



SDN

2018 Nigerian oil industry environmental performance index



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SDN supports those affected by the extractives industry and weak governance. We work with communities and engage with governments, companies and other stakeholders to ensure the promotion and protection of human rights, including the right to a healthy environment. Our work currently focuses on the Niger Delta.

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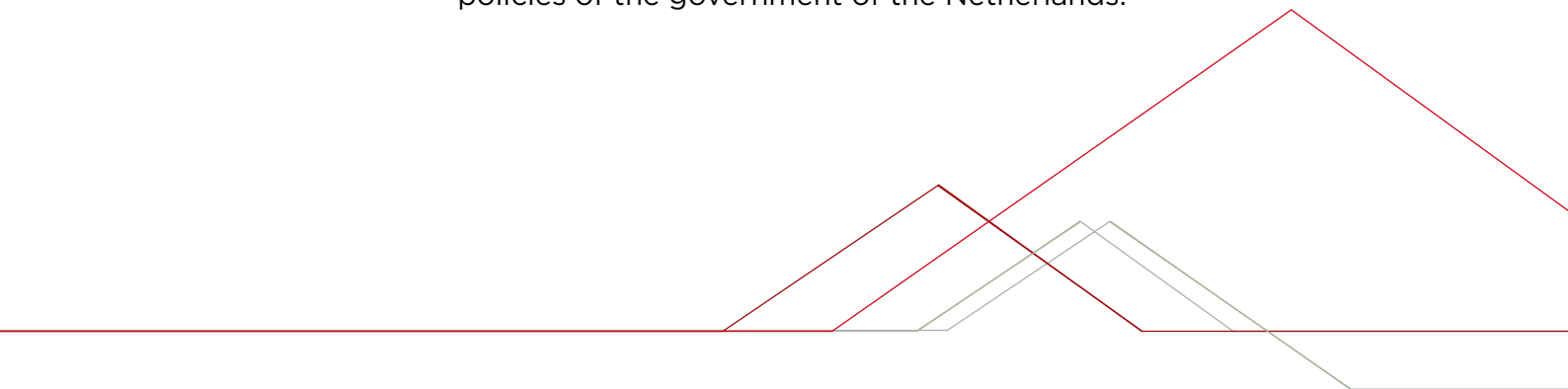
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Disclaimer

The analysis in this report is indicative and based on publicly available data. The environmental performance index (the Index) and Index methodology, which we have published online, were independently reviewed by relevant peer organisations, and are based on good-faith assumptions and calculations. We welcome new data and information on environmental emissions in the Niger Delta. We also welcome suggestions for how this work could be improved. We will aim to update our future analysis accordingly.

Note that we have, in general, used shortened versions of oil company group titles for readability, but the discussion of each company here relates solely to its Nigerian entity or entities.

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Executive summary

This report provides a comparative assessment of the environmental performance of 43 oil companies operating in Nigeria in 2018. This is the first environmental performance index (the Index) by SDN. It is based on the amount of oil spilled and gas flared (burnt off) by each company in the Niger Delta states of Abia, Akwa Ibom, Bayelsa, Edo, Delta, Imo, and Rivers. This data is sourced from the environmental monitoring tools of the Nigerian National Oil Spill Detection and Response Agency (NOSDRA).

Key messages:

- In total, a minimum of 25,308 barrels of oil and other potential contaminants are estimated to have been spilled in the Niger Delta in 2018, in 617 incidents. The average spill size was 41 barrels, or more than 6,500 litres, of oil. More than a quarter of all known oil spilled in 2018 was spilled in two Local Government Areas—Warri South-West, in Delta State, and Abua-Odual, in Rivers State.
- Oil companies operating in Nigeria flared an estimated 440 billion cubic feet of gas in 2018. This is equivalent to a quarter of Nigeria's 2017 CO₂ emissions, or more than the entire emissions of Ghana in the same year.
- In absolute terms, the highest oil spill and gas flare emissions tended to be generated by major international oil companies, as well as the state-owned oil company, the Nigerian National Petroleum Corporation (NNPC). This is unsurprising, as they also tend to have higher production volumes.
- Consequently, a small number of companies were responsible for the majority of emissions: 92% of recorded oil spilled is attributable to five companies (Aiteo, NAOOC, Heritage, NNPC, and Shell), while 50% of gas flared is attributable to only two companies, ExxonMobil and NNPC.
- However, local operators tended to have higher emissions relative to the volume of oil they produced. The Nigerian companies Express Petroleum and Summit Oil generated the highest emissions per barrel of oil produced.
- Overall, the Nigerian oil industry compares poorly with other oil industries. Placing data on Nigerian environmental emissions against the data from elsewhere makes clear that the amount of oil spilled and gas flared by the Nigerian oil industry is far higher, on a per-unit basis, than the African and global average.
- There are major discrepancies among data sources on Nigerian oil issues. Comparing news reports on specific oil spill incidents with official data on the same incidents demonstrates, for example, that there are challenges in confirming their size. Similarly, one NNPC publication reports a total figure of more than 76,000 barrels of “pipeline crude oil loss” for 2018, without further explanation. This is three times as high as the data from NOSDRA's Oil Spill Monitor (OSM), the source of data for this report. There are also differences in gas flare volumes. As such, our analysis is indicative only, but our working assumption is that the true extent of the release of potentially harmful substances into the Niger Delta's natural environment is much higher.
- To develop a clearer picture of industry-related emissions in Nigeria, greater transparency from government and industry is needed. This should include, for example, oil companies publishing their own annual account oil spills and other emissions, disaggregated by location, type of loss, volume, reported cause, and with a detailed description of impact, as a minimum. Publishing this data would help inform action to address environmental concerns and build mutual trust and accountability among all oil industry stakeholders.

Our work aims to minimise the negative impact of the exploitation of Nigeria's oil, and in publishing this report, we seek to increase understanding and access to information on the environmental performance of the oil industry in the region. We aim to enable constructive engagement on the policy solutions needed to minimise the negative impact of oil exploration and production, and ensure its benefits are distributed fairly—and ultimately harnessed to enable Nigeria's transition to clean energy.

This should be a key goal for everyone working for a peaceful, prosperous Niger Delta. It is particularly important because our analysis indicates that despite decades of concern over pollution in the Niger Delta, not enough progress has been made in preventing or addressing it. More than four million litres of oil were spilled in 2018, which in addition to a legacy of unresolved historic incidents means the region remains an ecological disaster zone.

Meanwhile, new spills, and ongoing gas flaring, mean further contamination of land, air and water. The impact on human health and livelihoods is devastating, and with Nigeria intending to increase oil production by a third in the coming years, it may get worse. The industry is also a major contributor to climate change.

Our Index provides a standardised comparison of the environmental performance of oil companies operating in the Niger Delta. It does this by calculating a score for five indicators related to the emissions each company produced in 2018: specifically, oil spilled and gas flared (burnt off as a by-product of oil production).^{*} The first four indicators relate to:

- The total volume of oil spilled by each company.
- The number of oil spills attributable to each.
- The amount of oil (if any) which was later removed from these spills.
- The volume of gas flared.

The fifth indicator is an emissions ratio: the amount of oil that each company spilled, and the gas it flared, in proportion to the total amount of useful crude oil it produced. Some companies did not produce oil in 2018, but do have oil spills or gas flaring attributed to them. This may be, for example, because they engaged in oil exploration but not production activity. We have produced different versions of the Index to take these factors into account. They are included in the database on which the Index is based. This is published online.

According to the data we used, all but one of the 43 companies discussed in this report flared at least some gas in 2018—which, if not explicitly authorised, has been prohibited in Nigeria for decades—while 18 companies were responsible for at least one oil spill. There are significant differences among these. For example, more than 92% of the total volume spilled can be attributed to just five operators: Aiteo, Heritage, NAOC, NNPC, and Shell.

The numbers above are absolute, which is significant, because regardless of the size of their operations, oil companies should be aiming to reduce their potentially harmful emissions to zero, or as close as possible. However, it is important to recognise the differences in progress towards that goal. This is why we calculate the fifth, relative indicator. This reveals that in relative terms, the Nigerian companies Express Petroleum and Summit Oil are the worst environmental performers.

^{*}2018 is the latest year for which all relevant data is available.

There will be many reasons for the differences in company performance, which we are unable to investigate here. But we do aim to draw attention to the continuing pollution of one of the world's largest natural wetlands, which is also home to 30 million people. NOSDRA's definition of a minor spill, in inland waters, is up to 25 barrels. There were at least 95 spills with a minimum estimated size of 25 barrels in 2018, which is equivalent to nearly 4,000 litres—easily enough to poison the water source for an entire community. The potential impact of 95 such spills is clear. Furthermore, the data is incomplete. It is unclear whether NOSDRA is able to reach every oil spill site, and the data available on offshore spills is nominal. As such, the actual volume of oil spilled in 2018 may be much higher.

Meanwhile, Nigeria continues to flare a huge quantity of gas. This has been linked to respiratory and other health problems, while the estimated volume of gas flared in Nigeria in 2018 released 25 million tonnes of carbon dioxide into the atmosphere. This is equivalent to more than a quarter of Nigeria's 2017 emissions. In addition, as in other oil industries, there is almost certainly methane leakage from Nigeria's oil industry infrastructure, the greenhouse effect of which is significantly more potent than carbon dioxide. As Nigeria aims to increase its oil production, so it will need to consider how these factors relate to the commitments it has made under the Paris Accords, to which it is a signatory.

Overall, the Nigerian oil sector currently produces around two million barrels of oil per day. Given this, the volume of oil spilled, in particular, may seem relatively small. But oil spills and gas flaring are the source of an ongoing public health and environmental emergency in the Niger Delta. Moreover, this has been the case for as long as the industry is old, with decades of legacy spills still not having been cleaned up. The lack of action to address these—or prevent further environmental damage—is unacceptable. It is a violation of the right of Nigerians to a healthy environment, and a major source of grievance in the region.

It is also clear that the environmental performance of the Nigerian oil industry as a whole does not compare favourably with oil industry performance elsewhere. With the Nigerian government seeking the aggressive expansion of the industry, there are difficult policy questions to grapple with relating to Nigeria's economic dependency on oil, the local impact, and the climate change implications of the industry as a whole. But it is clear that in terms of the Niger Delta, Nigeria's oil can be exploited in a more socially and environmentally responsible manner.

As such, we call on the Nigerian Federal Government and national and international oil companies operating in the region, as well as civil society, to approach this issue with renewed focus. NNPC, which is ultimately involved in the production of almost all Nigerian oil through its partnership agreements with local and other companies, has made clear its objective to increase total industry production to three million barrels per day by 2023. Our objective is to ensure that if this does happen, it is not at the expense of the human and environmental health of the Niger Delta.

Note that as part of this research we consulted with key stakeholders on draft versions of this report. These included representatives of oil companies, NOSDRA, and other civil society organisations. We would like to thank these groups for the contributions they made, which informed changes we made to the report. We discuss the feedback provided in the Annex, and will aim to incorporate other changes into future versions of the Index.

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Abbreviations and acronyms

bbl	Barrel(s) of oil
BOE	Barrel of oil equivalent
DPR	Department of Petroleum Resources
GFT	Gas Flare Tracker
HYPREP	Hydrocarbon Pollution Remediation Project
LGA	Local Government Area
mscf	Thousand standard cubic feet
NGFCP	Nigerian Gas Flare Commercialization Plan
NOGIAR	Nigerian Oil and Gas Industry Annual Report
NOSDRA	National Oil Spill Detection and Response Agency
OML	Oil Mining Lease
OPL	Oil Prospecting License
OSM	Oil Spill Monitor

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Graphs

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1. Introduction

Since discovering oil in the 1950s, Nigeria has become a major oil-producing nation. Its high-quality oil is sold around the world, and the industry is crucial to the economy. In total, local and international oil companies produced around two million barrels of oil per day in 2018, almost all of it for export. This is a significant source of revenue for the Nigerian government.

However, the impact on the ground in Nigeria's main oil-producing region, the Niger Delta, has been severe. The region is heavily polluted. This stems from a combination of badly maintained infrastructure, inadequate and poorly enforced regulation, historic militancy, and oil theft as part of the local, 'artisanal' oil industry. Decades of oil spills have ruined land and water sources, in the context of a region where many are dependent on agriculture and fishing for their livelihoods. The environmental damage also has disturbing health implications. For example, one study indicates that infant mortality rates double for children whose mothers lived near an oil spill prior to conception, and other research has shown a correlation between the presence of gas flares and respiratory problems. Because the principal component of natural gas is methane (which releases carbon dioxide when burnt), Nigeria's flare stacks also contribute directly to global climate change.

This report forms part of SDN's work to address these challenges. In order to do so, the first step is to understand the true extent of the problem, and much has already been written on environmental aspects of the oil industry in Nigeria. This includes research on technical and infrastructure issues, legislation and regulation, and the political economy of the artisanal oil industry, which operates outside any formal environmental protection standards.

To date, though, this has often focused on specific companies, incidents, or communities. This is partly because of the notorious lack of transparency in the Nigerian oil sector. Statistics are often made public when they are well out of date, if at all. This is made worse by the challenges inherent to research in the region, in particular relating to logistics and security, which are an obstacle to generating new evidence.

However, in 2019, the Nigerian government agency responsible for responding to pollution from the industry, the National Oil Spill Detection and Response Agency (NOSDRA), launched improved versions of two environmental monitoring tools. These are the [Oil Spill Monitor](#) (OSM) and [Gas Flare Tracker](#) (GFT), originally developed for NOSDRA by SDN. The OSM and GFT contain up to date and publicly accessible information on emissions to air and land: oil spilled, and gas flared, as part of oil exploration and production. The data in the OSM comes from NOSDRA oil spill site assessments. The data in the GFT is based on calculations made using satellite observations of heat from gas flare stacks.¹

This information makes it possible to produce an estimate of oil company environmental emissions across the Niger Delta. It also enables a standardised comparison of the environmental performance of oil companies operating in the region in 2018, based on the data available. This includes calculating emissions data for each company relative to the volume of oil it produced, and therefore accounting for the size of its operations.

¹ More information on the data and these tools is included below, and in the Methodology.

That is what this report does. We do not aim to quantify the overall impact of emissions, which is beyond the scope of this research (this would require significant additional data on, for example, human health records, soil contamination levels, and agricultural productivity in areas affected by the oil industry). We do aim to present technical information, in an accessible format, on the extent of oil and gas released into the environment.

We intend to produce this analysis each year, to help track progress in addressing pollution in the Niger Delta. This is especially important given the Nigerian government's public commitments to minimising the environmental consequences of the oil industry—for example, to reduce gas flaring to zero in 2020, a target which stands no chance of being met.

In doing so, we recognise that these challenges can only be solved by all parties working together. In the interest of transparency and scrutiny, we have published data and calculations relating to this research—and welcome constructive critique, so that we can improve the methodology in future. Our hope is that this analysis will inform discussion about how to reduce the negative impacts of the oil and gas industry, and ensure that its benefits are fairly distributed. Our goal for the report is to support engagement with regulators and oil companies on their environmental management practices, in order to identify the most effective methods of preventing and addressing industry emissions.

The report is structured as follows

01

Outline of the significance of oil to Nigeria's economy and society.

02

Explanation of the types of environmental emissions this report focuses on, their potential impact, and the sources of data for each.

03

Discussion of the total regional extent of environmental emissions from the oil and gas industry in the Niger Delta in 2018. This means oil spilled and gas flared in the states of Abia, Akwa Ibom, Bayelsa, Edo, Delta, Imo and Rivers.

04

Description and commentary on five indicators we use to assess the performance of the 43 individual companies we identified as operating in the Niger Delta in 2018 which produced environmental emissions.

05

Provision of a standardised comparison of the absolute and relative performance of these companies. This is based on a weighted index of the five indicators.

06

Conclusion, and suggestions for steps that government, regulators and the oil industry can take to help reduce the environmental emissions of Nigerian oil.

2. The Nigerian oil industry

2.1 History

Oil was discovered in Nigeria in 1956. The country's light, sweet crude is highly prized, and it has come to dominate the Nigerian economy. Indeed, a key challenge Nigeria faces is that its material wealth is dangerously dependent on the industry. For example, its export earnings are almost wholly derived from, and rise and fall in line with, oil production and prices. Furthermore, these exports are of crude; a chronic lack of operational domestic refining capacity means Nigeria is a major importer of refined fuel, the price of which is kept artificially low by subsidy. This distorts aspects of the broader economy. However, it is one of the few benefits the majority of Nigerian citizens derive from their country's oil industry. Because of this—and because many depend on diesel generators for electricity—it is politically contentious to propose changing it. This in turn helps sustain the dependency of economic activity on the industry in the first place, which is also a result of the politicised use of oil rents to prop up patronage and other networks that dominate state and society in Nigeria.

The goal of the Nigerian government to address these and related issues is to diversify the economy away from the export of oil as a commodity. However, this is a long-term objective, and in the meantime, oil's importance means it will continue to play a central role in Nigeria. This also means one of the major challenges associated with the industry is unlikely to go away: the damage done to the natural environment (and the human consequences of this) in the Niger Delta, where the vast majority of Nigeria's oil is produced. The damage is attributable in the main to the uncontrolled release of oil, spilled on land and into water, and gas, which is flared and released into the atmosphere. This release can take place at oil production sites, or anywhere along the pipeline network and other infrastructure involved in transporting oil.

2.2 Oil spills and clean-up

A number of factors are frequently cited for the thousands of oil spills which have taken place in Nigeria over the last fifty years. First is the direct cause: operational error, and faulty or damaged infrastructure, in particular relating to the pipelines which transport crude from where it comes out of the ground to where it is needed. Many pipelines are decades old and being used beyond their lifespan, and, it is frequently claimed, not adequately maintained by their operators.

This can be interpreted as a structural issue, which is the fault of the government, for not having enacted clear enough guidelines or sufficient penalties in Nigerian environmental legislation to deter poor maintenance, or provided regulators with the funding and logistics to enforce it. As such, oil companies may not be operating to international best practice, but they are not breaking any local laws (or at least, it is difficult to prove).

A third factor is the 'tapping' (or theft) of oil directly from pipelines, which often involves spillages. This is a major issue: according to NOSDRA data, three-quarters of spills in 2018 were attributable to this. Tapping is carried out to access oil either for export elsewhere, or to refine locally into fuel for the black market, as part of the artisanal oil industry (Stakeholder Democracy Network, 2018). This industry, which commonly takes place in camps hidden in the Niger Delta mangroves, is a complex social, political and economic problem. But the demand for the fuel it produces is strong—driven by local, domestic, transport and electricity needs—while in a region with sky-high unemployment, there is a ready supply of labour. It is also financially lucrative for those with enough power and influence to control the industry.

The interactions between government, oil companies, regulators, black market oil refiners and local economic needs are complex. In the unstable context of the Niger Delta—which, for example, frequently sees serious political violence around elections, and has experienced periods of militancy during the past three decades—this contributes to ongoing disagreement about what is ultimately responsible for environmental damage. However, there is greater clarity, in theory at least, on who is responsible for addressing it. The 2002 Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN) are clear: oil companies are responsible for containing and cleaning up oil spills related to their facilities (Department of Petroleum Resources, 2002).

However, the provisions in EGASPIN are guidelines and not regulations. This limits their enforceability, and is made worse by the fact that EGASPIN sits at the heart of a notorious regulatory overlap. The guidelines are issued by the government's Department of Petroleum Resources (DPR), the business and not environmental regulator of the Nigerian oil industry. This glaring conflict of interest needs to be addressed, with oversight of EGASPIN transferred to the Federal Ministry of Environment.

