

# Assessing The Socioeconomic Impacts of A Mystery Oil Spill on Coastal Communities in Eastern Obolo, Nigeria

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*Abstract- Oil spill incidents along the Niger Delta coastline persistently challenge environmental governance, yet the social dimensions of such events remain insufficiently documented, especially when responsibility for the spill cannot be unambiguously assigned. This paper presents a post-impact socioeconomic assessment of a so-called “mystery spill” detected on 2 October 2016 along approximately 22 km of the Eastern Obolo coastline in Akwa Ibom State, Nigeria, where neither spiller, volume, nor precise origin had been formally established almost a year after the incident. Drawing on participatory rural appraisal techniques, focus group discussions, key informant interviews, semi-structured interviews, transect walks, and triangulated secondary data, the study covered nine fishing communities and settlements located both within and immediately outside the alleged impact boundary. Findings indicate that artisanal fisheries, the dominant livelihood of the resident population, were perceived to be substantially disrupted, with reported declines in catch per effort, longer fishing trips, soiled gear, and a deterioration in already-fragile water and sanitation conditions. The absence of a pre-spill baseline, the contested attribution of the spill, and the inability to disentangle spill-related effects from broader macroeconomic decline and chronic infrastructural deprivation introduce considerable interpretive uncertainty. The study argues that the very ambiguity of “mystery” spills exposes structural weaknesses in Nigeria’s oil spill compensation regime, which privileges admissible commercial claims over the broader social losses experienced by affected populations. Defensible socioeconomic compensation in such contexts requires anticipatory baseline studies, indicator frameworks tailored to small-scale fisheries, and institutional reforms that decouple impact recognition from definitive proof of liability.*

**Keywords:** *Mystery Oil Spill; Socioeconomic Impact Assessment; Artisanal Fisheries; Niger Delta; Eastern Obolo; Compensation; Participatory Rural Appraisal*

## I. INTRODUCTION

Oil and gas extraction has shaped the social, economic, and ecological landscape of the Niger Delta for more than six decades, generating both national revenue and profound local dislocation. Spill incidents along the region’s coastline are a recurrent feature of this extractive economy, and their cumulative ecological and human-health consequences are now well documented (Ite et al., 2013; Lindén & Pålsson, 2013; Nwilo & Badejo, 2005). Each major episode has generated controversies over volume estimation, ecological recovery, and the adequacy of compensation paid to affected communities (Onyena & Sam, 2020).

Embedded within this larger pattern, however, lies a less examined category of incidents: spills whose origin cannot be unambiguously attributed to a single operator. Such episodes, commonly described in local discourse as “mystery spills”, complicate the conventional polluter-pays model of environmental governance, in which liability, clean-up, and compensation flow from a clearly identified source. Where the source is contested, affected communities are caught in an institutional limbo: regulators are reluctant to act decisively without proof of liability, while the operator most proximate to the affected zone disclaims responsibility on the grounds that no causal link has been established. The result is protracted neglect of clean-up obligations and indefinite postponement of compensation, even as livelihoods deteriorate (Sam et al., 2024).

The present study examines such an incident. On 2 October 2016, a crude oil leak was sighted along the Eastern Obolo coastline of Akwa Ibom State, Nigeria,

in the immediate vicinity of fishing settlements whose inhabitants depend almost entirely on the marine and estuarine environment. The fisher-folks alerted their council of chiefs, who in turn notified the paramount ruler and the National Oil Spill Detection and Response Agency (NOSDRA). NOSDRA in turn contacted AMNI International Petroleum Development Company, the operator of the nearest offshore facility (Okoro and Setu East fields, OML 112), located less than 12 km offshore. A Joint Investigation Visit (JIV) was constituted involving NOSDRA, the Akwa Ibom State Ministry of Transport and Petroleum Matters, AMNI, and representatives of the affected coastal communities. AMNI, however, contested liability, and almost a year after the incident, neither the spiller nor the volume of the spilled crude had been definitively established. It was within this context that a Post-Impact Assessment (PIA) was commissioned to determine the spread of the spill, the extent of damage, and the modalities for clean-up and remediation.

