KEBETKACHE WOMEN DEVELOPMENT & RESOURCE CENTRE

IMPACT OF OIL EXTRACTION ON WOMEN'S HEALTH IN BAYELSA

A Case Study of Otuabagi Community

info@kebetkachewomencentre.com

Kebetkache Women Development & Resource Centre

Authors

Dr Bieye Briggs

Emem Okon

© 2024

08033363172

#8 Bolo Street, D/Line

Port Harcourt, Rivers State.

info@kebetkachewomencentre.com

www.kebetkachewomencentre.com

KEBETKACHE WOMEN DEVELOPMENT & RESOURCE CENTRE

ABOUT US

Kebetkache Women Development & Resource Centre is a community action, education and human rights advocacy non-governmental, women's rights organization registered with the Corporate Affairs Commission (CAC) in Nigeria.

Kebetkache works on development and social justice issues that affect women and children in Nigeria and around the world. Kebetkache is rooted in communities in the Niger Delta and is recognized for her in-depth knowledge on issues such as women's rights, Extractivism, gender and social inclusion, peace and security as well as climate change.

Kebetkache works extensively with women in rural communities of the Niger Delta region, mobilizing and facilitating engagement with various levels of stakeholders, particularly as regards oil resource extraction.

November 2023 marked 20 years since Kebetkache registered and commenced activities mobilizing and organizing community women in the Niger Delta region of Nigeria to raise their voices to demand gender equality, social inclusion and corporate accountability.

Kebetkache envisions a society that recognizes and promotes women's rights, equality and inclusion. The mission of Kebetkache is to attain recognition of women's rights as a catalyst for the achievement of gender equality, social inclusion and environmental sustainability through advocacy, research, capacity strengthening and movement building. Kebetkache puts her mission in practice by wide range of strategies, which include training and capacity building, advocacy, encouraging community ownership of initiatives, fostering women's unity, and building a common women agenda across ethnic and linguistic divides, partnership building, research and documentation.

Kebetkache targets the following domain of change:

- Community driven gender equality strategies
- A sustainable community of women with recognized rights, power, and opportunity to participate in the decision making-processes.
- Localised Women Peace and Security framework
- Environmental responsive extractive practices with increased participation of women in all decision-making processes.
- Gender responsive climate change adaptation and mitigation strategies.

08033363172
#8 Bolo Street, D/Line
Port Harcourt, Rivers State.
info@kebetkachewomencentre.com

ACKNOWLEDGEMENT

Kebetkache Women Development and Resource Centre is grateful to a number of individuals and organizations who played important roles in the successful assessment of the impacts of extraction on women's health in Otuabagi community in Oloibiri clan, Ogbia local government area in Bayelsa state. Many thanks to Grassroots International and Both Ends for the funding support for this research activity.

Special thanks is extended to the Technical Lead of this research Dr Bieye briggs.

Thanks are due to many people who contributed to the success of this research work and the eventual production of this report. First is the Lead Researcher, Dr Bieye Briggs, the research Assistants, who collected the samples and the data. Special thanks to Prof Sofiri Peterside for his support for the research process and report compilation. Appreciation to Dr Emem Okon, the Executive Director of Kebetkache Women Development & Resource Centre for the critical role she played ensuring this research is completed successfully.

Many thanks to Both ENDS and Grassroots International for providing the grant funds that enabled the conduct of this research work. The support of the Community Leaders and the women in Otuabagi is well acknowledged and appreciated.

Emem Okon
Executive Director

TABLE OF CONTENTS

BACKGROUND OF THE STUDY

Nigeria, located on the west coast of Africa, is characterized by diverse terrains and climates ranging from dry to humid tropical. The country is home to many languages, including Yoruba, Igbo, Hausa, and English, among others. Nigeria boasts abundant natural resources such as petroleum, natural gas, coal, gold, and various minerals. Abuja, the capital city, is in the North Central region, while Lagos remains the largest commercial hub. Since gaining independence from British colonial rule in 1960, Nigeria has grown to become the most populous country in Africa with a population exceeding 222 million.

The Niger Delta, a vital region for Nigeria's oil production, covers nine states including Bayelsa, where the Otuabagi community is located. The Delta is heavily polluted due to extensive oil extraction activities, leading to environmental and socio-economic challenges. Youths in the region have long demanded better resource control and environmental justice due to the adverse effects of oil spills and gas flaring.

Bayelsa State, formed in 1996, has a population of approximately 2.5 million. Otuabagi, within the Ogbia Local Government Area, has been significantly impacted by oil extraction activities, with its local economy and environment suffering as a result.

STATEMENT OF THE PROBLEM

Oil extraction in the Niger Delta, particularly in Otuabagi, has led to severe socio-environmental issues. Despite being the site of Nigeria's first commercial oil discovery, the community has seen little benefit from the oil wealth. Instead, they suffer from environmental degradation, poor compensation, and inadequate infrastructure. Historical analyses often overlook the pre-colonial context of these conflicts, focusing primarily on the post-1956 era. This oversight fails to account for early local resistance to oil activities and the deeper socio-economic injustices rooted in oil extraction practices.

