Impact of Oil Production on Human Condition in Nigeria

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Abstract

This study focused on the impact of oil production on human condition in Nigeria. The paper used environmental degradation, life expectancy, and infant mortality rate as proxies of human condition. The data were obtained from the statistical bulletin of the Central Bank of Nigeria and World Development Indicator. The study covered 1980 to 2012. Vector autoregressive (VAR) model and variance decomposition analysis were explored. Three striking results were reported: (i) oil production of the first period positively impacted environmental degradation, while it was negative in the second period; (ii) Its first period lag has positive relationship but second period lag has negative relationship with life expectancy; and (iii) The variance decomposition analysis showed that oil production worsened environmental degradation and adversely impacted on infant mortality rate, while it positively affected life expectancy. Two major recommendations emanated from the study: (i) since oil production has a negative impact on human condition in Nigeria, efforts should be made to control carbon emission from fuel by ending gas flaring, especially in the Niger Delta region; and (ii) Government should look for means to channel their efforts into sustainable policies that would aim at transforming some of the largess from the oil sector into the health sector, as well as into the provision of infrastructural and life enhancing facilities like good roads, portable water, and so on. These can help to enhance life expectancy beyond its current stagnant state. All these as suggested will make the oil sector to have huge positive impact on human condition.

KEYWORDS: Oil Production; Human Condition; Niger Delta; Nigeria.

1. INTRODUCTION

Nigeria is Africa's largest oil producer and has been a member of the Organization of Petroleum Exporting Countries since 1971. The Nigerian economy is heavily dependent on the oil sector, which accounts for over 95 percent of export earnings and about 40 percent of government revenues (International Monetary Fund, 2008). Adenikinju (2008) noted that oil contributed over

US$391.6 billion to government revenue between 1970 and 2005, which accounted for 77.1% of total government revenue over the period. In the same vein, the country has earned over US$593.6 billion from oil exports, representing 93.6% of total foreign exchange within the same period. Nigeria produced about 2.53 million barrels per day, well below its oil production capacity of over 3 million barrels per day, in 2011. Nigeria is an important oil supplier to the United States until recently. In the last nine years, the United States has imported between 9-11 percent of its crude oil from Nigeria; however, United States import data for the first half of 2012 showed that Nigerian crude is down to a 5 percent share of total United States crude imports (International Energy Agency, 2013).

Oil is also a major source of energy in Nigeria and the world in general. Oil being the mainstay of the Nigerian economy therefore plays a vital role in shaping the economic and political destiny of the country. Although Nigeria's oil industry was founded at the beginning of the century, it was not until the end of the Nigeria Civil War (1967 - 1970) that the oil industry began to play a prominent role in the economic life of the country (Odularu, 2008). Nigeria discovered crude oil in 1956 and began to export crude oil in 1958. Annual revenue accruing from oil and gas exports run into billions of naira in recent years, and since the mid 1970s consistently has constituted over 85 percent of national earnings. However, there is a mismatch between petroleum export revenue and development performance. This is so because despite the huge export earnings, Nigeria is still a poor country. The mismatch that has been witnessed between oil revenue inflow and economic development performance contradicts the extant view in development economics that natural resource abundance would help the backward states to overcome capital shortfalls and provide revenues for sustainable development (Uwem, 2012), but lends support to the "resource curse" doctrine that abundant natural resource endowment makes a country lazy and poorly focused on development (Steven, 2003).

Nigeria's economy is struggling to leverage on the country's vast wealth in fossil fuels in order to displace the poverty that affects about 45% of its population. Although Nigeria has earned a huge revenue from oil exploration since its discovery, this earning has not really trickled down to the poor masses in terms of access to basic necessities of life like the provision of good roads, access to good education, good health, and better real income. It is not unexpected that economists refer to the coexistence of huge wealth in natural resources and extreme private poverty in developing countries like Nigeria as "resource curse". Indeed, the case reflect what has been aptly termed the "paradox of plenty" or the "curse of oil" or simply put; "Resource Curse" in economic literature.

