

Economic Implications of the Insecurity Surrounding the Oil and Gas Business Environment in the Niger Delta Region of Nigeria

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Abstract: - Since the detection of crude oil in Nigeria in the 1950's, the Nigerian oil and gas sector has been having huge transformation. This transformation has attracted many international and local investors. However, the insecurity surrounding the oil and gas business environment in the recent time has become a major threat to the investors and the Nigerian Government in meeting its actual revenue. Thus, this paper identifies the challenges responsible for the insecurity using descriptive-analytical approach and also examines the economic implication of such insecurity on the company's Net Present Value (NPV), Internal Rate of Return (IRR) and Payback Period (PP) using sensitivity analysis. The study made use of data obtained from secondary sources including published data from Nigerian National Petroleum Corporation (NNPC), Department of Petroleum Resources

(DPR), and Energy International Administration (EIA), Annual reports from already producing oil and gas fields, internet and journals articles. The study adopts Frustration Aggression Displacement theory as the theoretical framework. Revenue lost as a result of oil theft and oil bunkering, Cost of repairing or replacing vandalised pipelines/blown-up facilities, ransom paid to kidnapers and revenue lost as a result of annual shut-down due to vandalised pipes were the main variables considered. Sensitivity analysis on the field shows that out of the four variables captured under the insecurity facing the business environment, replacement cost as a result of the blown up facilities/ Vandalisation had the most impact of -42, -28 and 24% on company's NPV, IRR and PP respectively, while, annual shutdown had an impact of -9, -5 and 3% on NPV, IRR and PP respectively. Estimated ransom paid had an impact of -2, -2 and 1% on NPV, IRR and PP respectively and finally revenue lost as a result of oil bunkering and theft had an impact of -7, -12, and 4% on NPV, IRR and PP respectively. In conclusion, frequency of insurgent attacks has exposed business environment to insecurity resulting in collateral damage on the infrastructure, stability, development and success of the oil and gas sector. The study recommends the need for urgent and critical action from the government and oil companies to adopt new management strategies that will address and contain the insecurity and insurgency in Nigeria.

Key words: Oil and gas Sector, descriptive-analytical approach, insecurity, marginal fields, Niger- Delta militant groups.

I. INTRODUCTION

BRIEF HISTORICAL PERSPECTIVE OF OIL AND GAS EXPLORATION AND PRODUCTION IN NIGERIA

YEAR	HAPPENINGS
1907	The search for oil deposits started in Southern – western region of Nigeria
1914	Efforts ended because of the outbreak of World War I
1923	After the World War I, license was given to the D'Arcy Exploration Company and White Hall Petroleum. Neither of them found oil in commercial quantity so the license was returned
1937	Exploration began again. Shell and British Petroleum (Shell D'Archy) were granted the sole concessionary right over the whole country. They enjoyed a monopoly of exploration
1939-1945	Activities were terminated by world war II (WWII)
1946	Exploration wells were drilled by Shell after WWII
1951	1st test well was drilled in Owerri Area
1953	Oil was discovered in non-commercial quantities
1956	1 st commercial oil was discovered in an Olobiri field in the Niger Delta
1958	Second Oil discovery at Afam and the giant Bomu oil field/ First shipment of oil from Nigeria
1960s	Petroleum Sector Started playing a vital role in the economy and a total of 847,000 tonnes of crude oil was exported
1962	Elf and Nigeria Agip Oil company started operations in Nigeria
1963	The Ubata gas field was discovered by Elf and started their first production
1968	Mobil Producing Nigeria Limited was formed
1971	Nigeria joined the Oil producing, exporting countries
1970	Department of Petroleum Resources (DPR) Inspectorate started/ Mobil and Agip started production
1973	First Participation Agreement; Federal Government acquires 35% shares in the oil companies
1974	Second Participation Agreement, Federal Government increases equity to 55%
1975	DPR upgraded to Ministry of Petroleum Resources
1977	NNPC was established by the Government
1979	Third participation Agreement; NNPC increases equity to 60%, Fourth Participation Agreement; BP's shareholding nationalized, leaving NNPC with 80% equity and shell 20% in the joint venture
1984	The Agreement consolidates NNPC/ Shell joint venture
1989	Fifth participation; (NNPC=60%, shell, 30%, Elf=5%, Agip=5%)

1993	Production Sharing Contract signed –SNEPCO/ Sixth Participation Agreement ;(NNPC=55%, Shell=30%, Elf=10%, Agip=5%)
1995	SNEPCO starts drilling first exploration well/ NLNG’s Final Investment Decision taken
1999	NLNG’s first shipment of Gas out of Bonny Terminal
2000	NPDC/NAOC Service Contract signed
2002	A New PSCs agreement signed/ Liberalisation of the downstream sector/NNPC commenced a retail scheme

Source: Nigeria Oil and Gas Forum, 2013 [1]

Statement of Problem

Nigeria, after nearly four decades of oil production, had by the early 1980s become almost completely economically dependent on petroleum extraction. Nigeria has become West Africa's biggest producer of petroleum [2]. The first oil operations in the region began in the 1950s and were undertaken by multinational corporations, which provided Nigeria with necessary technological and financial resources to extract oil. Together, oil and natural gas extraction comprise 97 per cent of Nigeria's foreign exchange revenues. The Nigeria oil and gas sector is the largest and main generator of Gross Domestic Product (GDP) for the nation, yet it is facing so many challenges. In spite of the huge financial investment by the government, it could be argued that the sector is yet to yield much desired benefits for most Nigerians. The local content in the industry is still very low as over 60per cent of the major activities including exploration, drilling, production, well intervention and service provision remain primarily controlled and managed by multi-national oil companies.

