

PRODUCTION LOSSES IN NIGERIA

Moneda R&I puts numbers to the issues stunting the growth of Nigeria's crude oil production over the last two years.



Source: 1952 Africa

"Our mission is to trigger unconventional growth in African natural resource value chains - using alternative credit systems and world class execution."

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NIGERIA'S OIL PRODUCTION IN NUMBERS

[Year in focus: Jan 2020 - Dec 2021]



731

Production days



1.386Mbpd

Average Production



1.095Bbbls

Cumulative Production



101Mbbbls

Total

Production Lost

Source: NNPC, NUPRC & NOSDRA



24Mbbbls

Production lost due to vandalism



637

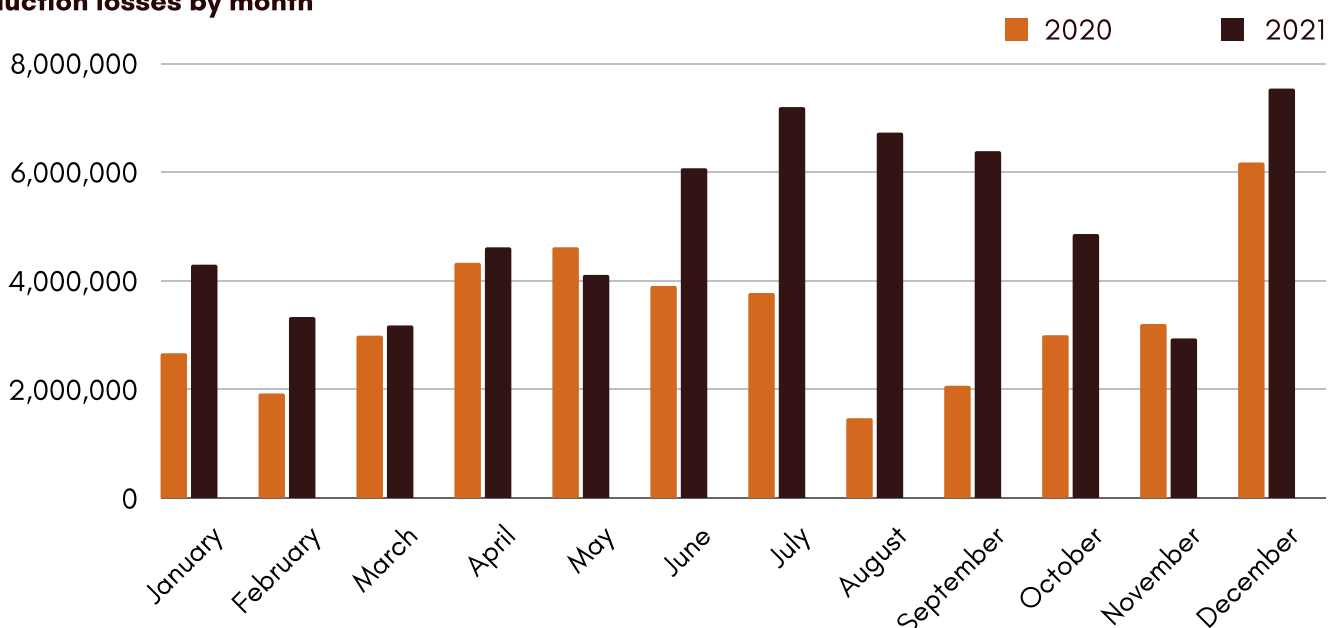
Sabotage/vandalism incidents

Just how badly has Nigeria's oil production performed?

Based on capacity and facility constraints, the country could have averaged production of **1.634 million barrels per day** but has managed **15.18% less**. This inability to meet full potential has been a result of production shut-ins due to operational issues, industrial action (strikes and protests by workers and host communities), and crude theft. To put this in context, the average production loss is equal to or greater than the total production capacity of any country in sub-

Saharan Africa bar Angola. At the time of this report, efforts to improve the situation and increase production up-time are yet to make headway. While the number of disruptive events is reducing, the volumes lost have either remained the same or have increased. For example, NOSDRA recorded a reduction in vandalism incidents between 2020 and 2021 from **359** to **278** but NNPC recorded an increase in production loss due to vandalism within that period from **10.61 million barrels** to **13.29 million barrels**. In effect, the number of incidents had reduced by **22.56%** but the volumes lost had increased by **20.17%**.