World Bank (2009) reported that as a result of mismanagement and corruption, 80 percent of energy revenues benefit only 1 per cent of the population. In 2005, Nigeria reached a huge agreement with the Paris Club of lending nations to wipe-off all of its bilateral external debt. Under the agreement, the lenders will erase most of the debt, and Nigeria will pay off the remainder with a portion of its oil revenues. The energy sector has proven so crucial that outside of it, Nigeria's economy is highly inefficient, infrastructure is grossly inadequate, human capital is underdeveloped - Nigeria ranked 151 out of countries in the United Nations Development Index in 2004 - (Library of Congress, "Country profile: Nigeria", July 2008), and human potential is almost completely unrealizable.

Clearly, political scientists as well as their economics counterparts have cited different reasons for the developmental retrogression associated with natural resources. While political scientists blame poor-governance in rent-based economies for this developmental trap, economists blame bad macro-economic policies, which crowd out local producers for the problem. This phenomenon is called the "Dutch Disease". According to political scientists, poor-governance in rent-based economies lead to a situation in which the state is "freed" from society's control when revenue from mineral resources replaces personal income taxes, the rights of citizens being significantly hampered and autocracy as well as rent-seeking behaviour become the norm from public officials and politicians alike.

Globally, the relationship between economic growth and environmental pollution resulting from carbon (CO_2) emission has remained a topical issue among different researchers and economists owing to the current global warming crises. This is because it is widely believed that the emission of CO_2 is a major cause of global warming (Mohammed et. al. 2012). Most of the carbon emission is also known to come from the production and consumption of non-renewable oil and gas (UNDP, 2010). Nigeria which has proven natural gas reserves of up to 184 trillion cubic feet is reputed to have the 7th largest gas reserves in the world. It is reported by the International Energy Agency (IEA, 2013) that the country loses about US$2.5 billion per year through gas flaring. This implies that what would have been used to improve the welfare of the people is now lost through flaring which in-turns damages their health and reduces their life expectancy, while also serving as a potential contributor to mortality rate in the country. Since inception of oil production in 1956 in Nigeria, natural gas has been flared on daily basis in quantum. Despite several attempts by the government to prohibit gas flaring (e.g. Petroleum Decree 1973; Associated Gas Re-Injection Decree 1979; Associated Gas Re-Injection (Amendment) Decree (1985); the signing of the Associated Gas Framework Agreement 1992 and most recently, the Gas Flaring (Prohibition and Punishment) Bill 2009), Nigeria still maintains its reputation as one of the biggest gas flaring nations in the world. It is estimated that about 18.9 billion cubic meters (BCM) of gas per annum is flared in Nigeria (IEA, 2013). This made the country to account for almost seventeen percent (17%) of the world's total gas flared.

Therefore, the phenomenon of Dutch disease, resource curse, gas flaring and others like corruption of public office holders and rent-seeking behavior make it expedient to carry out a research that will take a look at how oil production over the last few decades has impacted the living conditions of Nigerians. The specific objectives will include: assessing the impact of oil production on environmental degradation in Nigeria; examining the relationship between oil production and life expectancy in Nigeria; and determining the effect of oil production on infant mortality rate in Nigeria.

The rest of this paper is organized as follows: Section 2 reviews some salient studies in the literature and identifies an empirical gap this paper attempts to fill. Section 3 provides the methodological approach adopted and the definition of variables used. It also attempts to provide an explanation of the analytical approach adopted and sources of data used for the analysis. Section 4 discusses the empirical results and section 5 concludes with policy implications.

2. Literature Review

2.1 Empirical Review

Oil production and human conditions have received scholarly attention in the literature globally and in Nigeria. Xavier and Arvind (2003) addressed the natural resource curse using Nigeria as an illustration. The study found out that some natural resources – oil and minerals in particular – exert a negative and nonlinear impact on economic growth via their deleterious impact on institutional quality. Waste and corruption from oil rather than Dutch disease, they claimed, has been responsible for the poor long run economic performance of the country. They then suggested that this resource curse problem can be solved by directly distributing the oil revenues to the public.

Terry (2007), in his exploration of the social, political, and economic consequences of oil-led development of developing (oil-producing) countries of Africa, Asia, and Latin America, found that oil dependence countries demonstrate perverse linkages between economic performance, poverty, bad governance, injustice and conflict. This emanates from the structures and incentives that oil dependence creates. Terry therefore advocated that reforms be undertaken to reduce the adverse effects of oil dependence on the economy.