The local population, especially women, who are primarily farmers and fishermen, face significant challenges due to pollution from oil spills. The lack of environmental remediation or adequate compensation exacerbates poverty and health issues within the community. The continuous leakage from the decommissioned Oloibiri oil well highlights ongoing environmental neglect.

JUSTIFICATION OF THE STUDY

Since the decommissioning of Oloibiri oil wells around 1975, no comprehensive study has been conducted on the impact of oil extraction on the health of the Otuabagi community. This research aims to fill that gap by providing empirical evidence of the health and socio-economic effects of hydrocarbon exposure on women in the community. The findings could support the community's demands for environmental remediation and fair compensation for their losses.

AIM OF THE STUDY

The research aims to assess the health impacts of hydrocarbon extraction on the women of Otuabagi community.

OBJECTIVES

- To detect the presence of polycyclic aromatic hydrocarbons in the red blood cells of women in Otuabagi.
- To understand the women's perception of health impacts due to crude oil exploration.
- To determine the socio-economic status of women in Otuabagi before and after the commencement of oil extraction.

RESEARCH QUESTIONS

1. What was the socio-economic status of the Otuabagi community before crude oil extraction?
2. What is the current socio-economic status of Otuabagi since crude oil extraction began?
3. What are the prevalent health impacts of crude oil extraction among women in Otuabagi?

HISTORICAL OVERVIEW

The availability of viable source rock plays a significant role in the natural development or occurrence of hydrocarbons (Dahl et al. 1994). Interest in information on earth's lithospheric (crust and upper mantle) structures has steadily grown in recent decades, with the goal of developing knowledge on deeply submerged sediments, which are the primary sources of replenishing crude oil in the twenty-first century, as well as prospects for its abundance in oil-rich and new areas (Hachay, 2017).

The oil and gas industry contribute significantly to the continent's economy. Most developing countries with abundant petroleum resources rely on sales to generate revenue and economic development (Graham and Ovadia, 2019). The African continent is endowed in Earth's minerals; nevertheless, obtaining full knowledge of relative abundance through country-based assessments remains a difficulty. The discovery of new hydrocarbon fields on the continent continues to give economic leverage through trade and investment (African Development Bank (AfDB, 2009), maintaining Africa's status as a major exporting region in the globe.

Hydrocarbons have been a source of energy for many decades, accounting for 83% of global use today (Duissenov, 2013). In 1956, Shell D'Arcy (now Shell Petroleum Development Company) discovered the first commercial quantities of oil in Africa in Oloibiri in the Ogbia LGA of Bayelsa State, Niger Delta area of Nigeria, West Africa. In less than 20 years, the region gained recognition for having some of the world's largest oil and gas deposits (Steyn, 2009; Anyanwu et al., 2010; Akpata et al., 2013). Crude oil exploration began in East Africa in early 1920, with Anglo-American's Dudley Expedition to Abyssinia, followed by large attempts in Uganda and the Eritrean Red Sea, where considerable shallow drilling was conducted around oil seeps.

Eastern Africa is the burgeoning hydrocarbon province of the twenty-first century. However, successful exploration occurred only after decades of fruitless hydrocarbon searches.

The early 1950s saw the start of subsurface Palaeozoic hydrocarbon exploration in Libya's Sahara Desert, Algeria, Tunisia, and Morocco. The exploration began after the discovery in the 1930s and 1940s, due to the huge Palaeozoic basin in North Africa's Sahara Desert, which had the potential for hydrocarbons. The first petroleum wildcat exploration drilling occurred in Algeria in 1952, with the first non-commercial discovery made in 1953, but large finds were made in 1956 (Traut et al., 1998).

Recent oil discoveries have heightened the value of this resource in African economies. Five African countries dominate upstream oil production, accounting for 85% of the continent's oil reserves. These countries are Nigeria, Libya, Algeria, Egypt, and Angola. Other oil-producing countries are Gabon, Congo, Cameroon, Tunisia, Equatorial Guinea, Democratic Republic of the Congo, Cote d'Ivoire, and recently, Ghana (low output), while Mozambique and Tanzania have reportedly discovered crude oil.

Nonetheless, Other African countries, including Chad, Sudan, Namibia, South Africa, and Madagascar, have conducted exploration, but there have been no success stories (ECOWAS-SWAC/OECD 2007; AfDB 2008, 2009; Anyanwu et al., 2010; Akpata et al. 2013; EIA, 2017). According to figures from 2019, Nigeria was Africa's largest oil producer, generating over 101.4 million metric tons. Angola and Algeria followed with 69.1 million and 64.3 million metric tons of oil, respectively (Faria, 2020). Giant hydrocarbon fields in African sedimentary basins indicate a favorable convergence of geochemical conditions that allowed the development of good petroleum systems.

IMPACT OF CRUDE OIL EXTRACTION AND SPILLS ON ECOSYSTEMS AND HUMAN HEALTH

Crude oil extraction and spills present significant environmental challenges, affecting both terrestrial and aquatic ecosystems. The impact on vegetation, animals, and humans can be immediate or long-term, altering the region's ecological profile and economy. This report examines the consequences of crude oil spills on aquatic species and human health, discussing the mechanisms of pollution, the resulting ecological damage, and the theoretical framework for understanding these impacts.

