



Environmental Assessment of Ogoniland

First published in 2011 by the United Nations Environment Programme.
© 2011, United Nations Environment Programme.

ISBN: 978-92-807-3130-9
Job No.: DEP/1337/GE

United Nations Environment Programme
P.O. Box 30552
Nairobi, KENYA
Tel: +254 (0)20 762 1234
Fax: +254 (0)20 762 3927
E-mail: unepub@unep.org
Web: <http://www.unep.org>

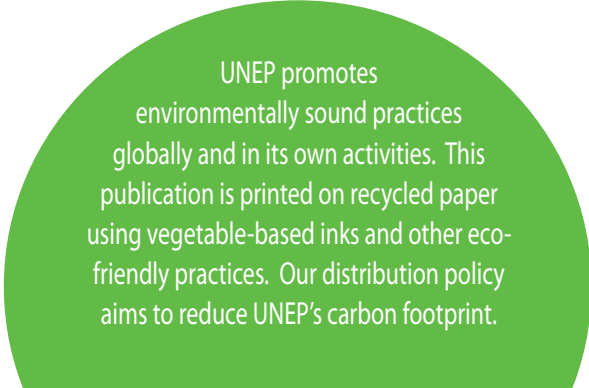
This publication may be reproduced in whole or in part and in any form for educational or non-profit purposes without special permission from the copyright holder provided acknowledgement of the source is made. UNEP would appreciate receiving a copy of any publication that uses this publication as a source. No use of this publication may be made for resale or for any other commercial purpose whatsoever without prior permission in writing from UNEP. The designation of geographical entities in this report, and the presentation of the material herein, do not imply the expression of any opinion whatsoever on the part of the publisher or the participating organisations concerning the legal status of any country, territory or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

This publication and other data on which it is based are available online at: www.unep.org/nigeria

Photography: Mazen Saggar and Victor Temofe Mogbolu. Unless otherwise credited, all other photographs in this publication were taken by UNEP staff.

Layout: Matija Potocnik
Cover image: Victor Temofe Mogbolu

Printed on Recycled Paper



UNEP promotes environmentally sound practices globally and in its own activities. This publication is printed on recycled paper using vegetable-based inks and other eco-friendly practices. Our distribution policy aims to reduce UNEP's carbon footprint.



Environmental Assessment of Ogoniland

United Nations Environment Programme

Table of contents

Foreword	6
Executive summary	8
Chapter 1: Introduction	18
1.1 Nigeria and the Niger Delta	20
Rivers State	22
Ogoniland.....	22
1.2 Impacts of oil exploration and production.....	24
1.3 The Ogoni struggle and the cessation of oil exploration and production.....	25
1.4 Reconciliation process	26
Chapter 2: Background to Environmental Degradation in Ogoniland	28
2.1 Environmental setting in Ogoniland and the Niger Delta	30
Geology	30
Groundwater.....	30
Surface water.....	31
Vegetation	32
Local communities.....	32
Ogoni interaction with neighbouring regions.....	35
Institutional framework.....	36
2.2 Petroleum hydrocarbons: origin and environmental consequences	36
Origin and use	36
Environmental consequences of hydrocarbons	37
Non-hydrocarbon environmental issues related to the oil industry	41
2.3 Oil industry-related infrastructure in Ogoniland.....	43
SPDC facilities in Ogoniland.....	43
Non-SPDC oil industry facilities in Ogoniland.....	46
Chapter 3: Objectives, Scope and Methodologies	50
3.1 Objectives	52
3.2 Scope of the investigation.....	52
Geographical scope	52
Technical scope of the assessment.....	53
3.3 Structure of the study team	53
Project management.....	54
Technical teams.....	54
Cross-cutting teams.....	55
Support teams	55
Use of local resources	58
Laboratories	59
3.4 Assessment methodologies	59
Community engagement.....	61
3.5 Phase 1: Scouting exercises, desktop reviews and reconnaissance	62
3.6 Phase 2: Intensive fieldwork	64

Assessment of soil contamination	64
Assessment of groundwater contamination.....	66
Assessment of naturally occurring radioactive materials	68
Assessment of surface water and sediment contamination	68
Assessment of fish contamination.....	70
Assessment of impact of oil contaminants on vegetation	71
Assessment of damage to mangroves.....	72
Assessment of impacts on air pollution and public health.....	72
Remote sensing.....	79
Sample management	81
Field measurements.....	83
Analytical measurements	83
Field data collection for remote sensing.....	84
Review of institutional issues.....	85
3.7 Contamination assessment criteria	85
Standards for soil.....	86
Standards for groundwater	87
Standards for drinking water	87
Air quality standards	88
3.8 Limitations, challenges and constraints	88
Scientific constraints	88
Security constraints	90
Access restrictions.....	91
Information constraints.....	92
Sample management constraints	93
Ill-defined boundaries	93
Vertical delineation of contamination.....	93
Time frame	93

Chapter 4: Assessment of Contaminated Soil and Groundwater 94

4.1 Field observations of the current situation on land	96
Habitation on or close to oilfield facilities	96
Unmanaged vegetation.....	98
Facilities not in operation.....	98
Decommissioned and abandoned facilities	99
Well blowouts	100
4.2 Field observations concerning illegal oil-related activities	101
Illegal tapping of oil wells and pipelines	101
Artisanal refining.....	102
4.3 Geological observations.....	105
Groundwater.....	105
4.4 Contamination assessments.....	108
Soil and groundwater contamination	108
Case study 1 SPDC pipeline right of way – 001-001 Ejama-Ebubu, Eleme LGA.....	110
Case study 2 SPDC suspended facilities – Bomu Manifold, K-Dere, Gokana LGA.....	115
Case study 3 SPDC legacy site – 008-010 Korokoro flow station	119
Case study 4 NNPC trunk line spill – 019-013 1990 pipeline leak in K-Dere	122