This paper focuses on the socioeconomic dimension of that PIA. It pursues three interrelated objectives. First, it documents the social, demographic, and economic conditions of the affected coastal communities and situates them within the broader development context of the Niger Delta. Second, it evaluates the perceived impacts of the spill on livelihood, income, and quality of life, drawing explicitly on indicators of human well-being adapted from the social impact assessment (SIA) literature (Slootweg et al., 2001; Vanclay, 2002, 2003). Third, and most distinctively, it interrogates the methodological and ethical complications introduced by the “mysterious” nature of the spill, in particular the difficulty of quantifying losses in the absence of a baseline and the challenge of designing equitable compensation when liability remains contested.

Two interlocking theoretical frames guide the analysis. The first is the Sustainable Livelihoods Framework (Carney, 1998; Ellis, 2000; Scoones, 1998), which understands rural household well-being as a function of access to natural, physical, financial, human, and social capital, and treats shocks such as oil spills as stressors that erode the asset base on which livelihoods depend. The second is the social impact framework articulated by Vanclay (2002), which insists on a clear analytical distinction between social

processes of change, demographic, economic, and institutional shifts produced by an intervention, and the impacts that these processes generate as experienced by people in their daily lives. Read together, these frameworks make it possible to interpret the Eastern Obolo case as more than a matter of market loss: the spill, real or alleged, intersects with pre-existing vulnerabilities to generate cascading effects on livelihoods, social cohesion, and institutional trust (Mitchell & Parkins, 2011).

## II. STUDY AREA

Eastern Obolo Local Government Area (LGA) is located between Latitudes 4°29'N to 4°31'N and Longitudes 7°34'E to 7°50'E (Figure 1) in the southernmost coastal zone of Akwa Ibom State, within the lower Niger Delta region. Geographically, it occupies a flat, low-lying, swampy basin criss-crossed by a dense network of meandering rivers and creeks, and characterised by a chain of sandy barrier islands separated by numerous estuaries and inlets. Habitable land is scarce because of recurrent tidal and wet-season flooding, and settlement is therefore largely confined to elevated levees along the coastline, rivers, and creeks, producing a pattern that is both linear and nucleated. The 2006 national population census recorded a population of 60,543 persons (30,003 males and 30,540 females) for Eastern Obolo LGA, contributing approximately 1.6% of Akwa Ibom State's total population of 3,902,051 (NPC, 2010).

The communities surveyed for the present study are predominantly Obolo (Andoni-speaking) people, who trace their origin to Utombi in present-day Cameroon and inhabit a strip of coastal territory between the Andoni and Qua Iboe rivers (Ejituwu, 1991). They share a common language, customary institutions, and a strongly fishery-based livelihood profile. Christianity is the dominant religion, alongside residual elements of traditional African belief. Traditional governance is organised around councils of chiefs and a paramount ruler, alongside formal local government structures headquartered at Okoroete. The administrative composition of the two relevant clans is summarised in Table 1, and the geographic coordinates of the sampled communities are presented in Table 2.

Table 1. Settlements and communities in the Eastern Obolo study environment

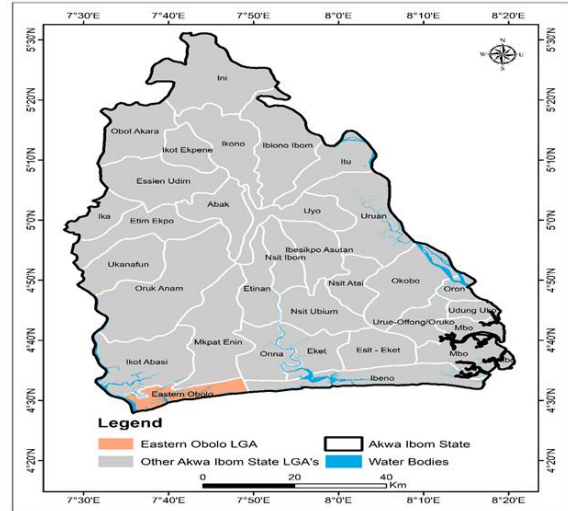
Clan / Sub-clan	Settlements / village communities	Status
Emereoke	Emere-Oke I, Emere-Oke II, Elekpon-Etekwun, Otunene, Ayama, Emeremen, Okwan Obolo	Gazetted
Emereoke	Agansa, Arankwaji, Emen Ekoo I, New Town, Uzama Emere-Oke, Amama Ubon, Ibot Osun, Otuwene, Uduwama, Ememem, Emen Ekoo II, Ama Nwon, Ama Ile	Not gazetted
Amazaba	Ozugbo, Amangbuoji, Bethlehem, Amauka, Ama Ngulasi, Ayama, Okorobilom	Gazetted
Amazaba	Okot-ime-Obolo, Otoyoy, Isi-Aganza, Amadede, Iyo-Ama	Not gazetted

Source: compiled from field consultations and Akwa Ibom State Statistical Year Book (2014).