Meanwhile, so long as new spills continue to contaminate the region, some will make the argument that clean-up initiatives are pointless. Oil companies cite the number of spills caused by sabotage—a challenge we acknowledge. Third-party interference is a major issue in the Niger Delta, and SDN has carried out extensive research and run projects to help find an end to the practice. We welcome input on how it can be addressed. However, oil spills have been taking place in the region for decades, since before the emergence of the artisanal industry as a significant factor in the political economy of Nigerian oil, and so it should not be used as a get-out clause. Furthermore, the existence of pollution is an underlying cause of the artisanal industry in the first place: for example, because of the livelihood opportunities lost as a result of the contamination of land, and the reduced incentive to preserve an environment which is already damaged. Oil companies have the capital, technical ability, and logistical reach to do more to monitor, prevent and ensure a swift response to all new spills. They have significant responsibility for minimising the potential for harm associated with their industry.

2.3 Gas flaring

Oil and gas are often found in the same geological formation, and when oil is extracted from a well, it brings natural (“associated”) gas with it to the surface. If the infrastructure does not exist to use this at source (such as for power generation, to re-inject it into the oil reservoir, or to transport it for use elsewhere), the gas, which is volatile, must be flared as a waste product.²

The history of attempts to reduce this in Nigeria is infamous. The first serious legislation intended to curb it was introduced in 1979, but, although appearing to be in decline, the practice continues. The latest regulations are clear: no producer (a company owning an Oil Mining Lease to extract oil in a particular area, or the operator of a marginal field) should routinely flare gas, unless they are expressly authorised to do so (Federal Republic of Nigeria, 2018).

² Gas may be legitimately flared for emergency and other operational reasons. Express authorisation is via a permit granted by the oil minister.

The principal policy problem is that the penalty for flaring gas is much lower than the value of oil. As such, it is more profitable for companies to extract the oil and pay the fine. The government cannot simply raise the fine to the value of the oil, as this would destroy the industry, and in doing so crash the economy. At the same time, Nigeria's budget exposure to oil's international price volatility makes long-term planning difficult. This in turn affects the government's already limited capacity to invest in the infrastructure necessary to create a market for gas off-take at scale. As a result, Nigeria's colossal gas reserves continue to be flared, while its gas-fired power plants are starved of resources, in a country where nearly half the population has no access to electricity (World Bank, 2019).

This situation is plainly a challenge. The government is now implementing the Nigerian Gas Flare Commercialization Plan (NGFCP) in an attempt to address it. Developed with the World Bank's Global Gas Flaring Reduction Partnership, the NGFCP involves selling title to associated gas being flared from individual oil production sites (Nigerian Gas Flare Commercialization Plan, 2020). As of late 2019, the tender process was still in its early stages, but the launch of the NGFCP is a promising development.

2.4 The environmental impact of oil spills and gas flaring

There are multiple potential impacts of the uncontrolled release of oil and gas. Most obviously, the prime receptor is the local natural environment around a spill site or gas flare.

Oil is toxic, and contact with it can lead to the contamination of land and water. The consequence of this in the Niger Delta is the loss of ecologically important mangrove and wetland areas. Human reliance on the environment means this impact is then transferred to the inhabitants of the region. One of the most significant consequences is for health. The land and water sources which people use to cook, clean and bathe in are contaminated by oil, and emerging research paints a disturbing picture of the long-term implications. For example, a 2017 study indicated that infant mortality rates double for children whose mothers lived near an oil spill prior to conception (Bruederle and Hodler, 2017). The health impact of gas flaring is less clear, but it has been linked with the acidification of rain and waterways (Kanayochukwu et al., 2016). Other research has also shown a correlation between the presence of gas flares and health problems in specific communities (Gobo et al., 2009); large-scale longitudinal studies on this and other potential impacts of gas flaring are a key area for further investigation.

As the environment becomes unable to support animal and plant life, biodiversity also decreases. Millions of people in the Niger Delta rely on fishing and farming for their income, so this creates the further consequence of the destruction of local livelihoods. As crops die and fish migrate, the revenue-generating potential of local communities diminishes. This is one of the factors pushing people into the artisanal refining industry—a source of new pollution in the region, but also income—and so leads to a spiral of further damage. Furthermore, the loss of income (and hence ability to save) reduces community resilience, and so increases the impact of other events such as flooding.

Nigeria's oil also contributes to climate change. The damage caused by oil spill pollution to mangroves and other forested land means the carbon sequestration capacity of the Niger Delta is reduced, while burning natural gas releases carbon dioxide into the atmosphere. The huge amount Nigeria flares means that its national industry is therefore an international challenge, as well as the other carbon emissions inherent in the extraction of oil, and the products derived from it.

Regional case study: Ogoniland

One part of the Niger Delta where the challenges of Nigeria's oil sector have combined in a disturbing manner is the Ogoniland area of Rivers State. Ogoniland was one of the first regions where oil production began at commercial scale in Nigeria. Decades of environmental damage led to protest and social unrest among Ogoniland communities, which caused Shell, the principal company operating in Ogoniland, to cease production in 1993.

In response to the unrest, the then-military government of Nigeria responded with violence, including hanging nine Ogoni community leaders. This led to the expulsion of Nigeria from the Commonwealth, and the memory of this episode continues to inform deep mistrust between state and society in the region.

The initial pollution in Ogoniland was, and remains, catastrophic. It has never been properly addressed. A UN Environment Programme report published in 2011 documented massive environmental, social and economic dislocation as a result of oil spills. This included recording ground water benzene levels in one area which were more than 900 times the safe level recommended by the World Health Organization. In response to the report, the Nigerian government established the Hydrocarbon Pollution Remediation Project (HYPREP), a large-scale initiative to clean and restore polluted land in Ogoniland. But HYPREP has been plagued by political, funding and logistical problems, and as of late 2019, only very early stage clean-up activities were under way. This demonstrates the challenge of organising serious action to address the ongoing environmental consequences of the Nigerian oil industry.

In 2019, the Nigerian government announced its intention to bring about the resumption of oil production in the Ogoniland fields within OML (Oil Mining Lease) 11. Major debate is ongoing in response to this.

The UN report on Ogoniland is available at https://postconflict.unep.ch/publications/OEA/UNEP_OEA.pdf

2.5 The social impact of oil spills and gas flaring

The cumulative social and political outcome of these issues has been a major breakdown in the relationship between state and society across the region. The perception that the government has no interest in the Niger Delta beyond its economic value is a grievance for many: although the government says the artisanal oil industry is illegitimate, the result of decades of industry and environmental mismanagement is that some local communities would say the formal industry is also illegitimate. The impact on livelihoods has been severe, with many in the region involved in subsistence agriculture and therefore particularly vulnerable to environmental degradation.

Accusations and counter-accusations regarding responsibility for oil spills have led to a flourishing 'pollution-monitoring' economy, although the degree to which this helps rather than hinders solutions to the problem is open to question. One key development is the use of pipeline surveillance contracts (Stakeholder Democracy Network, 2019). These contracts are awarded to private firms by government agencies and oil companies. Ostensibly, the firms are paid to monitor oil industry infrastructure for degradation and accidental damage, and protect them from vandalism. The reality is they are often protection rackets, organised by local groups, sometimes under political control, to prevent the same groups from attacking the pipelines in the first place. This complicates social relations in the context of the deep lack of trust between communities, companies and government in the Niger Delta, which is an obstacle to development.

This type of challenge is compounded by the feeling that things can get no worse. For example, there are anecdotal reports of communities failing to report oil spills immediately, because they believe they will receive greater compensation if the spill is bigger. This is despite the known deficiencies in the compensation mechanism in Nigeria, which is slow, expensive, and based on a flawed process (Stakeholder Democracy Network, 2020).

In sum, the links between oil, politics, violence, and environmental destruction in Nigeria are complicated, but clear. Action to end environmental damage as a source of discontent would help weaken them.

Environmental impact case study: Bayelsa State

In late 2019 SDN staff visited a ‘host community’ (a community that contains oil infrastructure) in Bayelsa national forest, in Bayelsa State. The community straddles one of the many creeks and rivers which make up the Niger Delta region.

When we visited, parts of the community had been flooded for weeks. This was the result of heavy local rainfall, and, we were told, of a dam being opened upstream earlier in the year on the Benue, the major tributary of the river Niger, in Cameroon.

A local community youth leader, Samuel, showed us around a recent oil spill site in the community, where there have been several incidents in recent years.*

The site contains a manifold—equipment which gathers and then distributes oil from all the pipelines in the area. It is housed in concrete, and we were not allowed to go near; even before coming this far, we had to explain our visit to the soldiers at a nearby checkpoint, part of the Nigerian army’s anti-militant operation in the area.

In mid-2018, vandals damaged the manifold, and oil started spilling into the ground. Later that year, they struck again. Hundreds of barrels of oil were released. Another spill in the area was reportedly the result of a corroded section of pipeline.

Response activity has been carried out, and the oil company involved has removed the surface oil. But remediation—the process of restoring an impacted environment to its pre-pollution state—has not yet taken place. The blackened plants on the far side of the water attest to the damage. We visited in November, but remediation was not due to begin until the dry season, which begins in early December. The flood waters must also recede before this can take place.

According to Samuel, the site visit carried out by the environmental regulator to assess the impact of the large 2018 spill did not capture the value of the cassava which used to grow on the site. And getting compensation is proving difficult. There are multiple parties involved, including ‘claims agents’ acting on behalf of some community members. Samuel thinks it would be better to talk to the oil companies directly.

Samuel says one positive is that although pipeline vandalism is a well-known activity in the Niger Delta, there is no bunkering in the area—local refining of stolen crude oil, which takes place in camps hidden in the mangroves that cover the region.

“We do not encourage interference at all, he says. But our young people are restive.”

There is little employment in the area, and oil companies will pay up to 5,000 naira per day (around 10 US dollars) as part of clean-up work.

Creating more pollution does not matter so much in an already polluted area, especially when there is the potential benefit of short-term employment. As such, some are tempted to damage the pipelines to earn the clean-up money. Samuel says those who do this do not understand the impact it has, despite community complaints of illness, which is attributed locally to oil pollution.

However, the community can't be sure, as although an oil company has built a health clinic nearby, the government has not been able to staff it. "And do you know how far Yenagoa is?" Samuel asks, referring to the difficulty of getting to the state capital, where healthcare is available.

He adds that the day before we visited, members of the community met with government representatives about the clinic. The state has promised personnel, Samuel says, but it has been promising for a long time.

In the meantime, pollution continues. Although not all of them are recorded, he says there have been spills throughout the area.

One initiative intended to address the specific problem of vandalism is pipeline surveillance. Contracts are awarded to local groups to monitor stretches of pipeline for signs of damage, and to prevent interference. In this community, surveillance workers in the community are often male elders, Samuel says. They are appointed because of their role as traditional leaders, but some never actually go near the pipelines.

The situation for Samuel and others like him across the region is difficult. There have been several spills in Samuel's community over the last few years. Identifying the cause of these in the first place can be difficult, while the impact depends on multiple factors.

In this community, the flooding has caused a delay in remediation, creating further difficulty for those who depend on the environment for their livelihoods. This is compounded by the lack of a safety net—such as having a health centre with no staff—and the slow process of accessing compensation, which is not guaranteed.

These issues demonstrate the complexity of addressing oil industry pollution. Changing the situation for good means improving not just spill prevention and response, but also addressing the social, political and economic factors which magnify the impact of a pipeline break. The task in the Niger Delta is not an easy one.

2.6 Emissions data and limitations

The key regulatory body charged with monitoring Nigerian oil industry environmental performance is the National Oil Spill Detection and Response Agency (NOSDRA). As part of its remit, NOSDRA gathers and stores data on oil spills and gas flaring on two public data platforms. These platforms are the source of emissions data used in this report. Note that they were initially designed by SDN in 2013-2014 as part of a project to provide technical assistance to NOSDRA, and then redeveloped by SDN in 2018-2019.

The first platform is the Oil Spill Monitor (www.nosdra.oilspillmonitor.ng, OSM). The OSM is the source of oil spill data for this Index. The information on each spill in the OSM comes from a Joint Investigation Visit (JIV) carried out by NOSDRA to determine the cause and consequence of each spill to which it is alerted. Spills are attributed to particular companies as part of this process.

Joint Investigation Visits

The Joint Investigation Visit (JIV) is the mechanism NOSDRA uses to assess oil spills in the Niger Delta. When NOSDRA receives information relating to an oil spill, it organises a visit to the reported location. The JIV is attended by NOSDRA staff members, oil company staff, and representatives of local communities affected.

Together, they determine and sign off on a record of the spill, including its precise location, the estimated volume of oil spilled, any containment measures taken, and the company whose infrastructure the spill came from.

The JIV has faced criticism in the past: for example, because disputes can arise over the details of a spill incident. This can lead to incomplete information being recorded in the Oil Spill Monitor (OSM).



Oil spill pollution in creeks of the Niger Delta.

The second platform is the Gas Flare Tracker (www.nosdra.gasflaretracker.ng, GFT). The GFT uses satellite data to identify gas flare locations, and then estimates the volume of gas flared at each of these.³

It is important to note that there are limitations to these sources. The data in the OSM is almost certainly incomplete: for example, many spill records indicate that an incident took place, but do not have an estimated volume attributed to them. One reason for this is that the Niger Delta is vast, and a lot of pipeline infrastructure passes through remote areas which, for example, may only be accessible by boat. NOSDRA has limited logistical capacity, and so getting to spill sites can be a challenge. In addition, there are sometimes accounts, for example, of oil companies denying NOSDRA access to reported oil spill sites. On the other hand, although it is not possible to verify the validity of the information, some companies are quite open in reporting spills and providing their data on these.

In terms of gas, the volumes discussed here are, as noted, estimates (the full calibration methodology for the GFT figures is explained on its website). Oil companies are supposed to provide complete data on the amount of gas they flare to Nigerian regulators. However, the extent to which the data they provide is accurate is unclear, with allegations that many flare points lack the metering equipment which is a legal requirement. This data also tends to be provided a long time in arrears (hence the development of the GFT, which provides monthly estimates). The GFT does not attribute gas flared to particular companies, but it does provide estimated volumes by concession. We have matched these with official data on who operates particular concessions in order to attribute gas flared.

The oil industry in Nigeria is in general opaque, and the availability of even basic corporate information on companies and their operations can be limited. The effect of all these factors is therefore confusion regarding the true extent of environmental emissions in the Niger Delta, which is part of the rationale for carrying out this research. Standardising reporting metrics and increasing disclosure requirements would be one way that the government could help address this. In the meantime, our assumption is that actual industry environmental emissions may be significantly higher than the picture we present here.

Further detail on sources and data is included in the Methodology for this report, which is published as a separate document.

³ The primary data source for the Gas Flare Tracker is the Visible Infrared Imaging Radiometer Suite (VIIRS) on board the Suomi National Polar-orbiting Partnership (S-NPP) satellite. The VIIRS source data is made available from the [National Oceanic and Atmospheric Administration](http://www.noaa.gov). The VNF product data used to locate gas flare sites and estimate the volumes of gas flared is from the Earth Observation Group at www.mines.edu. For more information, visit <https://nosdra.gasflaretracker.ng/data.html>.

3. Findings on environmental emissions in the Niger Delta

This section provides an overview of oil and gas emissions in the Niger Delta in 2018, based on the data available. It is split into three parts. First, it provides a summary of oil and gas emissions for the region as a whole. Second, it breaks this down into oil and gas emissions by specific companies, in terms of five core environmental performance indicators. Third, it weights and combines these indicators to provide an overall comparison of oil company environmental performance, where the fewer emissions are generated, in both absolute and relative terms, the higher a company's score.

3.1 Regional overview

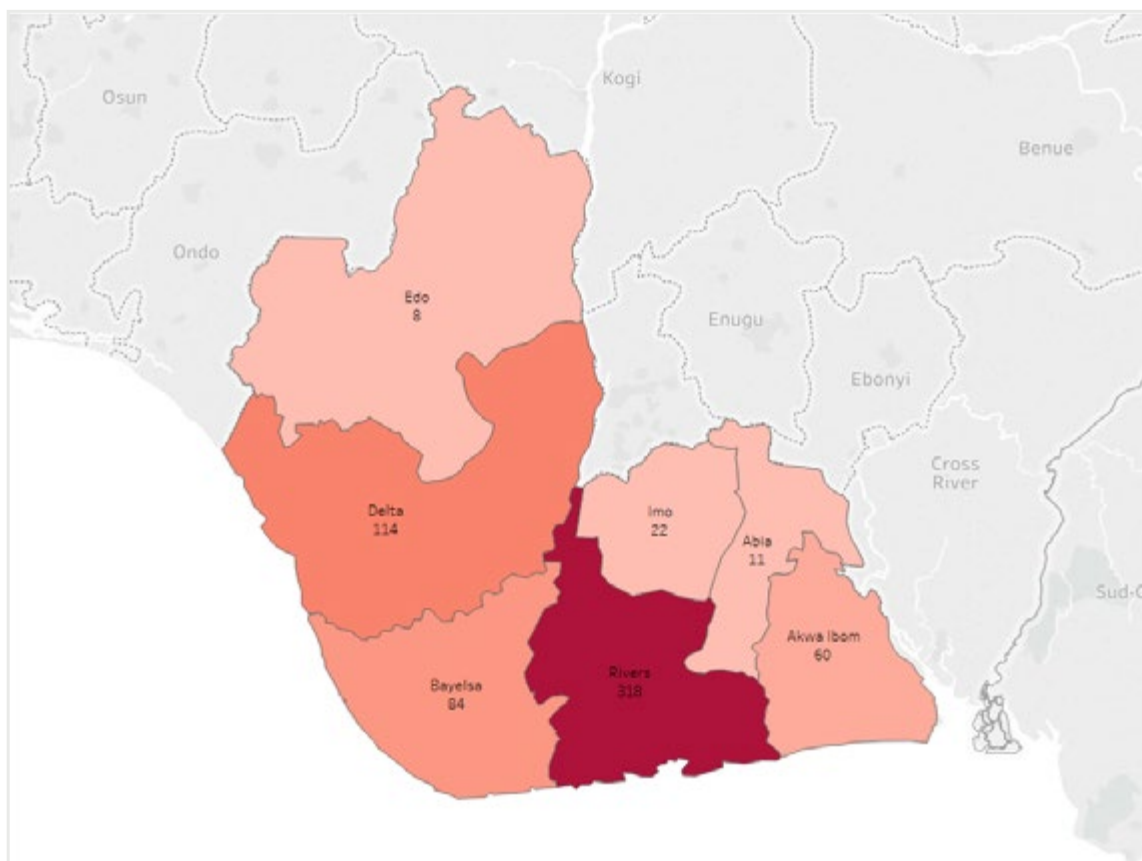
This section looks at the absolute amounts of oil and gas released into the environment in the Niger Delta in 2018, according to Oil Spill Monitor and Gas Flare Tracker data.

