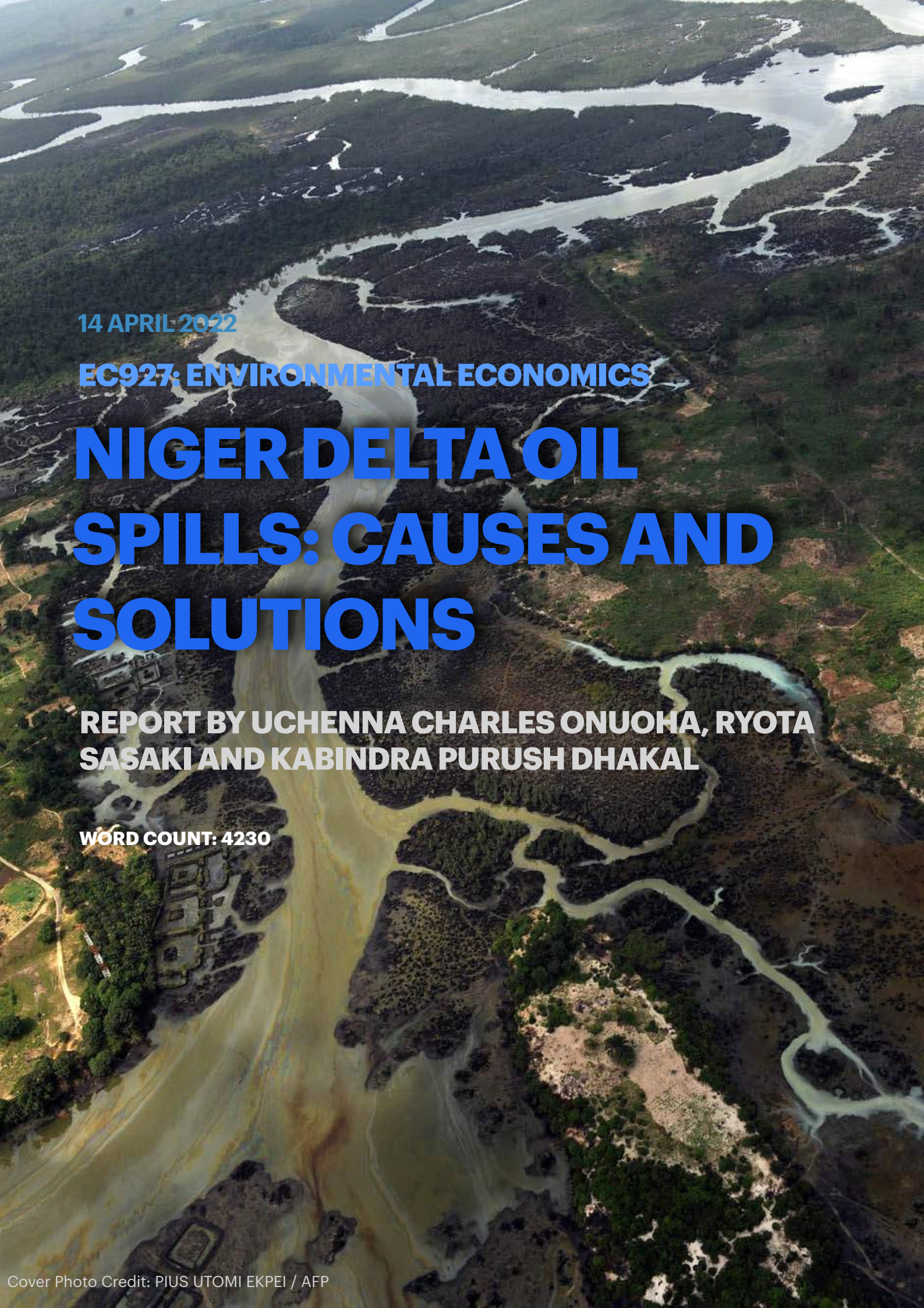

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EC927: ENVIRONMENTAL ECONOMICS

NIGER DELTA OIL SPILLS: CAUSES AND SOLUTIONS

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Introduction

Nigeria, with a population of 206 million, is the most populous country in Africa. Nigeria's gross domestic product (GDP) amounted to US$433 billion in 2020, the highest GDP in the continent (World Bank Data). With a production of 2 million barrels of crude oil per day, the country is also the world's 11th largest oil producer as of 2014.