Table 2. Geo-positions of communities and settlements visited during the post-impact assessment

S/N	Community / settlement	Latitude (N)	Longitude (E)
1	Okoroete urban (Jetty)	04° 32.108'	007° 44.644'
2	Elekpon Extension and Ama-abat	04° 30.659'	007° 44.724'
3	Edowni	04° 30.749'	007° 45.849'
4	Elekpon-Etekwun	04° 29.829'	007° 39.713'
5	Emereoke	04° 30.208'	007° 39.841'
6	Isi-Otoyoy and Ogboboutu (Amazaba)	04° 30.987'	007° 38.714'
7	Obianga (visited via Isi-Otoyoy)		

Source: handheld GPS readings, fieldwork 2017.



Source: Department of Geography & Environmental Sustainability, 2017.

### III. METHODOLOGY

#### 3.1 Research design

The study adopted a qualitative-dominant, mixed-method design grounded in Participatory Rural Appraisal (PRA) (Chambers, 1994). PRA was selected for three reasons. First, the population universe consisted of small, dispersed coastal fishing settlements with limited infrastructure, where conventional probability-based household surveys would have been logistically prohibitive within the available timeframe. Second, the social meaning of the spill, claims about lost livelihoods, perceptions of institutional neglect, and intra-community contestation of impact boundaries, was central to the research questions and is best elicited through deliberative methods. Third, PRA techniques have been shown to yield robust results in oil-impact assessments in the Niger Delta when multiple instruments are triangulated. The methodological architecture combined community-wide consultations, focus group discussions (FGDs), semi-structured interviews (SSIs), key informant interviews (KIIs), transect walks, and direct observation, supplemented by an extensive review of secondary data (Ojile, et. al., 2016; Akpofure and Ojile, 1999).

#### 3.2 Field procedures

Fieldwork was undertaken between 21 and 24 August 2017, almost ten months after the spill incident, as part of a larger PIA convened by NOSDRA. A pre-

fieldwork meeting in Eket on 21 August 2017 brought together two parallel study teams (one commissioned by Environmental Resources Managers Limited on behalf of AMNI, and one commissioned by NOSDRA), the regulators, the company, and a community-engaged consultant. At this meeting the original scope of two communities was revised: the community consultant clarified that ten settlements, five along the coastline and five along feeder creeks, had been affected. Of these ten, eight were ultimately reached for primary data collection, and the ninth (Obianga) was represented by community members invited to Isi-Otoyo for joint discussions, owing to logistical and security constraints. Field movement was undertaken by fibre boats fitted with 75 HP outboard engines, accompanied by Nigerian Police escorts and a community surveillance party. In each community, the team facilitated a community-wide meeting followed by a focus group discussion, supplemented by key informant interviews with traditional rulers, youth presidents, and experienced fishers.

### 3.3 Analytical framework and indicators

Population estimates for individual communities and settlements were generated using the exponential growth model:

$$P_n = P_0 (1 + r)^n$$

where  $P_0$  is the base population (1991/1996 census figures),  $r$  is the annual growth rate (3.4% for Akwa Ibom State, drawn from NPC, 2010), and  $n$  is the elapsed time in years. The exponential model was preferred to linear extrapolation and to the cohort-component method on the grounds of its simplicity, its modest data requirements, and its suitability for small populations whose dynamics are dominated by natural increase rather than migration.

Socioeconomic impacts of the spill were assessed using a small set of pragmatic indicators rather than an exhaustive multi-domain framework. This choice draws explicitly on the Arctic Social Indicators (ASI) tradition, in which Larsen, Schweitzer, and Fondahl (2010) and Larsen, Schweitzer, and Petrov (2014) argue for narrowing indicator systems to a representative set that satisfies five quality criteria: definitional clarity, robustness, scalability, data availability, and inclusiveness. It also reflects Vanclay's (2002) call to distinguish processes of

social change from impacts experienced by humans, the latter being the proper object of compensation. Three indicators were selected on these grounds: (1) livelihood and fisheries activity; (2) income derivable from fisheries; and (3) visual, aesthetic, and other claimed visible damages.