ENVIRONMENTAL IMPACT

Aquatic Ecosystems

Crude oil spills have profound effects on aquatic ecosystems. When oil spills occur, hydrocarbons contaminate water bodies, leading to severe consequences for marine life. The presence of hazardous chemicals, such as polycyclic aromatic hydrocarbons (PAHs), disrupts the normal functioning of aquatic species, affecting their growth, reproduction, and survival rates (Barron et al., 2020; Bebeteidoh et al., 2020).

In studies involving the fish Achirus lineatus, exposure to water contaminated with light crude oil altered the gut bacterial composition within 48 hours of exposure and continued to have effects over 28 days (Améndola-Pimenta et al., 2020; Cerqueda-García et al., 2020).

Furthermore, oil exposure combined with hypoxic conditions significantly impacted the metabolic activity and aerobic performance of red drum (Sciaenops ocellatus) (Ackerly and Esbaugh, 2020).

Additionally, the standard metabolic rate of various aquatic species decreased following oil exposure, which in turn slowed their growth rate (Khursigara et al., 2021).

PAHs have also been linked to impaired vision in fish. For instance, exposure to crude oil resulted in cell death in the retina and bradycardia in embryonic zebrafish (Danio rerio) (Magnuson et al., 2020). Gulf killifish (Fundulus grandis) exhibited reduced cardiovascular performance and lower hatching success rates when exposed to crude oil (Gurung et al., 2021).

Avian Species

Large-scale oil contamination also poses a severe threat to bird populations. Various species of seabirds and coastal birds suffer from inflammation, immune system suppression, oxidative cell damage, reduced reproductive success, organ malfunctions, hemolytic anemia, and increased susceptibility to diseases (Goethe, 1968; Briggs et al., 1996; Yamato et al., 1996; Esler et al., 2000; Giese et al., 2000; Golet et al., 2002; Alonso-Alvarez et al., 2007; Fallon et al., 2018, 2020)

Terrestrial Ecosystems

The impact of oil spills extends beyond aquatic ecosystems to terrestrial environments. Contaminated soils hinder building construction by degrading foundations, which can lead to structural failures and fatalities. Improper garbage disposal systems during oil exploitation further exacerbate pollution, with runoff contaminating water bodies and posing risks to marine animals (Jamieson and Gomes, 2020).

HEALTH IMPACT

Human Health

Human health is significantly affected by exposure to hydrocarbons in crude oil. PAHs, in particular, pose serious health risks. Chronic exposure to these chemicals can lead to cancer, cardiovascular diseases, neurological illnesses, respiratory disorders, visual and gastrointestinal ailments, and skin conditions (McKenzie et al., 2019; Stenehjem et al., 2015; Strelitz et al., 2019).

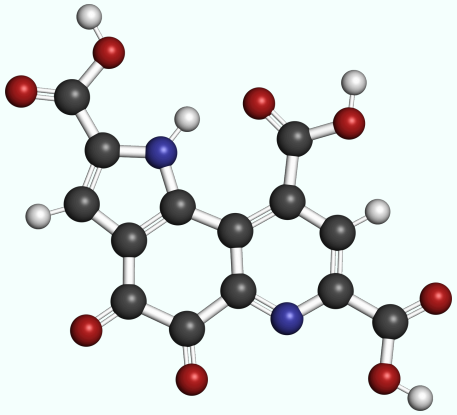
Vulnerable Populations

Certain populations are more vulnerable to the effects of PAHs. For instance, exposure to PAHs during pregnancy is linked to adverse outcomes such as miscarriage, congenital malformations, intrauterine growth restrictions, prematurity, stillbirth, and neonatal death (Sram et al., 2005; Balise et al., 2016; Harville et al., 2017). In Port Harcourt, high concentrations of soot (PM2.5) have increased the prevalence of acute respiratory infections among children under five (Fienimika et al., 2018). Similarly, congenital birth defects were significantly higher in Port Harcourt compared to other regions in Nigeria (Abbey et al., 2017).

Endocrine Distruption

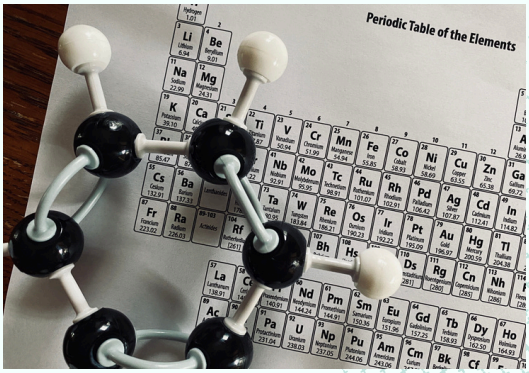
PAHs are known endocrine disruptors due to the presence of benzene rings in their structure, similar to steroid hormones. This structural similarity allows PAHs to cause reproductive dysfunctions in females, such as hormonal imbalances, infertility, anovulation, premature ovarian failure, and menstrual abnormalities (Sanderson, 2006; Sweeney, 2002; Drwal and Gregoraszcuk, 2019).

