Empowering Indigenous Communities in Oil Producing Areas Through First Responder Training: A Path to Awareness, Safety And Sustainability: A Study Of Bodo Remediation, Gokana L.G.A, Rivers State, Nigeria

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Abstract

Oil spill poses a major threat to the environment in which it is released if not properly checked and effectively managed. The place and role of a first responder is a coveted one for a timely and adequate response to oil spill and other environmental disaster. Using the Stakeholder Theory, this study examines the impacts of providing first responder training for residents of oil-producing communities. Statistically, about 1600 indigenes of Bodo were trained for phase 1 and 2 Bodo Remediation exercise. This study evidently shows that the response time to oil spills has improved which shows that the training enhanced the emergency response, safety awareness and environmental sustainability. The training also helped in building capacity and enhanced preparedness of individuals for swift and effective emergency response as well as community cohesion against environmental disaster. The study uses historical design method which draws on both primary and secondary data. The study concludes that first responder training programme should be advocated in order to empower affected communities to respond and contain timeously disaster which may occur in the course of exploring and exploiting natural resources for the well-being of all stakeholders.

I. Introduction

Since the discovery of oil in commercial quantities in Nigeria in 1958, thousands of spill incidents have occurred. Niger Delta located in the Southern part of the country is the oil rich region. Ogoniland in Niger Delta is one of the oil producing zones among others. According to Royal

Dutch Shell, 634 million barrels of oil were taken from Ogoniland between 1958 and 1993 before oil production in the area was halted (Pegg, 1999). Fig. 1.1 shows the extensive network of pipelines that criss-cross the land, creeks and waterways in Ogoniland till date, Bodo inclusive. This shows how an area that has not actively produce oil since 1993 is still vulnerable to regular oil spills. In 2008 and 2009 Bodo people suffered two devastating spills both caused by rupture/leaks in the Trans-Niger pipeline, which transports an estimated 120,000 – 150,000b/d of oil through Ogoniland (UNEP 2011). In terms of volume, Accufacts Inc. reported that 1,440 - 4,320 barrels of oil flooded Bodo area each day due to the leak. The total amount of oil spilt over the 72- day period is between 103,000 barrels - 311,000 barrels (Vidal, 2012). At least 5 spills have occurred in the area from 2009 till date. These reoccurring oil spills is a challenge that calls for concern, as oil spill pose a major threat to the environment into which it is released if not properly checked or effectively managed.

Oil spillage is a serious problem in Ogoniland particularly Bodo (Fig 1.2). This is because the aquifers upon which the inhabitants depend for drinking water are shallow, and can be polluted by infiltration of oil spilled recurrently in the area, within a short pace of time. Prolonged consumption of oil polluted water has adverse effects on the health of the consumers. Water with high level of hydrocarbon content may have negative effect on the kidney and liver of the consumers. Also, poor reproductive system, leukemia, increased blood pressure and reduced blood clotting are associated with the consumption of oil polluted water (Gay *et al.* 2010).

Figure 1.1: Typical Niger Delta Community Environment (Adapted from Watts, 2012)

