

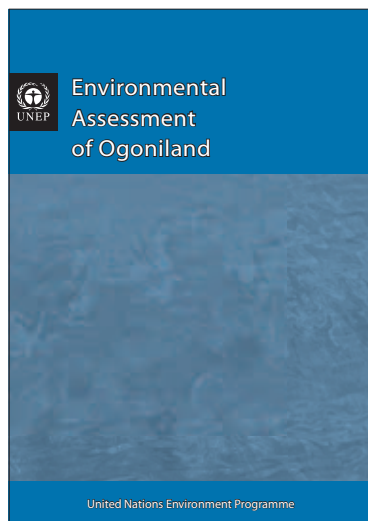
# UNEP In Ogoniland Newsletter

Special edition

August 2011

## Report released!

The report contains the findings and recommendations from a major two-year assessment by the United Nations Environment Programme (UNEP) of the environmental and public health impacts of oil contamination in Ogoniland, Nigeria, and options for remediation.



The Environmental Assessment of Ogoniland report is now available at: [www.unep.org/nigeria](http://www.unep.org/nigeria)

Note: The information generated by the assessment is presented in UNEP's 258-page report and in 67 separate site-specific fact sheets which amount to more than 1,000 pages. It is therefore only possible to provide an overview of the findings and recommendations here.

The assessment has found that oil contamination in Ogoniland and the surrounding creeks is widespread and severely impacting many components of the environment, including below ground. It has also found that exposure to hydrocarbons is putting the health of some community members at serious risk.

According to the report, individual contaminated land areas in Ogoniland can be cleaned up within five years while the restoration of heavily-impacted mangrove stands will take up to 30 years.

However, UNEP is advocating for action to protect human health and reduce the risks to affected communities to begin without delay.

If implemented, the report's recommendations could bring substantial new investment and employment opportunities to the Ogoni community.

The report contains recommendations to the oil industry on how to improve the control and maintenance of their facilities in Ogoniland and ultimately function in a way that benefits the lives and livelihoods of these communities now and in the future.

It also makes recommendations to the government on how to improve environmental regulation, monitoring and enforcement.

It is UNEP's hope that the findings can break the decades of deadlock in the region and provide the foundation upon which trust can be built and action undertaken to restore Ogoniland.



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UNEP hopes the study's findings can catalyze significant environmental and social improvements in the region and that a Transition Phase can begin as soon as possible



At the request of the Federal Government of Nigeria, the United Nations Environment Programme (UNEP) has conducted a comprehensive, independent assessment of the environmental and public health impacts of oil contamination in Ogoniland, Rivers State, Nigeria, and options for remediation. The 258-page report and data on which it is based are available at: [www.unep.org/nigeria](http://www.unep.org/nigeria)

## Assessment process

The UNEP project team surveyed 122 kms of pipeline rights of way and visited all oil spill sites, oil wells and other oil-related facilities in Ogoniland, including decommissioned and abandoned facilities, that were known and accessible to UNEP during the fieldwork period.

The map shows where the UNEP project team took samples of soil, groundwater, surface water, sediments, fish and air, and where public health records were reviewed. The table summarises the oil facilities of Shell Petroleum Development Company (SPDC) or the Nigerian National Petroleum Company (NNPC) around which detailed land and groundwater investigations were conducted.

Site classification	Number
SPDC pipeline rights of way	34
SPDC legacy sites	6
Suspended SPDC facilities	22
NNPC crude oil pipelines	2
NNPC product line	3

### Key terms:

**Hydrocarbons** – naturally occurring organic compound comprising hydrogen and carbon (most common are natural gas and oil)

**µg/l** – microgram per litre

**mg/kg** – milligram per kilogram



The report concludes that pollution of soil by petroleum hydrocarbons in Ogoniland is extensive in land areas, sediments and swampland

## What the study has found

People who are familiar with Ogoniland know that it harbours oil pollution. The significance of this assessment – indeed the reason the Government of Nigeria requested UNEP to conduct it – is that it provides for the first time in the public arena the scientific evidence on the nature, extent and impacts of oil contamination in Ogoniland.