### 3.4 Methodological limitations

Three limitations must be acknowledged at the outset, because they shape the interpretation of every result that follows. First, no pre-spill baseline of fish catch, household income, or environmental quality existed for the affected settlements, a problem that has been documented as endemic in Niger Delta restoration contexts (Sam et al., 2024). All claims of decline are therefore reconstructive and rely on the recall and self-report of community members. Second, the very identity of the spiller remained contested throughout the assessment, which means that the study cannot establish causal attribution to a specific operator and is constrained to report effects as alleged or perceived. Third, almost a year had elapsed between the spill and the field visit, during which time weathering, tidal action, and ongoing economic decline at the national level (Nigeria entered recession in 2016) may have masked or compounded spill-specific effects. These limitations are not incidental: they are constitutive of the "mystery spill" as an analytical category and they bear directly on the difficulty of designing fair compensation, an issue revisited in the discussion.

## IV. RESULTS AND DISCUSSION

### 4.1 Demographic profile of the study area

Population characteristics of the LGA and the state are presented in Table 3. Eastern Obolo had a 2006 census population of 60,543, projected to 71,083 by 2011, and is geographically very small (117 km<sup>2</sup>) but densely settled. With a density of approximately 670 persons per km<sup>2</sup>, the LGA is markedly more crowded than both the South-South geopolitical zone average and the Nigerian national average (Figure 2). This concentration is a direct consequence of the area's physical conditions: only the elevated levees and barrier ridges are habitable, so a relatively large population is squeezed into a narrow strip of land along the coastline.

Table 3. Population characteristics of Eastern Obolo LGA and Akwa Ibom State

Area	1991 total	2006 males	2006 females	2006 total	Area (km <sup>2</sup> )	Density (/km <sup>2</sup> )
Eastern Obolo LGA	13,911	30,003	30,540	60,543	117	670
Akwa Ibom State	2,409,613	1,983,202	1,918,849	3,902,051	6,772	576

Source: NPC (2010); NBS (2012); Akwa Ibom State Statistical Year Book (2014).

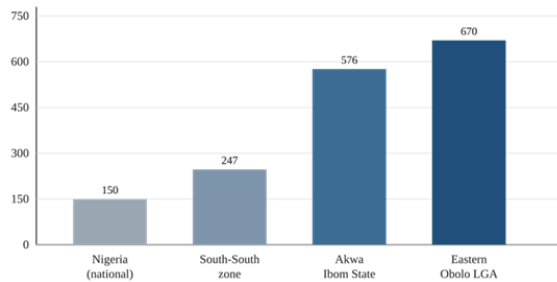


Figure 2. Population density (persons per km<sup>2</sup>) at national, regional, state, and LGA levels.

Table 4. Projected populations of selected Eastern Obolo coastal communities, 1991–2017

Community	1991	1996	2006	2011	2017	Notes
Okoro ete (LGA HQ)	2,547	2,903	4,056	4,794	5,858	
Iko Town	2,309	2,632	3,677	4,346	5,312	
Amadaka	740	844	1,179	1,394	1,703	
Emerooke I	512	584	815	964	1,179	PIA community

Emerooke II	492	561	784	926	1,132	PIA community
Elekpon	276	315	440	520	636	PIA community
Obianga	470	536	749	885	1,082	PIA community
Emeromen	172	196	274	324	400	
Easter	13	15	60	71	87	
Obolo total	911	993	543	083	456	All 26 communities

Source: Authors' calculations, 2017.

Note: Populations projected using the exponential growth model at 2.83% (national rural rate); base year 1991/1996. Source: NPC (1991, 2010); Akwa Ibom State Statistical Year Book (2014).

The data in Table 4 confirm a steady demographic expansion across all surveyed communities. The four PIA-priority communities (Emerooke I, Emerooke II, Elekpon, Obianga) collectively accounted for an estimated 4,029 inhabitants in 2017. Across the LGA as a whole, the growth rate of approximately 2.8% slightly exceeds the typical Nigerian rural rate of 2.5%, a finding consistent with the constraints to out-migration imposed by geographic isolation and the dependence of household economies on locally available marine resources.