Among many challenges confronting the sector are militant insurgency, infrastructural development, kidnaping, Vandalisation of pipelines, well blowouts, unstable investment climate, project financing, resource management, research and development, environmental policy as well as professional knowledge gap. Consequently, Nigeria, despite her huge oil reserve has continued to witness constant drastic decline in its production over time. (Fig 1). The major concern is what are the factors responsible for this decline? This leads us to the first objective of this paper which is to provide an analytical investigation on the factors responsible for the decline in the crude oil production despite the huge oil reserve of about 37.45billion barrels [3]. Additionally, the intensity of these variables will be investigated. It will also try to review the possible consequences and challenges presented by insurgency for the oil and gas sector investment

On the strength of earlier studies, this paper is adding some quality work in literature. Therefore the fundamental idea of this study is to examine the economical implication of the insecurity surrounding the oil and gas business environment in the Niger Delta region of Nigeria.

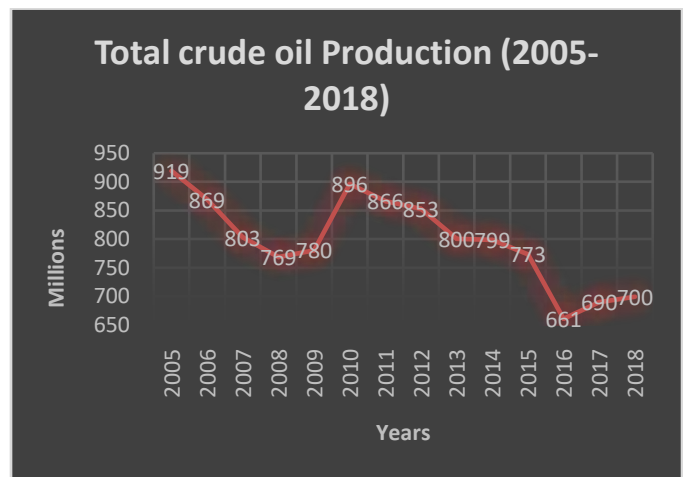


Figure 1: Historical Trend of Total Crude Oil Production in Nigeria (2005-2018) (MMBBL)

Source: Drawn with Data from NNPC Monthly Financial & Operations Report

II. LITERATURE REVIEW

The Emergence of Niger Delta Militancy

The first known insurgency or terrorism attempt in Nigeria may be credited to the movement to liberate the Niger Delta people led by Major Isaac Jasper AdakaBoro. Major Boro belonged to the Ijaw ethnic extraction in the Niger Delta region. His major complaint was against the exploitation of the oil and gas resources in the Niger Delta by both the federal and regional governments in total disregard of the citizens of the area. Boro formed the Niger Delta Volunteer Force (NDVF), an armed military group composed of 150 of his kinsmen. He firmly believed that the people of the Niger Delta deserved a more equitable share of the wealth which accrued from oil. To press the point, on 23 February 1966, the NDVF declared the Niger Delta Republic. The Republic lasted only 12 days before the federal military forces crushed the insurgency and arrested Boro. He and his followers were charged, tried and imprisoned for treason. However, on the eve of the Nigeria-Biafra war in July 1967, General Yakubu Gowon granted them amnesty. Boro enlisted in the federal forces in the war against the Biafran forces of Odumegwu Ojukwu. He died a hero at Ogu, near Okrika in Rivers State, having participated in the successful liberation of the Niger Delta from the Biafran forces.

From this episode of Nigerian history, we can identify a number of issues that continue to this day. First, the Niger Delta issue is not forgotten. It continues to be on the front burner in matters of security, insurgency and, indeed, the continued existence of Nigeria. Second, a resurgence of the threat of insurgency will likely re-emerge, either as a response to similar threats elsewhere in Nigeria or where there is a lapse in the policy thrust to remedy the imbalances which caused the insecurity in the first place. This is the background to the emergence of the Movement for the Emancipation of the Niger Delta (MEND) which we discuss later in this

section. Third, it is noteworthy that the causative factors in this insurgency are still very much visible in the entire Niger Delta region, namely, extreme poverty in the midst of extreme affluence, degradation of the human living environment to levels requiring concerted humanitarian intervention, discriminatory public policies resulting in political alienation of the human population, unsustainable extractive economies and, finally, the absence of environmental remediation policies and activities. All these, and maybe more, are likely to fuel discontent and exacerbate future conflicts and insurgent tendencies.

III. CONCEPTUAL ANALYSIS

The most gratifying approach to this presentation is to situate basic and leading concepts in their correct and key perspectives by way of conceptual and appropriate definitions analysis in order to validate what directions our argument here will lead to. Thus, concepts central to the discourse, such as, Insurgency, Security Challenges in the Niger Delta Region, and Conflict in the Niger Delta will be clarified in this section.

a. Insurgency

Insurgency is a confusing notion. The United States Department of Defence (2007) defines it as organised movement that has the aim of overthrowing a constituted government through subversive means and armed conflict [4]. This definition suggests that insurgent groups employ unlawful means towards achieving an end, which could be political, religious, social or even ideological. The goal of insurgency is to confront and overthrow an existing government for the control of power, resources or for power sharing [5].

b. Security Challenges in the Niger Delta

Niger Delta is a very densely populated region sometimes called the **Oil Rivers** because it was once a major producer of palm oil. The area was the British Oil Rivers Protectorate from 1885 until 1893, when it was expanded and became the Niger Coast Protectorate. The delta is a petroleum-rich region, and has been the centre of international controversy over pollution. Despite the vast wealth created by its petroleum, however, much of the Niger Delta region is characterized by widespread poverty, youth unemployment, political underrepresentation, and environmental degradation [6]

The **Niger Delta** is the delta of the Niger River sitting directly on the Gulf of Guinea on the Atlantic Ocean in Nigeria [7]. It is usually considered to be located within nine coastal southern Nigerian states, which include: all six states from the South South geopolitical zone, one state (Ondo) from South West geopolitical zone and two states (Abia and Imo) from South East geopolitical zone. Of all the states that the region covers, only Cross River is not an oil-producing state.

c. Conflicts in the Niger Delta

The current **conflict in the Niger Delta** first arose in the early 1990s over tensions between foreign oil corporations and a number of the Niger Delta's minority ethnic groups who felt they were being exploited and cheated, particularly the Ogonis and the Ijaws. Ethnic and political unrest, Competition for oil wealth has fuelled violence between ethnic groups, causing the militarization of nearly the entire region [8]

From 2004 on, violence also hit the oil industry with piracy and kidnappings. In 2009, a presidential amnesty program accompanied with support and training of ex-militants proved to be a success then. Thus until 2011, victims of crimes were fearful of seeking justice for crimes committed against them because of a failure to prosecute those responsible for human rights abuses [9]. Table 2 shows the Niger Delta militant groups in Nigeria.