This scientific detail includes the types of polluting substances, their quantities in different locations and the geology of Ogoniland. Here are examples of the study's findings.

### Contaminated soil and groundwater

- The study found there is no continuous clay layer across Ogoniland, exposing the groundwater to hydrocarbons spilled on the surface. This has major implications for the type of remediation required.
- At two-thirds of the land sites close to oil industry facilities which were assessed in detail, the soil contamination exceeds Nigerian standards, as set out in the Environmental Guidelines and Standards for the Petroleum Industries in Nigeria (EGASPIN).
- In 49 cases, UNEP observed hydrocarbons in soil at depths of at least 5 m.
- At 41 sites, the hydrocarbon pollution has reached the groundwater at levels in excess of the Nigerian standards (as per EGASPIN).
- As Ogoniland has high rainfall, any delay in cleaning up an oil spill leads to oil being washed away, traversing farmland and almost always ending up in the creeks. When oil reaches the root zone, crops and other plants begin to experience stress and can die, and this is a routine observation in Ogoniland.
- The highest concentration of total petroleum hydrocarbons in sediment - of 19,600 mg/kg - was found in a stream near Biara, in Tai LGA. (Note the relevant EGASPIN 'intervention' value is 5,000 mg/kg).

### Nisisioken Ogale, Eleme LGA

*The most serious case of groundwater contamination is at Nisisioken Ogale, in Eleme LGA, close to an NNPC product pipeline where an 8 cm layer of refined oil was observed floating on the groundwater which serves the community wells. The drinking water from nearby wells is contaminated with benzene, a known carcinogen, at levels over 900 times above the World Health Organization (WHO) guideline.*

*The report states that this contamination warrants emergency action ahead of all other remediation efforts. UNEP has already informed the Government to facilitate solutions for the community.*



## Location of sampling sites and health centres investigated



Note: Not all symbols can be viewed in cases where a high number of different samples were taken at sites situated close together

## Vegetation

- The impact of oil on mangrove vegetation has been disastrous. In many intertidal creeks, the mangroves no longer have leaves or stems. Extensive pollution of the mangroves is impacting the fish life-cycle.
- Any crops in areas directly impacted by oil spills will be damaged, and root crops, such as cassava, will become unusable. When farming recommences, the yields are reportedly lower than in non-impacted areas.
- Channels that have been widened and the dredged material are clearly evident in satellite images, decades later. Former mangrove areas which have been converted to bare ground are being colonized by invasive species like nipa palm (which appears to be more resistant to heavy hydrocarbon pollution than native vegetation).
- Remote sensing revealed the rapid growth in the past two years of artisanal refining, whereby crude oil is distilled in makeshift facilities. In Bodo West, in Bonny LGA, an increase in artisanal refining between 2007 and 2011 has been accompanied by a 10% loss of healthy mangrove cover – or 307,381 m<sup>2</sup>.

## Aquatic

- The surface water throughout the creeks contains hydrocarbons. The highest reading of dissolved hydrocarbon in the water column, of 7,420 µg/l, was detected near Ataba-Otokroma, bordering the Gokana and Andoni LGAs.
- Despite community concerns, the results show that fish consumption in Ogoniland, either of those caught locally or purchased from markets, was not posing a health risk. The report says that fish tend to leave polluted areas in search of cleaner water.
- However, the fisheries sector is suffering due to the destruction of fish habitat in the mangroves and highly persistent contamination of many of the creeks.
- The wetlands around Ogoniland are highly degraded and facing disintegration.
- The most extensive area in terms of treatment of contamination will be the topsoil from the swamplands.

## Public health

- The Ogoni community is exposed to petroleum hydrocarbons in outdoor air and drinking water, sometimes at elevated concentrations. They are also exposed through dermal (skin) contacts from contaminated soil, sediments and surface water.
- Since average life expectancy in Nigeria is less than 50 years, it is a fair assumption that most members of the current Ogoniland community have lived with chronic oil pollution throughout their lives.