3.1.1 Oil

Spill quantities and locations

617 oil spill incidents recorded by NOSDRA in the OSM in 2018 are included in this report. The map below shows the number of spills with a known location in each state:

Map 1: Number of oil spills by state

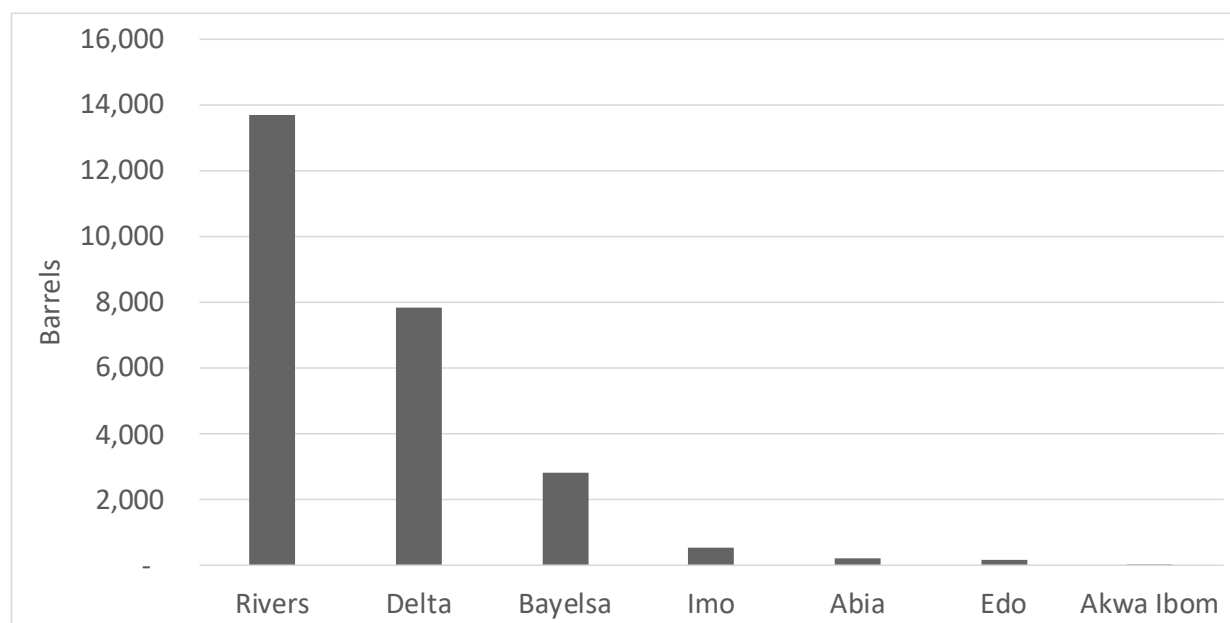


In total, the 617 spill incidents released an estimated 25,308 barrels of oil. The volume of oil spilled in each Local Government Area (LGA) is shown on the map below. The darker the red, the more oil was spilled:

Map of Rivers State showing the distribution of 100,000 Naira in 2010 across its Local Government Areas (LGAs). The map uses a color scale from light orange (low) to dark red (high). The highest concentrations are in Warri South-West (3,006) and Abua-Odual (3,067). Other significant areas include Port Harcourt (1,760) and Bonny (1,751). The map also shows neighboring states: Edo, Anambra, Enugu, Ebonyi, Imo, Abia, and Akwa Ibom State.

As the map makes clear, two LGAs alone, Warri South-West and Abua-Odual, saw more than 6,000 barrels of oil spilled—nearly a quarter of the total recorded. Their neighbouring LGAs also had high spill volumes. This helps explain why Rivers State and Delta State have the highest spill volumes overall:

Graph 1: Total oil spilled by state ⁴



Oil spill containment and recovery

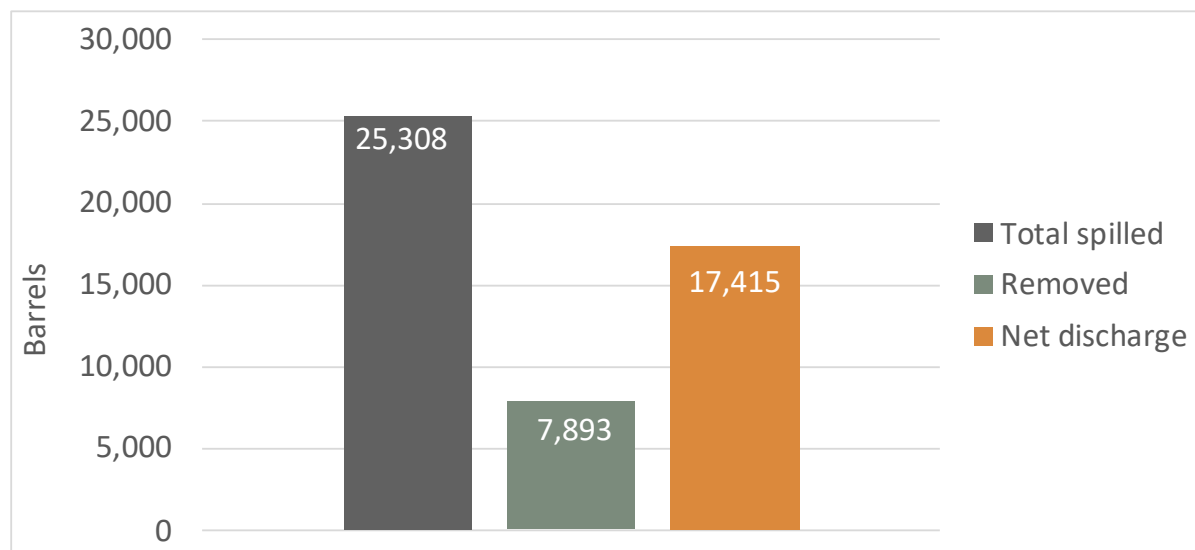
When a spill takes place, initial containment measures can be taken to limit its reach. For example, if a spill takes place near a river, floating booms can be placed across it, to prevent the current taking the oil downstream. It is important that these measures be implemented as quickly as possible (although sometimes they do not take place at all). If they are put in place, mechanical removal—in simple terms, scooping up oil with shovels and other implements—can then be used to recover the trapped oil. Note that this can physically remove the oil from site, but is not the same as restoration and remediation, which involves long-term treatment to remedy the toxic and other effects of oil spills on the environment.

Where available, the OSM includes data on how much (if any) oil has been recovered from each spill as a result of such containment measures. In this Index, we refer to this as “oil removed”. It is therefore possible to generate a net figure for how much oil has been discharged—the amount which remains in the ground and on the water—by subtracting this from the total volume spilled.

⁴ Note that figures are rounded and care should be taken not to over-interpret them. For example, offshore spills are often recorded in the OSM using the nearest state and with a nominal quantity. This is presumably because of the difficulty in accessing and quantifying evidence relating to these, but it means that although Akwa Ibom State recorded 60 spills in 2018, the total volume amounts (taking into account rounding errors) to only 12 barrels.

In 2018, 7,893 barrels, or 31%, of oil spilled was later removed. The total net discharge across the Niger Delta was therefore 17,415 barrels, or more than 2.7 million litres:⁵

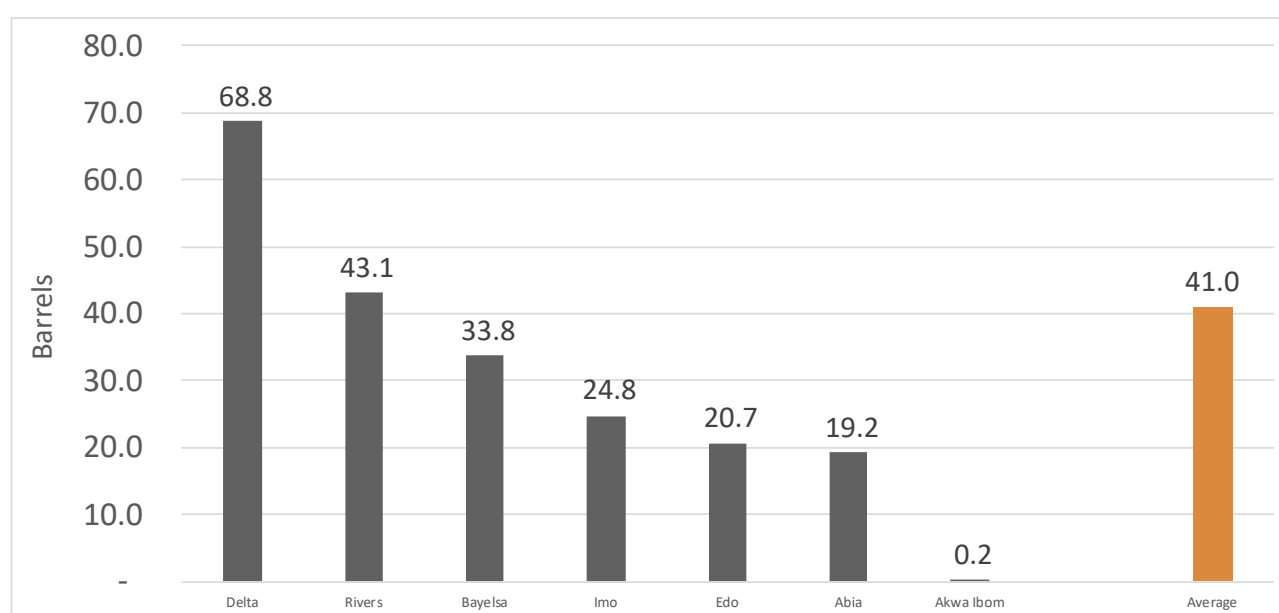
Graph 2: Total oil spilled and removed



Number of spills and average spill size

The average spill size for the entire Niger Delta was 41 barrels. This is the total volume of oil spilled divided by the total number of spills. However, breaking the data down by state reveals that the average spill in Delta State was more than twice the size of spills in every state other than Rivers State. The average spill in Rivers State was also larger than in other states:

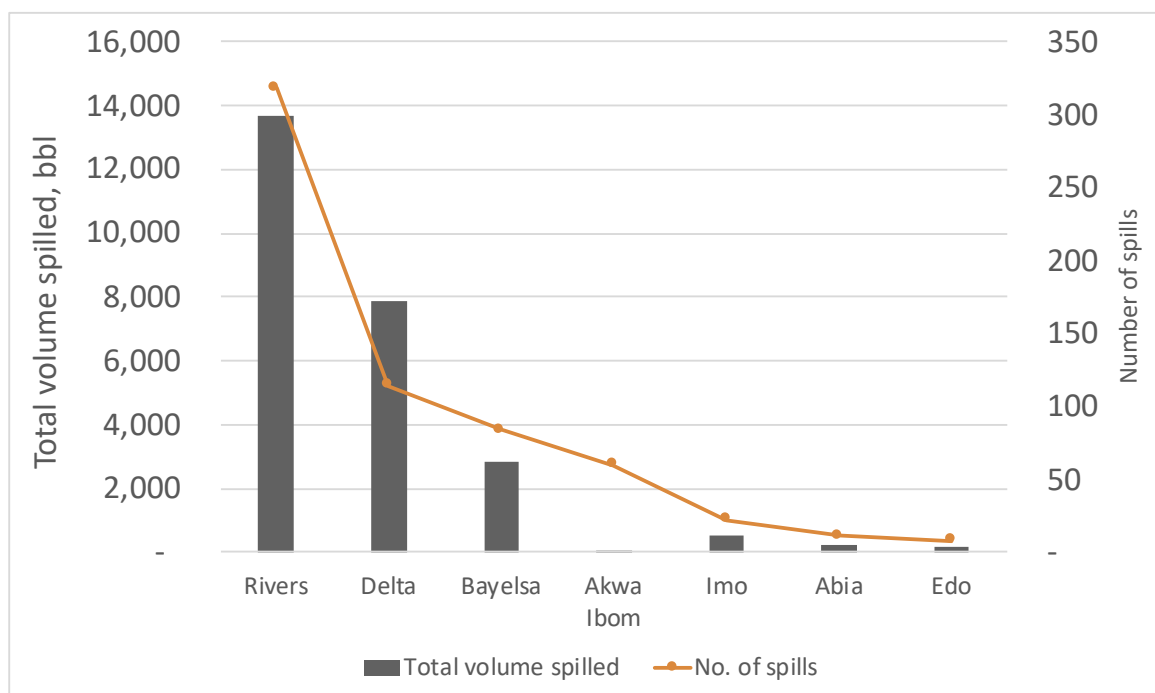
Graph 3: Average oil spill size by state



⁵ There are approximately 159 litres in a barrel of oil.

Delta and in particular Rivers State also had a far higher number of spills. This, combined with their high average spill, explains why these two states account for over 85% of total oil spilled—21,537 barrels in total. This suggests that at least in terms of absolute impact, these two states may be the worst affected, based on the data available:⁶

Graph 4: Total volume spilled and number of spills by state



However, it is also obvious that Akwa Ibom State, which saw 60 spills recorded, has an almost negligible spill volume. This may be because spills which take place offshore or are otherwise inaccessible are recorded in the OSM in the nearest state, in this case Akwa Ibom State, and have what usually appears to a nominal volume, close to zero, attributed to them. This is not unreasonable, as it at least records that an incident took place. However, it highlights the need for more effective oil spill monitoring, as it seems very likely that the total spill volume in Akwa Ibom State is much higher.

⁶ Note that because oil blocks and state boundaries do not overlap, it is difficult to determine specific production volumes by state. As such, care should be taken not to over-interpret this data: for example, if, as well as spill volumes, oil production in Delta State and Rivers State is also much higher than elsewhere, then the relative amount of oil spilled may be lower. This topic needs further research.

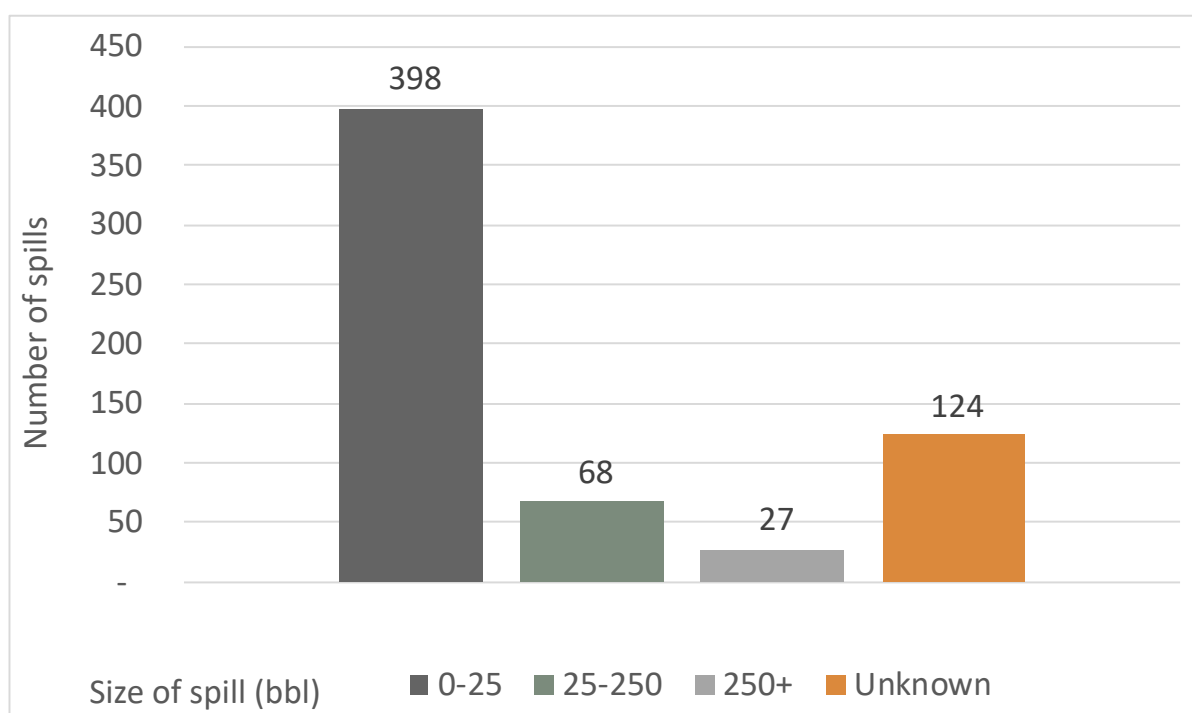
Spills by size

NOSDRA's classification of oil spills (see table) is based on the capacity needed to respond to them. In 2018, there were at least 95 spills of 25 barrels or more, which qualify as 'minor' if they take place in inland waters. However, 25 barrels equates to nearly 4,000 litres of oil. This is still easily enough to create lasting damage across a community. The potential impact of a single spill is therefore clear.

Table 1: NOSDRA oil spill size guide

Spill site	Spill size (bbl)		
	Minor	Medium	Major
Inland waters	0-25	25-250	250+
Land, swamp, shoreline or open sea	0-250	250-2500	2500+

Graph 5: Number of spills by size in barrels



Environmental impact case study: Rivers State

As part of our research on 2018 oil spills for this report, we visited an urban host community near the Rivers State capital of Port Harcourt.

In early 2018, a major oil spill took place in the middle of the community. The morning was still clear in the minds of local residents, who we spoke to about the incident. One man described a major pipeline, buried just underneath a local road, spilling oil:

“There was no sound, but it was like a fountain gushing out. When I came out, the place was damp and filled with oil. We came with sand to stop it getting into our house, but even so it made it in. You couldn’t go anywhere.”

Pointing to a post a hundred metres down the road, he told us that a thick layer of oil covered everything we were looking at.

Other residents told us that it took three days for the spill to be stopped, and several weeks for it to be cleaned up.

“People with overalls came and sprayed something on the oil. They also excavated some of the ground.”

Although the oil was eventually removed, some of the damage is permanent. The area where it spilled used to be a link road, but is now rutted, overgrown and impassable.

Local community members say it affected the animals and water, and killed all the grass, although this has now grown back. One woman told us she could not cook indoors for a month, because of the fire risk from oil residues. Instead, she had to go out for food each day and bring it back. Children in the area had to be carried through.

Residents say they don’t know what caused the spill, although the official cause recorded was sabotage.

This spill was large, and clearly had a big impact, but it has at least been cleared up. In hundreds of other areas around the Niger Delta, stagnant oil remains on the ground—poisoning the land and those who live on it.