Table 2: Militant Groups in the Niger Delta

Date	Militant Group	Brief Explanation
1992	The Movement for the Survival of the Ogoni People (MOSOP),	MOSOP was spearheaded by Ogoni playwright and author Ken Saro-Wiwa. They saw the government's empty promises of benefits for the Niger Delta people as a total failure. The Ogoni people growing increasingly dissatisfied and their environmental, social, and economic apparatus rapidly deteriorated. This began in December 1992. The conflict between Ogonis and the oil companies escalated to a very high level of greater intensity on both sides. Both parties began carrying out acts of violence and MOSOP issued an ultimatum to the oil companies (Shell, Chevron, and the Nigerian National Petroleum Corporation) which demanded some \$10 billion in accumulated royalties, damages and compensation, and "immediate stop of environmental degradation", and negotiations for mutual agreement on all future drilling.
1998-1999	Ijaw Youth Council (IYC)	Long-held Ijaw concerns about the loss of control of their homeland and their own lives to the oil companies were joined with a commitment to direct action. In the declaration, and in a letter to the companies, the Ijaws called for oil companies to suspend operations and withdraw from Ijaw territory. The IYC pledged "to struggle peacefully for freedom, self-determination and ecological justice and prepared a campaign of celebration, prayer, and direct action, Operation Climate Change, beginning December 28, 1998".
2000-2003	NigerDelta Development Commission (NDDC)	It was established in 2000 by former President Olusegun Obasanjo with the intention of developing the petroleum – rich Niger Delta region of the southern Nigeria. NDDC has focused on the development of social and physical infrastructures, environmental remediation and human

		development.
2003-2004	Emergence of Armed Groups in Niger Delta	The ethnic unrest and conflicts of the late 1990s (such as those between the Ijaw, Urhobo and Itsekiri), coupled with a peak in the availability of small arms and other weapons led increasingly to the militarization of the Delta. The groups have adopted names largely based on Western culture, some of which include Icelanders, Greenlanders, KKK, and Vultures. All of the groups are constituted mostly by disaffected young men from Warri, Port Harcourt, and their sub-urban areas. Although the smaller groups are autonomous from within, they have formed alliances with and are largely controlled from above by either AsariDokubo and his Niger Delta People Volunteer Force (NDPVF) or Tom's Niger Delta Vigilante NDV, who provide military support and instruction.
2006	Movement for Emancipation of the Niger Delta (MEND)	This is one of the largest militant groups in the Niger Delta. The organization claims to expose exploitation and oppression of the people of the Niger Delta and devastation of the Natural environment by public private partnerships between the International oil companies and the Federal Government. They have been linked to disruptions of petroleum operations in Nigeria as part of the Conflict in the Niger Delta, engaging in actions including sabotage, theft, property destruction, guerrilla warfare, and kidnapping.
2016- present	Niger Delta Avengers (NDA)	The NDA are a militant group in Nigeria's Niger Delta. The group publicly announced their existence in March 2016. The NDA have attacked oil producing facilities in the delta, causing the shutdown of oil terminals and a fall in Nigeria's oil production to its lowest level in twenty years. The attacks caused Nigeria to fall behind Angola as Africa's largest oil producer. The reduced oil output has hampered the Nigerian economy and destroyed its budget, since Nigeria depends on the oil industry for nearly all its government revenues.

Source: https://en.wikipedia.org/wiki/Conflict_in_the_Niger_Delta

d. The Insecurity Environment of Business in the Niger Delta

The insecurity environment of business refers to insecurity variables that affect the performance of a business but over which the business enterprise has little or no direct control. This study has been able to identify the major factors contributing to insecurity that is affecting Niger Delta oil business. The variables range from oil theft, kidnapping and demand for ransom, bombing, Illegal Oil Bunkering, assassination and repeated vandalisation of installed pipelines. All these variables have made business in the Niger Delta to be complex. This is indicated in figure 2 below:



Figure 2: The insecurity surrounding business environment in the Niger Delta

Source: Designed by the Author

Four out of the variables mentioned above will be considered in this study. This is because only these variables could be quantified as at the time of this study.

- i. Pipeline Vandalisation
 - ii. Kidnappings
 - iii. Facilities Blow - ups
 - iv. Illegal Oil Bunkering and Oil theft
- i. Pipelines Vandalisation

According to a legal dictionary, vandalism is a cruel devastation or damage to the property of another because this poses a danger to the society. In terms of oil, it is the illegal act of destroying oil pipelines to steal petroleum products and obstruct distribution for personal use (Oil Theft). In Nigeria, the Petroleum Production and Distribution Anti-Sabotage Act of 1975 governs the petroleum vandalism law; the act states that any person who disobediently, aids, incites or counsels another with the objective to obstruct or prevent the production of petroleum products in any part of Nigeria will be guilty of the offence of sabotage, and is liable to a death sentence or a term of imprisonment of up to 21 years. According to NNPC, from 2010-2014 a total of 20,965 cases of pipeline vandalism occurred. Figure 3 shows how crude oil is being siphoned by residents of Niger Delta after vandalising the pipelines without caring of fire accident.