An assistant from the Rivers State University of Science and Technology taking a water sample

- Hydrocarbon contamination was found in water taken from 28 wells at 10 communities adjacent to contaminated sites. At seven wells the samples are at least 1,000 times higher than the Nigerian drinking water standard of 3 µg/l. Local communities are often aware of the pollution but continue to use the water as they have no alternative.

## Institutional issues

- Overlapping authorities and responsibilities between Government ministries and a lack of resources within key agencies is having serious implications for environmental management on-the-ground, including enforcement.
- The key EGASPIN legislation is internally inconsistent with regard to one of the most important criteria for oil spill and contaminated site management – specifically the criteria which trigger remediation or indicate its closure (called the ‘intervention’ and ‘target’ values respectively).
- The Department of Petroleum Resources (DPR) and the National Oil Spill Detection and Response Agency (NOSDRA) interpret the EGASPIN differently. This is enabling the oil industry to close down the remediation process well before contamination has been eliminated and soil quality has been restored to achieve functionality for human, animal and plant life.





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The oil industry has been a key sector of the Nigerian economy for over 50 years, but the report underlines how many Nigerians have paid a high price

## *Oil industry practices*

- The study concludes that the control, maintenance and decommissioning of oilfield infrastructure in Ogoniland are inadequate. Industry best practices and SPDC's own procedures have not been applied.
- Remediation by enhanced natural attenuation (RENA) – so far the only remediation method observed by UNEP in Ogoniland – has not proven to be effective. Currently, SPDC applies this technique on the land surface layer only, based on the assumption that given the nature of the oil, temperature and an underlying layer of clay, hydrocarbons will not move deeper. However, this basic premise is not sustainable as observations made by UNEP show that contamination can often penetrate deeper than 5 m.
- Ten out of the 15 investigated sites which SPDC records show as having completed remediation, still have pollution exceeding the SPDC (and government) remediation closure values.

## *Overview of recommendations*

The recommendations have immediate or longer timelines.

Due to the wide extent of contamination, a combination of clean-up approaches will need to be considered, ranging from active intervention for cleaning the top soil and replanting mangrove to passive monitoring of natural regeneration. The report identifies eight emergency measures which warrant immediate action.

According to the report, until the land based contamination has been dealt with, initiating a clean-up of the sediments, creeks

or vegetation will be futile as contamination from the land will continue to migrate towards the creeks.

### **Emergency Measures**

1. Ensure that all drinking water wells where hydrocarbons were detected are marked and that people are informed of the danger
2. Provide adequate sources of drinking water to those households whose drinking water supply is impacted
3. People in Nsisioken Ogale who have been consuming water with benzene over 900 times the WHO guideline are recorded on a medical registry and their health status assessed and followed up
4. Initiate a survey of all drinking water wells around those wells where hydrocarbons were observed and arrange measures (1-3) as appropriate based on the results
5. Post signs around all the sites identified as having contamination exceeding intervention values warning the community not to walk through or engage in any other activities at these sites
6. Post signs in areas where hydrocarbons were observed on surface water warning people not to fish, swim or bathe in these areas
7. Inform all families whose rainwater samples tested positive for hydrocarbons and advise them not to consume the water, and
8. Mount a public awareness campaign to warn the individuals who are undertaking artisanal refining that such activities are damaging their health.

To begin prioritizing specific locations to be cleaned up, restored or rehabilitated, the study suggests the following framework:

- **Priority 1.** All instances where the Ogoni community is known to be at risk
- **Priority 2.** Instances where contamination could potentially affect the community (e.g. where groundwater, fishing grounds or agricultural land are impacted)
- **Priority 3.** Instances where a community's livelihood support base is impacted, and
- **Priority 4.** Instances where there is no immediate risk to people but where there is non-compliance with the law.