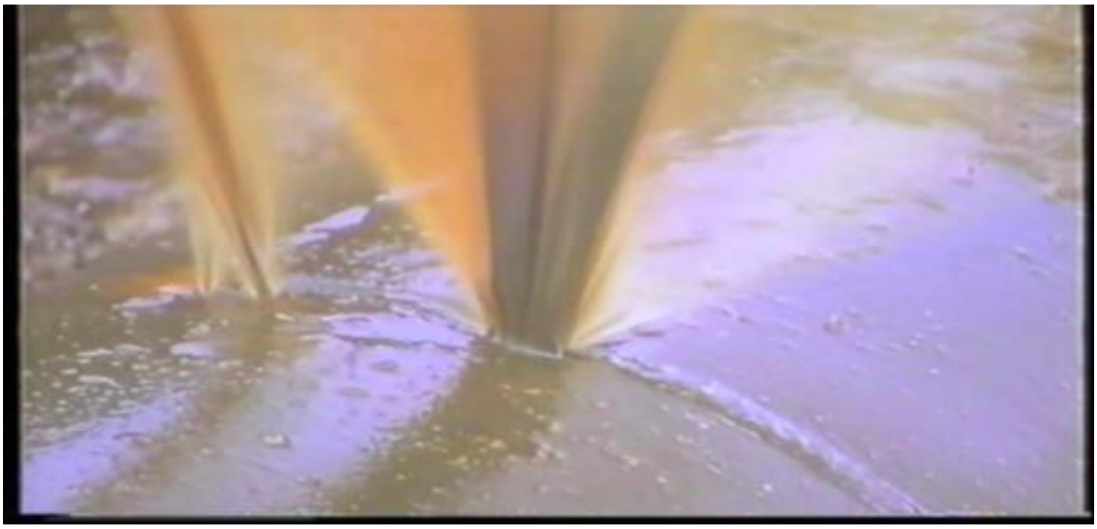


Figure 1.2: Ruptured Pipeline Spewing Crude Oil (Steiner, 2011)

Oil spill will continue to occur as long as the society depends on petroleum and its product; this is due to inherent potential for human error and equipment failure in producing, transporting and storing petroleum (Fingas, 2011). Since oil spill has become a norm which has crept in to dwell with the oil producing communities, it is necessary to give the indigenes First Responder Training.

Oil Pollution Preparedness, Response and Co-operation (OPRC) IMO Level 1 – First Responder Training is a course which addresses all aspects of oil spill planning, response and management.

Some objective of this course should be to give trainees;

1. An overview of the main causes of oil spills
2. Introduction to behavior, fate and impact of oil spill
3. Contingency Planning
4. Health and Safety
5. Response Techniques

Ensuring a safe and healthy environment has become the responsibility of all and given that government and the IOCs have been fingered for sharp practices there is need for training and retraining of first responders in case of disaster. This will foster community buy-in and friendly environmental practices. Using the Stakeholder Theory, this study examines the impacts of providing first responder training for oil-producing communities using Bodo Remediation exercise as a case study. The study discusses some basic concepts and skills which First Responders should be armed with in the event of oil spills before the statutory authorities are drafted in to put the situation under control.

II. Theoretical and Conceptual Framework

This study adopts the stakeholders' theory which advocates collaboration among oil-producing communities, IOCs, Governments and relevant agencies. There are some relevant concepts to be examined in context to aid and broaden the knowledge of a first responder in carrying out his or her responsibility.