By the same token, Olomola (2007) analysed the effect of oil rents on economic growth in oil exporting African countries. The study analysed the channels of transmission of natural resource curse on growth in these countries and its major findings confirmed evidence of resource curse in oil exporting countries in Africa. The author asserted that the absence of democracy and the despicable state of institutions in oil exporting countries helped to perpetuate corruption and retard economic growth.

Similar concerns were expressed in Emoyan et al (2008), Ighodalo (2007), and Omofonmwan and Odia (2009) where the oil and gas industry and the Niger Delta region of Nigeria were the focus of exposition. These studies examined the implications of oil production on the environment. To achieve their aim, the causes of environmental degradation and biodiversity depletion arising from the activities of the oil industry in the region were evaluated. The authors found that environmental pollution, biodiversity depletion and social destabilization, underdevelopment of host communities, global warming and associated elevated flood risk had specific negative impact on the region.

Yakub (2008); Odularu (2008) and Collier *et al.* (2003) have linked abundant natural resources to slow economic growth, civil conflict and socio-economic collapse. They resolved that among all natural resources, oil has been found to generate the highest risk of civil conflict owing to the large rents it offers. Thus, for these researchers, Nigeria needs to be very careful about the way it manages her huge oil earnings to avoid socioeconomic collapse, they also called for private sector participation in the crude oil sector.

Eregha and Irughe (2009) examined the oil related environmental degradation in the Nigeria's Niger-Delta and the emerging socio-economic multiplier effects on the people of the region. They were able to conclude that the emerging social disorder and HIV/AIDS prevalence in the oil-producing region of Nigeria results from the economic multiplier effects of unemployment and high level of poverty ravaging the region. Their key recommendation is that an integrated community based approach involving commitment from all stakeholders would be required to alleviate the problem.

Hammond (2011) carried out an extensive research on resource curse and oil revenues in Angola and Venezuela, while Morgan et al (2013) beamed their searchlight on oil, energy poverty and resource dependence in West Africa. Hammond found a contrasting fortune to Angola and Venezuela in terms of finding solutions to resource curse, which has enabled Venezuela to maximize the usage of its oil revenue compared to a poverty stricken Angola, and Morgan et al found that while higher oil prices have boosted Nigeria's revenues in recent years, poverty-reduction still remains a mirage. They then advocated for better oversight, monitoring and control of oil companies' activities.

Uwem (2012) and Ogbonna and Appah (2012) linked Nigeria's oil revenue to economic performance. Both studies found oil revenue to contribute less to Nigeria's economic performance due to corruption in the sector. They called for adequate investment in education and health to build human capital, as well as proper management of resources to achieve long run growth and development for the country.

Isola and Ejumedia (2012) studied the implications of population and oil production on CO_2 emissions in Nigeria within the framework of the error correction model. The study found population growth, oil production and per-capita income to positively related to CO_2 emissions in the country.

Based on different scholarly works that have been reviewed in this research (in particular, Emoyan et al 2008, Terry & Ighodalo 2007, Isola and Ejumedia, 2012 & Morgan et al 2013), it is observed that most of these studies have only concentrated efforts on the impact of oil production on carbon emission without considering life expectancy and mortality rate which are developmental variables. This is the gap the study aims to fill in literature. The study draws strength from the Khartoum Declaration cited by Adedeji, (1989) as "The human condition is the only final measure of development".

2.2 Theoretical Review

2.2.1 Theory of Oil Induced Environmental Effects: The Environmental Kuzent's Curve

A question on how economic progress may benefit the environment was posed by Alstine & Neumayer, (2009). Also, series of theoretical explanations have suggested that the environment will be less affected as incomes rise. Such theoretical explanations were supported in Dasgupta et al (2002), Stern (2003, 2004), Richmond and Kaufman (2006), Galeotti *et al.* (2009), Eregha and Irughe (2009), Fodha *et al.* (2010), Omojolaibi (2010) and Akpan and Chuku (2011). All of these studies have attempted to test the possible existence and validity of the Environmental Kuznets Curve in three broad areas.

