape of marine creatures; further causing low level of aerobic activities, hence poor agricultural output within the creeks. The government should then embark on improved method of agricultural practices and engage the people in it. This will reduce restiveness and improve agricultural output, reduce hunger and creates income and market for the people.

4. The presence of oil and grease in water posed great danger in the health of the people living within the creeks of the Niger Delta area. Hence, it is pertinent for government to provides good drinking water like borehole, build a functioning primary health services to cater for the health need of the people in the Niger Delta.

References

Adatia, A. K. (2012), “Effects of oil exploration and spillage in the Niger Delta region”. Journal of American Public Health Association (APHA) (1998).Standard Methods for the examination of water and waste water, Annual World Bank conference on Development Economics, 1995 (Washington, DC: 20th edition. Washington DC,USA pp. 1244.

Carrol,V., Howell, D., (2018), The environmental impact of oil exploration and exploitation in Niger Delta of Nigeria, Applied Ecology& Environ.Research,3(1):61-72.

Delta-Porta, D. (2000). Social capital, beliefs in government, and political corruption. in disaffected democracies: What’s troubling the trilateral countries? (edn) Economic Journal, Vol. 109, No 456, June 1999, pp. 338-340.

IMF Staff Papers, Vol. 30, No 2, pp. 283-305. Tanzi, Vito (1998), “Corruption around the international journal of applied science and technology Vol. 3No. 4.

Koons,C.B, McAuliffe, C.D & Weiss,F.T. (1997). Environmentalaspects of produced waters from oiland gas extraction operations, offshore and coastal waters, 723-729.

Moughalu. L.N &Omocho V. (2000) Environmental health hazards resulting from Awka Abbatior. African Journal Environ. Studies, 2:72-73

Ndem, B. E., Unuaefe, B. O., Egbe, J. E., (2018), Economic Impacts of Effluent Composition of a Process Industry on the Receiving Environment: A Study of Port Harcourt Refining Company, Economics And Social Sciences Academic Journal, Vol.1, No.6; June- 2019

Ndem, B. E., Egbe J. E. and Evoh, I. A., (2019) Effect of Niger Delta Crises on Crude Oil Production in Nigeria., European Journal of Accounting, Finance and Investment, Vol. 5, No. 9; September-2019; ISSN (3466 – 7037); p

Obire, O., &Amusan, F.O., (2003). "The Environmental Impact of Oilfield Formation Water on a Freshwater Stream in Nigeria", Journal of Applied Sciences and Environmental Management 7 (1) : 61-66. of Discovery and Innovations, 3 (1): 24-31.

Ojimba, T.P., (2012), “Oil pollution and agricultural productivity in the Niger Delta of Nigeria”. Osoba, S. O. (1996) “Corruption in Nigeria: Historical Perspectives”. Review of African

Ostrom, E. (1996), “Incentives, Rules of the Game, and Development”, Proceedings of the Political Economy, vol. 23, No. 69. sustainability projects. Sustainable Development Journal 2012: 20(1):18–27.

Tanzi Vito (1999), “Uses and Abuses of Estimates of the Underground Economy” in The Transparency International Annual Report 2017. World Bank). World: Causes, Consequences, Scope, and Cures”, IMF