i) Stakeholders Theory

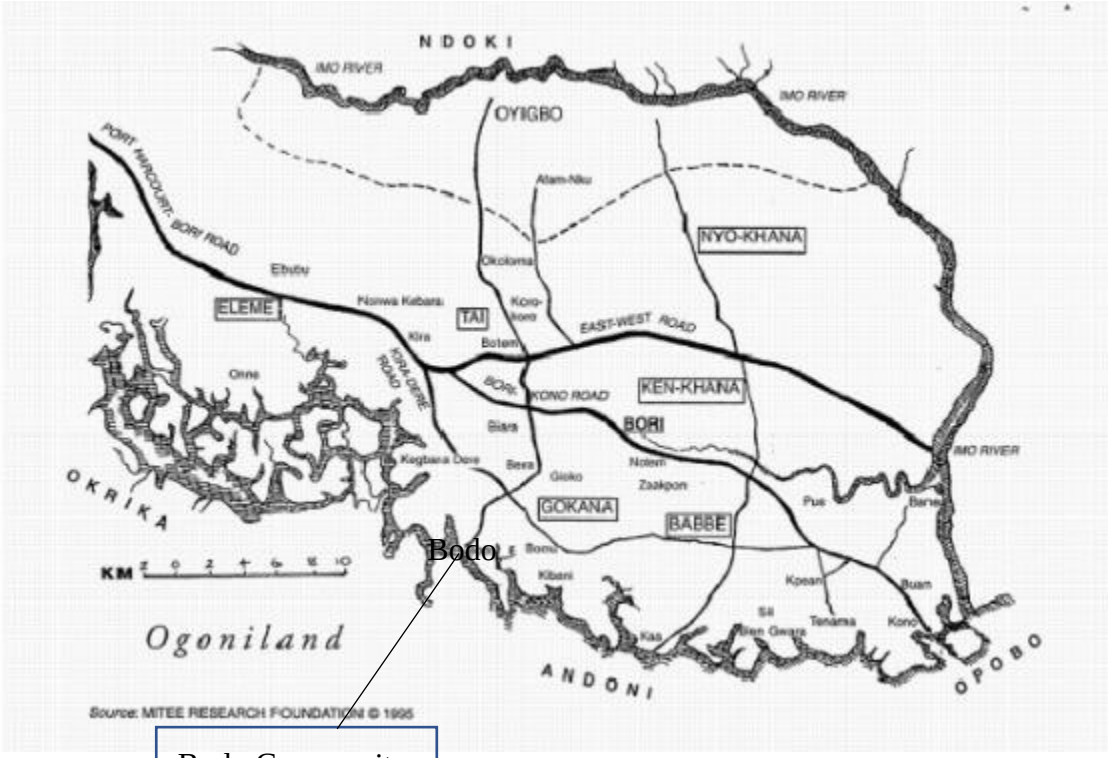
Stakeholder Theory is a view of capitalism that stresses the interconnected relationship between a business and its customers, suppliers, employees, investors, communities and others who have a stake in the organization. The theory argues that a firm should create value for all stakeholders, not just shareholders. R. Edward Freeman is credited with the original details of the Stakeholder theory in organizational management and business ethics that addresses morals and values in managing an organization.

According to Kevin Gibson (2012) , the term 'stakeholder' came into prominence with the work of Freeman (1984), when he challenged the prevailing view of managerial capitalism by saying that managers bear fiduciary relationship to those who have a stake in or claim on the firm…and though Freeman himself has not made the claim, the idea that the environment can be considered a stakeholder is attributable to a loose interpretation of his original definition of stakeholder as any group of individuals who can significantly affect or be affected by an organisation's activities (Freeman, 1984). Freeman's anthropocentric definition expanded the concept "stakeholder" by including "any naturally occurring entity which affects or is affected by organizational performance".

Stakeholder theorists support sustainable environment by relying on various foundational moral approaches. Phillips (1997), for example, bases his analysis on the notions of fairness and reciprocation. Central to most interpretations of the theory is the idea that stakeholders are interdependent and can forge symbiotic relationships as stakeholder's awareness is essentially, in Senge's (1990) words, "otherwise directed". Thus, a firm ought to recognize the local community by virtue of the benefits it has received from its host. Gibson (2012) took a far expansive view of community when he argues: "…tax breaks given to a company by a town [only] imply some obligation on the part of the firm. However, when it comes to environmental issues, I see no reason to consider any particular action as local, since all actions are likely to have some effect on total welfare". Gibson (2012) gives an instance where in the case of the Smog in Mexico, "the effects were probably far-reaching [so that] even if they are small they may be cumulative". One may agree with Gibson that the plant manager's decisions are partially responsible for climate change or other effects on people in distant land. It has been stressed that when it comes to planetary sustainability, the whole global population is likely to be affected by business decisions, and therefore ought to be considered under a stakeholder approach.

III. Study Area

Bodo is a community in Gokana Local Government Area, (Ogoniland) of Rivers State, Nigeria (Figure 1.3). The study area has an estimated population of about 69,000 as of 2015 and occupying Latitude 04^0 36' to 04^0 38'N and Longitude 07^0 15' to 07^0 16'E (Figure 3.1b). It is situated in the eastern part of the Niger Delta region of Nigeria (Scott and Zabbey, 2013).