Since the discovery of oil in 1956, at Olobiri Bayelsa State, the Nigerian economy has been heavily reliant on the export of crude oil. About two-thirds of the entire revenue to the federal government comes from the foreign exchange earnings of the petroleum industry (Reuters, 2020). Thus it comes as no surprise to anyone that the industry is the crown jewel of the nation. However, it is also the highest contributor to environmental destruction in the country. There have been numerous and significant oil spills, and incidents of perpetual gas flaring, in the main production hub in the country, the Niger River Delta Region.

This essay provides a description of one of the pollution problems in the Niger Delta Region. It explains the proximate and fundamental causes of this problem and the policy instruments available, whether currently or in theory, to environmental agencies in the country. Lastly, it prescribes a mix of instruments that can help protect the environment and encourage sustainable production of crude oil in the region.

The problem

On April 20, 2010, the world woke up to the horrifying news of the BP Deepwater Horizon oil spill. Touted as the single biggest oil spill in history, the collapse of an oil drilling rig in the Gulf of Mexico spewed an estimated 4 million barrels of crude into the waters there until the well was capped in July (US EPA, 2022).

This spill deservedly received international mass media coverage, due to the immediate and long-term devastation such a spill can produce. However, there was another crude catastrophe on the opposite side of the South Atlantic that had, and

continues to have, affected human lives and biodiversity but has largely been ignored by the mass media. The Niger Delta oil spills are collectively the worst of their kind in history--far outweighing Deepwater both in the scale of the pollution and the estimated effects.

Figure 1: Image of an oil spill from a well head from November 25, 2021, in Bayelsa, Niger Delta Region. (Photo credit: Temilade Adelaja/ Reuters)

Shell and Eni seem to be the biggest polluters, and both have admitted to underreporting the volume of oil spills in the past (Amnesty, 2022). Yet, even from their official estimates, the magnitude of the oil spills is tremendous. Between 2014 and 2017 alone, Eni reported 820 oil spills, with over 4.1 million liters of crude spilling out (Amnesty, 2022). And, between 2011 and 2017, Shell reported 1,010 spills amounting to 17.5 million liters of oil (Amnesty, 2022). In the same timeframe, the Nigerian

government estimates around 1369 Shell spills and 1659 Eni spills, showing that the magnitude even in this very small period could be much higher (Amnesty, 2022).

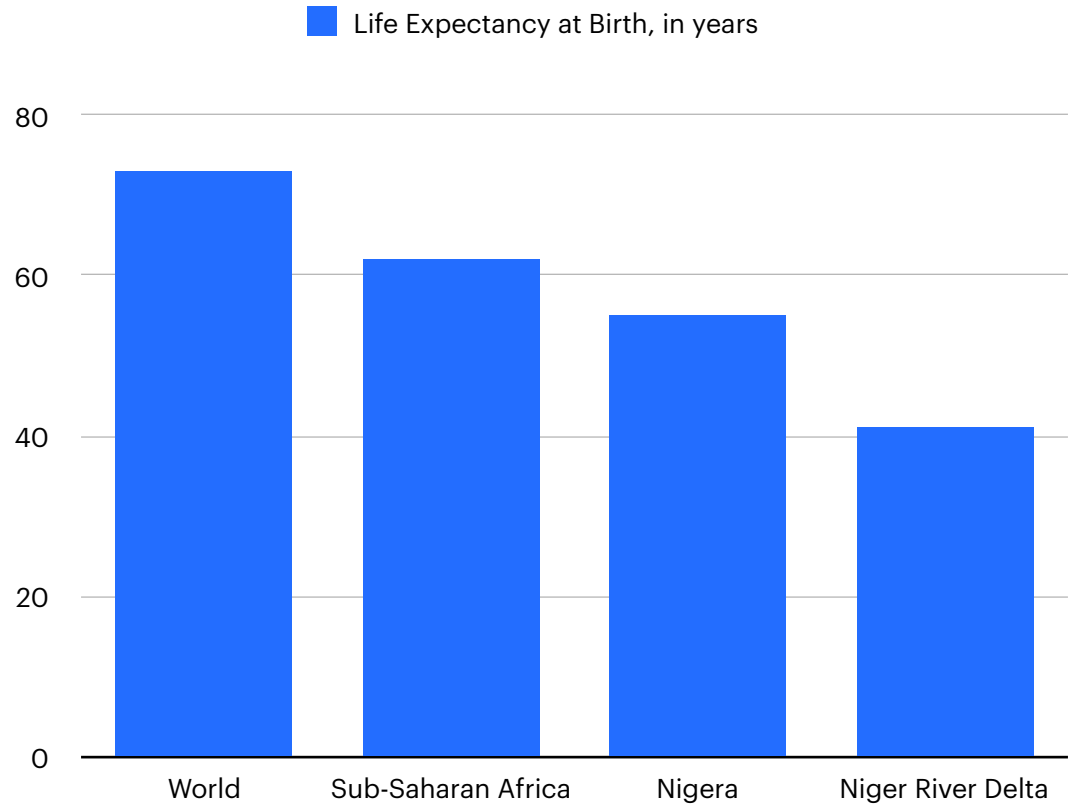
The government, in fact, has estimated 7,000 oil spills in the Niger River Delta area between 1970 and 2000; so, the problems are persistent and have added up (Vidal, 2011). With 606 active oilfields, the constant threat of oil spills has gotten even worse since the 2000s, as eroding pipes have not been replaced (Vidal, 2010).