Production losses by month



Source: NNPC, NUPRC & NOSDRA

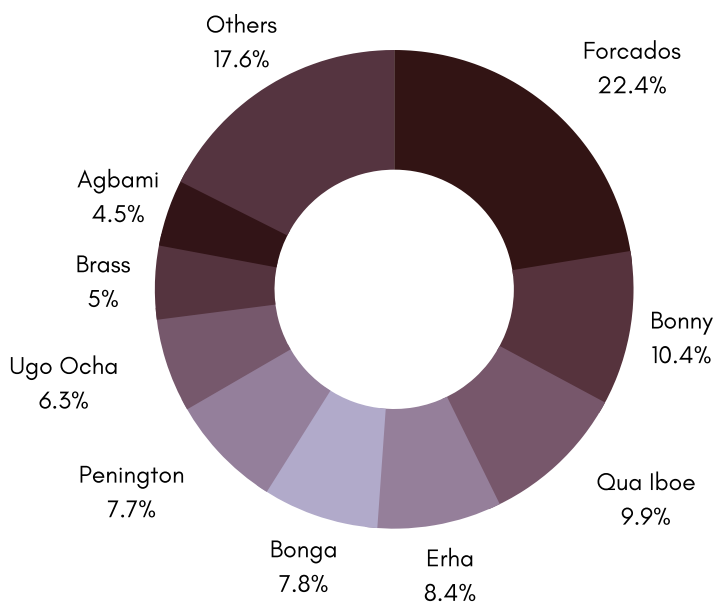
Over the last few years, there has been no discernable trend with respect to seasonality within the year but in terms of geography, a more obvious trend surfaces. **100%** of all production losses from fields offshore were as a result of operational issues (equipment failure and maintenance) but for onshore fields, in addition to operational issues, there is more to worry about including crude theft and industrial action from host communities.

NNPC reports production loss as a function of the receiving terminal and of the **447** events recorded by the company as responsible for the curtailment of production in 2020 and 2021, Shell's Forcados recorded the most with 80 events. Forcados also rec-

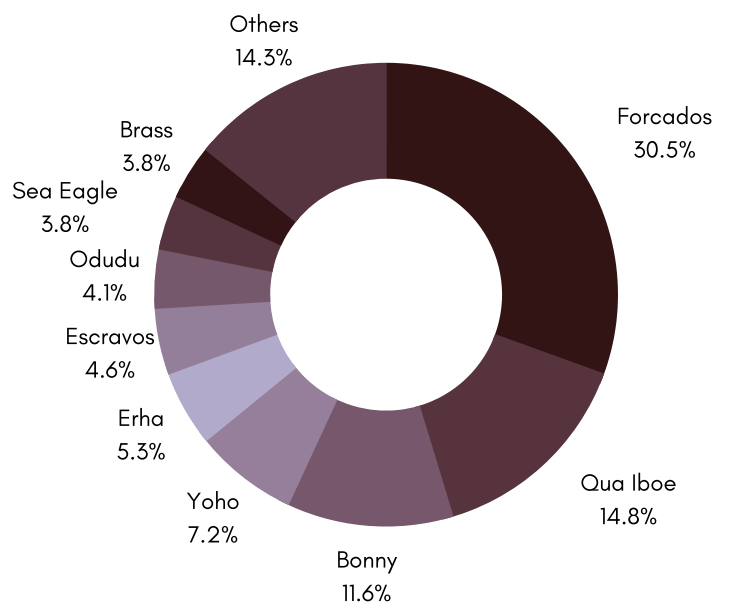
orded the highest cumulative shut-in production with 27.47 million barrels. Interestingly, it almost dwarves the numbers of Brass (56) in second place for number of events and Qua Iboe (12.92 million barrels) in second place for production lost. Analyzing the production loss as a ratio of the terminals' nameplate capacity still puts Forcados terminal far ahead of the rest. This means for every potential barrel the terminal could produce, Forcados terminal loses the most.

The problems are rarely in the terminals though but in the fields and pipelines connected to them. In the case of Forcados, much of the problem stems from OML 42 (Batan, Jones Creek, and Odidi fields) and the Trans Forcados Pipeline.