Here are other examples of the report's recommendations.

## Government

- The report recommends that the Government of Nigeria establishes an **Ogoniland Environmental Restoration Authority** to oversee implementation of this study's recommendations.



During and following clean-up operations in Ogoniland, a monitoring programme should be put in place

- The overall cost of the clean-up should not be an obstacle to its implementation. Therefore, an Environmental Restoration Fund for Ogoniland should be set up with an initial capital injection for the first five years of **N153 billion** (US\$1 billion) contributed by the oil industry and the Government. This Fund would be managed by the Authority.
- A **Centre of Excellence for Environmental Restoration** should be established in Ogoniland and could run training courses and ultimately become a model for environmental restoration, attracting international attention.
- Comprehensively review existing Nigerian legislation on contaminated site clean-up and incorporate community consultation to determine remediation closure levels so that decisions on new legislation are seen as both transparent and inclusive.
- Transfer oversight of the EGASPIN to the Federal Ministry of Environment.
- Mount an awareness campaign to improve the community's understanding of the environmental and health impacts arising from hydrocarbon contamination in Ogoniland.

## Public health

- Everyone who has consumed water from contaminated sources should be requested to undertake a comprehensive medical examination by physicians knowledgeable about the possible adverse health effects of the hydrocarbons detected.
- A public health registry should be established for the entire Ogoniland population in order to determine health trends and take proactive action individually or collectively where impacts related to long-term exposure to hydrocarbon pollution are evident.
- From a human safety point of view, as well as for security of oil installations, people living on oil facility rights of way should be encouraged to move away. According to the report, such cases need to be handled with sensitivity and alternative housing locations should be found regardless of the legal status of the people involved.

## Technical

- A proposed **Integrated Contaminated Soil Management Centre** would be a modern industrial enterprise in Ogoniland employing hundreds of people. On-site 'mini treatment centres' for bioremediation and excavation water would also act as staging areas feeding the main soil treatment centre.
- Local nurseries should be established so that healthy, indigenous plants will be available to regenerate heavily impacted mangrove stands.



## *Environmental monitoring*

- During and following clean-up operations in Ogoniland, a monitoring programme should be put in place in consultation with the national institutions mandated to deal with specific environmental issues. All results should be publicly available.
- Comprehensive preventive surveillance should be undertaken by a team consisting of oil industry representatives, environmental agencies and local community guides. It should include weekly aerial scouting of the entire Ogoni oilfield, weekly surveillance visits to the creeks and weekly visits to check progress with remediation where this is taking place.
- A monitoring plan focusing on the water bodies, including the Imo River, around Ogoniland should be initiated. It should cover water, fish, sediments and other organisms and could inform guidelines for zoning of areas where fishing and recreational activities are temporarily suspended owing to excessive pollution, and also track progress with remediation activities.

## *Operational*

- All sources of ongoing contamination, including artisanal refining, must be brought to a swift end before the clean-up of the creeks, sediments and mangroves can begin.
- A campaign in Ogoniland to end illegal oil-related activities should be jointly conducted by the government, oil companies and local authorities. As the study found that artisanal refining is endangering lives and causing pockets of environmental devastation in Ogoniland, the campaign should include an awareness component highlighting the environmental footprint of this activity and spell out other incentives, such as employment.

## *Oil industry operators*

- SPDC procedures for oil spill clean-up and remediation need to be fully reviewed and overhauled so as to achieve the desired level of environmental restoration. In addition to procedures and clean-up methods, contracting and supervision also need to be improved.
- SPDC should conduct a comprehensive review of its assets in Ogoniland and develop an 'Asset Integrity Management Plan for Ogoniland' and a decommissioning plan. These plans should be communicated to the Ogoni people to keep them better informed.
- It is recommended that all oil industry operators in Nigeria work with the Nigerian regulators to clarify the paradox of remedial intervention and target values being the same.