Figure 2: A fisherwoman shows her hands stained while cleaning up after an oil spill near her home. (Photo credit: Temilade Adelaja/ Reuters)

The problem has gotten so bad, the average lifespan of a person living in the Niger River Delta has fallen in the past two decades to around 40 years, against 55 years for the entire country (Vidal, 2010; World Bank Data, 2020). Figure 3 below shows how this compares the wider region and the world. The Niger River Delta Region has a

significantly lower average lifespan. In fact, the data indicates a 31 year gap between the global average and the region in question. Moreover, a study by Oghenetega, Godson, Okunlola and Ojenbede in the Niger Delta region found a significant link between women having still births and an exposure to high levels of oil; infant deaths were also more likely (Oghenetega, 2020).

Figure 3: Comparison of life expectancies at birth between the global average, the mean in Sub-Saharan Africa, Nigeria and specifically the Niger River Delta Region (Data Source: data.worldbank.org; Vidal, 2010).



Humans are not the only ones affected due to these oil spills. There are chronic and substantial effects on the delta's biodiversity as well (WWF, 2018). Being the third-largest river delta in the world, and the largest in Africa, the area in question provides a unique ecosystem that includes swamps, rainforests, woodlands, and grasslands (WWF, 2018). It is home to one of the largest Mangrove forests in the world that

sustains a complex ecosystem that is in regular contact with salt- as well as fresh-water (Ugochukwu and Ertel, 2012).

A significant challenge in assessing the damage to biodiversity comes from the fact that the oil exploration in the area goes back to 1956, whereas ecological exploration of the area has only ramped up in recent decades (Ugochukwu and Ertel, 2012). However, we are able to assess some damage to this delta region in terms of biodiversity.

A direct effect of the oil spill is water contamination. Not only is the surface water around a spill contaminated, but the oil seeps through the soil in certain parts to mix with groundwater as well; hence drinking water supplies are also polluted (WWF 2020). Oil pollution in water is known to affect oxygen absorption, directly affecting marine life (Ugochukwu and Ertel, 2012). Moreover, soil quality is affected, causing long-term issues with plant health and reforestation (Ugochukwu and Ertel, 2012).

Figures 4&5: Left- Dead fish washed ashore in May 4, 2020 all over the coastline and banks in the Niger Delta Region, although Shell denied any involvement in the incident (Nwakamma, 2020); Right- Mangrove forest in Bayelsa, Niger Delta Region, destroyed by an oil spill (Onyena and Sam, 2019).

The mangrove forests, an important part of coastal defence and disaster risk reduction against weather elements, are also affected by the spills (WWF, 2020). Given their role,

researchers believe “long-lasting tree death or reduced system viability” that can subsequently increase carbon release is a major concern here (WWF, 2020). It doesn’t help that most spills are reported around this mangrove ecosystem. The ability of oil to severely affect plant and animal physiology (both marine or surficial) and its prevalence in this important mangrove ecosystem is a cause of serious concern--one that will continue to hamper biodiversity in the area much after oil exploration ends (Ugochukwu and Ertel, 2012). It is bound to have multiplier effects on human life and on the economy of the region in the long term.