Figure 3: Activity of a vandalised oil pipeline [9]

Source: www.vanguardngr.com

(a) Key Pipelines Vandalisation accidents

- i. On October 17, 1998 and July 10, 2000, explosions on a 16-inch petrol pipeline linking the Warri refinery to Kaduna, in Ethiope West Local Government occurred, leaving hundreds of villagers dead and injuring hundreds more. [10]
- ii. In September 2004, a similar incident occurred at an oil pipeline in Lagos, as oil thieves tried to siphon the oil from the pipeline. The explosion led to the death of about 50 people in flames.
- iii. In a different incident, a gasoline pipeline blast occurred on Atlas Cove on May 12, 2006, killing about 200 people.
- iv. In December 2006, an elevated pipeline carrying petroleum products in Abule Egba, Ogun State was punctured by oil thieves, which attracted hundreds of scavengers in the area to steal the fuel in kegs. This triggered an explosion killing hundreds of people.
- v. May 8, 2007, three major oil pipelines (one in Brass and two in the Akasa area) were attacked which resulted to shut down of oil production and power cut.
- vi. In 2015, due to an oil pipeline previously damaged by acts of sabotage, an explosion occurred at the site of the repair works of the Tebidaba-Clough Creek Line,. This led to the death of 12 members of the maintenance of a local company and leaving three people injured [11].

- vii. In April, 2016, a civilian was confirmed dead and another one injured during a gun battle with pipeline vandals in the Ibafo area of Ogun State. [12].

(b) Causes of pipelines vandalism

- i. Greed and Youthful Exorbirant: Many of the youths of today are looking for different avenues to get rich quick. This usually occurs when some wealthy criminals prey on these young minds by empowering them with stool for pipeline vandalism for their selfish interest and reward them with cash compensation [10].
- ii. Unfulfilled promises by the Federal Government and oil companies. There were high expectations that the international companies and the federal government would develop the Niger delta with social amenities and empower the youths. The lack of or little development of the area led to huge poverty and subsequent uprising in the region [13].
- iii. Damaged and corrosive pipelines: The three major causes of oil spills are corrosion, production operations and sabotage. Deterioration of pipelines used in transportation networks, makes the pipelines vulnerable to punctures, breaks and exposure for vandals to steal petroleum products [10].
- iv. The high unemployment rate among the educated youths compelled some of them to take to anti-social behaviours such as oil pipelines vandalism, oil theft and kidnapping for ransom etc. Moreover, there was the international dimension of pipelines vandalism whereby some unscrupulous Nigerians collude with

foreigners to steal crude oil in the country for pecuniary gains [13]

- v. Issues of ineffective security arrangement around pipelines and vital oil facilities largely as a result of inaccessibility of many areas in the Niger Delta region and the menace of pipeline vandals and oil thieves [13].

(c) Effects of pipelines Vandalisation

Pipelines vandalisation affects the oil communities in the Niger Delta, her food production and most importantly is the environmental effects of oil exploration in terms of the socio economy of the people (Okpo and Eze, 2012). The following are the major effects identified:

- i. *Economic loss*: Vandalisation causes partial or total shutdown of production, thereby leading to a huge loss in revenue to both the investor and the government [10,13]
- ii. *Fire outbreak*: when some of the pipelines are vandalised, it leads to oil leakage. This prompts the people living around the area to siphon the fuel. They either transfer to a local refinery or sell in the black market. The non challant attitude, negligence and lack of education makes them not to have an idea of what might trigger an explosion. Any slight ignition causes explosion. Sometimes it occurs for many days razing villages (10).
- iii. *Environmental pollution and ecosystem damage*: Oil spillage which occurs as a result of vandalisation can adversely affect living organisms and vegetation. The chemical components of oil spilled, include

chemical composites which are poisonous to groundwater and soils ([15],[10].

- iv. *Population displacement and loss of lives*: There has been thousands of deaths and massive migration due to fire outbreak, environmental degradation and security threats [13].
- v. *Fuel scarcity*: Due to refinery downtime experienced in most cases, the NNPC is usually not able to meet upwith its quota of fuel supply, causing a reliance solely on independent marketers [10]
- vi. *Insecurity*: Pipelinesvandalisation also generated social insecurity and compelled some international oil companies to divert their investments from the country which stagnates the country's economic growth [10,11,16].

ii. Kidnapping

Since 2006, militant groups in Nigeria's Niger Delta, especially the Movement for the Emancipation of the Niger Delta (MEND), have resorted to taking foreign employees of oil companies' hostage as part of the conflict in the Niger Delta. More than 200 foreigners were kidnapped, the victims are normally released unharmed after a ransom is paid, and although several have been killed during botched seizures or rescue attempts "Victims are maimed, raped and manhandled in such a manner that the stigma remains almost perpetually. The families and associates are knocked down by intractable trauma [17,18]. Table three shows the total occurrence experienced in the oil and gas sector in Nigeria from 2002-2014. Figure 4 shows 24 Filipino that were held captive in the creeks of the oil-producing Niger Delta.

Table 3: Cases of kidnappingthat occurred from 2002-2014.

Year	Date of Occurrence	Incident	Date Released	Ransom Demanded
2002	April	Hostage taking of 10 Workers by Militant youth gang, Ekeremor L.G.A.Ijaw/Bayelsa state		N3.1M
2003	June 29	Kidnap of Staffof Oil servicing Co. working for shell by Ijaw youth militants in Bonadi/Burutu L.G.A Delta State	14 days after	N24.4m
	November 11	Kidnap of 9 crew and 4 military escorts of oil barges by Ijaw militants	November 13	
	November 14	Kidnap of 14 Workers of Chevron of Texaco by Militants Ijaw youths/Bayelsa State		
	November 28	Kidnap of 7 Workers of Bredero Shaw Pipe Coating Oil Servicesby Militant Ijawyouths Delta state	December	USD 5M
2006	January 10	The kidnap of 4 foreign workers from an offshore platform. ¹	January 30	
	February 18	An oil barge was attacked by MEND rebels. Nine hostages were detained (3 Americans, 2 Egyptians, 2 Thais, 1 Filipino and 1 Briton). ²	Egyptians, Thais and Filipino were released on March 1. 2 Americans and 1 Britain were released on march 27	
	May 11	Vito Macrina, an Italian, and two other employees of Saipemwere abducted ³	May 12	
	October 3	A militant group abducted four Scots, A Malaysian, an Indonesian and a Romanian from a bar in Akwalbom State ⁴		