Volume of production lost by terminal 2020



2021



Source: NNPC, NUPRC & NOSDRA

Terminal	Operator
• Forcados	• Shell
• Bonny	• Shell
• Qua Iboe	• ExxonMobil
• Erha	• ExxonMobil
• Bonga	• Shell
• Penington	• Chevron

Terminal	Operator
• Brass	• Eni
• Agbami	• Chevron
• Yoho	• ExxonMobil
• Escravos	• Chevron
• Odudu	• TotalEnergies
• Sea Eagle	• Shell

THE CAUSE AND EFFECT



Of the three main causes of the loss in production in the country, crude oil theft has taken the limelight and deservedly so since it does not only mean a loss in potential revenue, it also means there would be extra costs involved in repairing damaged facilities. Regardless of this, the country's inability to meet OPEC+ quotas and take advantage of the prevailing high oil prices warrants an effort to explore all causes and plug potential holes in the system.

Nigeria's crude theft problem still lingers but could it be getting worse?

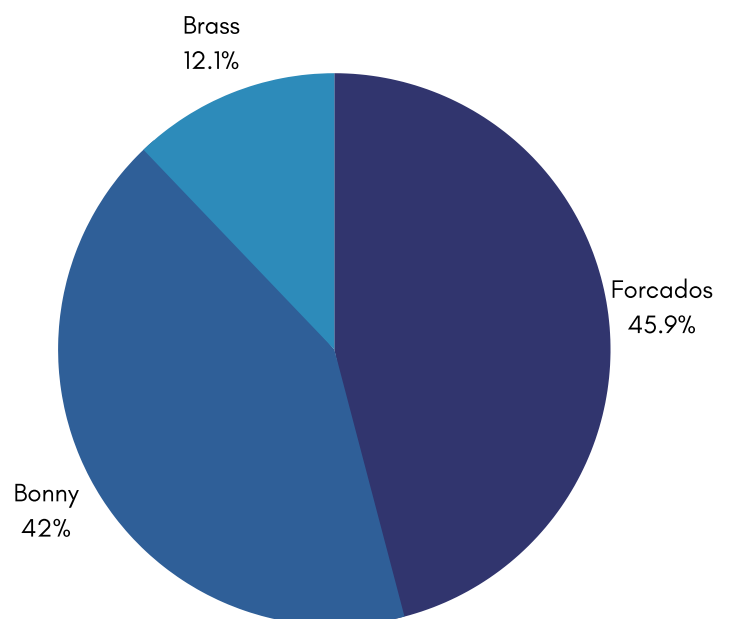
The exact volumes stolen by vandals are generally unknown. This figure requires the subtraction of meter readings at the wellheads and the meter readings at the terminals both of which are not publicly available. One thing is certain though, sabotage and vandalism induce production losses in three ways; actual crude oil stolen by vandals, oil spills during the sabotage, and shut-in production aimed at reducing losses and carrying out repairs on the vandalized facilities.

A conservative estimation of the production lost due to all three consequences of sabotage/vandalism is about **32,832 barrels per day** all of which resulted

from **637 recorded incidents**. Of this volume, according to NOSDRA, **48,298 barrels** (averaging **66.07** barrels per day) were spilled and this points to the fact that significant volumes of the production lost were either stolen or shut-in.

All incidents related to sabotage/vandalism were connected to just three terminals all of which are