3.1.2 Gas flaring

Total gas flared

Graph 7 below shows how much gas is estimated to have been flared in each state, in thousand standard cubic feet (mscf, a common industry unit). Table 3 shows how much each state flared as a proportion of the total. Delta State and Rivers State account for two-thirds of all gas flared in the Niger Delta on their own:

Graph 6: Gas flared by state

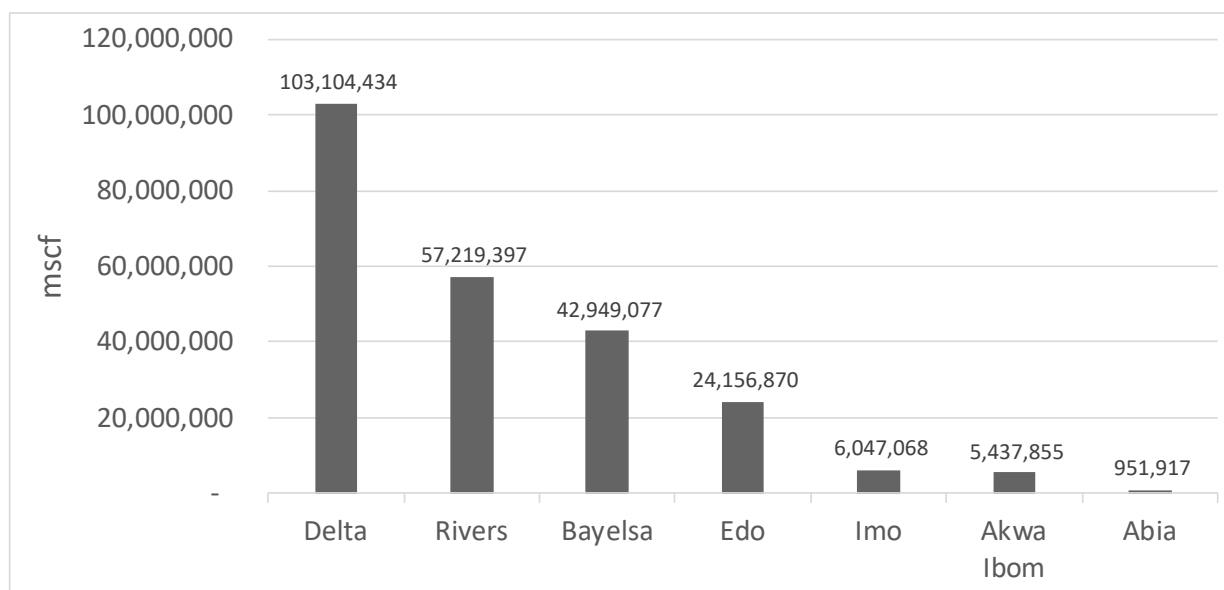


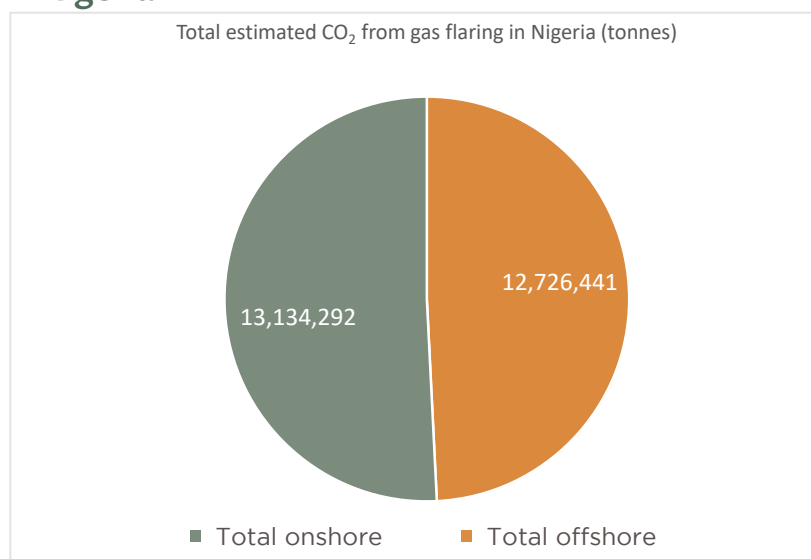
Table 2: : Gas flared by state as a percentage of the total

State	Volume (mscf)	% of total
Delta	103,104,434	43.0%
Rivers	57,219,397	23.9%
Bayelsa	42,949,077	17.9%
Edo	24,156,870	10.1%
Imo	6,047,068	2.5%
Akwa Ibom	5,437,855	2.3%
Abia	951,917	0.4%
Total	239,866,619	100%

Gas flare carbon emissions

Converted to carbon dioxide, the total amount of gas flared onshore and offshore in Nigeria amounts to an estimate of more than 25 million tonnes released into the atmosphere in 2018:

Graph 7: Carbon dioxide emissions from gas flaring in Nigeria



These emissions are equivalent to 27.5% of Nigeria's total 2017 carbon emissions. For comparison, they are also two-thirds higher than the entire emissions of Nigeria's (admittedly much smaller) regional neighbour Ghana, which produced 15 million tonnes of CO₂ in 2017 (US Energy Information Administration, 2020).

3.2 Company analysis

The figures in the previous section describe the overall scale of environmental emissions in the Niger Delta, according to data available in the Oil Spill Monitor and Gas Flare Tracker. These emissions are attributable to the companies which make up the Nigerian oil sector. However, there will clearly be differences among them. This section identifies some of these differences, examining emissions on a company-by-company basis.⁷ It describes company environmental performance in terms of five core indicators, in turn. The first four are absolute, while the fifth is relative to a company's oil production volume. The indicators are:

- Quantity of oil spilled (in barrels)
- Number of oil spills
- Oil spill removal rate (the proportion of oil spilled by a company which was later removed)
- Volume of gas flared (in mscf)
- Emissions ratio (total oil spilled and gas flared relative to company oil production)

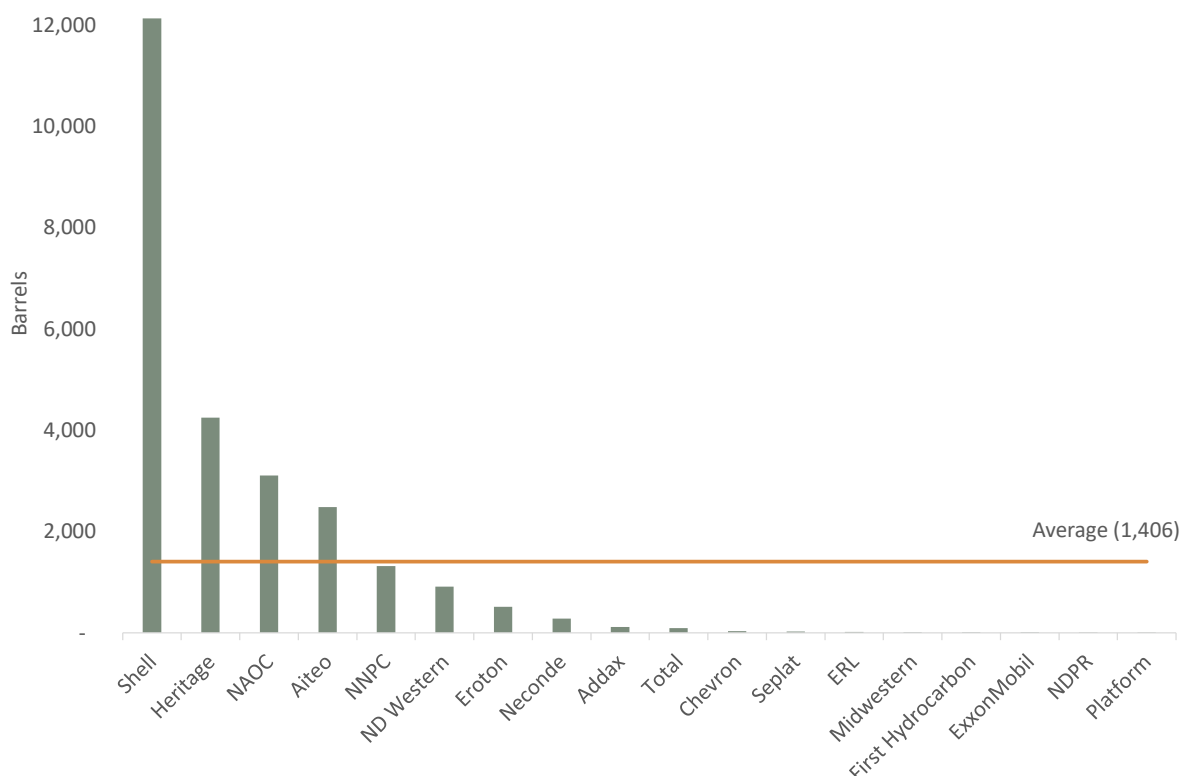
⁷ Eight companies are not included in the Index: Atlas, Consolidated, Equinor, Frontier, Millenium, Prime, Waltersmith, and Yinka. This is because there is not an oil spill or gas flare volume which can be attributed to them under the relevant regulations, even though they do have an officially-reported oil production volume. Note that this does not mean that they do not have other, or unreported, environmental emissions.

3.2.1 Indicator one: total oil spilled

In total, 18 companies operating in the Niger Delta in 2018 had oil spills attributed to them by NOSDRA.⁸ Indicator one describes the total volume of oil spilled as a result of all spills attributed to each company.

The lower the total spill figure, the better the environmental performance is considered to be in the Index:

Graph 8: Total oil spilled by company



92% of the total volume of oil spilled—over 23,000 barrels—is attributable to five companies, generally referred to in the OSM as:

- Aiteo, an indigenous Nigerian oil company
- Heritage (the Jersey-based owner of indigenous Nigerian oil company Shoreline)
- The Nigerian Agip Oil Company (the Nigerian subsidiary of Eni)
- The Nigerian National Petroleum Corporation (Nigeria's state-owned oil company)
- The Shell Petroleum Development Company (the Nigerian subsidiary of Royal Dutch Shell)

Note as previously that the data presented here is the data made available by NOSDRA. We have standardised the names of oil companies to shortened versions of corporate group titles for readability. See the Annex for further information.

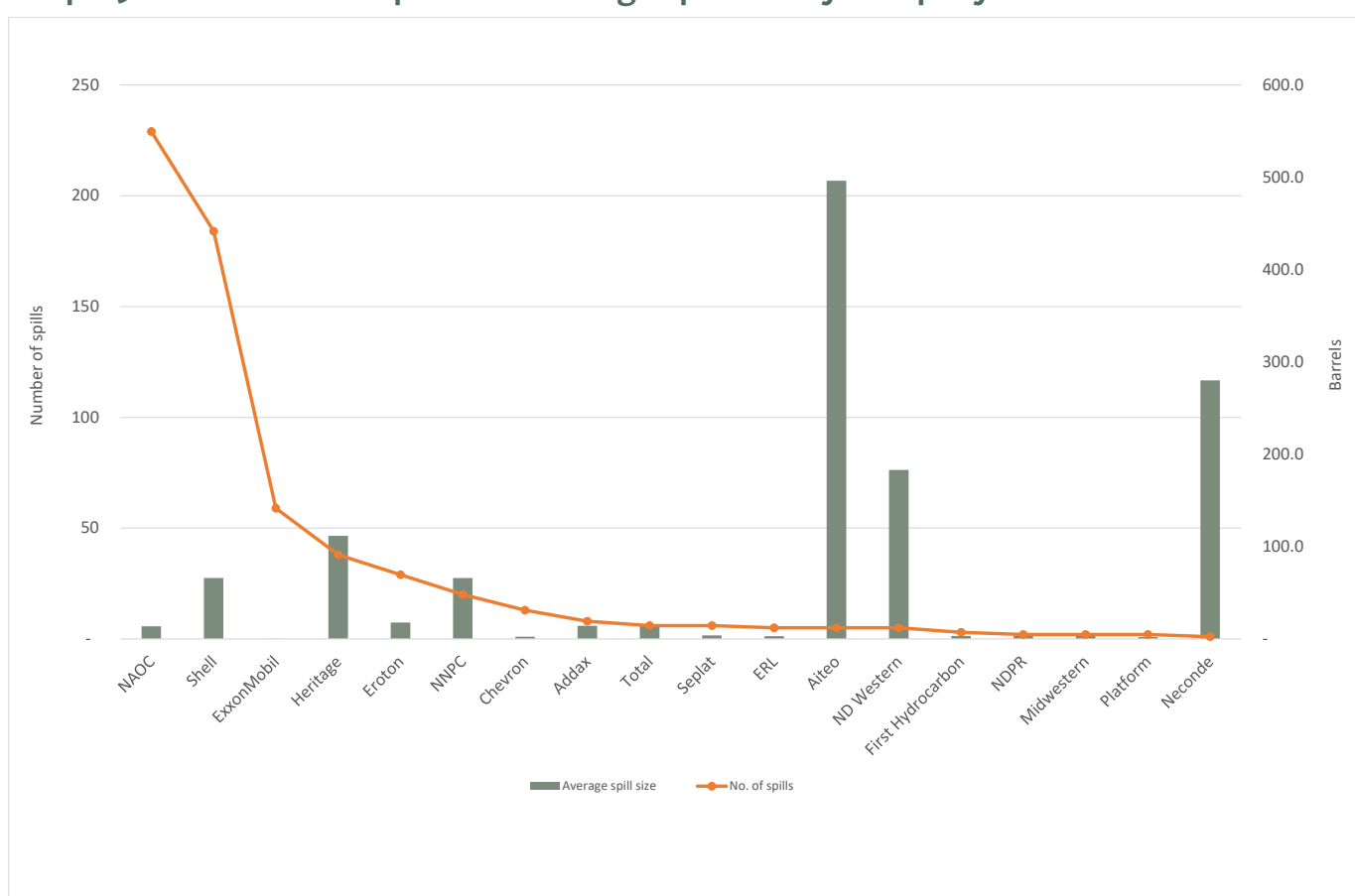
⁸ This does not, of course, mean that the other companies did not spill oil, only that they were not recorded as having done so. Note as previously that the information in this report is the public record of oil spills in 2018, according to the relevant Nigerian environmental regulator.

3.2.2 Indicator two: number of oil spills

NAOC had the highest number of spills overall—229 during the course of 2018. This is significant: as discussed previously, a spill need not be large to have a major impact, and so it is as important to address the cause of frequent small spills as it is to address major incidents.⁹ Shell’s high number of spills, combined with its relatively high average spill volume, explains why it spilled more than double the next-worst performer in terms of total volume. Shell also saw the biggest single spill of 2018, of more than 2,000 barrels.

The lower the number of spills recorded, the better the environmental performance is considered to be in the Index. Note that in the graph below, the average spill size is included for comparison, but does not contribute to the indicator score.

Graph 9: Number of oil spills and average spill size by company



⁹ There are numerous reasons for when, where and why oil spills take place. The OSM includes data on reported cause, with sabotage reportedly being responsible for three-quarters of incidents. However, as previously noted, ultimate responsibility for preventing and cleaning up oil spills lie with the companies that operate oil infrastructure.

3.2.3 Indicator three: oil spill removal rate

Total (gross) volume spilled is the most relevant figure for a company's environmental performance: oil has the most direct impact on the local environment and the communities which live there, and the aim of oil companies should be not to spill any. However, it is also important that spills are cleaned up once they have taken place, which begins with removing surface oil at a spill site.

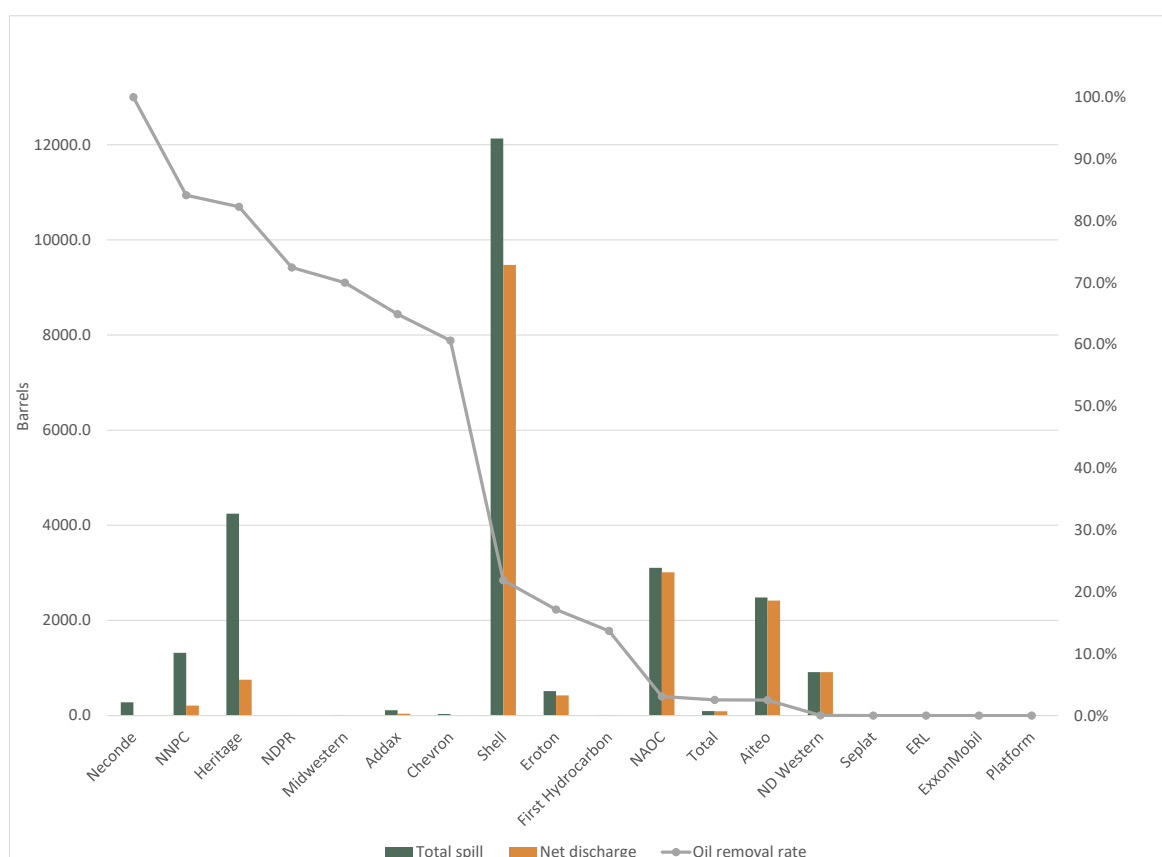
We calculated the total oil spill removal rate for the spills attributed to each company, and plotted this against the total net discharge (total volume spilled less total oil removed).¹⁰ Doing so highlights that although Heritage still has the third-highest absolute spill volume, the high removal rate for its spills means that its net discharge is significantly reduced.

On the other hand, although around a fifth of oil spilled by Shell was removed, its high total volume spilled means that the estimated 9,475 barrels net which it discharged into the environment presumably remain there, untouched—more than half of the net discharge for the entire region.

Note that these oil removal volumes are recorded by NOSDRA in its data on 2018 oil spills. As clean-up activity may continue after the time of assessment, further oil may later be recovered. This is discussed in the Annex.

The higher the oil removal rate, the better the environmental performance is considered to be in the Index:

Graph 10: Total spill, net discharge and oil removal rate by company

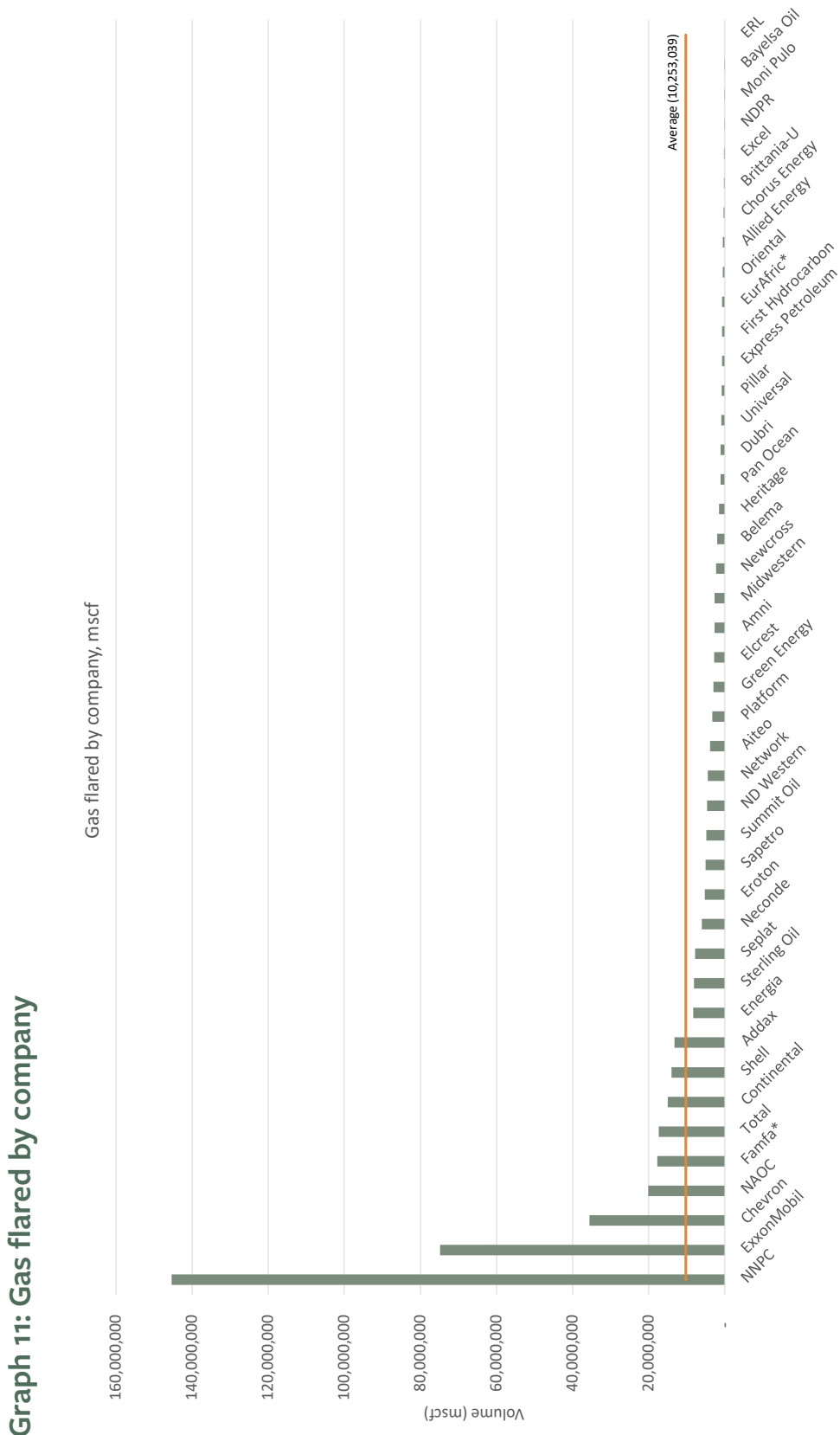


¹⁰ Note that oil removal may not necessarily be a result of company action. However, it still affects the total amount of oil spilled attributable to a company, and hence environmental performance is partly a function of this metric.