In the first instance, some of these studies cited environmental quality as a normal good, if not even a luxury good. In other words, the income elasticity of demand for environmental quality is greater than zero, possibly even greater than one, or as income grows environmental concern rises as well, perhaps even more than proportionally so (World Bank, 1992). Moreover, very wealthy countries may be better able to guarantee a safer environment through their institutional environmental capacity (Neumayer, 2003). However, the argument whether rich countries care more about the environment than poor countries, is far from conclusive (see Kriström & Riera, 1996).

Secondly, economic growth will likely increase the possibility that more modern and less pollution intensive man-made capital and technology are introduced (Grossman & Krueger, 1991). While pollution per unit of output may be decreasing, absolute pollution levels may be increasing as economic growth increases.

Thirdly, as income rises and as the economy develops, the share of industrial output in the GDP tends to decrease as the share of the service sector goes up. These sectoral changes may favour less-polluting sectors. Starting from low levels of income, structural changes in the economy will most possibly have a devastating effect on the environment thereby causing pollution to increase as the share of the agriculture sector wanes and the share of industry blossoms. There may also be limitations in the scope of these changing patterns of output, given that people's revealed preferences indicate that pollution-intensive material goods are still valued highly (Neumayer, 2003). The "pollution haven hypothesis" produced a suspicion that high-income countries might have become cleaner because they have exported their pollution-intensive industry to the low-income countries of Africa, Asia, and South-east Europe. Despite some recent evidence for such claims, the empirical record for this argument remains somewhat inconclusive (Neumayer, 2003).

Furthermore, rising income brings down population growth rates, thus, the pressure exerted by population on the environment decreases An extensive discussion has been carried out on this assertion elsewhere (see Isola & Ejumedia, 2012). Although studies like Simon (1996) did not agree that population growth is detrimental to the environment, there is clear evidence that larger populations tend to generate more emissions (UNDP, 2010). However with considerable variance in the data, it is clear that population growth is determined by factors other than a country's income level (Neumayer, 2003). Therefore, we can't really conclude that economic growth is either a necessary or a sufficient condition for containing population growth. For instance, it is argued by Alstine & Neumayer (2009) that if investment can be made for women in education and also for providing retirement insurance schemes for them, it can signify the best ways to reduce population growth in such country.

Stern (2003, 2004) asserted that there is a very strong link between energy use (such as oil production and consumption), levels of economic activity and economic growth. Energy extraction and processing always involve some forms of environmental disruption, including both geo-morphological and ecological disruption as well as pollution. Energy use involves both pollution and other impacts, such as noise from transport, and land-use impacts, such as the construction of roads, etc. As all human activities require energy use; in fact, all human impacts on the environment can be seen as the consequences of oil production and consumption. Whenever attempts are made to create order in the economic system, it also implies making attempt to create disorder in nature. The factors that reduce the total amount of energy needed to produce a dollar's worth of GDP, also act to reduce the environmental impact of economic growth in exactly the same way as they reduce energy consumption or flaring. However, it is not all impacts of energy use that are equally harmful to the environment or human general wellbeing, but greenhouse gas emissions like $C0_2$ through crude oil production and exploration can be very harmful to health and can in-turn have a debilitating effect on human condition in general.

3. Theoretical Framework & Methodology

The environmental Kuznets curve is an attempt to determine the relationship between environmental degradation and economic growth. It simply states that as population grows, the people demand for more output and as output expands, the environment suffers more degradation (Stern, 2003). In the early stages of economic growth, degradation and pollution increase, but beyond some level of income per capita (which will vary for different indicators) the trend reverses, so that at high-income levels economic growth leads to environmental improvement (Stern, 2004). This implies that as incomes rise, the demand for improvements in environmental quality will increase, as will the resources available for investment (Dasgupta et al, 2002). As employed by Stern in 2003, the functional relationship can be expressed as:

$$(E/P) = f(GDP/P) \qquad (1)$$

Equation (1) can be explicitly written as:

$$\ln(E/P) = \alpha + \beta 1 \ln(GDP/P) + \beta 2 (\ln(GDP/P))^2 + \varepsilon \qquad (2)$$

Where E is emissions, P is population, and ln indicates natural logarithms. The first term on the RHS is the intercept parameter and the β's are slope parameters.

However, for the purpose of empirical modeling in this study, the explanatory variable which is output growth (GDP), will be represented with growth of oil production. This is to enable us measure directly the impact of the oil sector on environmental degradation, which will in-turn have implication on the welfare of the growing population.