Production lost to vandalism by terminals affected

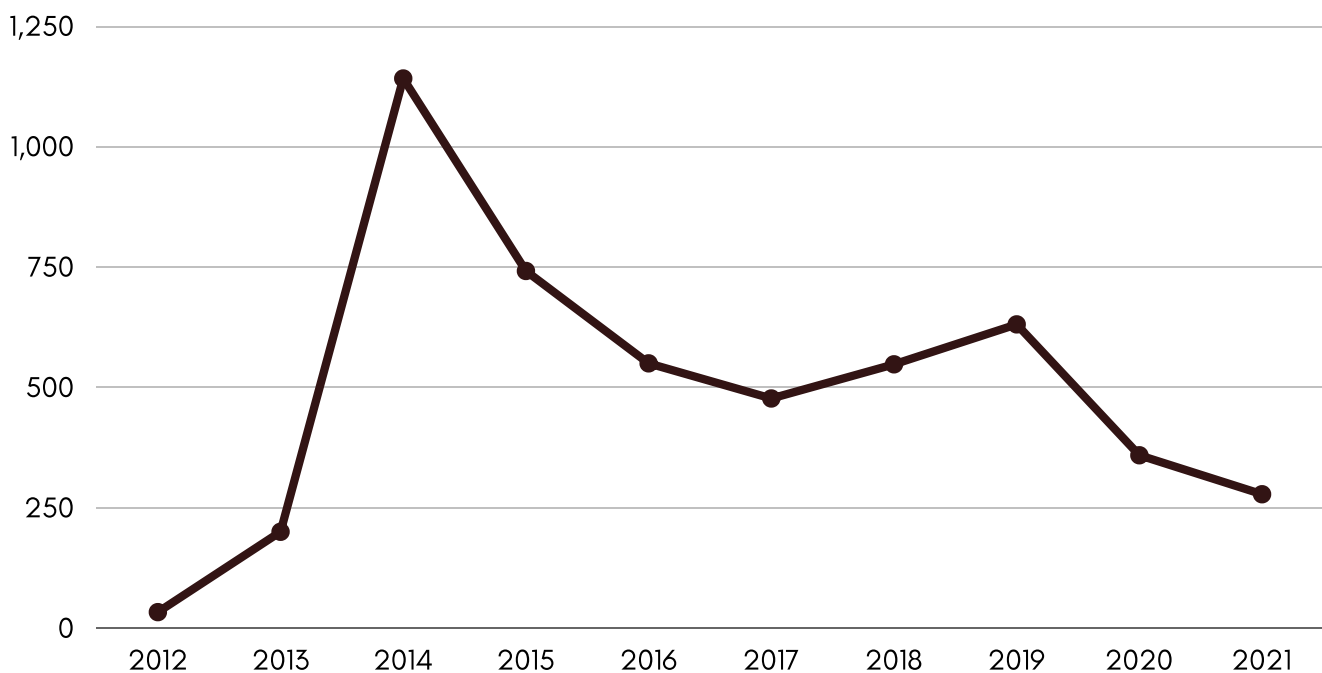


Source: NNPC

onshore - Forcados, Bonny, and Brass, in that order. Bonny and Brass both saw increments in production loss (**38.17%** and **221.68%** respectively) between 2020 and 2021 while Forcados' reduced by **7.92%**.

Over the last 10 years, there has been a downward trend in the number of sabotage incidents recorded. As a result, it is unlikely that the high number of **1142** reached in 2014 will ever be reached.

Production lost to vandalism by terminals affected



Source: Nigeria Oil Spill Detection and Response Agency (NOSDRA)

Across the country, **68.72 million barrels** of production were shut-in due to operational issues within the period in review increasing by **70.93%** from 2020 to 2021. Even the offshore fields are not immune to these issues, Total's Akpo was the offshore field with the highest number of events (**25**) although they were all minor issues and the shut-in production for the field was only **0.72%** of the total production lost.

One would assume, in the case of the offshore fields, that the older fields would require more frequent maintenance work consequently leading to more production loss but that has not been the case. In 2021, Egina which started production in 2018 had more events (**8**) than Bonga (**1**) which started producti-

Start-stop-repair-restart: a cycle that moves a little too fast for comfort.

Mechanical parts are prone to wear, tear, and malfunction but too frequent malfunctioning should definitely raise questions. One prominent incident over the last two years is Amni's Ima field which was shut for maintenance for **545** straight days producing zero oil during this time. It was not publicly announced what exactly was being fixed or what stalled the maintenance work.

on 13 years earlier. Although Egina's production loss was just about **195,000 barrels** higher, the lack of consistency with the expected trend [or lack of trend at all] is very much obvious.

In addition to repairs and maintenance, onshore fields face another interesting foe - full tanks. Some terminals have had to request operators of producing fields to shut in production in a bid to prevent their tanks from overflowing. The problem that this will pose is that while shutting in production may be abrupt, restarting production is not always the same. As a result, apart from the production lost during the shut-in time, there is still some loss experienced during the gradual restart of the field(s).

Workers and host communities want to be heard and there is only one way to make operators listen.