3.2.4 Indicator four: gas flared

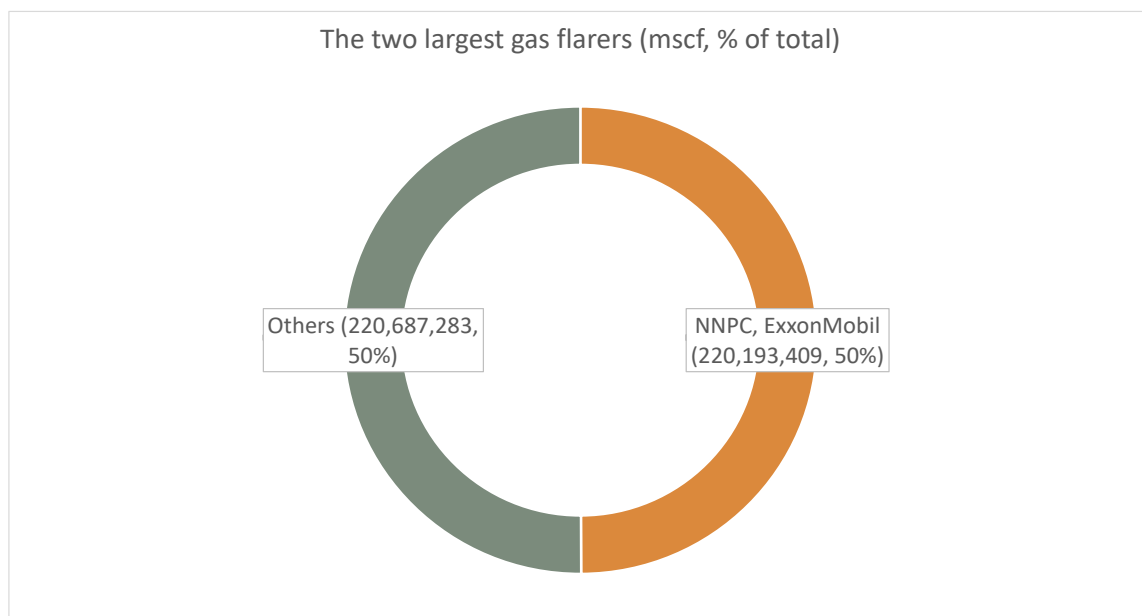
This indicator describes the total volume of gas flared by each company. There is a huge difference between the companies to which flared gas can be attributed for the Niger Delta in 2018.

The lower the figure, the better the environmental performance is considered to be in the Index:



Half of the gas flared in the region is attributable to two companies: ExxonMobil and the state-owned oil company, NNPC. This is unsurprising, given that on paper NNPC is involved in almost all exploration and production in Nigeria via the joint venture and other operating agreements through which the industry is organised:

Graph 12: The two largest gas flarers



3.2.5 Indicator five: emissions ratio

Indicators one to four relate to the absolute release of oil and gas into the environment. This is important, as oil companies should be aiming to reduce oil spills and gas flaring to as close to zero as possible, regardless of the size of their operations. However, as different companies produce different quantities of oil, it is also possible, and instructive, to examine the emissions they produce relative to this.

In order to do so, oil and gas volumes must first be made directly comparable. This can be done using a conversion factor, which turns a given volume of gas flared into barrels of oil equivalent (BOE).¹¹ This is the number of barrels of oil that would have the equivalent energy value to the gas flared. As oil and gas are often found in the same geological formation, it is common industry practice to calculate this figure in order to compare total hydrocarbon reserves across different resource basins, and so it serves here to estimate total hydrocarbon reserves released into the environment.

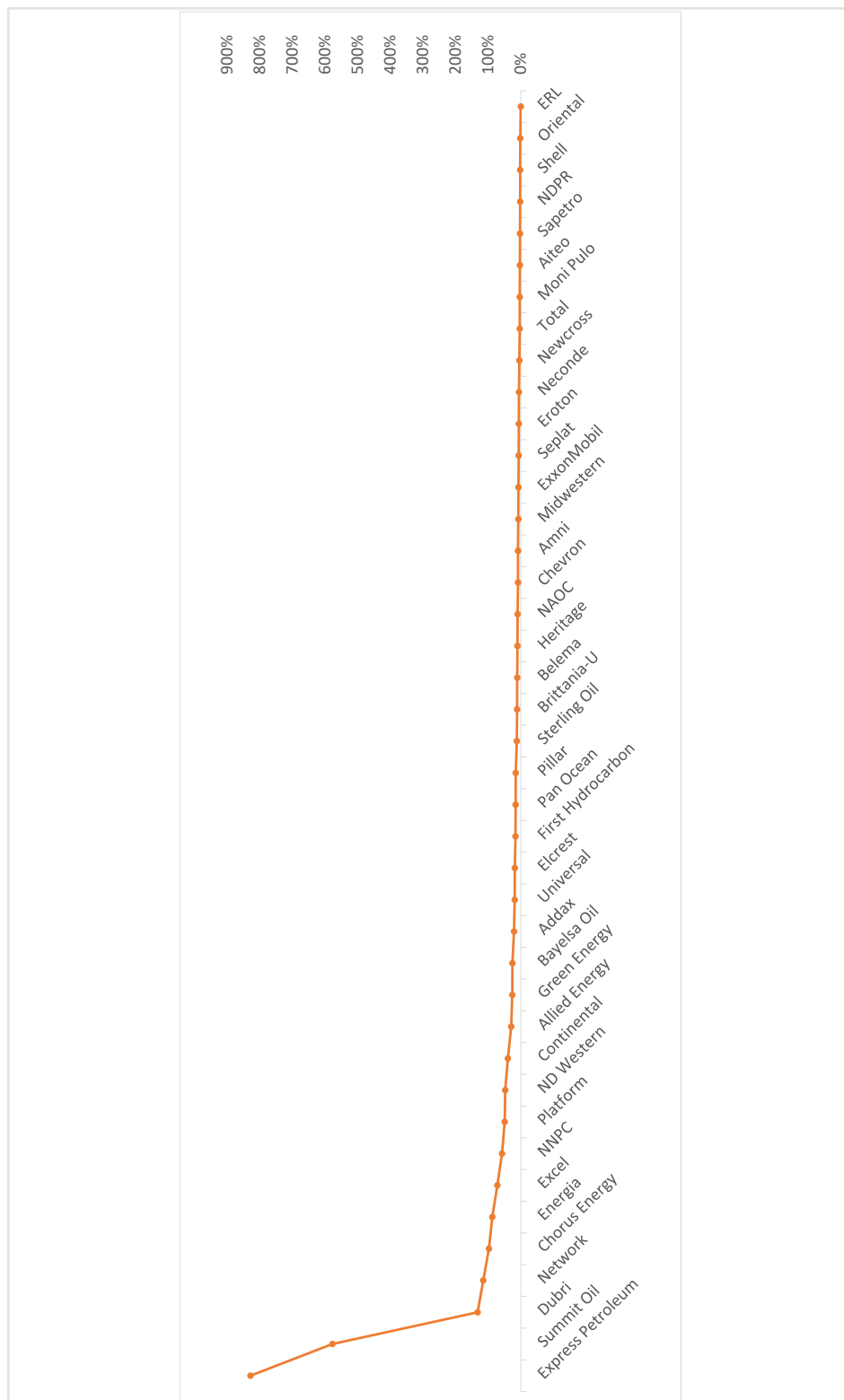
Once the BOE figure has been obtained, combining it with a company's total oil spill volume (which is already in barrels) gives a total emissions figure: that is, the total amount of oil and gas a company released into the environment. Dividing this figure by each company's annual oil production then gives its emissions ratio, which is its total emissions expressed as a percentage of its useful oil production.

¹¹ The process for doing so is described in the methodology.

For example, a company that produced 100,000 barrels of oil in a year, and 10,000 BOE as emissions, would have an emissions ratio of 10%: it released the equivalent of 10% of its useful oil production into the environment as emissions. More than 100% means that a company is producing more in environmental emissions than it is in useful output.

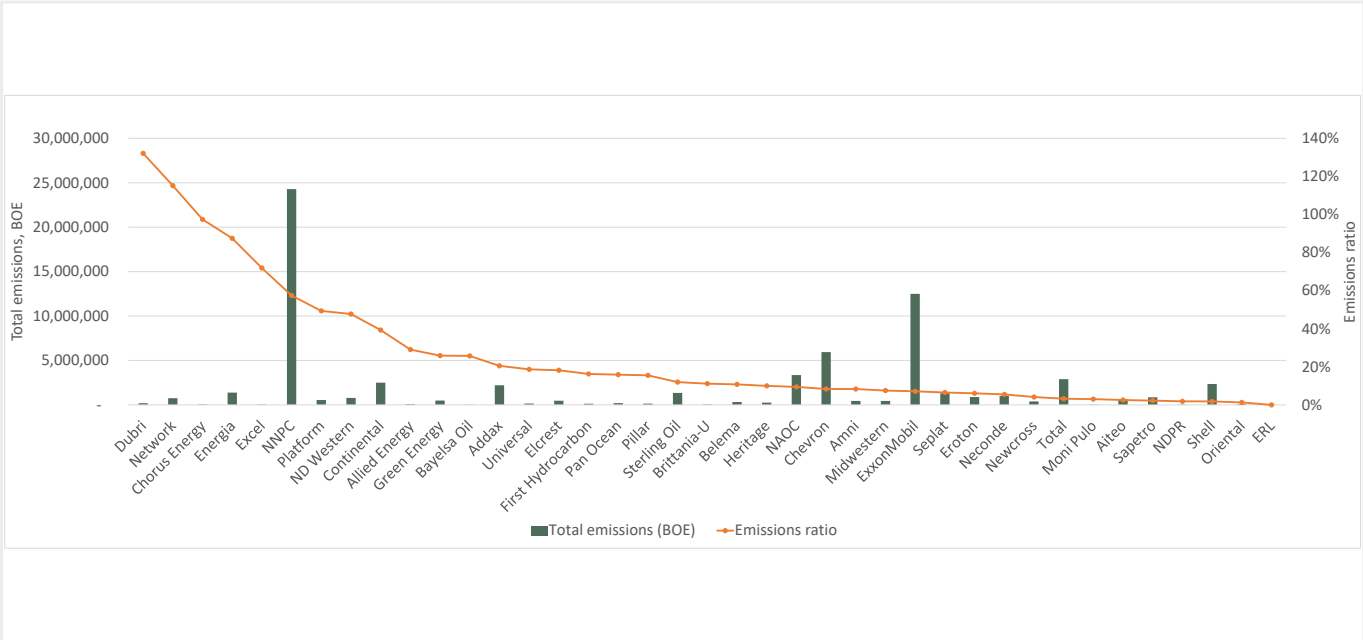
Note that an emissions ratio can only be calculated if a company actually produced oil. The graph below shows the ratio for all companies which have official production volumes attributed to them for 2018. The lower the percentage, the better the environmental performance:

Graph 13: Emissions ratio by company



Performing this calculation makes it obvious that the worst performers in relative terms are the indigenous Nigerian companies Express Petroleum and Summit Oil. However, these are both clearly outliers. Excluding these two companies makes the differences between the emissions ratios of the other companies more distinct:

Graph 14: Total emissions and emissions ratio by company (oil producers only, excluding outliers)



Plotting the emissions ratio against the total emissions for each company, as in Graph 14, also highlights the different ways of evaluating environmental performance. Because of the scale of their operations, the major international companies discharge far more in absolute terms. However, in general, their relative performance is stronger. Indeed, Shell—the worst performer in absolute terms—is among the best in terms of its relative environmental emissions.

However, the degree to which gas flaring tends to account for the majority of total emissions should be taken into account. As noted previously, half of all gas flared in Nigeria can be attributed to NNPC and ExxonMobil, which helps to explain why they have very high total emissions. But the impact of oil spills, which make up a much smaller proportion of total emissions, may be more significant for local communities in the Niger Delta. We place a higher weight on oil-related indicators in our Index because of this.

4. The environmental performance index

The indicators analysed in section three demonstrate how disaggregating emissions data enables oil company environmental performance to be assessed in different ways. Individual indicators are benchmarked against the worst absolute emissions in each category, based on the principle that companies should be targeting zero oil spills and gas flared.

To provide an overall assessment of each company, we developed these by combining the indicators and calculating a total score for each company between 0 and 1.¹² The higher the number, the better a company's relative environmental performance. To reiterate, this is relative to the other companies in the Index. Only the theoretical high score of 1 would imply 'zero' emissions from oil spills and gas flaring.¹³ However, this would not necessarily mean that a company did not have other environmental impacts, such as operational emissions, as well as challenges related to issues including land use, water management, and deforestation.

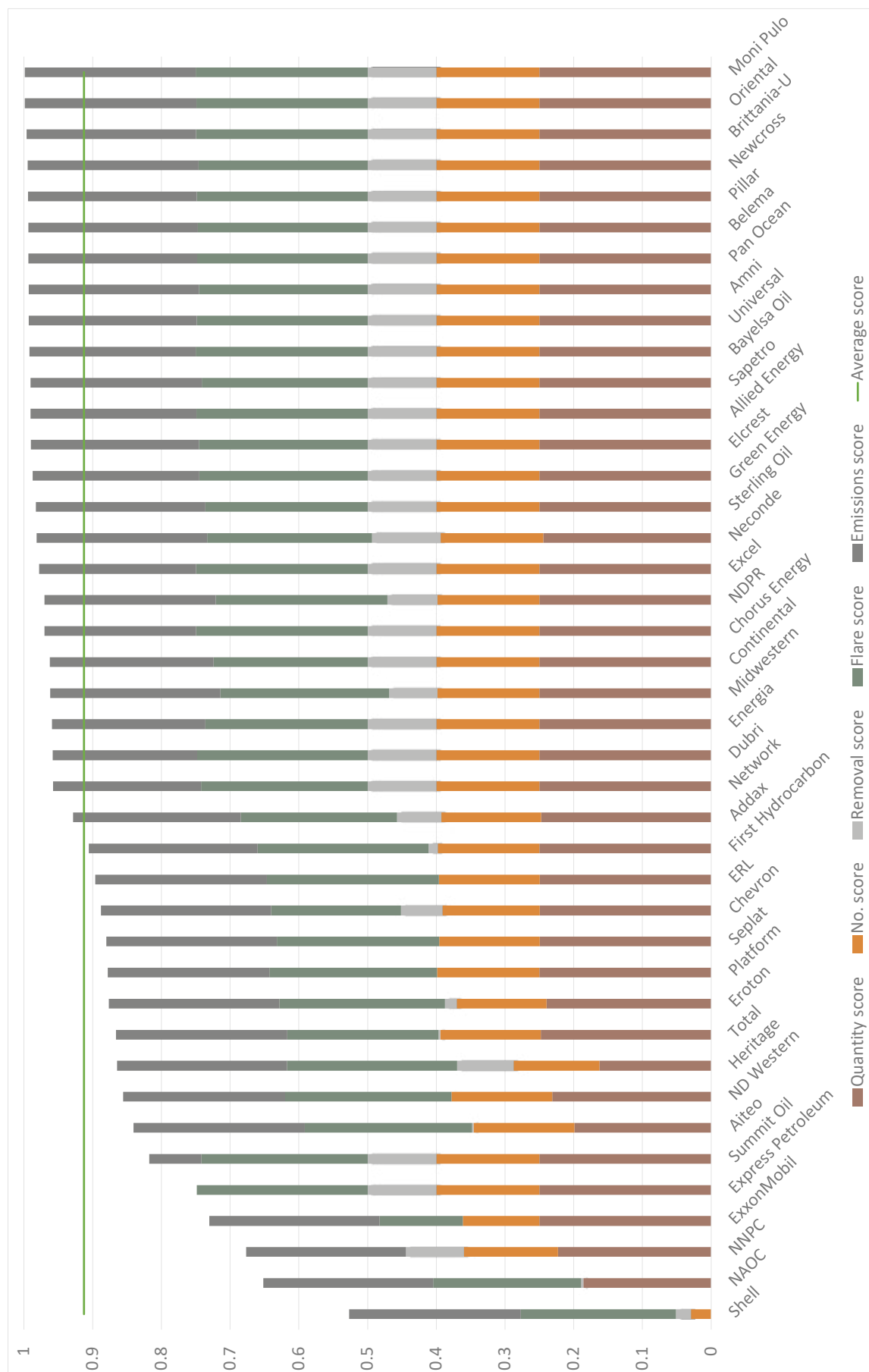
Note that we have produced three versions of the Index. This is to account for the fact that not all companies spilled oil, flared gas, or produced oil in the first place, and so relative performance differs depending on how companies are grouped. All three versions of our Index are included in the database which accompanies this report, and we encourage readers to look at these.

¹² The process for doing this is described in the methodology.

¹³ Scores are rounded, and so it appears that some companies score 1. This is not the case.

The version of the Index in Graph 15 includes the 41 companies which produced oil and spilled oil or flared gas in 2018. The higher a company's score, the better its relative environmental performance:

Graph 15: The 2018 environmental performance index—all oil-producing companies



In broad terms, some clear features can be identified.

01 With higher production, all other things being equal, come higher emissions. As such, the international oil companies tend to score less well, in absolute terms. Of the major international companies, Shell has the lowest environmental performance score, according to the calculations used in our methodology. This is because we prioritise the absolute discharge of oil, on the grounds that size matters: one ‘minor’ spill has the potential to damage cropland for one community, but a spill of a thousand barrels could ruin the productive capacity of an entire stretch of shoreline. This is an order of magnitude worse.

Other international companies, such as ExxonMobil, as well as the Nigerian national oil company, NNPC, flare a very large volume of gas. This accounts for their placement further down the Index, while others still, such as NAOC, have a high number of spills. As previously discussed, the cumulative impact of these is an important consideration when discussing environmental performance.

We wrote to companies included in this Index to request data, and with a copy of this report. In response to our communication, Chevron told us that its gas strategy involves elimination of routine gas flaring and building a profitable gas business through a diverse portfolio of domestic, regional and export supply projects, that fulfil the NNPC/CNL Joint Venture’s Domestic Gas Supply Obligation and support the Nigerian Gas Master Plan, and that as a result they have reduced routine flaring in their Nigerian operations by over 90% in the last ten years.