## *Recommendations for the Ogoniland community*

- This is a transformative moment and the Ogoni community should seize it in a positive manner. The community should



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Concurrently implementing priority actions will have an immediate impact on people's lives and livelihoods

take full advantage of the employment, skills development and other opportunities that will be created by the clean-up operation.

- Community members should avoid long negotiations over access by oil spill response teams as this means that responses to spills are delayed, resulting in a greater environmental impact.
- The community should take a proactive stand against individuals or groups who engage in illegal activities such as bunkering and artisanal refining.

## Next steps

Restoring the livelihoods and well being of future Ogoni generations is within reach. It is UNEP's hope that the recommendations from its study will be accepted and implemented as quickly as possible – by the Government, the oil industry and the community.

A Transition Phase is recommended to maintain momentum and begin detailed planning in the period between the release of UNEP's environmental assessment and the commencement of a clean-up operation guided by an Ogoniland Environmental Restoration Authority.

UNEP has now concluded what it was requested to do by the government and the UNEP team in Port Harcourt is progressively being reduced. However, UNEP stands ready to assist with further steps, if formally requested.

## Thank you from UNEP

This study would not have been possible without the local knowledge and cooperation of the Ogoni people and the support of many other stakeholders in Nigeria. UNEP is grateful

to the thousands of community members who participated and contributed information and assistance, including the many community guides and volunteers.

UNEP also wishes to sincerely thank the Nigerian and international members of UNEP's multi-disciplinary project team. A full list of project contributors is in the report.

### For more information on UNEP's Environmental Assessment of Ogoniland project

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### List of Site Fact Sheets

To accompany the Environmental Assessment of Ogoniland report, individual fact sheets have been prepared for 67 of the sites investigated in detail by UNEP. They are available online at: [www.unep.org/nigeria](http://www.unep.org/nigeria)

#### Eleme LGA

- AJEOKPORI-AKPAJO
- ALETO
- ALUEJOR- ONNE
- EBUBU/EJAMA/AGBETA
- EJAMA- EBUBU
- NKELEOKEN- ALODE
- NSISIOKEN- AGBI, OGALE
- OBAJI OKEN- OGALE
- OBOOLO (2 sites)
- OCHANNI- EBUBU
- OGALE
- OKENOGBAN- ALODE
- OKENTA- ALODE (3 sites)
- OKPONANDONWA-ALODE
- OKULUEBU OGALE (2 sites)
- OMUNWANNWAN- SIME
- NEW ELELENWA M/F- AKPAJO
- NSIOKEN-AKPAJO

#### Gokana LGA

- BARABEEDOM DERE
- BARABEEDOM- K.DERE
- BERA (2 sites)
- BERA / KPOR
- BOOBANABE- K.DERE (2 sites)
- DEBON- BODO/MOGHO
- GBOGOZOR- BODO
- GIOR- K.DERE
- KEGBARA KPOR

- NWEKOL DERE
- NWEKOL- KEGBARA DERE
- NWEKOL/ZORBUKE, K.DERE
- NWEEMUU SAANAKO- MOGHO
- PEETEEH- K.DERE
- SAANAKO- MOGHO
- SIBARI- GBE
- VURUVURU DERE
- SIVIBIRAGBARA- BODO

#### Khana LGA

- KWAWA
- WIIBOORA- KPEAN
- WIIBUSUU- KPEAN
- WIIEBORSI- KPEAN
- WIIKARAGU- KPEAN
- WIIKAYAKO- KPEAN

#### Tai LGA

- AABUE- KOROKORO (2 sites)
- AABUE-UEKEN- KORORKORO
- BARA AKPOR- BOTE, TAI
- BARA-ALUE
- BARANYONWA DERE / GIO
- BUEMENE- KOROKORO (3 sites)
- GBENE-UE, DOR-UM
- GUILEEH- KOROKORO
- KEBARA- KIRA
- KOROKORO
- KPITE (2 sites)
- KPITE / BIARA
- KPORGHOR / GBAM (2 sites)
- MUUBORGBARA- KPITE/BIARA