Fundamental causes

Since the oil leakage problem in the Niger Delta began, the Nigerian government has enacted many conservation policies such as the Oil Pipeline Act in 1956, Federal Environmental Protection Agency Act in 1990, and the Harmful Waste Cap in 1990, etc. However, Collins, Ugochukwu, and Ertel (2008) stated that most states and local governments’ institutions in charge of environmental management are deficient in funding, information, analytical capability, trained staff, technical expertise, and other prerequisites needed to implement comprehensive policies and programmes. All these issues are reminiscent of typical institutional failure in governance.

Additionally, they pointed out another institutional failure: an ineffective policy structure. Particularly, they identified that the Federal Environmental Protection Agency (FEPA) Act of 1988 and Environmental Guidelines and Standards for the Petroleum Industry in Nigeria implemented by the Department of Petroleum Resources (DPR) in 1991 overlap with each other in the area of covering the environmental targets. They claimed that these inefficient and complicated situations frequently bring about counterproductive consequences and progress delays. Therefore, the Nigerian government must streamline interactions of each policy to avert duplication of functions as it would help achieve more sophisticated policy enforcement.

Oil spills in the Niger Delta have significantly damaged the diverse aquatic population, agricultural land, manifold biodiversity, and people’s lives. The research by Ordinioha and Brisibe (2013) revealed that oil spills have reduced food security for households by 60% and increased the probability of childhood malnutrition by 24%. Also, for

newborn infants, oil pollution was found to have attributed to 16,000 deaths within the first few months of life in 2012 (Ratcliffe, 2019). Despite these devastating outcomes, these negative externalities have not been compensated properly in the market.

Since the consequences of oil spills are non-excludable and non-rivalrous, a public bad exists in the market. There is no clear national definition of property rights for rural areas where these spills occur. Since the oil companies operating in the country are domiciled in foreign countries, the national courts have a murky interpretation of rights and liability. These conditions indicate a failure in oil production in Nigeria.

Proximate causes

The direct cause of the oil spills in the Niger Delta can be attributed to several factors. An investigative report by Hinsch (2019) estimates that 50% of the spills in this region are caused by pipeline and tanker accidents, 28% by sabotage activities of locals, 21% by oil production operations, and 1% by inadequate production equipment. These direct causes were assented to by Mba et al., (2019).

As far back as 1999, Manby (1999) illustrated the effect of corroding pipelines in the Delta in a Human Rights Watch publication. He estimated that pipelines with estimated lifetimes of 15 years were still in operation 25 years later. Shell Petroleum Development Company (SPDC), a subsidiary of Shell Inc., reported replacing old pipelines and reducing oil spills by 37% in 1998 when compared to 1995. This replacement involved burying pipelines that 15 years later, given the topography of the Delta, would have corroded, surfaced, and expunged their contents.

In a landmark case that was settled out of court, the Court of Appeal in The Hague ruled that SPDC was responsible for 66 percent of pipeline leaks covered by the lawsuit (Vetter, 2021). What's more, the parent company, Royal Dutch Shell, was found to have violated its duty of care (Vetter, 2021). This judgment once more directly implicated the negligent actions of "Big Oil" as the major cause of oil pollution in the Delta.

Another direct cause of these catastrophic spills is oil companies' slow response time. Amnesty International (2018) reported that it took Eni 430 days to respond to an oil

spill from one of its pipelines. Shell responded within 24 hours. This negligent maintenance attitude causes oil spills to continue for months.

Policies at hand

The current regulatory framework and environmental protection agencies

To protect the environment, successive Nigerian governments have created several environmental agencies since the 1990s. The Federal Ministry of Environment (FME) was established in 1999 with a mandate to ensure environmental protection and natural resources conservation. Within this Ministry, the National Oil Spill Detection and Response Agency (NOSDRA) was established in 2006 and tasked with the responsibility of monitoring and responding to oil spill disasters in the country. This agency has the mandate, being established by an Act of Parliament, to ensure industry compliance with the legal framework of the country relating to environmental issues.