THEORETICAL FRAMEWORK



Classification and Sources of PAHs

PAHs are organic chemicals composed of two or more benzene rings. They are nonpolar, hydrophobic, and lipophilic molecules with low vapor pressure and high melting and boiling points (Lu et al., 2011; Adeniji et al., 2019). PAHs are classified based on their ring structure into light PAHs (LPAHs) with two to three rings, and heavy PAHs (HPAHs) with four or more rings (Li et al., 2019). They are further categorized based on their origin: petrogenic PAHs (from petroleum products), pyrogenic PAHs (from combustion processes), and biogenic PAHs (naturally occurring) (Baumard et al., 1998; Fernandes et al., 1997).



Environmental Persistence and Toxicity

Certain populations are more vulnerable to the effects of PAHs. For instance, exposure to PAHs during pregnancy is linked to adverse outcomes such as miscarriage, congenital malformations, intrauterine growth restrictions, prematurity, stillbirth, and neonatal death (Sram et al., 2005; Balise et al., 2016; Harville et al., 2017). In Port Harcourt, high concentrations of soot (PM2.5) have increased the prevalence of acute respiratory infections among children under five (Fienimika et al., 2018). Similarly, congenital birth defects were significantly higher in Port Harcourt compared to other regions in Nigeria (Abbey et al., 2017).

Endocrine Distruption

Remediation of PAH-contaminated environments is a critical concern. Various strategies, including physical, chemical, biological, and combined approaches, have been employed with varying degrees of success. Among these, microorganism-based solutions for ecological restoration of PAH-polluted habitats have shown promise (Kuppusamy et al., 2017; Malla et al., 2018; Mehetre et al., 2019). The selection of appropriate remediation methods depends on the contaminated matrix and environmental conditions (Kuppusamy et al., 2017).

Study Area

- Otuabagi community in Ogbia Local Government Area, Bayelsa State, Nigeria.
- Predominantly Ijaw tribe, mainly fisher folks and farmers.
- Presence of oil pipelines due to oil and gas deposits explored by multinational oil corporations.

Scope of the Study

- Conduct health impact assessment of hydrocarbon extraction among women in Otuabagi community.

Study Population

- Women residents of Otuabagi community aged 18 and above.

Study Design

- Descriptive cross-sectional.

Inclusion Criteria

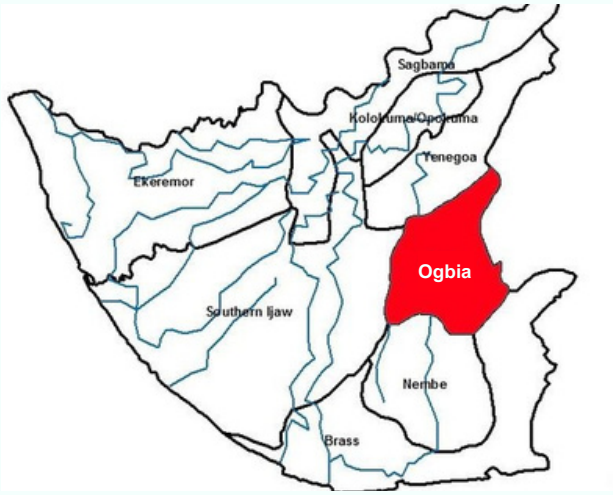
- Women above 18 years residing in Otuabagi community.

Exclusion Criteria

- Girls under 18 years.
- Female community members not residing in Otuabagi.

Sampling Size

- 80 participants.



Map of Bayelsa showing Ogbia Local Government

Sampling Method

- Multi-stage sampling method.
- Simple random sampling followed by systematic sampling.

Study Instruments

- Structured questionnaires.
- Various laboratory equipment including Gas Chromatography Technology Network, pH meter, conductivity meter, etc.

Study Instruments

- Questionnaires administered by trained research assistants.
- Blood samples collected by certified laboratory scientists.
- Drinking water, soil, and plant samples collected using sterile containers and equipment.

Blood Samples

Trained and certified laboratory scientists and technicians were recruited to collect blood samples from research participants. after consent

Drinking Water Samples

Water samples were collected from pit water, 2 community boreholes and the Kolo creek within the community. Sterile containers of 2 litres were used to collect the sample. Research assistants trained to collect samples put on face masks, sterile hand gloves before collecting the water.

Soil and Plant Samples

3 soil samples were collected, one served as a reference while the other samples were collected near the location of Oloibiri Oil Well 2.

Yam and cocoyam (mama coco) samples were collected after uprooting them from the ground with the aid of a shovel.

Air Quality Assessment

In conducting the air quality assessment, strategic placement of aeroquality sensors facilitated continuous monitoring over a 24-hour period. This approach ensured comprehensive coverage and accurate data collection regarding air quality parameters. By analyzing the data gathered from these sensors, insights into the levels of various pollutants in the air were obtained, allowing for comparison against WHO reference values to assess potential health risks to the community.