02 In relative terms, indigenous Nigerian companies perform worse than other companies. Their absolute environmental emissions are lower than the bigger companies, so they tend to appear further to the right in the Index. However, because their absolute production volumes are much lower, their emissions ratio are higher, as graphs 13 and 14 in this report make clear.

Another way to demonstrate this is by putting the rank for each company’s total score (in other words, its overall position in the Index) next to the individual rank for its emissions ratio. This shows that while Shell, for example, has the worst overall rank in the Index, it is third-best in terms of the quantity of emissions it produced per barrel of oil. Indeed, the worst performers on a per-unit basis (those in orange and red in the right-hand column of table 3) are all indigenous Nigerian companies. Calculating the average emissions ratio for indigenous and major international companies as a group (table 4) also shows that the international companies have stronger performance on a per-unit basis.

As noted previously, we prioritise total emissions in our Index, and this is important: absolute emissions released into the environment are what matter most for the inhabitants of the Niger Delta, and as a proportion of total emissions, the contribution of smaller companies is much less. Nonetheless, the differences in relative environmental performance are relevant: in the context, for example, of the stated (and controversial) intention of the Nigerian government to bring about the resumption of oil production in Ogoniland. Anecdotally, local communities sometimes call for oil production contracts to be awarded to indigenous companies, on the basis of their perceived stronger environmental performance. Our analysis implies this may not be the case. What is clear is that the distinction between international and other companies may not be as sharp as assumed.

Table 3: Total score rank vs emissions ratio score rank

Company	Rank (total score)	Rank (emissions ratio score)
Moni Pulo	1	7
Oriental	2	2
Brittania-U	3	20
Newcross	4	9
Pillar	5	22
Belema	6	19
Pan Ocean	7	23
Amni	8	15
Universal	9	26
Bayelsa Oil	10	28
Sapetro	11	5
Allied Energy	12	30
Elcrest	13	25
Green Energy	14	29
Sterling Oil	15	21
Neconde	16	10
Excel	17	35
NDPR	18	4
Chorus Energy	19	37
Continental	20	31
Midwestern	21	14
Energia	22	36
Dubri	23	39
Network	24	38
Addax	25	27
First Hydrocarbon	26	24
ERL	27	1
Chevron	28	16
Seplat	29	12
Platform	30	33
Eroton	31	11
Total	32	8
Heritage	33	18
ND Western	34	32
Aiteo	35	6
Summit Oil	36	40
Express Petroleum	37	41
ExxonMobil	38	13
NNPC	39	34
NAOC	40	17
Shell	41	3

Green - higher relative performance
Red - lower relative performance

Table 4: Average emissions ratio (Chevron, NAOC, ExxonMobil, Shell, Total)

Indigenous company average emission ratio:	18.34%
Major international company average emission ratio:	5.41%

03 Overall, there are some clear performance ‘bands’. 61% of companies in the Index above (25 of 41) score above the average score of 0.91. But this means that 61% of companies score within a range of only 9% of total possible scores. This is partly a function of the fact that a small number of companies are responsible for the majority of oil spilled, and oil spill indicators account for half of each overall score. Those companies which did not spill at all will therefore tend to cluster at the other end of the Index, as the relative differences between them are minimised, although this does not mean there are not important differences between companies in terms of specific indicators (as discussed).

04 This may also reflect broader challenges related to the data available on the Nigerian oil industry. It is very difficult to verify the volumes of oil spilled. The JIV process is imperfect, and, for example, although there are technologies available to oil companies to do so, it is not clear how oil spill volumes at sea are measured, if at all. This means that companies which operate entirely offshore may appear to produce fewer environmental emissions than they actually do.

Moreover, sources differ drastically. This Index uses data from the tools developed by SDN for NOSDRA (note that NOSDRA provides the actual data in the OSM, although the GFT generates gas flare volume estimates from satellite observations). But there are discrepancies with other agencies, as well as oil companies.

For example, in comparison with the NOSDRA figure of 25,308 barrels of oil spilled in 2018, NNPC reports 76,150 barrels of “pipeline crude oil loss”, without further comment, in its 2018 Annual Statistical Bulletin (Nigerian National Petroleum Corporation, 2018). Meanwhile, DPR’s 2018 Nigerian Oil and Gas Industry Annual Report says 9,718 barrels were spilled in 2018 (Department of Petroleum Resources, 2019). This figure does not seem credible, given NOSDRA’s figure is more than twice as high and the NNPC total is almost eight times as high.¹⁴ There are also differences between DPR-reported gas flare volumes and those in the GFT, as well as between company oil production volumes from different sources.

These discrepancies are extremely hard to reconcile, and as such our analysis is indicative only. But it is clear that the true extent of oil spill pollution in the Niger Delta may be far higher—and, importantly, that there may be additional companies which have spilled oil, but which are not presently included in the OSM data. If this is true, there will likely be greater variance in the scores in the Index.



Excavating mud polluted by a nearby oil spill.

¹⁴ We have written to DPR and NNPC asking for clarification of these figures.

As an example of another difference in figures, Shell Nigeria's website says that it spilled nearly 15,000 barrels of oil in Nigeria in 2018, while the figure for Shell in the OSM (for the states covered in this report, where the vast majority of onshore oil production takes place) is just over 12,000. Recording oil spills is challenging, and there may be valid reasons for the discrepancy; we use NOSDRA's figures for all companies, in order to ensure consistency and fairness. However, using Shell's own figures would actually lead to the company scoring worse.

It is to Shell's credit that it provides detailed information on oil spills on its website, and that NNPC provides at least an aggregate industry figure. Other companies also provide information of varying detail. But the discrepancies reveal the degree to which NOSDRA—which does a difficult job, in difficult circumstances—needs additional support and funding to deliver its remit.

Companies who know their wellhead production volumes and the amount delivered at the end of a pipeline are presumably able to measure the difference and infer losses from this data, while NOSDRA relies on having spills reported to it and then delivering a physically and politically complex site visit to assess each one. It is therefore no surprise if figures differ.

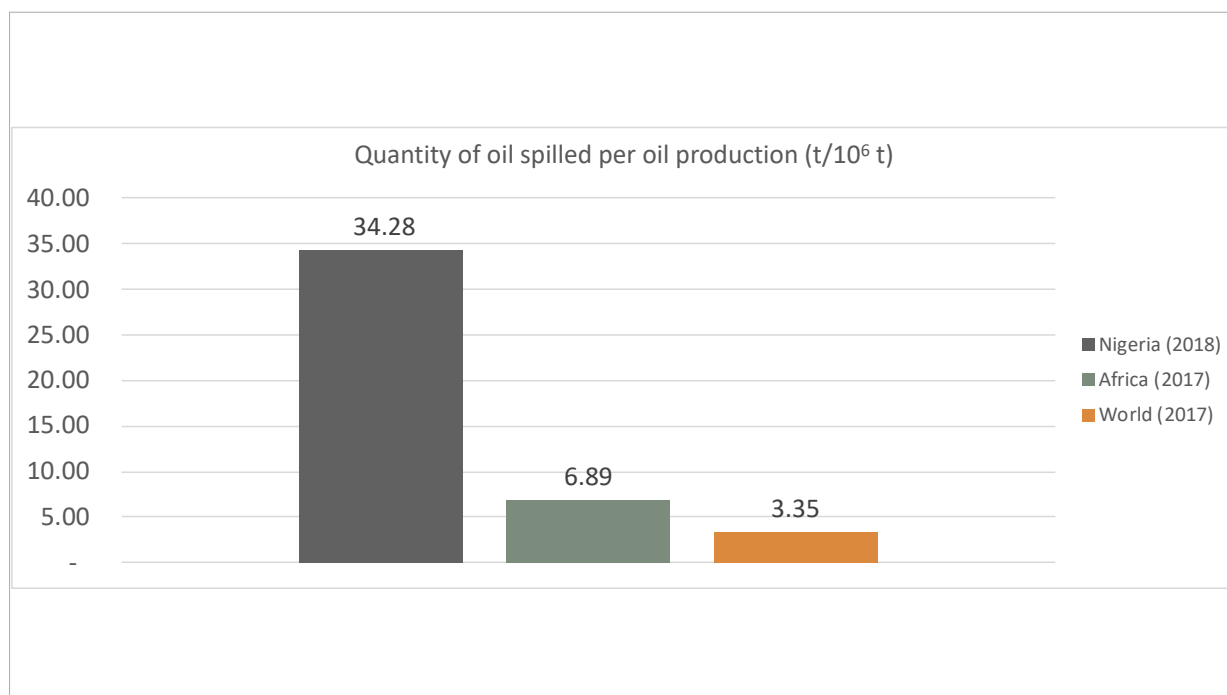
Note that NOSDRA has recently redesigned its oil spill reporting framework to help clarify the volumes of liquids spilled: for example, differentiating between oil, and mixtures of oil and water, or condensate.

This is a welcome step towards providing a more complete picture of oil spill issues. More generally, bridging the data gap—by making oil company disclosures of their own emissions data both public and mandatory—would enable a more informed understanding of the environmental challenge in the Niger Delta. As it stands, this Index can be an indicative assessment only.

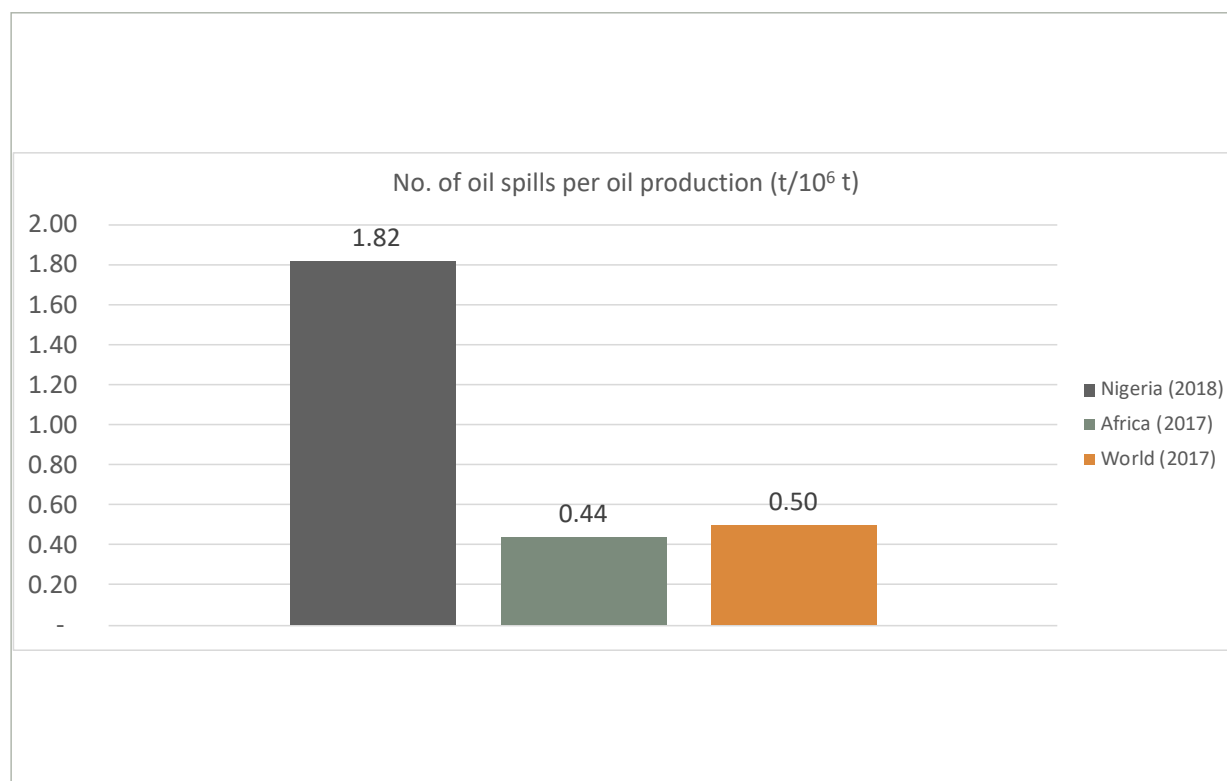
05

The total quantity of emissions in Nigeria is large. In absolute terms, the companies we looked at spilled an estimated 25,000 barrels of oil, and flared nearly half a trillion cubic feet of gas. These are sizeable figures in aggregate, while communities can be significantly impacted by a single spill or gas flare site. Furthermore, Nigeria is demonstrably a poor performer in international terms. This is made clear by placing 2018 Nigerian environmental emissions data alongside the 2017 data of the International Oil & Gas Producers' Association (IOGP). This is an imperfect comparison, partly because it depends on calculation assumptions, and partly because the data is from different years (the IOGP data was the latest available, at the time of writing). However, the discrepancy is sizeable, with the Nigerian oil industry appearing to have far higher emissions than other oil industries (graphs 16-18).

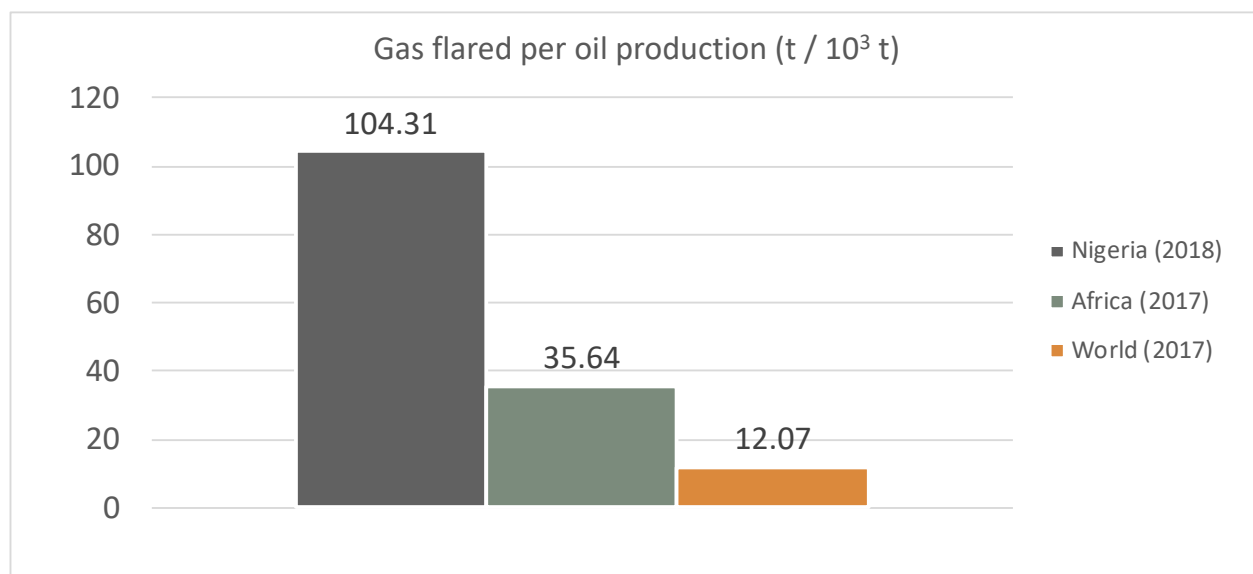
Graph 16: Nigerian vs international oil industry–oil spill quantity



Graph 17: Nigerian vs international oil industry–number of oil spills



Graph 18: Nigerian vs international oil industry–gas flared



The poor performance of Nigerian oil is obvious to inhabitants of the Niger Delta, which is why there continues to be significant local anger at the environmental impacts of the industry. As such, care should be taken not to interpret the fact that many companies score close to 1 in our Index—which ranks relative not absolute performance—as a sign of strong performance. It simply means that their emissions are lower than those of other companies in Nigeria. Relative to the rest of the world, the Nigerian oil industry overall is a demonstrably poor performer.

5. Conclusion: the environmental cost of Nigerian oil

We intend to produce this report on annual basis, in order to examine the trends, if any, in the environmental performance of the Nigerian oil industry, and to help identify measures to support action on environmental performance. As it stands, this report provides a snapshot of the situation in 2018, the last complete year for which all relevant data is available.

5.1 Emissions in context: current and future developments

It is clear that the environmental *impact* of the petroleum sector in Nigeria depends on: where an oil spill takes place; whether a community is down or upwind of a gas flare; local capacity to initiate and follow up on containment, and response measures to pollution.

But 30 million people live in the middle of a major hydrocarbon deposit in the Niger Delta, and they cannot simply move to avoid an industry which is based on extracting what is in the ground beneath them.

The cumulative environmental cost is therefore huge. In 2018, hundreds of oil spills leaked thousands of barrels of crude into the area's land and water. Only a little over a quarter of this was removed, and in any case, removal does not mean the reversal of impact. An increasing body of research is documenting the effects of oil industry emissions on human health, while given the subsistence nature of livelihoods for some communities in the region, the economic cost is also high. A farmer whose crops fail because their land has been poisoned by an oil spill will lose their entire means of generating income.

As such, the destruction of livelihoods in this manner makes those who lose them dependent on other people, while in some cases also generating an incentive to join the artisanal oil industry. This is an understandable short-term response, but one which contributes to the long-term problem. Furthermore, the oil spill figures in this report are almost certainly an underestimate.

Meanwhile, and despite progress made in recent years, oil companies operating in Nigeria still flared a huge quantity of natural gas in 2018. This is a practice which has been linked to local health problems, and is demonstrably a cause of global climate change.

This situation must change. Those who bear the biggest local impact from the oil industry are among those least able to seek redress: the route to justice for communities which have suffered from environmental damage is slow, complicated, and expensive.

Furthermore, in August 2019 NNPC announced that its objective is to increase Nigerian oil production by a third by 2023 (Reuters, 2019). As such, absent improvements in pollution prevention, management and control, the state of the environment in the Niger Delta can be expected to get significantly worse. The government is also encouraging oil prospecting around the Lake Chad basin. If Nigeria ends up developing a new oil-producing region there, it is imperative that the mistakes of the past be avoided.

5.2 Addressing the challenge: government priorities

Nigeria needs to address these issues, in the context of supporting a long-term transition to an economy powered by cleaner energy sources. It is unrealistic to expect the Nigerian government not to exploit its hydrocarbon reserves, in the near term, at least. But they can be exploited far more responsibly.

The overriding priority should be to empower, legally and financially, a set of independent regulators to oversee the industry.

The President must work with the National Assembly to pass the NOSDRA Amendment Bill, intended to strengthen the statutory basis on which NOSDRA can inspect and regulate oil producers.

Further delays to the passage of this Bill would signal that the government is not serious about its much-touted reform of the industry.

The President, who is also Petroleum Minister, must also address the conflict of interest whereby DPR, the agency responsible for maximising revenue, is also responsible for minimising environmental costs. This contradicts international best practice.

However, passing legislation is one thing. Enforcing it is another. NOSDRA should be provided with the funding and logistical resources to discharge its mandate. Its Zonal Office staff—responsible for organising the response to oil spills on site—sometimes lack the basic equipment necessary to do their job. This must change. For its part, NOSDRA should assess and make public the estimated number of oil spill sites it is unable to reach or conduct a full investigation into, so a clearer picture of the true extent of pollution can be drawn.

Related, DPR should commission and publish a comprehensive, independent asset integrity review of all oil and gas infrastructure in the Niger Delta. This should then inform the development of a plan to ensure the repair and upgrade all infrastructure which does not meet international best practice standards (for example, which does not include leak detection and remote flow reduction capability).