Equation (2) can now be written in a functional form as:

$$ED = f(OP) \qquad (3)$$

Where ED stands for environmental degradation, and OP stands for oil production.

Explicitly, equation (3) can be explicitly written as:

$$ED = \alpha + \beta 1(OP) + \varepsilon \qquad (4)$$

However, keeping in mind the specific objectives of this study, three equations will be employed for analysis and will be specified as follows:

$$ED = \alpha + \beta 1(OP) + \varepsilon \qquad (5)$$

$$EX = \alpha + \beta 1(OP) + \varepsilon \quad (6)$$

$$IMR = \alpha + \beta 1(OP) + \varepsilon \quad (7)$$

Where ED represents environmental degradation, EX represents life expectancy, and IMR represents infant mortality rate.

However, as stated in section one of this study, the vector auto-regressive (VAR) model is the most suitable for this work. This derives from the fact that it will enable us to look at how the lags of the oil production affect all of the indicators of human condition that are used in this study. Also, the VAR model makes it possible for each equation to be estimated with the usual OLS method separately and forecasts obtained from the VAR models are in most cases better than those obtained from the far more complex simultaneous equation models (Mahmoud, 1984; McNees, 1986).

The rationale for using the VAR/VECM model is stems from the nature of the study where we have one explanatory variable and three dependent variables. The VAR/VECM model will enable us to regress all variables (dependent and independent) on one another and result of the equation of interest is then interpreted and explained. The VAR model to be estimated to capture all our equations is stated as follows:

$$LED_t = \alpha_{10} + \beta_{11} (LOP)_{t-1} + \beta_{12} (LIMR) + \beta_{13} (LEX)_{t-1} + \beta_{14} (LED)_{t-1} + \varepsilon_1 \quad (8)$$

$$LIMR_t = \alpha_{20} + \beta_{21} (LOP)_{t-1} + \beta_{22} (LIMR) + \beta_{23} (LEX)_{t-1} + \beta_{24} (LED)_{t-1} + \varepsilon_2 \quad (9)$$

$$LEX_t = \alpha_{30} + \beta_{31} (LOP)_{t-1} + \beta_{32} (LIMR) + \beta_{33} (LEX)_{t-1} + \beta_{34} (LED)_{t-1} + \varepsilon_3 \quad (10)$$

$$LOP_t = \alpha_{30} + \beta_{41} (LOP)_{t-1} + \beta_{42} (LIMR) + \beta_{43} (LEX)_{t-1} + \beta_{44} (LED)_{t-1} + \varepsilon_4 \quad (11)$$

Where LED is the Log of Environmental Degradation, LIMR is the Log of Infant Mortality Rate, LEX is the Log of Life Expectancy, and LOP is the Log of Oil Production.

After using the VAR test, Variance Decomposition analysis will also be conducted to examine the response of the dependent variables in the VAR/VECM to shocks in the error terms. This becomes very important because it may be difficult to interpret the coefficients obtained from the VAR model, since they totally lack any theoretical underpinning and may become unstable or insignificant owing to the introduction of lag values into the model.

4. EMPIRICAL RESULT AND ANALYSIS

Table 1: ADF Unit Root Test Results

Variable	ADF Tau Statistics (Linear Trend)	Order of Integration
Δ*ED*	-5.959219*(0) [-4.198503]	1
ΔEX	-4.586692*(9) [-4.273277]	1
ΔIMR	-3.586900**(7) [-3.548490]	1
ΔOP	-6.894451*(0) [-3.192902]	1

*Note: * significant at 1% ** significant at 5%; Mackinnon critical values and are shown in parenthesis. The lagged numbers shown in brackets are selected using the minimum Schwarz and Akaike Information criteria.*

The unit root test result above shows that environmental degradation, infant mortality rate, life expectancy index, and oil production are all stationary at first difference for linear trend test models. This indicates that those incorporated series in the dynamic regression model have no unit-root at first difference with the implication that the series (in their first difference) are mean reverting and convergences towards their long-run equilibrium.