2007	Jan 10	Nine South Koreans and one Nigerian working for Daewoo Engineering and construction in Yenagoa were abducted ⁵	Jan 12	
	May 1	Six Expatriate workers were seized around the remains of a camp fire		
	May 3	8 foreigners were held hostage from an offshore vessel by MEND	Less than 24 hours later	
	May 25	Employees of Hydrodive (a South African, four Britons and Americans and 1 Nigerian) were kidnapped near the Aunty Juli platform of the Sanganacommunity.	19 days after	
	July 8	A Briton and a Bulgarian were abducted from a barge near Calabar in cross River state	August 8	
2008	September 9	27 workers were kidnapped along with their vessel by MEND militants	2009	
	December 19	MD and Accountant of RUSAL Nigeria were kidnapped out of Guarded Camp in IkotAbasi ⁶	February 15, 2009	\$7,000,000
2009	Jan 21	A Romanian worker was kidnapped by Rebels from Niger Delta ⁷		
	April 16	A Canadian, Jullie Ann Mulligan on a Rotary International exchange, was kidnapped in Nigeria. ⁸	May 1	\$136,000
2010	January 12	A Colombia and 3 Britons working for Netco were kidnapped near Port Harcourt ⁹		
	April 11	A Nigerian Employee of Total was kidnapped by unknown men in Southern Nigeria ¹⁰		
2011	Nov 17	Two Americans and One Mexican sailor aboard were kidnapped by militants ¹¹	December 3	
2012	December 17	Five Indian sailors aboard Brussels were kidnapped by MEND	January 27, 2013	
	December 20	Four South Korean oil workers were kidnapped by MEND from an oil plant in the Niger Delta	December 23	
2013		Seven Expatriates working for Chevron Nigeria Limited were abducted in Pennington oil platform offshore Nigeria.(6 Russians and 1 Estonina) ¹²		
	February 7	2 Russians and 1 Romanian sailors were kidnapped from a British cargo ship by MEND	March 13	
	February 17	MEND kidnapped 6 Russian sailors aboard the <i>Armada Tuah 101</i> cargo ships	February 26	200 million Naira
2014	November 28	One Indian and two Pakistan construction workers were kidnapped in the Emakalakala town in Bayelsa ¹³		

Source:Ikelegbe, 2005, Awuri,2011, Ojo 2013.[19,20,21]



Figure 5: Kidnapped International oil workers

Source: Integrity, 2007 [22]

iii. *Blown Up facilities*

Over the years Nigeria has been facing a lot of disruptions due to attack on the offshore pipelines by militants from the Niger Delta regions. Table 4 shows the incidences that recently occurred in the Niger Delta. Figure 6 shows a sample of blown- up facilities carried out by the Niger Delta Avengers.

Table 4: Blown up occurrence in the Niger Delta

Date	Incident	Facilities Affected
February 10, 2016	NDA blew up Bonny Soku Export Line	Gas Export Line
February 13,	NDA attacked SPDC underwater 48-inch crude oil Pipeline at Forcados Export Terminal in Delta State	48 inch crude oil export Terminal
March 16	A bomb explosion on an Agip oil platform in southern Nigeria. This is the first MEND attack in a major bombing campaign	Oil Platform
May 4	NDA attacks a Chevron Valve Platform at Abiteye in Delta State	Valve platform

May 20	NDA blew up NNPC's Escravos Gas Pipeline in Delta State	Gas Pipeline
May 26	NDA blew up NNPC gas and crude oil trunk line in Warri, Delta State	Trunk line
July 12, 2016	Blown up crude oil pipeline operated by ExxonMobil in Bayelsa	The Qua Iboe 48-inch crude oil export line
September 13, 2016	The group hit ENI's Ogboinbiri-Tebidaba and Clough Creek-Tebidaba pipelines both in Bayelsa State and Shell Petroleum Development Company's (SPDC) 48 inch export line at the Forcados Terminal, Burutu Local Government area of Delta State (Ogundele, 2016)	48 inch export line at the Forcados Terminal
October 2016	A crude oil pipeline was blown up at Ughelli North local Government Blown up of Chevron Escravos pipeline	Crude oil pipeline Export pipeline



Figure 6: Blown-up facilities by the Niger Delta Avengers

Source: PM News, 2016 [23]

Iv Oil Theft

This is considered to be the illegal appropriation of crude or refined oil products from the government's pipelines of multinational oil companies. Oil theft in Nigeria is aided by the extensive corruption between security forces, militia organizations, the local population, and oil company employees who use a variety of methods to steal oil from the

multinational oil corporations that are stationed within the country. Currently, Exxon Mobil, Chevron, Statoil, Shell, and Agip are the five largest multinational oil companies present in Nigeria [24]. Figure 7a shows the destroyed illegal oil distillation sites in the Niger Delta by the Joint Military Task Force (JTF) while figure 7b displays the oil theft carried out by the indigenes of the Niger Delta region



Figure 7a: Explosion as a result of oil theft

Source: Ships and Ports, 2017 [25]



Figure 7b:- Oil theft experienced in the Niger Delta

Source: Accelerate TV, 2016 [26]

IV. THEORETICAL FRAMEWORK

This study adopts Frustration Aggression Displacement theory. First, we need to explain frustration. Frustration is a feeling of tension that occurs when our efforts to attain some goals are blocked. When this occurs, it can create feelings of anger, which in turn can generate feelings of aggression and aggressive behaviour. This theory has been utilised to describe a lot of violent behaviour over time.

The frustration-aggression hypothesis was proposed by Dollard, Doob, Miller, Mower, and Sears (1939). According to this view, in some situations, frustration does augment the likelihood of aggression. [25] had college students experience one of three types of frustration (failure to win money, failure to earn a better grade, or failure on a task). All the three groups showed more subsequent aggression than a control group that was not frustrated. Research indicates that frustration is more likely to lead to aggression if the aggressive behaviour helps to eliminate the frustration. The amount of frustration and subsequent aggression depends on how near the individual is to the goal when they are blocked. [27] and her confederates purposely cut in front of people standing in line at movies, grocery stores, etc. If they cut ahead of a person second in line, they were much more likely to elicit verbal aggression than if they cut ahead of someone twelfth in line.