Data Analysis and Presentation

Collected data underwent thorough analysis using statistical tools and various laboratory methods, including Gas Chromatography and Flame Ionization Detection. This rigorous analysis enabled the identification and quantification of contaminants such as PAHs in different environmental samples. Results were presented meticulously in tables, frequencies, percentages, and pie charts, providing a clear overview of findings for easy interpretation and dissemination to stakeholders.

Ethical Consideration and Study Limitations

The research prioritized ethical considerations, obtaining consent from community leadership and individual participants. Participants were educated on the health impacts of hydrocarbon pollution, ensuring informed decision-making and voluntary participation. However, challenges such as difficulty in mobilizing participants due to farming commitments, limited funding constraining the scope of the study, and security concerns in the volatile Niger Delta region were encountered. Despite these limitations, measures were taken to address security issues and mitigate the impact of constraints on the study's outcomes, thereby ensuring the integrity and validity of the research findings.

PAH LEVELS IN BLOOD OF OTUABAGI WOMEN

Overview

- 15 Polycyclic Aromatic Hydrocarbons (PAHs) identified in blood samples.
- All exceed the WHO permissible limit of 0.00002mg/l

Key Findings

- **Benz(a)pyrene**
- Importance: Cancer risk marker according to IACR.
- Exceeds limit by: 8,875 times.

- **Indeno(1,2,3-c,d)pyrene**
- Exceeds limit by: 12,430 times (Highest among all PAHs).

- **Fluoranthene**
- Exceeds limit by: 475 times (Lowest among all PAHs).

PAH CONTAMINATION IN DRINKING WATER SOURCES IN OTUABAGI

Safe Water Sources

- NDDC Water: No PAH detected.
- Borehole Water 02: No PAH detected.
- Borehole Water 01: PAH within acceptable limits.

Contaminated Water Sources

- Pit Water 01 & 02: High PAH levels; visible turbidity and contamination.
- Kolo Creek Water 01 & 02: High PAH levels; Kolo Creek Water 01 has multiple PAHs.
- Rain Water 01: Multiple PAHs detected; indicates atmospheric pollution.
- Oil Well 2 Water: Not a drinking source; contributes to Kolo Creek pollution.

Key Observations

- Pit Waters: Highly turbid, uncovered, visible contamination by reptiles, rodents, insects, weeds, and algae.
- Kolo Creek 01: Polluted due to proximity to Oloibiri Oil Well 2, active since 1975.
- Rainwater: Unexpectedly high PAH, suggesting regional atmospheric pollution from neighboring communities.
- Community Impact: Despite visible and known contamination, lack of better alternatives forces reliance on unsafe water sources for drinking, cooking, and bathing.

Health Implications

- PAH Levels: Exceed WHO standards in several sources.
- Community Health: Potential risk from high PAH exposure due to reliance on contaminated water.

Environmental Insight - Pollution Sources

- Oil Well 2: Major contributor to Kolo Creek contamination.
- Atmospheric Pollution: Likely from neighboring gas flaring and oil refining activities.

Physio-chemical Properties

- Drinking water samples from the Otuabagi community. The pH of the water samples were all strongly acidic. The acidity of water can affect electrolyte balance and cause diseases that impair fluid regulation in the human system. It can also predispose women of the community to cardiovascular and renal diseases.

MICROBIOLOGICAL CONTAMINATION IN OTUABAGI DRINKING WATER SOURCES

Key Findings

- **Micro-organisms Detected**
  - Escherichia coliform
  - Faecal coliform
  - Other bacteria

Health Implications

- Non-potable Water: All samples are contaminated and unsafe for drinking without treatment.
- Faecal Contamination:
- Indicates contamination by faeces.
- Sources include defecation into Kolo Creek and indiscriminate disposal of faecal waste.

Community Practices and Risks

- **Kolo Creek Usage**:
  - Defecation directly into the creek.
  - Creek used for drinking, increasing risk of waterborne diseases.
- **Home Sanitation:**
  - Indiscriminate disposal of faecal waste contaminates other water sources.
- **Health Impact:**
  - High risk of diarrheal diseases.
  - Significant impact on child mortality, especially under-5.

WHO Potability Standards

- Criteria for Safe Drinking Water:
  - Free from chemicals and micro-organisms.
  - Tasteless, colourless, and odourless.
- Zero Tolerance: No micro-organisms should be present in drinking water.
- Health Interventions: Measures to reduce the incidence of diarrheal diseases, particularly in children

PAH CONTAMINATION IN SOIL AND PLANTS IN OTUABAGI COMMUNITY

Soil Contamination

- High PAH Levels: Detected in Oil Well 2 Soil 1 and Soil Sample 2.
- Pollution Source: Crude oil spills confirmed by presence of PAHs.
- Microbial Indicators:
  - Hydrocarbon Utilizing Bacteria (HUB)
  - Hydrocarbon Utilizing Fungi (HUF)
  - Presence indicates crude oil contamination.

Plant Contamination

- Staple Foods Affected: High PAH levels in cocoyam and cassava.
- Impact on Crops: Some Cassava and Cocoyam were already rotting in the ground and community women said it was a regular occurrence in their farmlands, they believed that this trend was due to pollution of the soil by crude oil, thus negatively impacting the crop yield and household income.
- Economic Impact: Reduced crop yield and household income for community women.