Table 2: The result of the vector autoregressive (VAR) model

Dependent Variable: LED		**Included observations: 41 after adjustments**		
LED = C(1)*LED(-1) + C(2)*LED(-2) + C(3)*LEX(-1) + C(4)*LEX(-2) + C(5) *LIMR(-1) + C(6)*LIMR(-2) + C(7)*LOP(-1) + C(8)*LOP(-2) + C(9)				
	Coefficient	**Std. Error**	**t-Statistic**	**Prob.**
C(1)	0.560575	0.175390	3.196169	0.0031
C(2)	-0.195347	0.192613	-1.014194	0.3181
C(3)	-47.54404	20.11363	-2.363772	0.0243
C(4)	43.22269	16.85899	2.563777	0.0153
C(5)	4.243898	6.361584	0.667113	0.5095
C(6)	-5.690153	7.299420	-0.779535	0.4414
C(7)	0.914996	0.557997	1.639788	0.1108
C(8)	-0.388156	0.528135	-0.734956	0.4677
C(9)	22.19494	37.26825	0.595545	0.5557

R-squared	0.926873	**Mean depend var**	3.694676
Adj R-squared	0.908591	**S.D. depend var**	0.496202
Log likelihood	24.68037	**Schwarz criterion**	-0.388746
F-statistic	50.69949	**Durbin-Watson**	1.983885
Prob(F-statistic)	0.000000		

Source: Authors' computation from Eviews

The estimates of the VAR equation above imply that the variable of interest, which is oil production, has a positive effect on environmental degradation in the first period, which conforms to our apriori expectation, but has a negative relationship on it in the second period. This can be attributed to the fact that emission from oil production continues unabated in Nigeria in spite of the call for an end to gas flaring all over the world. The probabilities show that the first period lag of environmental degradation and both first and second period lags of life expectancy intercept are statistically significant in explaining changes in environmental degradation at 5% significant level.

4.1 Variance Decomposition Analysis

The Variance Decomposition of oil production, environmental degradation, life expectancy, and infant mortality rate over 41 years computed in EViews is shown below.

Table 3: Variance Decomposition of oil production

Period	S.E.	LED	LEX	LIMR	LOP
1	0.150021	7.799028	0.015573	0.150322	92.03508
2	0.190624	15.00808	0.787330	1.268393	82.93619
3	0.217198	19.42553	0.633301	2.461280	77.47989
4	0.239104	19.50532	0.729138	3.685113	76.08043
5	0.257054	18.00944	1.591088	5.112629	75.28684
6	0.271084	16.24228	3.101384	6.699438	73.95690
7	0.281211	14.63964	5.021405	8.350694	71.98826

8	0.288064	13.38106	7.073556	10.00458	69.54080
9	0.293053	12.53787	8.985303	11.63977	66.83707
10	0.298158	12.10642	10.54435	13.26395	64.08528

From table 3 above, the variance decomposition of oil production over a 10 period ahead is reported. In terms of explaining its own shocks, 92% of oil production variance can be explained by its own innovation in the first period. It is also observed that as time passes by; its contributions are fairly tumbling till it reaches 64% in the last quarter. However, it has the highest contribution over the forecasted period compared to the other variables. This brings attention to the conclusion that over the years, oil production can be greatly explained by its own shocks.

Following oil production itself, the 2nd up to the 9th period demonstrate the relative importance of environmental degradation (LED) in explaining the variation of oil production. As captured for the second year, LED accounts for 15% in the variation of oil production, infant mortality rate (LIMR) accounts for 1.29% while life expectancy (LEX) accounts for just 0.79%. In lieu of the above, the conclusion drawn reveals that excluding oil production itself, in 2 years forward, variations in oil production is more influenced by environmental degradation, infant mortality rate, and less influenced by life expectancy. This implies that the impact of oil production is more felt in environmental degradation, infant mortality and less felt on life expectancy in Nigeria. Nevertheless, we observed a slightly different scenario in the10th period where infant mortality gained slight weight over environmental degradation.