Bodo Community

Figure 1.3: Map of study area (Ogoniland) showing Bodo Community (http://www.ogonicharity.camp7.org)

1. An overview of the main causes of oil spills

Oil spill is the discharge or release of oil (crude or refined) into the environment due to malfunctioning of equipment like corrosion, blowouts or through human error or activities like sabotage and artisanal refining. Some causes of oil spill are discussed thus:

(a) Corrosion of pipelines:

This is the leakage of pipelines that are very old (i.e. have exceeded 15 years, the maximum life span of pipelines that are active in operation by any oil industry according to Nigerian law). Most of these pipelines are old and poorly maintained; resulting in corrosion and leakages that bring about oil spills (Brume, 2004). This is the highest contributor to all oil spillages as thousand barrels of oil gush into the environment through corroded pipes.

(b) Sabotage:

This is a process whereby the saboteur bursts the pipeline and extracts oil. In the process the pipeline is damaged and oil spill occur. Most spills that occur due to sabotage are accompanied by fire outbreak which destroys the vegetation and animal life. The fire outbreak associated with petroleum products spillage usually causes more damage to the environment than the petroleum products spill alone (Dwire and Kauffman, 2003, Otitoloju and Are 2003). There are different ways used by the saboteur which includes:

- By the use of hacksaw on the facility.
- By the use of drilling machines to make a drill hole to siphon the products carried within.
- By the process of blasting with the aid of explosive.
- By the acid substance that are capable of rusting metals which almost all oil facilities are made of. The acid is poured on the surface, allowed for some time (days to weeks or months) depending on the reactive strength and type of metal in contact with (Atubi, 2006).

(c) Artisanal refining:

Is a practice whereby crude oil illegally obtained from pipelines is refined in bushes (forests) close to swampy areas using local technology and skills. Though the Niger Delta environment may have already been polluted by the recklessness of major oil companies operating in the area, artisanal refineries which are unregulated have exacerbated the pollution with their crude technology (Ikanone *et al.* 2014). Artisanal refining processes include; heating and boiling, separation of different products and emptying of the waste. The refining process generates a significant amount of waste dumped in rivers, creeks and on land, while the evaporated low fractions pollute the air shed (Obenade and Amangbara, 2014).

(d) Blowouts:

This occurs when well is not kept under control i.e. hydrostatic mud head pressure counterbalances the formation pressure during drilling operations. This is very disastrous.

(e) Human/ operation error:

This involves improper discharge of oily waste or over flow of oil from bags colliding and boosting due to worn-out of the barges and ineffective complete of maintenance during operation

(f) Equipment failure:

This refers to when equipment malfunction during operation.

(g) Natural disaster:

When natural disasters such as hurricanes, typhoons, tornados; heavy down pour, flood occur, pipes are pulled apart and as a result oil is spilled.

2. Introduction to behavior, fate and impact of oil spill

The behavior of oil spilled in the marine environment cannot be overemphasized in carrying out effective initial response actions as it helps in deciding whether to mount a response at all, selecting appropriate technique and carrying out clean-up operations safely. The assessment of the extent an oil spill depends on the typical properties of spilled oil and weathering processes (Yuriy et al., 2020).

The individual processes discussed in the following section act together to bring about the weathering of spilled oil.

2.1 Evaporation

It is the removal of oil from the sea surface as vapor. Evaporation is important because it will lead to changes in the properties of the oil. The more volatile components of oil evaporate to the atmosphere.

2.2 Emulsification

When the spilled oil absorbs water and form water-in-oil emulsions, it is called emulsification. This increases the volume of pollutant.

2.3 Dispersion: This refers to the transfer of oil from the sea surface in the form of droplets which are distributed into the water. This process is important as it remove a significant of water from the water surface and put it in the water column, which may dramatically lessen the effects of the spill.

2.4 Biodegradation

Biodegradation is the process whereby oil is broken down by microorganisms in the marine environment. It is dependent on ambient temperature.