4.2 Livelihood structure and the centrality of fisheries  
 Across all surveyed communities, approximately 95% of the resident population was engaged in fishing or fisheries-related activities, with the remainder occupied in petty trading, civil service, boat-building, net-mending, and engine repair. The artisanal fishery operates with canoes between 6 and 13 metres in length, powered by outboard engines ranging from 9.9 to 40 HP, and crewed by three to five men. Fishing gear includes gill nets, cast nets, beach seines, hooks, and a variety of traps. Fishers target small pelagics such as *Sardinella* spp. and *Ethmalosa* spp. in the November–April dry season, supplemented by demersal species (croakers, catfish, shynose) and shrimp. Fishing trips extend from 25 fathoms at the

Elekpon-Etekwun ground to as much as 50 fathoms beyond the AMNI offshore platforms at Emereoke. In the rainy season, when ocean conditions are hazardous, women and adolescents shift to inshore collection of periwinkles, oysters, and shellfish in the mangroves.

The fisheries productivity record at the LGA level (Table 5 and Figure 3) is striking. Recorded fish landings in Eastern Obolo rose from approximately 29,984 tonnes in 2009 to a peak of 49,240 tonnes in 2013 before declining to 43,824 tonnes in 2014. The state report does not attribute this decline to any specific cause, and it cannot be linked to the 2016 spill (which post-dates the data series). The existence of such a productivity record without a corresponding socioeconomic baseline at community level illustrates one of the central paradoxes of the Eastern Obolo case: aggregate landings data exist, but disaggregated, settlement-level information of the kind needed to substantiate compensation claims does not.

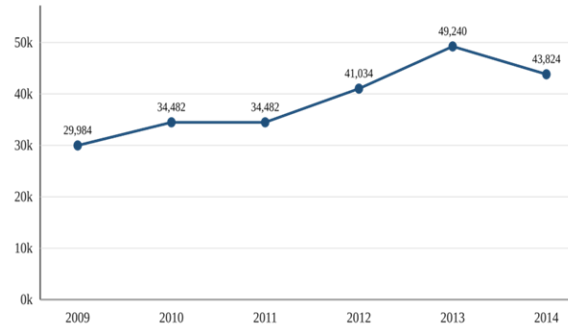


Figure 3. Recorded fish landings, Eastern Obolo LGA, 2009–2014 (tonnes).

Source: Akwa Ibom State Statistical Yearbook (2014).

Table 5. Recorded fish landings (tonnes) for selected coastal LGAs of Akwa Ibom State, 2009–2014

LG	2009	2010	2011	2012	2013	2014
A						
East	29,9	34,4	34,4	41,0	49,2	43,8
ern	84	82	82	34	40	24
Obo						
lo						
Mb	44,1	50,7	59,3	70,6	58,6	65,6
o	37	58	86	70	56	94
Iben	25,1	28,9	33,8	40,3	33,4	27,7
o	87	65	89	27	41	56
Eket	18,4	21,2	24,8	29,6	24,5	28,9
	87	60	75	01	68	90
Esit	30,3	34,9	40,8	48,6	40,3	41,0
Eket	70	25	62	26	59	56
Ikot	31,4	36,1	42,2	50,3	10,0	20,6
Aba	20	33	75	08	62	16
si						
Stat	329,	380,	438,	521,	447,	448,
e	099	113	869	954	884	123
total						

Source: Fisheries Department, Ministry of Agriculture and Natural Resources, Uyo, as reported in the Akwa Ibom State Statistical Year Book (2014).

#### 4.3 Income from fisheries: range, variability, and the limits of self-report

Income data were elicited through narrative interviews with fishers in each community. At Elekpon Extension, individual fishers reported daily earnings of ₦10,000–₦15,000 from inshore fishing six days a week, while a three-man crew returning from a two-day deep-sea expedition (Plate 1) reported a gross catch value of ₦200,000 against fuel and provisioning expenses of approximately ₦50,000. At Edowni, fishers reported gross landings between ₦50,000 and ₦300,000 per trip, with significant variation between calm and rough conditions. At Elekpon-Etekwun and Emereoke, the two communities reported as most directly affected by the spill, deep-sea expeditions yielded between ₦150,000 and ₦300,000 per landing under favourable conditions, against expenses of ₦40,000–₦45,000, but “bad days” could reduce gross income to ₦30,000–₦50,000 with substantial losses on gear and fuel. Figure 3 presents these reported income ranges visually (Figure 4).