Berkowitz's Revision of the Frustration-Aggression Hypothesis

Berkowitz contends that aggression is the result of an interaction between an internal emotional state and cues that are available in the environment. Frustration alone is not sufficient to produce aggression. A frustrating experience creates a readiness to aggress. Whether aggression will occur depends on stimulus cues.

The feeling of displeasure experienced by the Niger Delta Militant Insurgency Groups is considered to have led them to express anger through violence. They attach their struggle on the level of poverty, denial and deprivation

Sensitivity Analysis

- i. Components include the total cost incurred as a result of Niger Delta Militant insurgency and insecurity. Four major variables were captured; Revenue lost due to annual shut down (days) as a result of blown up facilities/vandalised pipelines. This was captured by multiplying the number of shut down (days) by the oil price of the shutdown days.
- ii. Ransom paid as a result of kidnapping: This is the total amount of money paid to kidnappers as a result of kidnappings.
- iii. The Cost of repairing or replacing the blown up spur line¹⁴ facilities/vandalised pipelines:- This is the total cost incurred in repairing or replacing all the blown up spur line facilities

- iv. Revenue lost due to oil theft and illegal oil bunkering: - Having known the average daily production of the oil field, it was easier to calculate the value lost whenever there is an occurrence of theft and bunkering.

Model Assumptions

NAME	VALUE
Estimated Ransom Paid	\$5 million per year for both fields
Annual shut down	50 days per year
Facilities replacement cost	5% of tangible CAPEX
Revenue lost as a result of oil theft and bunkering	Average production of 7,000 barrels per day

In order to capture insecurity as an uncertainty for the sensitivity analysis, uniform distribution was assumed for the ransom paid and total number of shutdown days as a result of vandalism and blow ups while the facility replacement cost was assumed to have a triangular distribution (this conforms with data and information from oil and gas industries in Nigeria).

Distribution Assumption

Input parameters	Minimum	Likelihood	Maximum	Distribution type	
Ransom Paid (\$M)		1	5	10	Uniform Distribution
Annual Shutdown (days per year)		20	50	100	Uniform Distribution
Replacement Cost (% of Tang. Capex)		2		10	Triangular Distribution
Revenue lost as a result of oil theft and bunkering (barrels/day)		5000	7000	10000	Uniform Distribution

V. RESULT ANALYSIS

Figures 8, 9 showed that the four input variables considered have negative impact on the NPV and IRR. But figure 10 showed that they have positive effect on the Payback period. For the investment, replacement cost of blown up/ vandalised facilities was considered the most sensitive variable with an impact of -42, -28 and 24% on the three profitability parameters (NPV, IRR and PP) respectively. This simply indicates that a 42% increase in the replacement cost will cause a 42% decrease in NPV and vice versa. For the IRR, a 28% increase in the replacement cost will cause a 28% decrease in the IRR and vice versa. While for the payback period, it had a positive impact of 24%. This simply means that an increase in the variable will increase the payback period and vice versa.