Table 4: Variance Decomposition of Environmental Degradation

Period	S.E.	LED	LEX	LIMR	LOP
1	0.150021	100.0000	0.000000	0.000000	0.000000
2	0.190624	82.28088	12.32236	0.601637	4.795123
3	0.217198	64.66274	28.83301	0.713016	5.791234

4	0.239104	53.36680	40.92344	0.672318	5.037438
5	0.257054	46.23665	48.71501	0.672994	4.375339
6	0.271084	41.78531	53.14036	0.778628	4.295707
7	0.281211	39.14031	54.86224	1.034628	4.962817
8	0.288064	37.58656	54.56405	1.472711	6.376681
9	0.293053	36.48741	53.07427	2.092217	8.346099
10	0.298158	35.29443	51.40347	2.829968	10.47214

Table 4 above shows the variance decomposition of environmental degradation. The own shock for environmental degradation only has sustained impact on itself up to the 4^{th} period where its value of 100% came down to 53.37%. From the 5^{th} to 10^{th} period, life expectancy shows the highest sustained effect in the variation that occurred to environmental degradation. This implies that through transmission mechanism, whatever happens to environmental degradation will greatly affect life expectancy.

Table 5: Variance Decomposition of Life Expectancy

Period	S.E.	LED	LEX	LIMR	LOP
1	0.150021	2.593342	97.40666	0.000000	0.000000
2	0.190624	3.007980	96.80333	0.188589	9.94E-05
3	0.217198	3.250634	95.97115	0.554709	0.223510
4	0.239104	3.345733	94.51651	1.175675	0.962081
5	0.257054	3.371960	92.18774	2.131393	2.308910
6	0.271084	3.325464	88.83734	3.503328	4.333866
7	0.281211	3.183096	84.35204	5.379973	7.084891
8	0.288064	2.933685	78.66056	7.843849	10.56190

9	0.293053	2.591323	71.79141	10.94088	14.67638
10	0.298158	2.205700	63.95779	14.63440	19.20211

Table 5 shows the variance decomposition of life expectancy. The own shock for life expectancy has sustained impact on itself period 1 to period 10 where its 97% came down to 63.96%. Apart from life expectancy, oil production has the highest sustained effect in the variation that occurred to life expectancy from the 2nd to 10th period.

Table 6: Variance Decomposition of Infant Mortality Rate

Period	S.E.	LED	LEX	LIMR	LOP
1	0.150021	0.251761	34.40373	65.34451	0.000000
2	0.190624	1.223975	30.05053	66.05416	2.671334
3	0.217198	4.601389	26.01643	63.53668	5.845497
4	0.239104	7.030004	23.35754	61.17715	8.435311
5	0.257054	8.193556	21.19059	59.74826	10.86760
6	0.271084	8.699618	18.86001	59.09443	13.34594
7	0.281211	8.964982	16.20654	58.98347	15.84500
8	0.288064	9.196918	13.35500	59.19667	18.25142
9	0.293053	9.495065	10.55652	59.52459	20.42382
10	0.298158	9.906108	8.093481	59.77844	22.22197

Table 6 shows the variance decomposition of infant mortality. The own shock for infant mortality has sustained impact on itself from period 1 to period 10 where its 65% value came down to 59.78%. Apart from infant mortality, oil production has the highest sustained effect in the variation that occurred to infant mortality from the 8th to 10th period, but from period 1 to 7, life expectancy has the highest sustained effect on infant mortality rate. This also shows that infant mortality rate and life expectancy are strongly linked with environmental degradation.

In a nutshell, it can be concluded that oil production has a great impact on environmental degradation, life expectancy, and infant mortality rate, and whatever fate befalls environmental degradation is transmitted to infant mortality and life expectancy.

The essence of Variance Decomposition (the Forecast Variance Decomposition), Christelle et al (2013), is to denote the breakdown of the forecast error variance for a particular time horizon. Explicitly, the Variance Decomposition separates the variation in an endogenous variable into the component shocks to the VAR/VECM. In essence, this analysis provides information about the relative importance of each random innovation in affecting the variables in the VAR/VECM (Ludi & Ground, 2006; Georgantopoulos, 2012). Also, the Variance Decomposition can reveal which variables in the model has short term or long term impacts on another variable of interest. Therefore, the main reason to conduct the Variance Decomposition is to obtain information about the relative significance of each random innovation in affecting the variables in the estimated model. Pesaran and Shin (1998) maintained that the Variance Decomposition analysis is very sensitive to the ordering of variables.