Production loss of **7.11 million barrels** was recorded due to industrial action by workers and members of the host communities. Although this contributed the least to the total production loss, its frequency of occurrence still calls to be looked into. In total, these protests lasted 345 days - 164 days in 2020 and 181

days in 2021. The workers staging protests are more often than not members of the staff who are employed on a short-term contract basis. This demographic of oil and gas staff has been adjudged to be treated unfairly and incommensurate with the amount of work put in. This raises a question of the labor policies of the operating companies, a question which is very rarely probed, and as a result production losses from this area may not see an end any time soon.

STITCHING THE PIECES



In the grand scheme of things, who wins and who loses?

The obvious winners are those involved in the sabotage of pipelines and the sale of the stolen crude oil. This is an estimated **\$1.77 million daily** (using the 2020 - 2021 running average oil price) that is being restricted to the hands of a few. The not-so-obvious yet somewhat legal beneficiaries of the sabotage events are contractors that provide pipeline repair services. Operators in Nigeria could spend as high as **8.2 times** more on pipeline maintenance when compared with operators from the rest of the world with similar mileage. While operators now have to spend more on repairs of these facilities, this means more contracts will be awarded to service contractors than would have otherwise been necessary.

The subset of people that stand to lose the most is the average Nigerian. An average of **\$4.184 billion** was lost per year in the review period, which would have translated to **\$1.329 billion** in government revenue (the rest going to cost recovery and operators' profit). This is about **3.52%** of the 2021 budget, funds that could have ideally gone into building infrastructure and paying salaries. Nigeria's current dependence on

imports for petroleum products means fuel supply is not directly dependent on domestic crude oil production. However, with the anticipated increase in the operation of local refineries in the coming months, a new side to the impact on the average Nigerian could surface. Every barrel less produced means less petroleum product supply and could lead to fuel scarcity at the pumps with an increasing scale of production losses. This side of the problem may not be too dire since some of the stolen crude oil makes its way to illegal refineries which also contribute to the supply of petroleum products domestically.

Another effect of the vandalism problem is the role it plays in pollution. In Nigeria, only **28%** of oil spills are operational (corrosion, structural failure etc.) while the larger percentage is related to vandalism. These spills go on to impact the environment, rendering land infertile for planting and the rivers inconducive for fishing. Most of the stolen crude also makes its way to illegal oil refineries whose processes do not meet global standards and as such release significant soot into the atmosphere. The brunt of it falls on the residents of these areas who lose their means of livelihood and worse, can barely breathe.

Moving past these issues would require a collective effort.

Operators need to invest more in preventive and predictive maintenance rather than corrective maintenance. There is a dearth of up-to-date and data-driven technology in the country's oil and gas space which has restricted productivity levels to as low as it was decades ago. Investment in new technologies could unlock higher productivity and consequently reduce downtime.

With respect to the vandalism problem, the solution may not be as straightforward. Although technology could play a part, it would only be a small cog in a very complex machine. There has been much talk about new and improved digital monitoring systems which could lead to quicker response time to [attempted] vandalized facilities but these are only corrective measures and would hardly address the root cause - distrust amongst host communities, government, and operators.

The government's immediate answer to the problem is brute force, for example, a joint task force finds and destroys illegal refineries across Rivers state but does not target the vandals of flowlines and pipelines since it is not feasible to monitor thousands of kilometres of pipeline 24/7. What happens is that if the market for

the stolen crude dwindles locally, the vandals will find a market abroad.

The IOCs have found their way out, literally. TotalEnergies has announced that it will also sell its stake in the SPDC JV [onshore] assets alongside Shell. The indigenous operators who are picking up some of these assets now have to worry about their crude oil being stolen. Quite a number of these companies are exploring alternative evacuation media as a possible way out. The only alternative evacuation medium is trucking [or barging in the case of swamp fields], however, it is more expensive than piping. It costs about **15 times** as much to truck crude oil compared to transport via pipelines. Should increasing crude theft tilt the economics in the favour of trucking, it is still a logistical nightmare, especially in high production fields.

Tackling the root cause will be a more effective solution to the problem. The newly passed Petroleum Industry Act (PIA) could have been used as a tool to create an avenue for constant dialogue among the stakeholders. The development of a Board of Trustees for the host community development fund fails to include representatives of operators and government. It is important that such a committee is established so that the interests of all parties are covered and all grievances are said, heard, and addressed in real-time.



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