Bioremediation Insight

- Role of HUB and HUF: Degrade hydrocarbons in soil.
- Remediation Strategy: Bioremediation, although rarely employed, uses these microorganisms to clean up oil-polluted sites.

Community Health and Agriculture

- Health Risks: Consumption of PAH-contaminated crops.
- Agricultural Challenges: Soil pollution negatively impacts food security and economic stability.

AIR QUALITY IN OTUABAGI COMMUNITY

Air Quality Findings

- Parameters Exceeding WHO Limits: All except Nitrogen Dioxide (NO2), which was not detected.
- Pollutants Detected: Various unspecified pollutants surpass WHO permissible limits.

Health Implications

- Hypertension: Increased rates possibly due to air pollution.
- Negative Birth Outcomes: Correlated with unhealthy air conditions.

Pollution Sources

- External Influence: No local gas flaring or crude oil refining in Otuabagi.
- Neighbouring Activities: Gas flaring and artisanal oil refining in nearby communities likely contributing to air pollution.

PRE-OIL EXPLORATION CONDITIONS IN OTUABAGI COMMUNITY

Environmental and Social Conditions

- Soil Fertility and River Cleanliness:
  - Highly fertile soil, productive for agriculture.
  - Clean rivers, supporting healthy ecosystems and community life.
  - Similar conditions were observed in most Niger Delta communities before oil exploration.

Lack of Infrastructure

- No Portable Drinking Water:
  - Primary water sources: Kolo Creek and rainwater.
  - Kolo Creek is also used for defecation and washing clothes, leading to potential contamination.
- No Hospitals: Reliance on traditional healers and native doctors for medical needs.
- No Tarred Roads or Electricity: Limited infrastructure development.
- Transportation: Main mode was via canoes.

Community Life

- Social Infrastructure: Lacking essential services and facilities before oil exploration.
- Peaceful Environment: Majority of the respondents noted relative peace before oil exploration activities began.

Key Takeaways

- Pristine Environment: Fertile soil and clean water resources before oil activities.
- Lack of Basic Services: Absence of critical infrastructure and social amenities.
- Traditional Lifestyle: Dependence on natural water sources and traditional healthcare.
- Community Stability: General peace and stability before the impact of oil exploration.

POST-OIL EXPLORATION CONDITIONS IN OTUABAGI COMMUNITY

Environmental Degradation

- Aquatic Life Decline:
  - No Fish and Sea Products: The majority strongly disagree or disagree on the abundance of aquatic life since oil exploration began.
  - Cause: Environmental pollution from crude oil spills.
- Agricultural Decline:
  - Decreased Farm Produce: The majority strongly disagree or disagree on the abundance of farm produce.
  - Observations: Crops like cocoyam and cassava rotting in soil, affecting yields and reducing household income (majority agree).

Water Pollution and Access

- Polluted Rivers:
  - The majority disagree that rivers are clean, with visible oil films on the surface.
  - Bathing and Recreation: Cultural practices eroded due to river pollution.
- Portable Water:
  - The majority disagree on the availability of potable drinking water.
  - Water Sources: Polluted Kolo Creek, hand-dug pits, rainwater, two boreholes, and a non-functional public utility due to lack of electricity.

Infrastructure and Services

- Electricity:
  - The majority strongly disagree or disagree on the presence of electricity despite visible infrastructure.
  - Issue: No electricity for over 7 years.
- Healthcare:
  - The majority agree that hospitals exist but lack personnel and equipment, offering only skeletal services.
- Education:
  - The majority agree that schools have been built.
- Roads:
  - The majority agree that tarred roads have been built.

Social and Economic Impact

- Peace and Stability:
  - The majority strongly disagree or disagree on the presence of peace since oil exploration began.
  - Issues: Social unrest, inter-communal and intra-communal conflicts, youth restiveness, and leadership disputes.
  - Cause: Divide-and-rule tactics by multinational oil companies.
- Quality of Life:
  - The majority strongly disagree or disagree that their lives have improved since oil exploration.
  - Perception: Most Niger Delta communities do not benefit directly from oil exploration, suffering instead from pollution and its health impacts.

Key Takeaways

- Environmental Impact: Severe degradation of water and soil, loss of aquatic life and agricultural productivity.
- Infrastructure Gaps: Presence of basic infrastructure but lack of functionality and maintenance, particularly in electricity and healthcare.
- Social Unrest: Increased conflicts and instability linked to oil exploration activities.
- Quality of Life: Overall decline in living conditions, with minimal direct benefits from oil exploration activities.

PERCEPTION OF WOMEN OF OTUABAGI ON THE IMPACT OF CRUDE OIL EXPLORATION ON THEIR HEALTH

Health Impacts

- **Negative Health Effects:** The majority agree that oil exploration has negatively affected their health.
- **Uncertainty About Healthcare Facilities:** The majority are unsure if multinational oil companies or the government have built and equipped hospitals for easy access to healthcare. Existing facilities lack necessary equipment and manpower.