Plate 1: Fish picking and selection after fishermen return with their landings and catch is a serious fisheries-related exercise involving women, children and buyers as part of final processing for sale as witnessed at Elekpon extension-Amaabat Fishing Port/Settlements.

Source: Fieldwork, 2017.

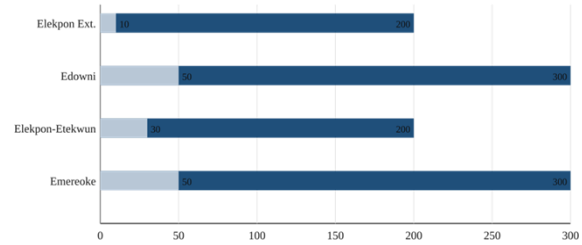


Figure 4. Reported gross income per fishing trip across the four most extensively interviewed communities (₦ '000).

Source: Focus Group Discussions and Key Informant Interviews, 2017.

Two analytical observations follow from these figures. First, the income range across communities is wide and overlapping, and there is no clear evidence from the income data alone that fishers within the alleged impact zone earn systematically less than those immediately outside it. Second, and more fundamentally, self-reported income from rural self-employed populations is well known to be unreliable: householders rarely keep records, are often engaged in multiple income-generating activities whose contributions cannot be cleanly separated, and may have strategic reasons to under-report (taxation) or over-report (compensation expectations). The methodological literature on rural livelihood assessment has long emphasised this difficulty (Carney, 1998; Ellis, 2000), and it is acutely felt in the present case. The income evidence, taken at face value, therefore cannot serve as a quantitative basis for compensation calculations; it can only document the order of magnitude of livelihoods at risk and the perceived direction of change.

#### 4.4 Perceived impacts of the spill on livelihood and well-being

Despite the quantitative ambiguity of the income data, qualitative evidence of perceived impact was strikingly consistent across communities. There was 100% affirmation among community discussants that fish catch had declined since the spill, that fishing now required greater effort (longer trips, deeper grounds, more fuel), and that younger fishers had taken on a disproportionate share of the burden because the work had become physically more demanding. Visible damages reported by community members included a darkening of water colour following the incident, the

death of fish and other aquatic organisms observed floating on the water surface, soiling of nets and canoes berthed at the waterside, slippery and dangerous beach surfaces, and a reduction in the picking of periwinkles from the shoreline. Several oiled nets were exhibited to the study team as evidence. Beyond these material impacts, community members emphasised the psychological burden of an event whose origin was being denied: the sense that their livelihood had been damaged but that no party would acknowledge responsibility was, in their account, as demoralising as the material loss itself.

These perceived impacts can be read against the typology of Liu and Wirtz (2006), who identify five categories of oil spill cost: environmental damage, socioeconomic loss, clean-up cost, research cost, and other expenditure. In practice, however, only a subset of these costs is ever compensated. International and Nigerian compensation regimes generally restrict awards to “admissible claims”, typically involving documented commercial loss, damaged property, and clean-up expense, while losses to subsistence, food security, social cohesion, and cultural use of the environment are rarely compensable. This restriction is consequential for indigenous and small-scale fishing populations, whose livelihoods are not organised around commercial supply chains and whose losses fall almost entirely outside the categories that compensation regimes recognise. The Eastern Obolo communities thus face a compounding disadvantage:

not only is the spiller contested, but even if attribution were achieved, much of what they have lost would not qualify as compensable under prevailing rules (Onyena & Sam, 2020; Sam et al., 2024).

#### 4.5 Infrastructural deprivation and the difficulty of disentangling spill effects

The communities surveyed display a profile of acute infrastructural deprivation that long predates the 2016 spill. Table 6 summarises the social amenities available across five of the surveyed settlements. There are only two functional public primary schools and one secondary school for the entire study area; the school at Ogboboutu/Isi-Otoyo is housed in an improvised structure of wood and zinc sheeting that doubles as the community town hall. Not a single functional public water facility exists across the surveyed settlements: a borehole installed by the defunct Oil Mineral Producing Areas Development Commission (OMPADEC) and a mono-pump installed by the equally defunct Petroleum Trust Fund (PTF) have both fallen into disuse. Households source drinking water from shallow ponds, hand-dug wells, isolated freshwater streams, and rainwater harvesting, with chronic problems of saltwater intrusion and elevated iron content. None of the surveyed communities is connected to the national electricity grid; private generators serve the few who can afford them, and the majority rely on hurricane lanterns and firewood.