The government must also ensure the success of the Hydrocarbon Remediation Project (HYPREP). HYPREP is the major clean-up project intend to address decades of pollution in the Ogoniland area of Rivers State. It is years behind schedule, although activity began in 2019. Successfully executing HYPREP, and ensuring that progress is transparent and publicly accountable, would demonstrate meaningful commitment to addressing past and preventing future environmental damage from the oil industry.

Finally, progress needs to be delivered on harnessing natural gas, with the twin objectives of reducing flaring and increasing access to power. Lack of access to reliable electricity is an obstacle to economic growth in Nigeria. It also drives demand for generator fuel. This, in turn, is a factor in the artisanal oil refining industry, which operates completely outside any formal environmental protection initiatives, is a major source of pollution, and is sometimes used to justify inaction on the broader issues in the Niger Delta. The Nigerian Gas Flare Commercialization Plan offers a potential, and long overdue, solution to gas flaring.



Gas flaring in the Niger Delta.

5.3 Oil industry action

As our analysis shows, performance varies across companies and geography. The range of circumstances in which oil companies operate may partially account for this—onshore and offshore, in new, marginal, and mature fields—with different infrastructure and working practices involved in extracting oil related to each.

The challenges of artisanal oil refining are also real, and environmental performance is not purely a technical question: Shell says on its website that 90% of its spills in Nigeria are caused by sabotage. However, oil companies should not seek to explain poor environmental performance solely in terms of the conduct of others. There are many unanswered questions relating to the social performance of the industry.

Investigating the reasons for the differences in environmental performance in more detail is a key area for further research, and the first step to doing this—and addressing the social questions—is to build trust, by increasing transparency. All oil companies should follow the lead of Shell and others, and publish an annual account of their oil spills and other solid and liquid emissions, disaggregated by location, type of loss, volume, reported cause, and with a detailed description of impact, as a minimum. They should also publish a monthly account of all gas flared at any relevant facilities, disaggregated by location, site, volume and chemical composition of gas flared, as a minimum. Doing so would help establish a more accurate record of the true extent of environmental emissions and their causes.

It is only by acknowledging the scale of the problem that companies will dispel the notion that they are fundamentally interested in Nigeria solely for their own benefit. This in turn would help improve their social licence to operate, which in the context of the region—where oil production is frequently shut in because of local protests relating to the industry, and its environmental performance—should also be of interest to investors. Nigerian oil's environmental, social and governance issues, not to mention the climate risk associated with investment in non-renewable energy, will be of increasing interest to financial and other risk managers.

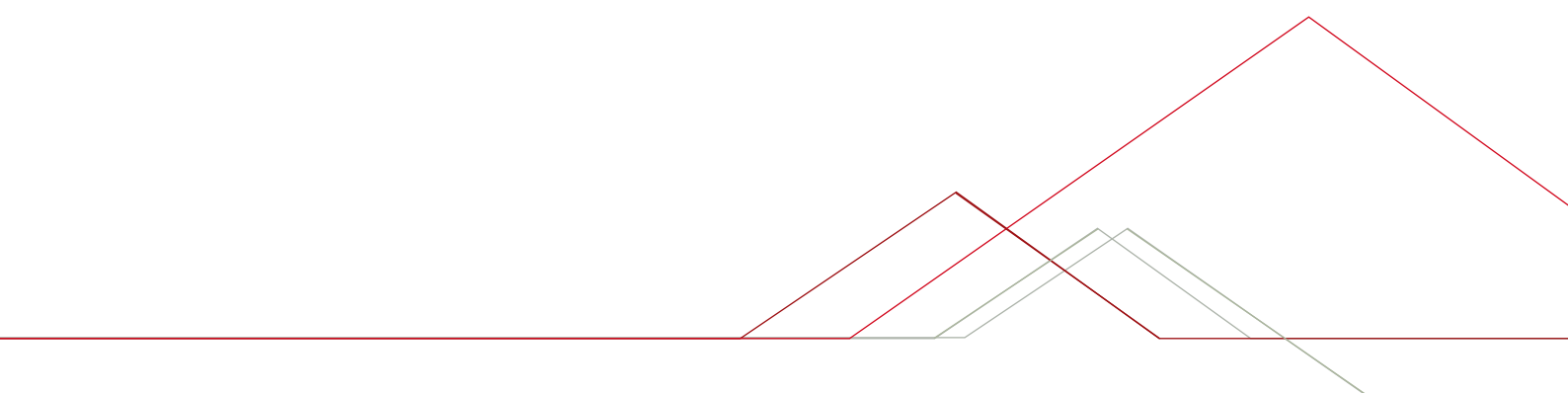
5.4 Next steps

SDN will engage constructively with all those willing to find a solution to these challenges. We are organising a series of public and private events to launch this report, and look forward to hearing from all interested parties on how change can be enacted.

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7. Appendix

7.1 Company scores

The table below contains information on individual indicator scores and ranks by company. These relate to Index A in the database, which is also the version discussed in section 4 of this report. It includes all companies which produced oil in 2018.

Company	Quantity score (weighted)	No. score (weighted)	Removal score (weighted)	Flare score (weighted)	Emissions ratio score (weighted)	Total score (weighted)	Average total score	Rank (quantity score)	Rank (no. score)	Rank (removal score)	Rank (flare score)	Rank (emissions ratio score)	Rank (total score)
Moni Pulo	0.25	0.1500	0.10	0.25	0.25	0.999	0.91	1	1	1	3	7	1
Oriental	0.25	0.1500	0.10	0.25	0.25	0.999	0.91	1	1	1	9	2	2
Brittania-U	0.25	0.1500	0.10	0.25	0.25	0.996	0.91	1	1	1	6	20	3
Newcross	0.25	0.1500	0.10	0.25	0.25	0.995	0.91	1	1	1	18	9	4
Pillar	0.25	0.1500	0.10	0.25	0.25	0.99	0.91	1	1	1	12	22	5
Belema	0.25	0.1500	0.10	0.25	0.25	0.99	0.91	1	1	1	17	19	6
Pan Ocean	0.25	0.1500	0.10	0.25	0.25	0.99	0.91	1	1	1	15	23	7
Amni	0.25	0.1500	0.10	0.25	0.25	0.99	0.91	1	1	1	20	15	8
Universal	0.25	0.1500	0.10	0.25	0.24	0.99	0.91	1	1	1	13	26	9
Bayelsa Oil	0.25	0.1500	0.10	0.25	0.24	0.99	0.91	1	1	1	2	28	10
Sapetro	0.25	0.1500	0.10	0.24	0.25	0.99	0.91	1	1	1	28	5	11
Allied Energy	0.25	0.1500	0.10	0.25	0.24	0.99	0.91	1	1	1	8	30	12
Elcrest	0.25	0.1500	0.10	0.25	0.24	0.99	0.91	1	1	1	21	25	13
Green Energy	0.25	0.1500	0.10	0.24	0.24	0.99	0.91	1	1	1	22	29	14
Sterling Oil	0.25	0.1500	0.10	0.24	0.25	0.98	0.91	1	1	1	32	21	15
Neconde	0.24	0.1493	0.10	0.24	0.25	0.98	0.91	34	24	1	30	10	16
Excel	0.25	0.1500	0.10	0.25	0.23	0.98	0.91	1	1	1	5	35	17
NDPR	0.25	0.1487	0.07	0.25	0.25	0.97	0.91	25	25	27	4	4	18
Chorus Energy	0.25	0.1500	0.10	0.25	0.22	0.97	0.91	1	1	1	7	37	19
Continental	0.25	0.1500	0.10	0.22	0.24	0.96	0.91	1	1	1	36	31	20
Midwestern	0.25	0.1487	0.07	0.25	0.25	0.96	0.91	28	25	28	19	14	21
Energia	0.25	0.1500	0.10	0.24	0.22	0.96	0.91	1	1	1	33	36	22
Dubri	0.25	0.1500	0.10	0.25	0.21	0.96	0.91	1	1	1	14	39	23
Network	0.25	0.1500	0.10	0.24	0.22	0.96	0.91	1	1	1	25	38	24
Addax	0.25	0.1448	0.06	0.23	0.24	0.93	0.91	33	34	29	34	27	25
First Hydrocarbo	0.25	0.1480	0.01	0.25	0.25	0.91	0.91	27	28	33	10	24	26
ERL	0.25	0.1467	0.00	0.25	0.25	0.90	0.91	29	29	38	1	1	27
Chevron	0.25	0.1415	0.06	0.19	0.25	0.89	0.91	31	35	30	39	16	28
Seplat	0.25	0.1461	0.00	0.24	0.25	0.88	0.91	30	32	38	31	12	29
Platform	0.25	0.1487	0.00	0.24	0.24	0.88	0.91	24	25	38	23	33	30
Eroton	0.24	0.1310	0.02	0.24	0.25	0.88	0.91	35	37	32	29	11	31
Total	0.25	0.1461	0.00	0.22	0.25	0.87	0.91	32	32	35	37	8	32
Heritage	0.16	0.1251	0.08	0.25	0.25	0.86	0.91	40	38	26	16	18	33
ND Western	0.23	0.1467	0.00	0.24	0.24	0.86	0.91	36	29	37	26	32	34
Aiteo	0.20	0.1467	0.00	0.24	0.25	0.84	0.91	38	29	36	24	6	35
Summit Oil	0.25	0.1500	0.10	0.24	0.08	0.82	0.91	1	1	1	27	40	36
Express Petroleum	0.25	0.1500	0.10	0.25	0.00	0.75	0.91	1	1	1	11	41	37
ExxonMobil	0.25	0.1114	0.00	0.12	0.25	0.73	0.91	26	39	38	40	13	38
NINPC	0.22	0.1369	0.08	0.00	0.23	0.68	0.91	37	36	25	41	34	39
Eni	0.19	0.0000	0.00	0.22	0.25	0.65	0.91	39	41	34	38	17	40
Shell	0.00	0.0295	0.02	0.23	0.25	0.53	0.91	41	40	31	35	3	41

7.2 Oil industry feedback

Introduction

SDN aims to work constructively with all stakeholders committed to reducing the environmental impact of the Nigerian oil industry. As such, we sought in particular to engage with the oil companies included in the Index as part of our research and publication process, and NOSDRA, as the key regulator. This annex summarises feedback from their representatives and our response to this feedback, including how we hope to develop future versions of the Index.

Oil company feedback: summary

We wrote to companies initially to inform them of our intention to produce the Index, and to request their data on oil production and gas flare volumes. Prior to publication, we then wrote to companies for a second time, with a copy of the draft Index, inviting them to provide their response at a discussion event in Lagos. This took place in March 2020. Some companies provided their comments separately.

Finally, we asked companies if they wished to provide directly attributable statements for us to publish. None did, but based on comments made during our engagement, we would like to draw attention to a number of points. These relate to the ways in which oil company representatives suggested the Index could be improved. Particular comments raised by industry representatives related to:

- Concerns that the Index does not sufficiently recognise the challenges that the industry faces with respect to third party interference (namely oil theft).
- The view that offshore and onshore spills should be assessed separately, due to onshore production being more affected by third party spills.
- The potential to include broader indicators of environmental performance, such as the degree to which companies publish their own data on oil spills and gas flaring.

We agree that these are important issues, and provide responses below. We believe the reaction and engagement of company representatives shows that this Index has already provided a useful basis for discussion, and we thank them for their input. We are committed to improving this work, and to developing an Index of the highest possible quality, and we will aim to incorporate many of the points raised in future versions of the Index. We would also note that there is a limit to the extent to which the Index can account for every factor which could be useful in assessing environmental performance, especially when not all the relevant data is publicly available. We have highlighted this throughout this research where relevant.

We have incorporated a number of changes in the text of the published report based on comments made by oil industry representatives. Other key points raised by them on the Index relate to:

Third-party interference

As noted in the report, the artisanal oil industry and third-party interference are major concerns for the oil industry, regulators and local communities in the Niger Delta. Company representatives were concerned that the Index methodology did not sufficiently acknowledge the challenge of third party oil spills. For example, staff from one company said that an operator producing oil solely onshore, in an oil theft hotspot, would face different challenges from a company operating solely offshore. We acknowledge the significant role that third party interference can play in oil spills, and in future versions of the Index, further consideration will be needed on the extent to which a high level of third-party interference should be reflected in a company's score.

We also note that the ability to prevent interference does not rest solely with operators. Figures 1 and 2 below make clear that according to the data available, and as noted in the Index, most oil spills are a result of third party interference, commonly referred to as sabotage. This is also true for the volume of oil spilled, although also as noted in the Index, there are many spills which appear only to have a nominal volume attributed to them in NOSDRA's data. The actual volume of non-sabotage-related oil spilled may therefore be much higher.

Figure 1

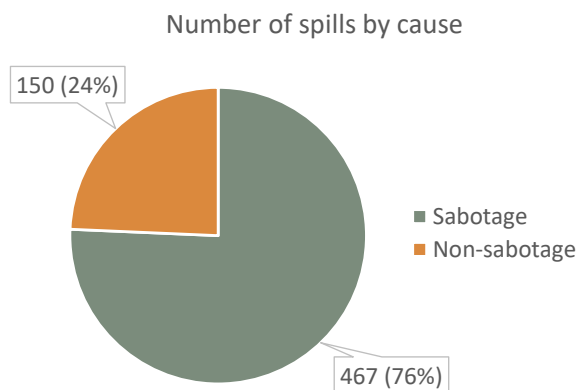


Figure 2

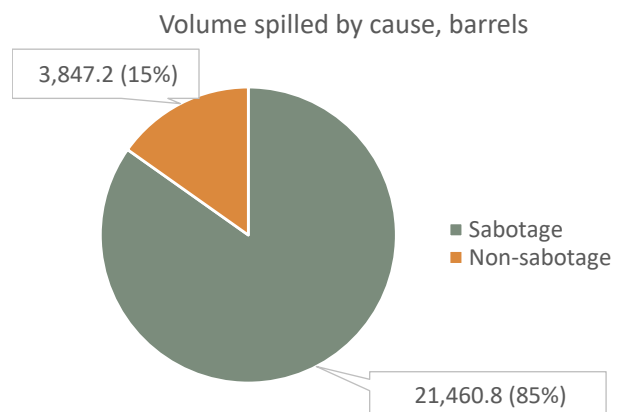


Figure 3 shows the total number of spills attributed to each company, including a breakdown of reported cause. The companies are ordered according to the number of operational spills (in other words, those not caused by third party interference). This shows, for example, that NAOC and Shell continue to appear near the bottom of the rankings, as they do in the Index. However, it is ExxonMobil which has the highest number of spills – more than double the number of Shell – that are attributable to operational error or infrastructure failure, rather than sabotage.

Figure 3

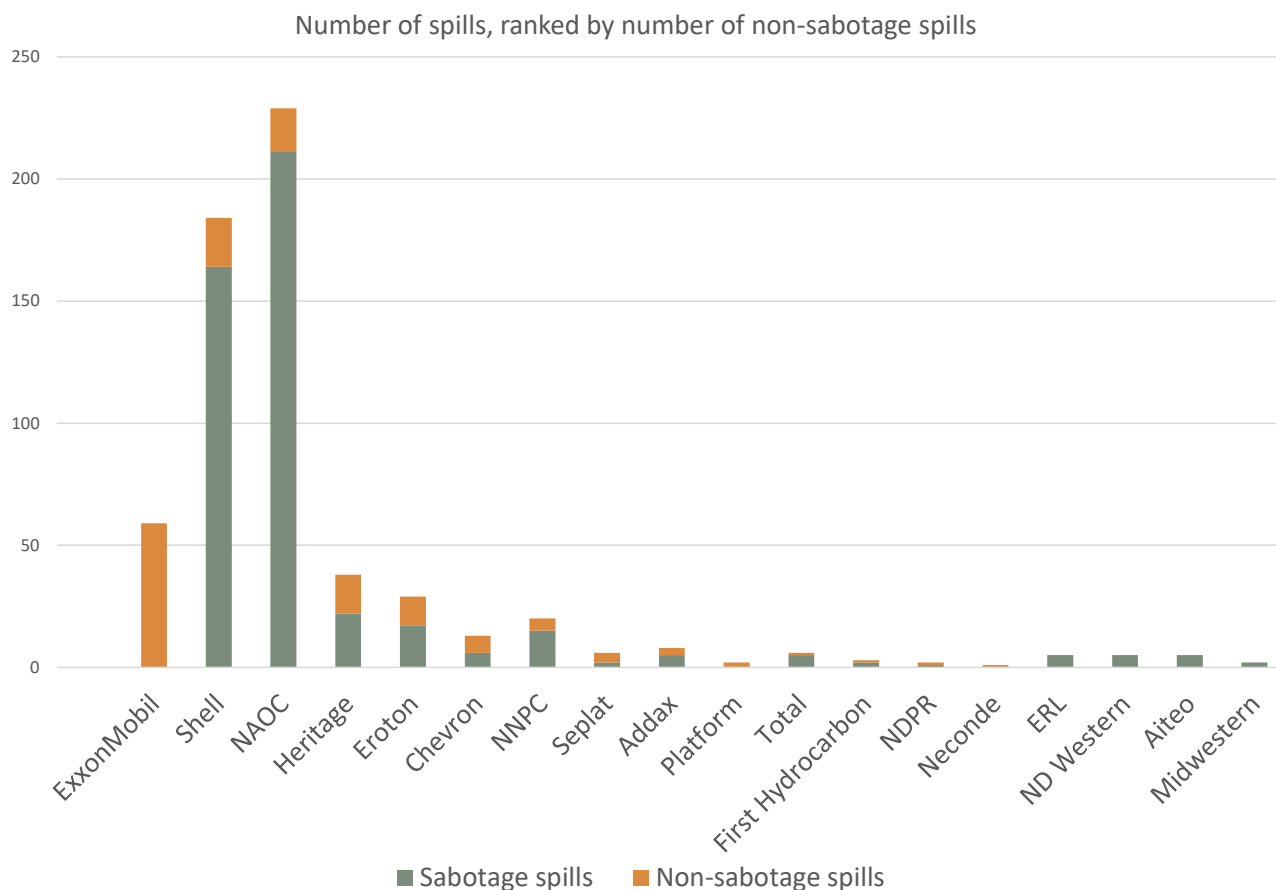
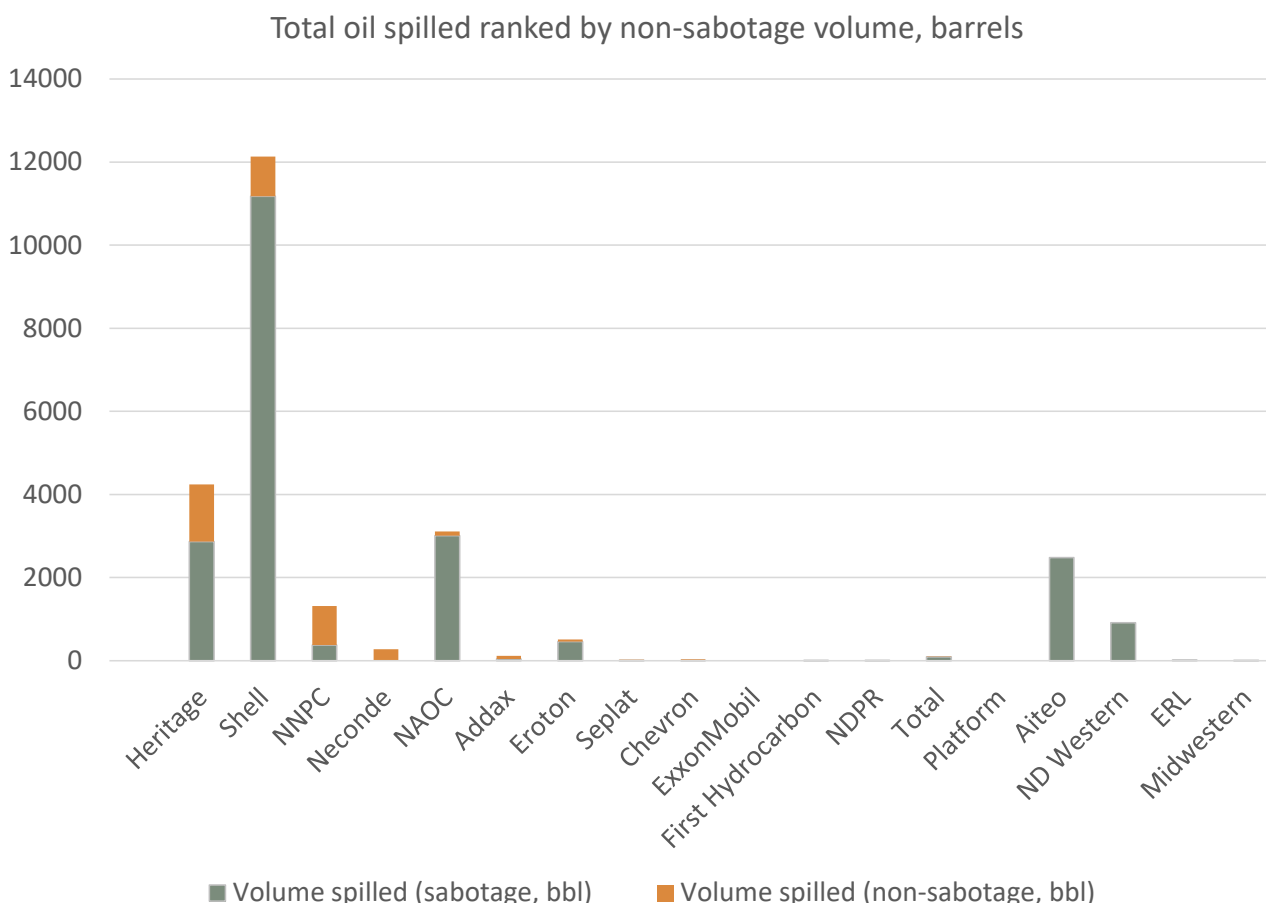


Figure 4 shows the total volume of oil spilled attributed to each company, again including the breakdown by reported cause. The companies are ordered according to the volume of oil spilled for operational (non-sabotage) reasons. Heritage spilled the largest volume of oil as a consequence of these reasons. Shell and NNPC also spilled a significantly greater volume of oil for operational or infrastructure reasons than other companies. It is also interesting to note that despite its high number of spills, as made clear in figure 3, ExxonMobil reportedly spilled a very small quantity of oil. This may be related to the issue of nominal volumes previously discussed.