Reproductive Health

- **Menstrual Health:**
  - The majority menstruate, with a minority reporting normal menstruation.
  - A minority experienced early menopause (before age 35).
- **Pregnancy and Childbirth:**
  - The majority have achieved pregnancy, carried it to term, and delivered vaginally.
  - Most did not notice abnormalities in their babies, though a minority did.
  - A minority reported stillbirths, immediate post-birth deaths, and premature births.

Respiratory Health

- **Symptoms:**
  - The majority have experienced cough, nasal discharge, difficulty in breathing, and noisy breathing.
  - Most did not seek hospital treatment for these symptoms.
- **Possible Causes**: Air pollution from gas flaring and artisanal crude oil refining in neighboring communities.

Cardiovascular and General Health

- **High Blood Pressure:** A minority have been diagnosed.
- **Sleep and Headaches:** Half have difficulty sleeping; a majority have frequent headaches.
- **Shortness of Breath and Fatigue:** A minority experience shortness of breath and fatigue easily.
- **Poor Health-Seeking Behavior:** Most do not visit hospitals for treatment.

Diabetes Indicators

- **High Blood Sugar**: A minority have been diagnosed.
- **Symptoms:** Frequent urination, constant thirst, and excessive hunger suggest possible undiagnosed diabetes.

Gastrointestinal Health

- Bowel Habits: The majority have normal bowel habits.
- Abdominal Pain: More than half experience abdominal pain, likely due to contaminated food and water.

Skin and Eye Health

- Skin Issues: A minority report itching, rashes, and skin discoloration, likely due to PAH exposure.
- Eye Issues: The majority have poor vision, with some using glasses.

Key Takeaways

- Health Impact: Significant negative health impacts linked to crude oil exploration.
- Inadequate Healthcare: Lack of equipped and staffed healthcare facilities.
- Poor Health-Seeking Behavior: Most women do not seek medical help for their symptoms.
- Widespread Health Issues: Respiratory, cardiovascular, gastrointestinal, skin, and musculoskeletal problems are prevalent.

DISCUSSIONS

The study found that all participating women in Otuabagi had at least one PAH in their blood, with concentrations far exceeding WHO and ATSDR limits. This contamination is likely due to ingestion of polluted food and water, and possibly inhalation of polluted air. Drinking water sources, except for certain boreholes, were heavily contaminated with PAHs and microorganisms, rendering them unsafe. The presence of PAHs in soil and staple crops suggests extensive environmental pollution from crude oil spills. The study also revealed significant declines in local agriculture and fishing yields, exacerbated by pollution, and a host of health issues among women, including respiratory problems and high blood pressure, likely linked to environmental contaminants.

RECOMMENDATIONS

Federal Government Intervention

The Federal Government of Nigeria, through the National Oil Spill Detection and Remediation Agency (NOSDRA), should conduct a Joint Investigative Visit (JIV) to the Oloibiri oil well 2 in Otuabagi community to permanently seal the well that continues to spill crude oil onto farmlands and rivers.

Community Development Committee (CDC) Initiatives

Seal Contaminated Pits: The CDC should immediately seal all hand-dug pits used for drinking water collection with sand.
Community Awareness: Conduct a widespread enlightenment campaign to inform community members about the contamination of pit water and Kolo creek water, advising against their use for drinking.

Water Supply Enhancement

Generator for Borehole: Ensure a constant supply of water from the community borehole by providing and fueling a dedicated generator set. The water should be treated or boiled to 100°C and allowed to cool before drinking.

Peaceful Protest

Mobilize the community to conduct a peaceful protest to the Bayelsa State Government to highlight their plight and demand necessary actions.

Healthcare Revamp

Primary Healthcare Centre: The Bayelsa State government, through the Ministry of Health, should urgently revamp the Primary Healthcare Centre in Otuabagi by deploying medical personnel and necessary equipment, drugs, and consumables, including a functional ambulance.

Electricity Restoration

The Bayelsa State government, through the Ministry of Power and the State Electricity Distribution Company, should restore electricity supply by identifying and addressing the causes of the prolonged blackout.

Solar-Powered Water Pumping

Provide solar-powered batteries to pump water from the NDDC water board, ensuring a safe and sustainable drinking water supply.

LONG-TERM ACTIONS (3 MONTHS TO 1 YEAR)

- **Health Audit:**
  - The Federal Government, through the Ministry of Health, should conduct a comprehensive health audit of the Otuabagi community to assess the impact of environmental pollution on their health and implement appropriate intervention strategies.

- **Environmental Impact Assessment:**
  - Pollution Source Identification: Conduct an environmental impact assessment to identify pollution sources and sites, followed by immediate remediation of these sites.

- **Remediation Orders:**
  - Environmental Remediation: The Federal Government should mandate Shell Petroleum Development Company to clean and restore the Otuabagi environment, including lands, water bodies, and air, to their pre-exploration state.
  - Compensation: Shell Petroleum Development Company should be required to pay adequate compensation for environmental pollution, loss of livelihood, and adverse health impacts on the community.