NOSDRA currently relies on the "voluntary engagement and support" of the oil firms to provide "data, logistics, quantity estimates, soil/water samples, and cleanup operations" (Nigerian Oil Spill Monitor, 2021). While NOSDRA is the primary agency for oil spills, other departments have overlapping powers, such as the Department of Petroleum Resources (DPR), several State Ministries of Environment, and the National Maritime Authority (NMA). This arrangement represents duplicity of functions, increased expenditure of national allocations, and delay in enforcement, a sign of weakened institutions. Finally, the "Clean Nigeria Associates" is an umbrella through which the Oil companies tackle significant oil spills (Nwilo and Badejo, 2005).

In addition to the above, several regulatory frameworks address oil pollution Atanda (2015). They include;

- The Constitution of the Federal Republic of Nigeria - 1999 - addresses human and natural resources exploitation.

- Oil in Navigable Water Act - 1968 - addresses the discharge of oil from ships.

- Petroleum (Drilling and Production) Regulations - 1969 - address oil prospecting licenses in the event of oil pollution

- Associated Gas Re-injection Act - 1979 - addresses gas flaring by oil companies

- National Enforcement Standards and Regulation Enforcement Agency Act (NESREA) - 2007 - responsible for enforcing environmental policies.

Refer to Table 1 below. It provides a snapshot of the major policy options available to the various agencies in Nigeria tasked with environmental protection with regard to mitigating and prosecuting perpetrators of oil spills. However, as the laws and agencies overlap in function and enforcement, it results in unclearly defined property rights, poorly funded institutions, and even cases of regulatory capture by the oil companies.

Perhaps with the passing of the NOSDRA Amendment Draft Bill in 2018, which changed the name of the agency to the National Oil Pollution Management Agency (NOPMA) and gave stronger directions and a larger budget, we may have been able to see more effective control of the oil spills. However, as the president of the country has refused to sign the amendment, it lies in limbo (Ibunge, 2021). It seems the cabinet fears the reduction of ministerial powers (Ibunge, 2021).

Moreover, even if it were to pass, competing agencies such as the Department of Petroleum Services (DPR) do still exist; hence, current challenges may persist in the future. However, one powerful environmental agency with the right set of instruments is what the Niger Delta needed, and NOPMA can fill this gap.

Table 1: Policies and actions currently available to environmental protection agencies in Nigeria, with regards to oil spills

Policy / Action	**Year Launched**	**Policy Type**	**Responsibility of**	**Remarks**
Launch of military Joint Task Force (JTP)	2008	Military coordination between the army, navy, and paramilitary agencies, specifically created to target oils thieves and saboteurs, to reduce "oil bunkering"	Central government, through the Defence Ministry	- Created to reduce "oil bunkering", which is a minor cause of oil spills after oil companies failure to react and infrastructure issues. - However, has seen mixed results. - Although arrests, seizures, and sabotage of illegal refineries have been made, the oil theft continues (Boris 2015). - Recently, militants in the Niger Delta have accused the JTP of being complicit in bunkering (Ebiri and Jimoh 2018).
Amnesty to oil thieves and militants	2009	Incentive to be forgiven for past crimes	Central government	- Launched by Yar Adua administration, the president's death the same year virtually stopped the programme (Boris 2015). - Results unknown.
Arming of the Nigeria Security and Civil Defence Corps (NSCDC)	2009-2013	Offensive and policing	Central government	- An alternative to the police force, the NSCDC was given greater power and armed to protect oil pipelines from tampering (Boris 2015). - While there are not many reports on their working since, the continuation of oil spills from the pipelines means they haven't been effective. - Alternatively, if the NSCDC has been effective in stopping tampering, it lends greater credibility to the reports of poor infrastructure and neglect by oil companies fueling most spills.
Environment Impact Assessment Decree No. 86	1992	Impact assessment as a barrier to entry	Central government through the Ministry of Environment	- Created in response to oil spills and requires future oil exploration and transportation to conduct Environmental Impact Assessments before regulatory approval. - Due to overlaps with jurisdiction and misinterpretations of guidelines, do have not really worked (Echefu and Akpofure 2002). - A case study of the policy instrument calls it "a waste of resources, financially and materially" due to "serious bottlenecks and bureaucratic confusion" (Echefu and Akpofure 2002).