Figure 4



For comparison, the same graphs are provided overleaf in figures 5 and 6, including only non-sabotage spills and spill volumes. This makes the relative differences easier to see.

Figure 5

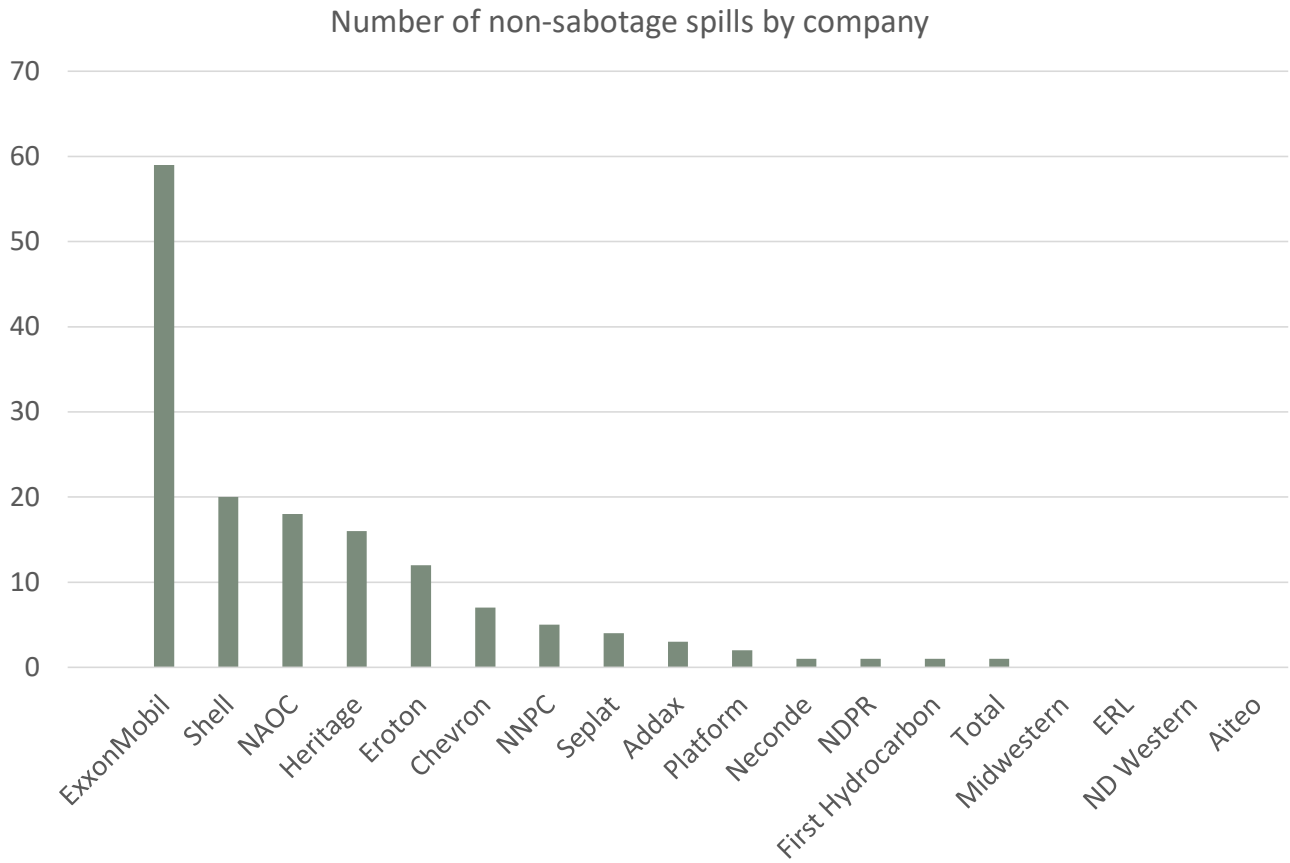
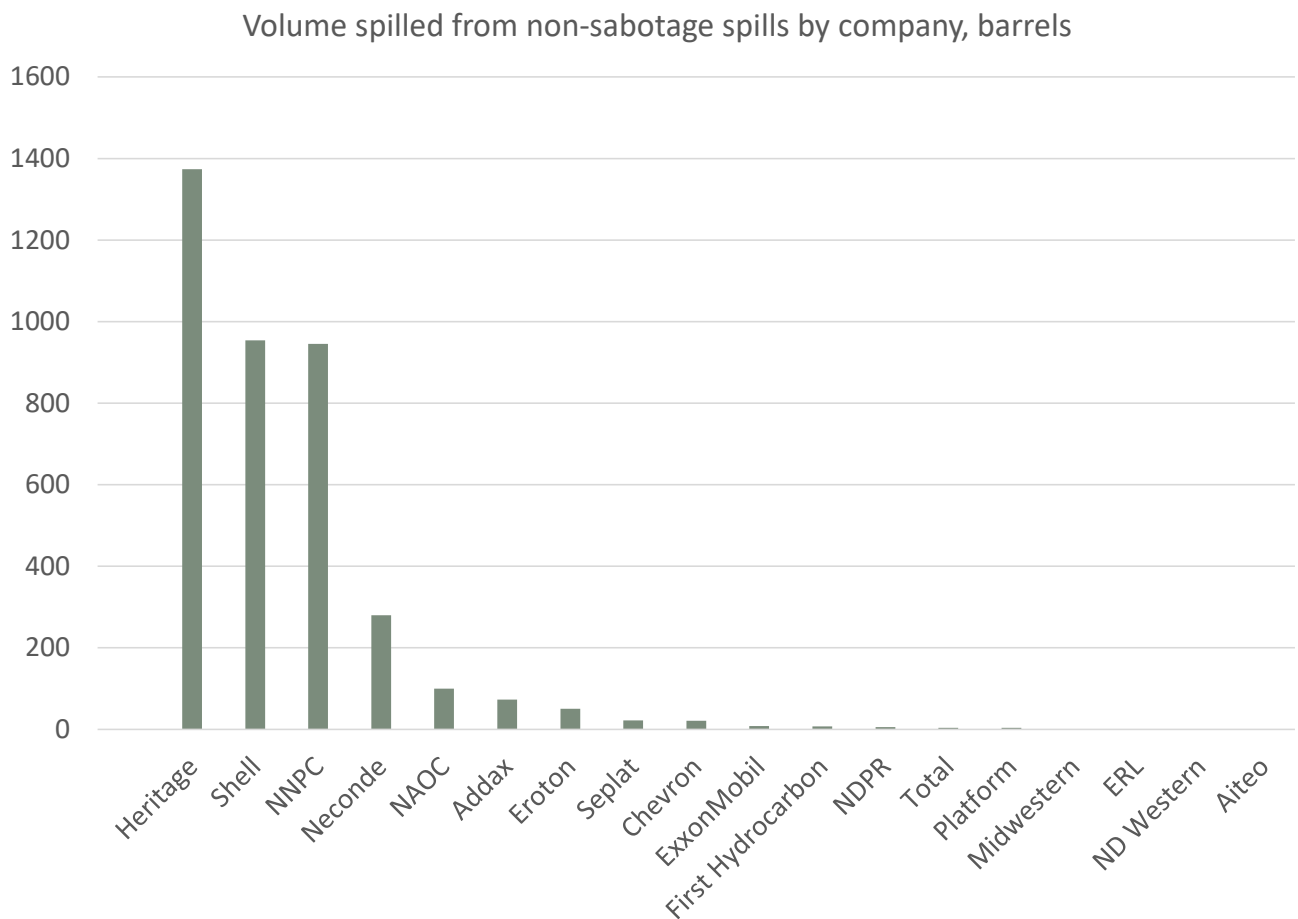


Figure 6



We strongly reiterate the importance of dealing with illicit oil activity, both as an environmental challenge itself and as part of the Niger Delta's broader challenges. We work on many aspects of the oil and gas sector in Nigeria, and this Index focuses on the formal oil industry, with its purpose to establish total emissions related to individual companies. But we have also carried out extensive research on the artisanal industry. This includes, for example, our flagship report examining the economics of the artisanal refining industry, *More Money, More Problems*, which is available at: www.stakeholderdemocracy.org/moremoneymoreproblems. We have also run projects intended to generate alternative livelihoods in locations where the artisanal refining industry is prevalent, and welcome input on how this work might be expanded.

Infrastructure location and extent

Related to third party interference issues, some companies wished to clarify that whether production takes place onshore or offshore has an impact on their relative ability to prevent spills. As noted above, this would most obviously be because the artisanal oil industry operates onshore. Companies operating onshore may therefore be at a disadvantage in the Index because their pipeline and other infrastructure is more vulnerable to third party interference. Other companies made the same point relating to the relative length of pipeline and other infrastructure they operate, and how this may increase susceptibility to sabotage. A company producing from several small oil fields may have more pipeline (and hence potential sabotage) exposure than a company producing the same amount of oil from one larger field.

All potentially harmful environmental emissions are a problem, and the purpose of the Index is to quantify total releases related to particular companies. However, we acknowledge the importance of these distinctions, and in future will aim to account for them, where possible.

To do so, we call on oil companies to disaggregate and publish their onshore and offshore production volumes. We also call on all companies to provide full public details of any oil spills which take place offshore, for the benefit of both civil society and regulators. As noted in this Index, it appears that most offshore incidents in the NOSDRA database of oil spills, the Oil Spill Monitor, have only nominal volumes attributed to them. To provide a fair comparison, it is necessary to have as detailed an understanding of these as possible.

Data sources

As noted in the Index, identifying and assessing oil spills is a complex task. The environmental emissions attributed to each company in this report are the total emissions estimated or recorded by the pollution monitoring tools of the National Oil Spill Detection and Response Agency (NOSDRA). We have not altered this data beyond standardising it for use in our database. Minor changes made as part of this are highlighted in the database published.

Companies wished to clarify the source of data for oil spill removal volumes. These can vary depending on the point in the assessment process at which they are recorded. The source for these volumes in the Index is the "Quantity recovered" column of data in the Oil Spill Monitor. This may refer to the relevant field, which has the same title, on two NOSDRA forms used to assess oil spills and their clean-up. These are available on NOSDRA's website:

- Form B: Risk Based Assessment of Oil Spill Incidence
- Form C: Site Clean-up / Remediation Assessment Form.

Form B is supposed to be submitted within two weeks of a spill, while Form C is to be completed after any clean-up has taken place. As such, if the “Quantity recovered” column in the Oil Spill Monitor refers to Form B, it may be that more oil has since been removed from the spill site than what is recorded in the data (and used for our Index). However, it is not clear in the data to which form the figure on oil removed for a given incident refers. In any case, there is only one column including this information, and so these are the figures we have used for our calculations. The alternative would be not to include any oil removal figure at all, which would penalise company performance unreasonably. And if the “Quantity recovered” column does refer to Form C, this is presumably the final amount of oil which has been removed. As such, we do not think that a company’s performance suffers unfairly from this issue.

Transparency and other indicators

Companies felt the Index would be strengthened by taking into account public and other commitments to transparency on environmental issues. For example, some companies wished to highlight that they produce and publish their own data on environmental emissions in Nigeria.

This is important, and we acknowledge and commend this in the Index. We call on all oil companies, international and indigenous, to do the same. We plan to incorporate an indicator relating to the transparency of companies in this regard in future versions of the EPI. In general, we strongly believe in mutual accountability, which is why we have published all of our own data and calculations relating to the EPI. We welcome further constructive critique on this work.

Stakeholder engagement

Companies noted that there is a wide range of stakeholders involved in work to prevent and respond to environmental emissions in the Niger Delta, including government, civil society and local communities, and that all these groups should be involved in work to address the issues raised in this report.

We agree, and we consult regularly with these and other stakeholders on our work. Drafts of this research were reviewed by staff from NOSDRA and oil companies themselves, as well as a Port Harcourt-based NGO, and an international NGO working on business, environmental and human rights issues. The database and methodology were reviewed by an independent consultant.

NOSDRA feedback: summary

We have incorporated a number of changes suggested by NOSDRA representatives in the text of the published report.

One key issue mentioned by NOSDRA relates to the description of companies included in the Index. Some of the oil companies operating in Nigeria have subsidiaries.

We believe that the most useful way to compare performance across companies is to aggregate the volumes of oil spills and gas flared by these subsidiaries, and their production volumes. This means that a single score can be generated for the performance of all companies operating in Nigeria which are related to each other.

This means, for example, that the oil spill figures we provide for NNPC are the sum of the individual figures for its various subsidiaries listed in the OSM as having spilt oil, such as the Nigeria Pipelines and Storage Company, and the Nigerian Petroleum Development Company. Different versions of company titles are sometimes used in the OSM; in the published database which is the basis for this research we have made clear how we have standardised names. In general, where applicable we use the global group name to refer to a company, although the analysis in this report relates solely to

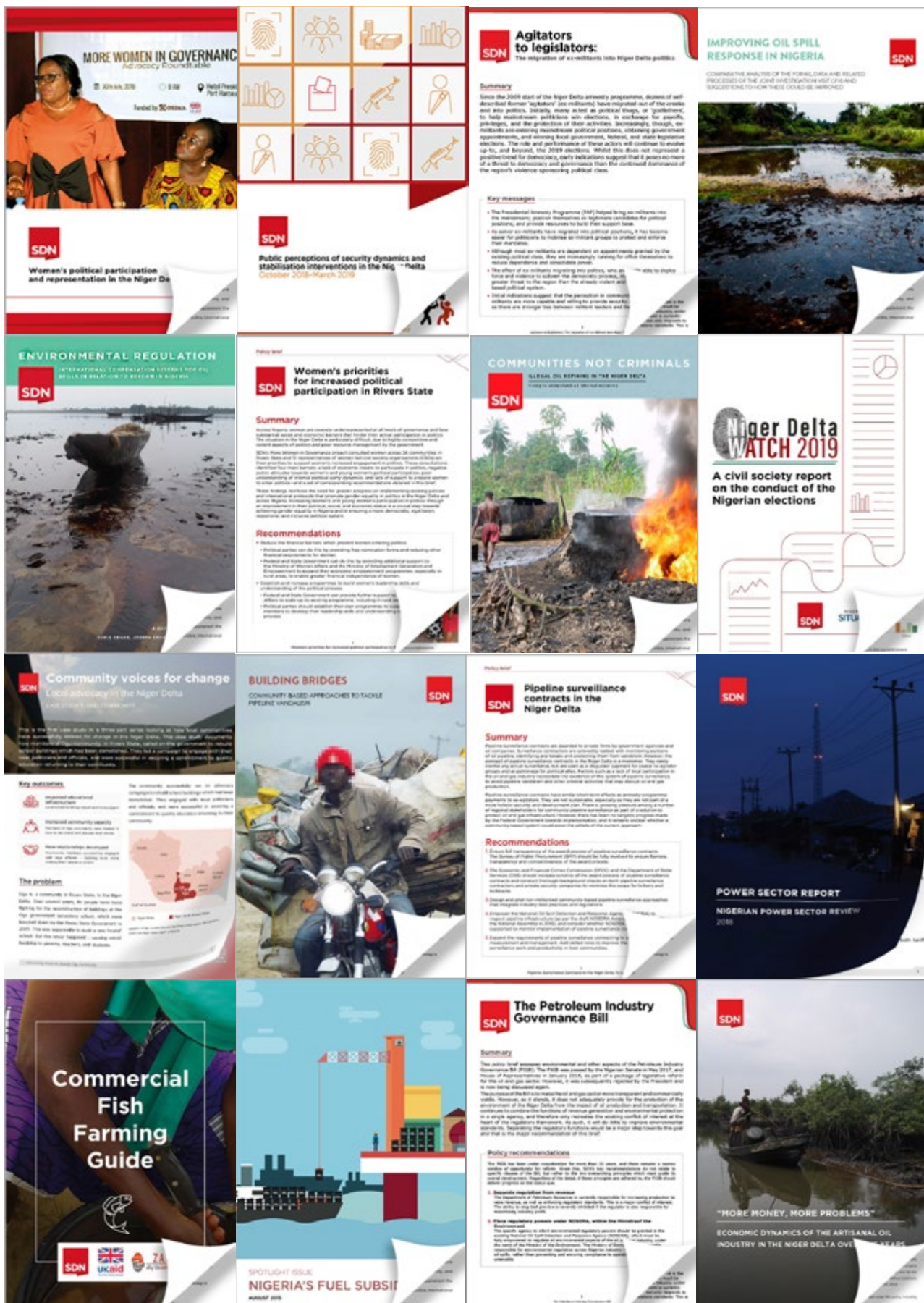
its Nigerian entity or entities.

NOSDRA suggested we break scores down by subsidiary, where applicable. In future versions of the Index we will consider providing additional analysis based on this.

Future engagement

We would like to reiterate our thanks for the feedback on this research from all parties, and the improvements we have been able to make as a result. Note that the research and analysis do not necessarily reflect the views or policies of any organisation which provided input.

We welcome further feedback.



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“More than four million litres of oil were spilled in the Niger Delta in 2018, which in addition to a legacy of unresolved historic incidents means it remains an ecological disaster zone.”



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2018 Nigerian oil industry environmental performance index