Table 6. Social amenities and infrastructure across surveyed Eastern Obolo communities

Indicator	Elekpon Ext. / Ama-abat	Edowni	Emereoke	Isi-Otoyo / Ogboboutu	Elekpon-Etekwun
Water supply	Shallow wells; rainwater	Open ponds; rainwater	OMPADEC borehole and PTF mono-pump (both abandoned); shallow wells	NDDC facility abandoned; shallow ponds; rainwater	Shallow pond; rainwater harvesting
Electricity	None; lanterns	None; lanterns	Council electrification project abandoned mid-way; lanterns	None	None
Schools	None on site	None	1 primary (4 government + 3 community-paid teachers, 150 pupils); 1 secondary (450 students, 11 teachers); 3 nurseries	Improvised structure of wood and zinc; 2 teachers; ~50 pupils	None on site

Health	None	None	1 health post (council-built, weakly functional)	PHC with 5 nurses; weakly functional	None; sick travel to Okoroete
Transport	Foot intra-; speedboats inter-	Foot; speedboats and canoes	Speedboats, canoes, motorcycles along coastline	Speedboats and canoes; no jetty / shore protection	Foot; speedboats and canoes
Housing	Thatched ephemeral	Temporary thatched	Daub walls with zinc roofs; some corrugated zinc; some ephemeral	Daub walls and zinc roofs	Almost all thatched, some zinc walls and roofing

Source: field observations and community consultations, 2017.

This infrastructural context has direct interpretive consequences for the spill assessment. When community members report difficulty obtaining drinking water following the spill, the report must be understood against a baseline in which clean water access was already severely constrained. When they report psychological distress, the distress is layered onto a chronic condition of state and corporate absence. And when they demand compensation, the demand is implicitly compensation not only for the spill but for a longer history of neglect. The methodological challenge is therefore not simply to attribute observed effects to the spill in isolation, but to interpret the spill as one event within an accumulated structural condition, a recognition that aligns the present case with the broader Niger Delta literature on environmental injustice and infrastructural neglect (Idemudia, 2014; Ukiwo, 2007; Watts, 2004).

#### 4.6 The contested geography of impact

One of the more revealing findings of the study concerns the contested boundary of the impact zone itself. Community representatives identified Emereoke, Elekpon-Etekwun, and Etekwun as more severely affected than the neighbouring settlements of Elekpon Extension, Ama-abat, Ayalokpon, and Edowni, even though all these settlements lie along the same coastline within a few kilometres of one another and all reported some impact on fisheries. The basis for this differentiation is not self-evident. Both the alleged impact communities and the comparison communities reported a similar distance to the AMNI facility (six to seven fathoms in their reckoning), similar fishing technologies, and similar species composition.

Several physical-oceanographic factors could in principle explain differential exposure: the curvature of the coastline, prevailing wind direction, longshore current patterns, and the volume of oil transported by waves and currents to particular shoreline segments. The communities at the mouth of the Emereoke Creek, where the creek discharges into the Atlantic Ocean, plausibly experience higher accumulation through estuarine trapping. However, none of these explanations was systematically established by the assessment, and the evidence does not exclude a less flattering interpretation: that the boundary distinction was at least partly produced by intra-community politics around compensation claims. The cautionary lesson is that impact boundaries in mystery-spill contexts are not neutral scientific objects; they are shaped by, and feed back into, local contestation over the prospective distribution of compensation.

#### 4.7 The compensation dilemma in mystery-spill contexts

The cumulative weight of these findings, the absence of a baseline, the unreliability of self-reported income, the contested geography of impact, the intersection of spill effects with chronic deprivation, and the contested attribution of the spill itself, converges on a fundamental policy problem: how can socioeconomic compensation be assessed and implemented in a setting where the source of harm is contested and the harm itself is impossible to quantify with precision? The international literature on oil spill compensation has tended to assume that liability is established and that loss is quantifiable in commercial terms (Liu & Wirtz, 2006). Mystery spills violate both assumptions and thereby expose the limits of the prevailing model. Three implications follow. First, the requirement of definitive proof of liability functions, in such contexts,

as a de facto barrier to any compensation, rewarding the operator with the strongest incentive to deny responsibility and penalising the affected population for the very ambiguity that produced their predicament. Second, the restriction of compensation to admissible commercial claims systematically under-counts the losses experienced by subsistence-oriented populations, for whom the relevant capital is not commercial revenue but a complex of natural-resource access, household labour, food security, and cultural practice (Carney, 1998; Vanclay, 2002). Third, the absence of pre-spill baselines, a structural feature of weakly governed extractive frontiers, means that even where the will to compensate exists, the empirical foundation for calculating the award is missing (Sam et al., 2024). The Eastern Obolo case illustrates each of these difficulties in concentrated form and demonstrates that the “mysterious” character of certain spills is not merely a forensic curiosity but a governance problem with deep distributional consequences.