Environmental Guidelines and Standards for the Petroleum Industry In Nigeria (EGASPIN)	1991; revised in 2002 and 2006	- Command and control for oil transport (including oil pipelines) - Command and control, trading rights for pollution and impact assessments for other projects, such as gas flaring or oil drilling	Central government through the Department of Petroleum Resources	- The guidelines seem to be more focused on gas flaring and air pollution. - Scope of command and control in oil spills is limited, even after 2006 revisions (IEA 2022). - Review by IUCN lauds strict definition of pollution sources, including oil spills, and outlined limitations and prohibitions (Olawuyi and Tubodenyefa 2018). - However, the review also criticises the lack of implementation that continues to allow pollution to continue unabated (Olawuyi and Tubodenyefa 2018).
Merchant Shipping (Oil Pollution Preparedness, Response And Co-Operation Convention) Regulations	2012	- Command and control policy that specifies the type and number of safety boats, stockpiles of dispersants, and reporting standards related to oil spills in ships and ports within Nigerian waters - Also covers regulations for other pollutants	Nigerian Maritime Administration and Safety Agency (NIMASA), which reports to the Ministry of Transport	- Law reviews have analysed this regulation as being comprehensive and functional (Abedoyin 2021). - Clearly defined penalties for ships and ports that pollute. - However, in our case, this does not solve the pollution problem, as most oil spills have come from pipeline leaks and wells, not from ships and ports.
National Oil Spill Detection and Response Agency (NOSDRA) establishment	2006	- Agency created specifically to address the question of oil spills, focusing on compliance to international regulations	Central government through the Ministry of Environment	- NOSDRA was created to adhere to the guidelines of the International Convention on Oil Pollution Preparedness, Response and Cooperation, which Nigeria has endorsed. - The agency lacks teeth and is bottlenecked by competing agencies such as the DPR.
NOSDRA Amendment Draft Bill to change the agency to National Oil Pollution Management Agency (NOPMA)	2018 (passed through the legislature but as of 2021 has not been signed by the president)	- Command and control instruments to control the level of oil spill - Has the power to address and punish third-party oil spillers (such as thieves and vandals) - Can inspect plant and pipeline decommissioning, and enforce penalties and fines - Can assess and analyse all levels of oil spills (local, national, and international) and identify responses and budgetary needs	Ministry of Environment	- NOPMA has the power that NOSDRA was envisioned for. - Instruments look promising. - Increased budget to compensate locals while being able to punish thieves and vandals can strengthen cases against oil companies for all cases not related to third parties. - Power to assess and investigate oil spills is welcome, but the work might still clash with competing agencies and policies. - Even though the amendment passed through the Nigerian Senate passed the amendment in 2018, the President refused to sign it citing “perceived reduced powers of the petroleum minister and extra economic burden on the oil sector” (Ibunge 2021).

Other Policy Options Available in Principle to EPAs

Trading Pollution Rights: Carbon trading is a mechanism through which a government or a responsible authority allocates emissions (pollution) credits to firms operating in an industry. This is done in an attempt to reach an emissions target that the authority deems to be socially optimum. These credits are permitted to be traded among firms. Subsequently, the total number of credits can be decreased in order to facilitate firms to shift to cleaner production. The same process can be applied to the oil spill problems in Nigeria. If the government sets a limit on the volume of oil spills that can occur in the country and distributes credits to oil-producing firms, firms are obliged to keep oil spill incidences and volume within the given credit limit. As the idea is based on carbon trading, these oil spill credits can be traded among firms. By decreasing the total published credits, the government can gradually solve the oil spill problem. With the added powers to NOPMA (see Table 1), spill numbers and volumes could be tracked and allocated to the perpetrator.

Tax Incentive (Decrease): To incentivise oil companies to reduce oil spills and clean up environmental disasters, the government can decrease the tax rate levied. According to the Petroleum Profit Tax (PPT) Act, oil companies pay taxes of 50% (Production Sharing Contracts), 65.75% (Joint Ventures), and 85% (Non-Production Sharing Contracts) of profits to the federal government (PwC Nigeria, 2022).

An incentive system can be developed to reduce the proportion of taxes if and only if companies do not spill crude over a financial year. The system can even reduce tax rates further if companies take the initiative to clean up and restore the environment in the Niger Delta. This is purely an incentive-based system to influence the behaviour of "Big Oil" corporations. Of course, consideration has to be given to the Marginal Abatement Costs (MAC) of such a clean-up against the added profits realised through the incentive.