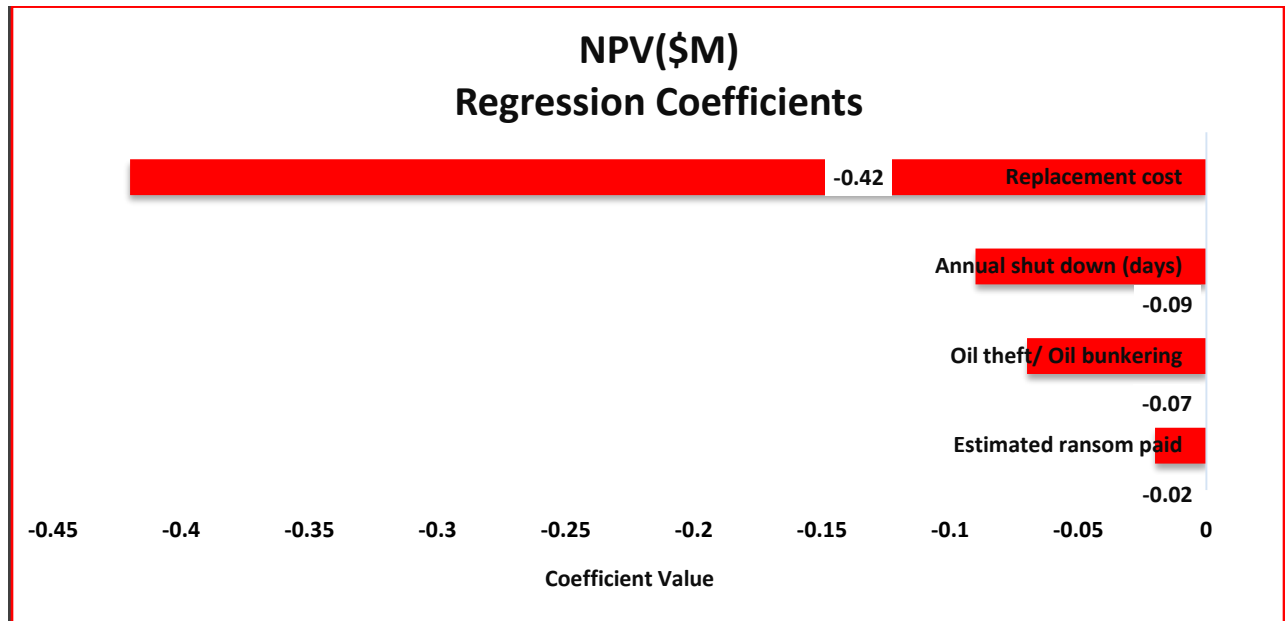


Figure 8: NPV Sensitivity Analysis

Source: - Authors computation

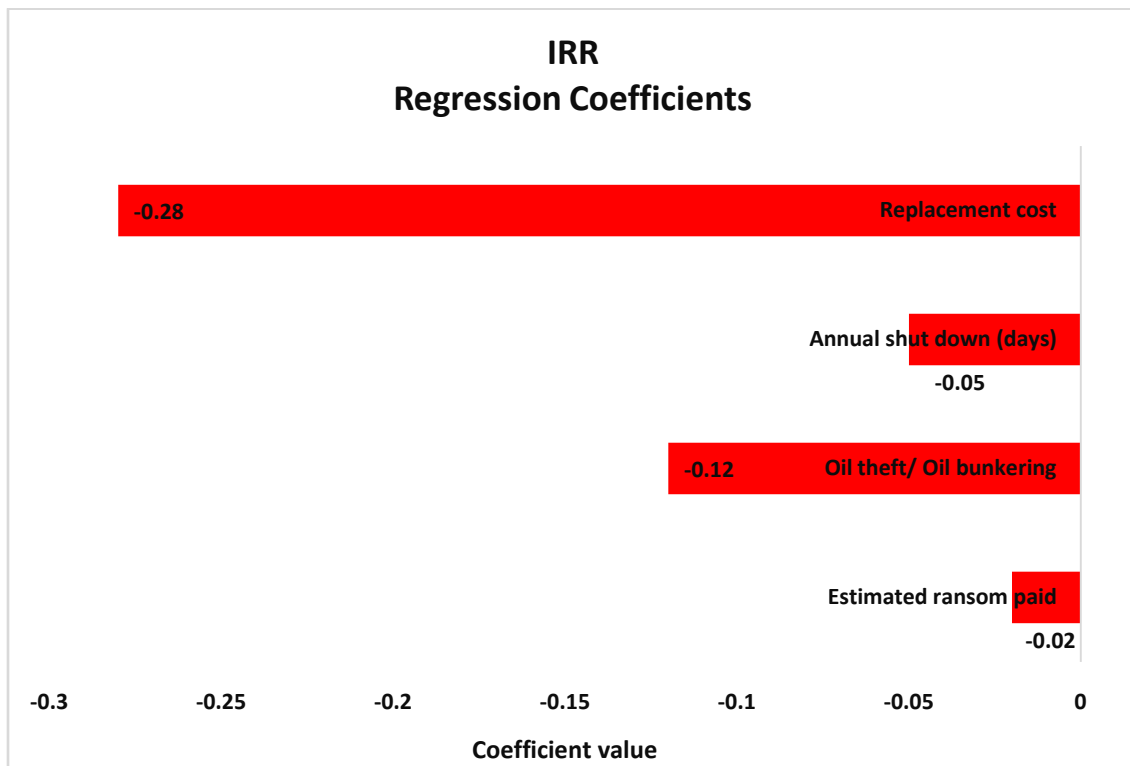


Figure 9: IRR sensitivity Analysis

Source: - Authors computation

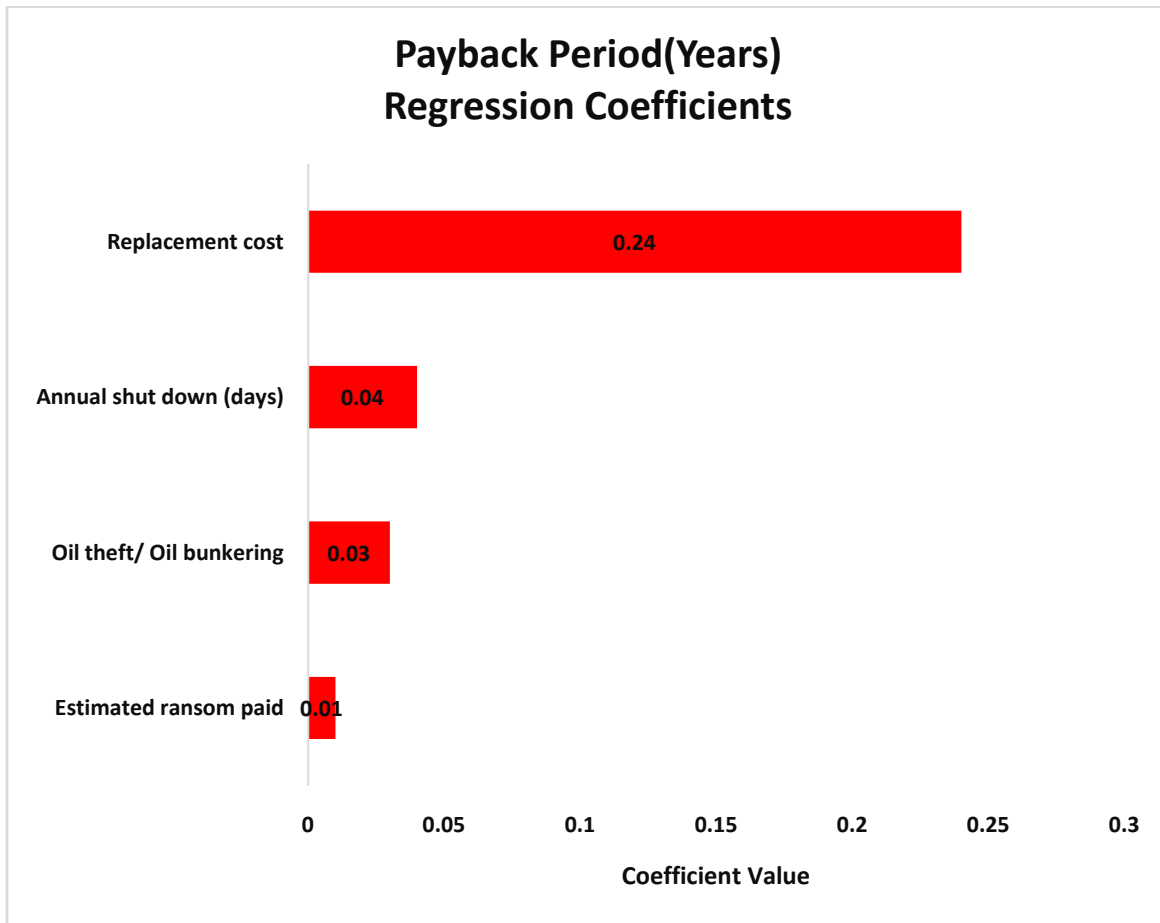


Figure 10: Payback Period Sensitivity Analysis

Source: - Authors computation

VI. CONCLUSION AND POLICY RECOMMENDATION

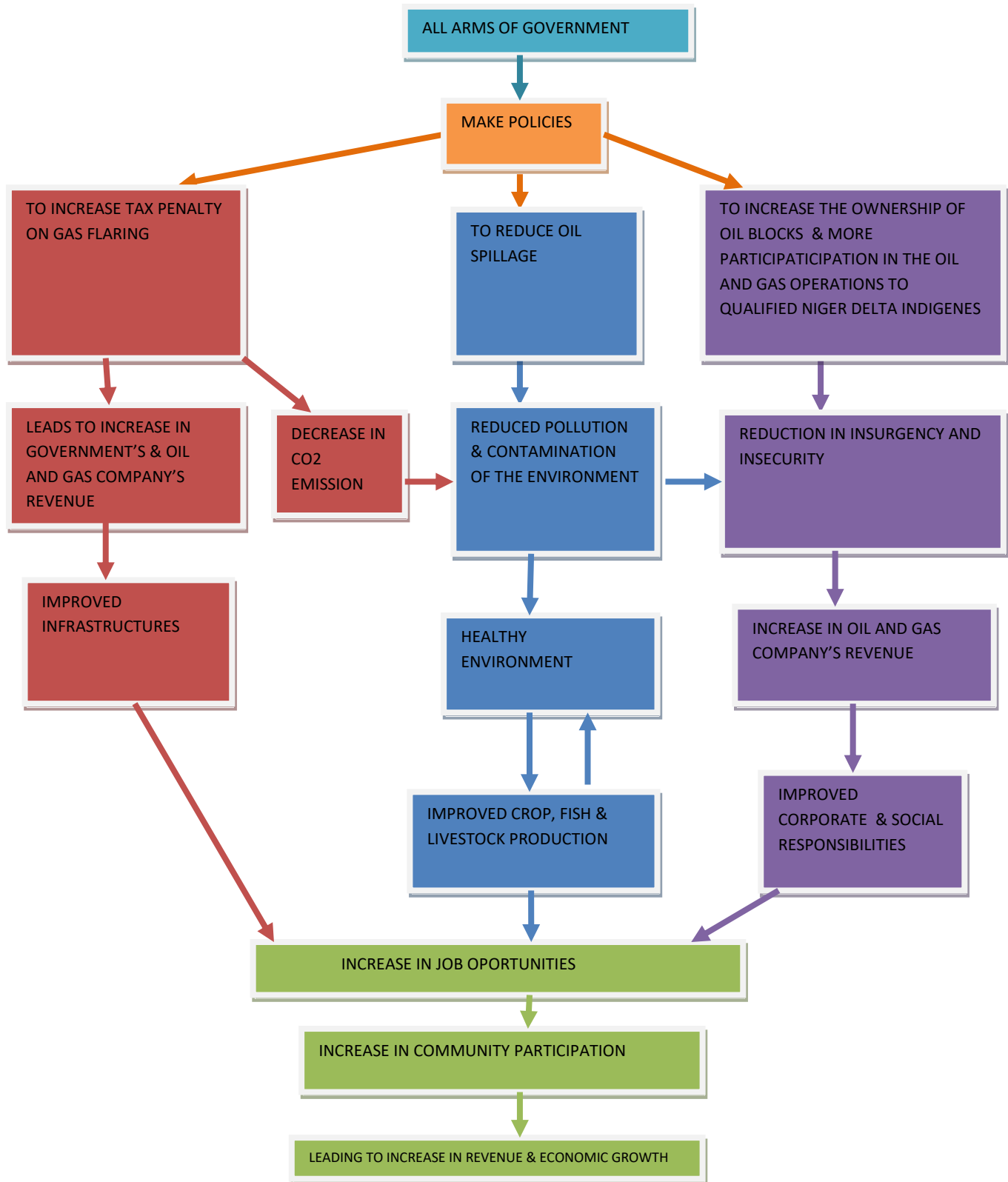
This study has been able to analyse the Economic Implications of the Insecurity surrounding the Oil and Gas business environment in the Niger Delta region of Nigeria. Descriptive analysis was adopted to identify the main challenges affecting the business hub and these include: pipeline vandalisation, kidnapping, oil theft/ oil bunkering and facilities blow up. Sensitivity analysis was conducted to estimate the impact of the variables on the key profitability indicators (NPV, IRR and PP).

Results showed that the four input variables considered have negative impact on the NPV and IRR. But a positive effect on the Payback period. For the investment, replacement cost of blown up/ vandalised facilities was considered the most sensitive variable with an impact of -42, -28 and 24% on the three profitability parameters (NPV, IRR and PP) respectively.

In conclusion, frequency of insurgent attacks leading to insecurity surrounding the oil and gas business in Niger Delta environment has resulted in collateral damage on the infrastructure, stability, development and success of the oil and gas fields.

The main conclusion is that Niger Delta Insurgency and Insecurity are considered to be man-made and this is as a result of unemployment, lack of access to livelihood resources, rising cost of living, polluted environment and government negligence. Therefore they may only be solved by man. So this requires urgent and critical demand on the government and oil companies to adopt new management strategies such as creation of employment, sincere empowerment of the youth and the remediation of all the polluted areas. Thus, this will address and contain the insurgency and insecurity in oil and gas region in Nigeria.

RECOMMENDATION CHAT TO AID POSITIVE CHANGES IN THE NIGER DELTA OF NIGERIA (AUTHOR’S COMPUTATION)



Source: Designed by the Author

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