Case study 5 NNPC product line spill – 001-005 Nsisioken Agbi, Eleme LGA	127
Case study 6 Fly tipping of oilfield waste - 001-022 – oil waste dump site	130
Case study 7 SPDC remediation site 008-002 – Korokoro Well 3, Korokoro, Tai LGA	132
Background concentration of hydrocarbons	136
Barium pollution.....	136
Naturally occurring radioactive material (NORM) results.....	136
4.5 Discussion of institutional issues	138
Multiple institutions with unclear mandates.....	138
Resolving the issue	142
Review of SPDC’s practices and performance.....	142
SPDC operational practice at oil spill sites	150

Chapter 5: Assessment of Vegetation, Aquatic and Public Health Issues 152

5.1 Impact of oil on tide-dominated delta swamps and mangroves.....	154
Case study 8 Artisanal refining of crude oil at 020-001 Bodo West oilfield, flow station and manifold.....	161
5.2 Impact of oil on land-based vegetation	167
5.3 Contamination of surface water, sediments and fish	169
Presence of oil	169
Water quality	169
Petroleum hydrocarbons in water	173
Impacts of oil on sediments.....	175
Impacts of oil on fisheries.....	175
5.4 Impacts of oil on public health.....	183
Exposure and health questionnaires.....	183
Case study 9 Groundwater pollution at Nsisioken Ogale, Eleme LGA	189
Ogoniland is not an island	200

Chapter 6: Recommendations 102

6.1 Operational recommendations	205
Maintenance of oilfield facilities.....	205
Decommissioning of oilfield facilities	205
Prevention of illegal activities	205
Oil spill response.....	206
Ongoing remediation of contaminated sites	206
6.2 Technical recommendations for environmental restoration.....	207
Clean-up of contaminated soil and sediments	207
Decontamination of groundwater	210
Rehabilitation of mangroves.....	211
6.3 Recommendations for public health.....	214
Communities exposed to petroleum hydrocarbons in their drinking water.....	214
Communities living on rights of way	215
People involved in bunkering and artisanal refining.....	215
6.4 Recommendations on follow-up monitoring.....	215
Preventive surveillance.....	216
Monitoring of groundwater.....	217
Monitoring of water bodies, fish and aquatic sediments	217
Monitoring of vegetation and fauna	217

Air quality monitoring	217
Public health monitoring	217
6.5 Recommendations for changes to regulatory framework.....	217
Legislative matters	217
Institutional arrangements.....	219
6.6 Recommendations for follow-up	219

Chapter 7: Ogoniland’s Path to Sustainability **222**

7.1 Recommendations for Government	224
Creation of an Ogoniland Environmental Restoration Authority	224
Creating an Environmental Restoration Fund for Ogoniland.....	226
Creating a Centre of Excellence for Environmental Restoration	227
Declare the intent to make the wetlands around Ogoniland a Ramsar site.....	228
Mount a campaign against environmental degradation.....	228
7.2 Recommendations for oil industry operators.....	228
7.3 Recommendations for the Ogoniland community	229
7.4 Interim actions to move forward	229
7.5 Transition Phase.....	231

Appendices

Appendix 1: Acronyms and abbreviations	234
Appendix 2: Glossary.....	236
Appendix 3: References.....	240
Appendix 4: Collaborating partners	245
Appendix 5: List of contributors.....	246

Foreword

The history of oil exploration and production in Ogoniland is a long, complex and often painful one that to date has become seemingly intractable in terms of its resolution and future direction.

It is also a history that has put people and politics and the oil industry at loggerheads rendering a landscape characterized by a lack of trust, paralysis and blame, set against a worsening situation for the communities concerned.

The reality is that decades of negotiations, initiatives and protests have ultimately failed to deliver a solution that meets the expectations and responsibilities of all sides.

In an attempt to navigate from stalemate to action, the Government of Nigeria, in consultation with many of the relevant actors, invited UNEP to consider undertaking an assessment of oil pollution in Ogoniland.

UNEP has acquired an international reputation for assembling expert teams, coordinating demanding assessments and bringing scientific and empirical evidence to policymakers.

UNEP initially consulted with a wide range stakeholders and the United Nations Country Team in Nigeria in order to consider the scope and indeed the feasibility of the assessment.

We were confronted with a unique challenge: lack of trust between actors; political tensions between communities; regional and national government; gaining access to Ogoniland; security

In order to ensure the independence of the study and provide the logistics necessary, a framework for cooperation was negotiated in which all parties were involved and a recognized team of national and international experts then recruited for the two year assessment.

This report details how that team carried out their work, where samples were taken and the findings that they have made. Over a 14-month period, the UNEP team examined more than 200 locations, surveyed 122 kms of pipeline rights of way, reviewed more than 5,000 medical records and engaged over 23,000 people at local community meetings. Detailed soil contamination investigations were conducted at 69 sites. Altogether more than 4,000 samples were analyzed, including water taken from 142 groundwater monitoring wells drilled specifically for the study and soil extracted from 780 boreholes.

The findings in the report underline that there are, in a significant number of locations, serious threats to human health from contaminated drinking water to concerns over the viability and productivity of ecosystems. In addition that pollution has perhaps gone further and penetrated deeper than many may have previously supposed.

This report represents the best available understanding as to what has happened to the environment of Ogoniland – and the corresponding implications for affected populations – over many years of oil industry operations. It provides the government.

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_9821