Tax Incentive (Increase): Another policy could be to tax oil spills directly. This is similar to the carbon pricing mechanism. Taxing oil spills according to the volume spilt gives a direct incentive for firms to invest in reducing such occurrences--or a disincentive to ignore them once occurred, as they have in the past. For example, if

the oil spill pricing was set as $X per barrel, firms are incentivised to put money into stopping oil spills until the costs of doing so reach $X. The government will increase the oil spill price gradually and it leads to further investments to stop oil spills.

Changing the production quota: Nigeria is a member of the Organisation of Petroleum Exporting Countries (OPEC) which sets a production quota for member countries. Oil firms strive only to meet the distributed quota given by the government. The problem is that the volume of oil spilt does not count towards the companies' quotas. As the MAC of dealing with oil spills is greater than the operational costs of production, firms do not have any financial incentives to reduce pollution.

Thus, the potential policy intervention could be to require firms to count the volume of oil spilt in their production quotas. If this regulation was implemented, firms would lose their expected revenue from selling crude oil due to letting oil spills happen. It naturally motivates firms to stop oil spills to maintain their prospective income. The government's interests here align with the companies' as OPEC quotas must be met. Therefore, both surveillance by the government agencies and the risk mitigation procedures of the oil companies should increase.

Explicit Law Defining Property Rights: Given the incomplete and murky nature of environmental laws in Nigeria, another proposal is the introduction of a comprehensive property rights legislature surrounding oil production. For example, international oil companies cannot be held responsible for negligence within the national judiciary system. Most of the court cases involving these companies are adjudicated in the country where the company is domiciled or by the International Court of Justice (ICJ). This process can take years and cost significant resources that locals do not have. By clarifying the rights of locals in the Niger Delta to hold oil companies accountable for their actions domestically, some of the negative externalities of their actions can be internalised. One possible regulation within the legislature could be for the oil companies--for production and transport--to be registered entities domiciled within the country.

Recommendation: A policy mix to mitigate oil spills by companies

It is clear that there are a host of issues plaguing effective control of the problem at hand. The companies seem apathetic to the spills, mainly because it does not affect production quotas and it is difficult to hold them accountable. At the same time, the Nigerian government seems reluctant to increase budgetary allocations while giving up ministerial control. However, a strategic mix of policy measures, discussed shortly, may solve the problem and align all parties' interests towards mitigating oil spills.

Policy 1: Petroleum Industry Domestic Culpability Act

In 2021, Royal Dutch Shell's media release showed plans to transition to a net-zero energy business plan. Royal Dutch Shell is the parent company of the Shell Petroleum Development Company operating in Nigeria (Shell, 2021). The story was similar for Chevron, where they too have released a roadmap for advancing a lower carbon future (Chevron, 2021). On the other hand, the United Nations in 2011 concluded that "it would take 30 years to clear up the vast amounts of pollution in the Niger Delta" (Khalid, 2021).

After decades of legal battle, Britain's highest court ruled that the Royal Dutch Shell can be held responsible for oil spills by its subsidiaries (Croft, Raval and Munshi, 2021). However, such a case will have to be tried in Britain. This makes it cumbersome and expensive for ordinary citizens and citizens' groups affected by these oil spills in the delta region to exercise their rights through the judicial process.

While Big Oil continues to spin stories of going green to the world, its subsidiaries in the Niger Delta continue to devastate the environment. This is because, legally, subsidiaries are very different from parent companies. This gives rise to our first policy proposition.

To correct this market failure, we propose a bill to clarify property rights and hold both parent companies and their operating subsidiaries culpable for oil pollution. Comprehensive legislation on culpability on home (Nigerian) soil that all operating oil companies must agree to before they can commence operations will help ensure that such rights are upheld and will incentivise a behavioural change.

By encouraging property rights, institutions can facilitate greater social responsibility in making choices and decisions (Perman et al., 2013). We will analyse the effectiveness of this policy using the framework enumerated in Table 2 below.

Table 2: Property Rights Policy Evaluation in the Context of the Niger Delta Oil Spill Pollution

No.	Criterion	Remarks
1	Cost-Effectiveness	- This is a cost-effective approach to incentivise behaviour among oil operating firms. The cost of enacting legislature will include the direct and indirect costs of writing a bill and presenting it before parliament for approval. Subsequently, oil companies can either choose to comply with the rules contained in the law or cease operations in the country. - For victims, like local communities and the government, the cost of legislation is reduced. The cost of running cases on home soil will be lower than chasing such cases in the UK or at the Hague.
2	Long-Run Effects	- In the long run, this policy will facilitate bargaining because affected residents are able to seek compensation through the judicial system. Companies will have to weigh the cost of settlements vs the cost of clean-up activities.
3	Dynamic Efficiency	- This proposed legislation will ensure continuous incentives for both old and new companies to continuously improve the maintenance of pipelines while implementing capable spill-prevention systems.
4	Flexibility	- A significant downside to most laws is that once implemented, they become quite difficult or cumbersome to amend.
5	Dependability	- A property rights law for pollution reduction is dependable because it serves as a foundation for future judiciary rulings.