CONCLUSION

The study highlights the severe health and environmental challenges faced by the women of Otuabagi due to crude oil exploration. High levels of polycyclic aromatic hydrocarbons (PAHs) in their blood and widespread contamination of water, soil, and food underscore a dire public health crisis. Despite being the first site of commercial oil discovery in Nigeria, the community suffers from pollution, inadequate healthcare, and neglect by both the government and oil companies like Shell. Immediate and sustained interventions are crucial to address these issues and improve the well-being of Otuabagi's residents.

- Abbey, M. et al. (2017). University of Port Harcourt Teaching Hospital study on congenital birth defects.
- Ackerly, K. L., & Esbaugh, A. J. (2020). Combined effects of crude oil exposure and hypoxia on red drum (Sciaenops ocellatus).
- Adeniji, A. O., Okoh, O. O., & Okoh, A. I. (2019). PAHs in the environment: Sources, fate, and risk.
- Alonso-Alvarez, C. et al. (2007). Effects of oil spills on seabird immune function.
- Améndola-Pimenta, M. et al. (2020). Gut bacterial composition changes in Achirus lineatus exposed to light crude oil.
- Balise, V. D. et al. (2016). Reproductive and developmental effects of PAHs.
- Barron, M. G., Ka'aihue, L., & Podrabsky, J. (2020). Impact of oil spills on aquatic ecosystems.
- Baumard, P., Budzinski, H., & Garrigues, P. (1998). PAH origin classification.
- Bebeteidoh, O. et al. (2020). Long-term effects of oil spills.
- Beyer, J., Trannum, H. C., Bakke, T., Hodson, P. V., & Collier, T. K. (2020). Review of oil spill impacts on marine environments.
- Briggs, K. T. et al. (1996). Impact of oil spills on coastal birds.
- Brette, F. et al. (2017). Cardiovascular toxicity of PAHs in fish.
- Bruce, N., Perez-Padilla, R., & Albalak, R. (2017). Health effects of biomass fuel exposure.
- Cerqueda-García, D. et al. (2020). Long-term exposure to crude oil and gut microbiota in Achirus lineatus.
- Choi, H. et al. (2008). Prenatal PAH exposure and cognitive development in New York City.
- Drwal, E., & Gregoraszcuk, E. (2019). Endocrine disruption by PAHs.
- Dubansky, B. et al. (2018). Long-term impacts of the Deepwater Horizon oil spill on fish health.
- Edwards, S. C. et al. (2010). PAH exposure and child lung function.
- Esler, D. et al. (2000). Immune response in sea ducks following oil exposure.
- Fallon, J. A. et al. (2018). Inflammation and immune response in seabirds exposed to oil.
- Fienimika, D. A. et al. (2018). Respiratory infections in children in Port Harcourt.
- Fernandes, M. B. et al. (1997). Source apportionment of PAHs in the marine environment.
- García-Sánchez, Á. et al. (2018). PAH pollution in the environment.
- Giese, M. et al. (2000). Effects of oil spills on seabird reproductive success.
- Golet, G. H. et al. (2002). Long-term effects of the Exxon Valdez oil spill on wildlife.
- Goethe, F. (1968). Oil pollution and its impact on seabirds.
- Gurung, R. et al. (2021). Impact of crude oil on Gulf killifish cardiovascular performance.
- Harville, E. W. et al. (2017). Prenatal exposure to environmental contaminants.
- Jamieson, A. J., & Gomes, T. (2020). Impact of oil exploitation on terrestrial environments.
- Khursigara, A. J. et al. (2021). Metabolic rate impacts of oil exposure on aquatic species.
- Kuppusamy, S. et al. (2017). Remediation strategies for PAH contamination.
- Li, H. et al. (2019). Classification of PAHs by ring number.
- Lu, M. et al. (2011). Environmental behavior and toxicity of PAHs.
- Magnuson, J. T. et al. (2020). Retinal and cardiovascular effects of PAH exposure in zebrafish.
- Malla, M. A. et al. (2018). Microbial degradation of PAHs.
- McKenzie, L. M. et al. (2019). Health effects of exposure to oil and gas extraction activities.
- Mehetre, G. T. et al. (2019). Bioremediation of PAHs.
- Mojiri, A. et al. (2019). PAH pollution sources and remediation.
- Sram, R. J. et al. (2005). Health effects of prenatal PAH exposure.
- Sanderson, J. T. (2006). Endocrine disruption and PAHs.
- Stenehjem, J. S. et al. (2015). Occupational exposure to PAHs and cancer risk.
- Strelitz, J. et al. (2019). Exposure to PAHs and health outcomes.
- Sweeney, T. (2002). Endocrine disruption by environmental chemicals.
- US EPA. (2008). Priority pollutants.
- Yoo, J. S. (2018). Health impacts of PAH exposure.
- Yamato, O. et al. (1996). Oxidative cell damage in seabirds exposed to oil.

KEBETKACHE

Kebetkache Women Development & Resource Centre
#8 Bolo Street, D/Line, Port Harcourt, Rivers State
Nigeria.
Phone: +234 813 196 9053
Website: www.kebetkachewomencentre.com
Email: kebetkachewomendev@gmail.com
info@kebetkachewomencentre.com