2.5 Photo-oxidation

Hydrocarbons can react with oxygen which may lead to the formation of soluble products or persistent tars.

2.6 Sedimentation and sinking

Here dispersed oil droplets can interact with sediment particles and organic matter suspended in the water column so that the droplets become dense enough to sink down the water column. Sinking is often brought about by the adhesion of particles of sediment or natural organic matter to the oil.

2.7 Impact of oil spilled on the shoreline

Oil spilled in the marine environment have numerous negative impacts. According to Nwankwo and Ifeadi (1988) oil spilled on water surfaces prevents natural aeration and leads to death of trapped marine organisms below the surface. This includes the Plankton, Seabirds, Fish and Aquaculture. It also causes land degradation and deforestation. Gunlach (2019) revealed that mangrove that use to cover 962.33 hectares in Bodo before has reduced to 26.51 hectares (Figure 1.4)

Figure 1.4(a): Uncontaminated Mangrove Forest (Reinaldo, A., 2008)

Figure 1.4b: Contaminated Mangrove Forest (Steiner, 2011)

Oil spill also impact the shorelines of oil producing communities as it hits the following social economic habitats: Tourist industry, Boat Marinas and Industrial Plants.

The recovery time of impacted environment varies from weeks to years, and depends on the habitat impacted, the condition of the area, the amount of oil spilled, and the cleaning methods. Table 1.1 shows some examples of habitats with their recovery time.

Habitat	Recovery Time
Plankton	Weeks to Months
Sea birds	4 to 8 Years
Fish	2 to 10 Years
Coral Reef	10 to 20 Years
Sea Grass Bed	5 to 20 Years
Mangroves	20 o 80 Years

3. Contingency planning:

This refers to the cause of action designed to help an organization respond effectively to a significant future oil spill incident that may or may not happen. It is separated into the following phases: Alerting and Reporting; Evaluation and Mobilization; Containment and Recovery; Disposal; Remediation or Restoration. In practice, these phases often overlap rather than follow each other consecutively.

Most contingency plans also allow 'Tiered Response' which means that response steps and plans escalate as the incident become more serious. Since the seriousness of an incident is often not known in the initial phases, it is therefore important to determine the magnitude of the spill and its potential impact (Merv, 2011).

Alerting the first response personnel and the responsible government agency is the first step in the activating an oil spill contingency plan. Reporting a spill to the designated agency, regardless of the size or seriousness of the spill, is a legal requirement. This is where the indigenes of the oil producing communities are needed most as they notice spills as soon as possible in the facilities in their environment. In 2003 a national oil contingency plan was prepared and approved in 2005. National Oil Spill Detection and Response Agency (NOSDRA), is part of the Nigeria Ministry of Environment, Housing and Urban Development, was established as the institutional framework for implementation of the National Oil Spill Contingency Plan (NOSCP). Other bodies are Nigerian Maritime Administration and Safety Agency (NIMASA), Clean Nigeria Associates (CNA).

The law expects each operating oil company to possess a contingency plan for the prevention, control and removal of spilled oil from its own facilities. However, when spills exceed 2,000 barrels Clean Nigeria Associates (CAN) can be called to intervene (Nigeria-ITOF).

Once a spill is detected, it has to be responded to in line with the contingency plan. With the knowledge a First Responder has gotten about oil spill and response, he/she takes the following response steps:

- He/she reports the oil spill incident to the industry regulator, NOSDRA or other Spill Regulatory bodies.

- He /she barricades the area affected by the spill with red barricade tape (danger tape). This passes a message to the people around the affected site that a potential serious hazard is present, hence they avoid the area and also keep flames away to avoid fire outbreak. In cases whereby danger tape is not available other local signs that will pass the message should be used.
- He/she works effectively with professional Spill Responders to contain the spill inorder to ensure that damage to human health and the environment is minimized.