Our proposed piece of legislature is a Command and Control (CAC) policy instrument. While this approach does have many advantages as specified above, there are always

shortcomings such as loopholes in the law that can be exploited. As such, we are mixing this proposal with an incentive-based policy instrument to help reduce oil pollution in the region.

Policy 2: Taxing oil spills to change firm behaviour

Perman et al., (2013) stated that market-based incentives are more cost-efficient than regulation and control for three reasons. First, markets are efficient in processing information; second, market instruments eventually bring about pollution control in the least costly way; and third, market-based measures produce dynamic gains in the course of time to their incentive patterns. The next policy in tackling oil spills in Nigeria can be an economic incentive measure. One of the major instruments in the incentive-based policy instruments is emission charges/taxes.

Carbon pricing is a fundamental policy instrument for reducing GHGs emissions. Carbon pricing is a system by which a cost is imposed per unit of emission in a specified area. We will adopt a similar approach for oil pollution as well. We mentioned in the section covering proximate causes that old, eroding pipelines and firms' hesitancy to maintain or replace them was a major issue.

Through this approach, oil companies operating in the region will rationalise the tradeoff between the operating cost of maintenance, monitoring and replacement versus the cost of an oil spill tax. The price set per barrel of oil spilt is the determining factor for this approach.

Each oil firm operating in Nigeria has data (whether estimated or factual) about the volume of oil spilt. The mandate of NOSDRA/NOPMA (if the amendments mentioned in Table 1 are signed into law by the president) also covers investigating such spills and estimating the oil loss. By utilising such data, an oil spill tax can be levied on each responsible company. This incentivises oil companies to perform a cost-benefit analysis on the cost of mitigation vs the estimated price of such a tax. This will encourage them to invest in proper maintenance and risk management to reduce their overheads.

A shortcoming of this policy is that firms are not held responsible retrospectively for previous spills. However, the government can employ funds generated from this tax to clean up previously affected ecosystems.

The taxes that the government collects from oil spill pricing can be regarded as a transition tax. This means these taxes can be used to improve other social issues. In this case, the tax should particularly be used for the areas that have been polluted by oil spills. Therefore, as long as these collected taxes are used properly, the oil spill pricing generates ancillary benefits, specifically double dividends.

Conclusion

The devastation that oil spills have caused in the Niger Delta is vast and barely quantifiable. Yet, this essay has made an attempt to summarise the magnitude of the issues and their causes. Further, it has analysed the policy options currently at the disposal of various agencies in Nigeria, and proposed others that are in principle applicable to the oil spill problem.

The authors have gone on to propose two policies that should alleviate the oil spills while paying for clean up programmes and other community benefits. Certainly, the first policy will make it more cost-effective for the locals and central or provincial governments to pursue legal measures within the country should the second policy fail.

However, both policies rely on oil spills being found out when they occur. They also rely on accurate measurements of the volume of the spill every time. For this, the implementation of the amendments to the NOSDRA Act (as mentioned in Table 1), becomes imperative. The Nigerian central government must assess the long term benefits of oil spill mitigation and be ready to give up some ministerial powers to accommodate the transition of NOSDRA to NOPMA.

The removal of the scope to address oil spills from competing agencies, such as the DPR, would not only free up the budget but also effectively remove the bottlenecks and overlaps the multiple agencies currently experience. This streamlining of the

environmental protection agencies could then be taken as a third policy instrument that effectively ties the other two together.

Lastly, it must be said that this essay reports and analyses the effects, causes and policies of the oil spill problem in the Niger River Delta Region. There are, however, other issues that may have similar impacts in scope and scale--such as gas flaring (Ugochukwu and Ertel 2012). Further study on these other pollution sources is a must before these policies are implemented, as their inclusion might warrant further changes.

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