## V. RECOMMENDATIONS

Five recommendations follow from the analysis above. They are addressed jointly to regulators (NOSDRA in particular), state institutions, oil and gas operators, and the research community.

First, anticipatory baseline socioeconomic studies should be undertaken systematically in all coastal and inland communities lying within plausible impact zones of offshore and onshore oil and gas operations. Such baselines should include household-level data on income, fishing effort and catch, water and energy access, health, and educational attainment. The argument for anticipatory baselines is straightforward: without them, no defensible quantification of post-spill loss is possible, and the burden of proof falls unfairly on the affected communities (Sam et al., 2024).

Second, a tiered framework for socioeconomic compensation should be developed that explicitly distinguishes between direct commercial losses, subsistence and livelihood losses, cultural and psychological losses, and longer-term recovery costs. Each tier should be associated with documented assessment protocols and indicative valuation

methods, drawing on the indicator quality criteria of Larsen, Schweitzer, and Petrov (2014): definitional clarity, robustness, scalability, data availability, and inclusiveness. Such a framework would reduce the discretion exercised by operators in determining what is and is not “admissible” and would bring Nigerian practice closer to the international standard.

Third, the institutional treatment of mystery spills requires reform. NOSDRA should be empowered, in collaboration with State Ministries of Environment, to initiate provisional clean-up and interim compensation in cases where the source of a spill is contested but its existence and approximate extent are not. Liability can subsequently be determined through forensic fingerprinting and regulatory adjudication, with cost recovery from the responsible party once identified. Decoupling the recognition of harm from the determination of liability would prevent affected communities from being held hostage to forensic delay.

Fourth, urgent investments in basic infrastructure are warranted, both as a matter of social justice and as a methodological enabling condition for future impact assessment. The provision of functional schools, health posts, potable water, and electricity in the Eastern Obolo coastal communities would not in itself compensate for the spill, but it would address the chronic deprivation that distorts the interpretation of every subsequent shock.

Fifth, the research community should undertake comparative work on mystery spills as a distinct analytical category. The Eastern Obolo case is unlikely to be unique: along the wider Niger Delta coast, contested-attribution incidents probably occur with greater frequency than the published record suggests, and a comparative study would clarify the extent to which findings from this single case generalise to other sites.

## VI. CONCLUSION

This paper has presented a post-impact socioeconomic assessment of an oil spill detected along the Eastern Obolo coastline of Akwa Ibom State, Nigeria, in October 2016, whose source remained contested and whose volume was undetermined almost a year after

the incident. Drawing on participatory rural appraisal techniques and a small set of pragmatic socioeconomic indicators, the study documented the social, demographic, and economic profile of nine affected coastal communities and evaluated the perceived effects of the spill on livelihood, income, and visual environment. Findings indicate that artisanal fisheries, the dominant occupation of the population, were perceived to have been substantially disrupted, that fishing now required greater effort for diminishing returns, and that fishers, gear, and beaches showed visible signs of oiling. Yet the absence of a pre-spill baseline, the unreliability of self-reported income data, the contested geography of impact, and the deep entanglement of spill effects with chronic infrastructural deprivation make precise quantification impossible.

The deeper contribution of the study lies less in its empirical findings than in what those findings reveal about the limits of the prevailing oil spill compensation regime. Mystery spills are not simply forensic puzzles; they are governance failures that expose how the requirement of definitive liability, the privileging of admissible commercial claims, and the absence of anticipatory baselines combine to systematically disadvantage the populations most affected by extractive activity. The Eastern Obolo communities are caught between an operator who denies responsibility, regulators who hesitate to act without proof, and a compensation framework that would not, in any case, recognise the full range of their losses. Addressing this predicament will require institutional reform that decouples the recognition of harm from the determination of liability and a broader social-impact framework capable of valuing what subsistence communities actually lose when their environment is compromised.

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