After a spill has been identified and containment measures taken, a Joint Investigative Visit (JIV) is carried out. The JIV is where the oil company representatives, community representatives, and appropriate government agencies visit the oil spill site to agree on the cause, impact and scale of spill. The resulting JIV document is signed by all parties, followed by clean up or compensation as the case maybe. When the community representative is an Indigenous First Responder, it makes the process easier as there will be little or no conflict in the process due to knowledge gathered from the First Responder Training.

4. Health and Safety

There is need to recognize the potential hazards of a spill. This entails identifying the symptoms of toxic shock exposure and select protective measures. The key elements of a Safety Plan can thus be put in place. Some key elements of a safety plan include: Personal protective; equipment; Protection for specific areas; Eyes, Head, Body, Arms, Feet and Legs; Hearing, Respiratory Protective Equipment (RPE).

Health and Safety aspects of Oil Spill Response

The Occupational Safety and Health Act require that the employers provide a safe and healthy work place free of recognized hazards. Workers are also expected to follow the employer's safety and health rules. Both parties are expected to do their part in compliance with their countries' national standard or OSHA.

Key methods of managing safety include: safety briefings; risk matrix; identification of areas of risk and putting up mitigation measures.

5. Response Techniques

While it is important to focus on ways to prevent oil spills, methods of controlling them and cleaning them must also be developed as well. An integrated system of contingency plans and response of oil spill to significantly reduce the environmental impact and severity of the spill. The key to effective response to an oil spill is to be prepared for the unexpected and to plan spill counter measures that can be applied under the worse possible conditions. Oil spills vary in size and impact and require different levels of response. The techniques to use in responding to a spill is dependent on the spill size, impact and type of oil

Based on the Bodo Remediation Phase 1 and 2, about 1,600 indigenes have undergone IMO 1 Training as its one of the pre-requisites to be met before actively participating in the cleanup exercise. The training was restricted to only selected people. The percentage of trained people is low compared to the population of the entire community.

However, providing First Responder Training to community members have positive effects in the areas of:

a) Increased Safety Awareness: First Responder Training instills a heightened sense of safety awareness. Trained individuals can identify potential hazards in their environment and take preventive measures to mitigate risks, contributing to a safer community overall.

b) Sustainability: A safer environment facilitated by effective emergency response training, can contribute to the long-term sustainability of the community. Reduced accidents and environmental damage can protect natural resources and support a stable economy.

c) Capacity building: First Responder Training serves as a form of capacity building within the community. As individuals acquire skills and knowledge, the community's overall ability to handle emergencies and address challenges improves.

d) Enhanced Preparedness: Trained community members are better prepared for a range of emergencies, including those specific to the oil industry. They can effectively communicate and coordinate with professional responders, ensuring a more efficient response.

In the past, there have been reports of oil producing communities restricting oil companies from responding to oil incidents which prolongs spills and in turn increase severity of impact on the environment. After the First Responder Training in Bodo, it is evident that response time to spill has improved. Therefore, training the entire community will enhance community cohesion as all indigenes will work together to ensure the safety and well-being of their neighbors. After having awareness of the impact of spill and recovery time, all hands will be on deck to ensure a safe environment and sustainability. In case of oil spill incidents, the community will readily work with professional responders to stop spill, contain and clean up as soon as possible.

With all that have been gathered, providing first responder training to indigenes of oil producing communities will be beneficial to both indigenes and oil industry. The community members will enjoy safe environment while the companies will safe cost of hosting major oil spill cleanup process

IV CONCLUSION

In conclusion, the provision of first responder training to oil producing indigenous communities stands as a transformative force shaping awareness, safety and sustainability. The findings of this research advocate for the continued support and expansion of these training initiatives. Policy changes, funding and community engagements are vital instruments in securing long-term wellbeing of oil producing communities. In a nutshell, these steps will not only strengthen the safety net for those living in the frontline of industrial and environmental risks but also empower them to thrive, resiliently charting a path towards a sustainable and secure future.

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