5. Conclusion and Recommendation

5.1 Conclusion

The analysis of the impact of oil production on the human condition in Nigeria revealed that while the country has been reaping huge earnings from crude oil production over the period under study, there has not been significant impact of crude oil production in improving environmental conditions for Nigerians. The VAR result and the variance decomposition analysis attest to this. This implies that while oil companies have profited immensely from Nigeria's oil wealth being exploited for over 45 years now, local communities in the oil rich areas live with the daily pollution caused by non-stop gas flaring – where the gas associated with extraction is burnt off into the atmosphere (Gas flaring in Nigeria, 2004). This has also permeated the whole economy as the result clearly showed that the condition of Nigerians in general has not improved because environmental degradation has continued endlessly through gas flaring. This has through transmission mechanism indirectly affected life expectancy and mortality rate in Nigeria. The inference that can be drawn is that though oil production did not have a joint negative impact on all the variables of human condition used in the study, (owing to the fact that it does not really worsen life expectancy and infant mortality) the fact that its effect on environmental degradation is positive indicates that it will still have a negative effect on both life expectancy and infant mortality rate at the long run through transmission mechanism. Therefore, we can conclude that oil production has a negative impact on human condition in Nigeria.

5.2 Recommendation

With regard to the nature of the observations in this study, the strategic policy options proffered are as follows: efforts need to be directed by the country at ensuring that environmental degradation (carbon emission from fuel) is effectively controlled. This can be done through concerted efforts at putting an end to gas flaring in Nigeria (especially, in the oil producing areas) as specifically recommended in Nigeria's Gas Master Plan of 2008. Also, oil spillage must be dealt with to ensure that health hazards associated with environmental degradation resulting from oil production is reduced to the barest minimum. This will definitely improve human living condition in Nigeria. Although, oil production did not aggravate life expectancy in this study, it is yet believed that life expectancy in Nigeria has stagnated for four decades (1970-2012), merely improving by 10years compared to many developed countries who are even now recording a life expectancy of about 75 years per-thousand live births. Therefore, policy makers in Nigeria must be able to channel their efforts into sustainable policies aimed at transforming the largess from crude oil production into the health sector, as well as into the provision of infrastructural and life enhancing facilities like good roads, portable water, and so on. This can help to enhance life expectancy beyond the current stagnation state and also reduce infant mortality rate further.

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APPENDIX

Table 1: Data on Oil Production and Human Condition.

YEAR	ED	OP	IMR	EX
1970	25.51924	915.22	152.9	42.36946
1971	19.85687	945.73	150	42.78112
1972	16.99566	977.31	147.9	43.18117
1973	17.32249	1009.99	145.8	43.56198
1974	15.51775	1043.8	143.8	43.91851
1975	20.31721	1078.79	141.4	44.24732
1976	20.45666	1115.01	139	44.54793
1977	17.47643	1152.5	136	44.82346
1978	18.93698	1191.31	133.5	45.07354
1979	19.52734	1231.48	130.9	45.29663
1980	30.95341	1273.08	128.6	45.48827
1981	37.86624	1337.19	127.2	45.6439
1982	44.4047	1387.36	126	45.76251
1983	49.17702	1410.62	125.4	45.84405
1984	54.23711	1456	124.5	45.89054
1985	50.83421	1506.54	124.5	45.90402
1986	51.90821	1532.57	125.2	45.88756
1987	45.38713	1410.76	125.7	45.84668
1988	46.96004	1515.89	126.3	45.78841
1989	76.81873	1769.89	126.3	45.7198
1990	79.38419	1821	126.6	45.63734
1991	75.35457	1868.66	126.7	45.53454
1992	82.12388	1923.38	127	45.41537
1993	79.66909	1954.8	126.8	45.29027
1994	74.39484	1888.2	126.1	45.17973
1995	66.3201	1979.04	125.3	45.11571

1996	70.6432	1985.05	123	45.13322
1997	70.20073	2075.75	120.9	45.25371
1998	68.03249	2181.28	118.9	45.48615
1999	70.18176	2086.17	115.6	45.82954
2000	39.61006	2314.75	112.5	46.27232
2001	40.09239	2339.79	109	46.79146
2002	38.12175	2197.15	105.4	47.35049
2003	35.69826	2451.97	102.1	47.91637
2004	31.81561	2453.17	98.7	48.47261
2005	37.41585	2571.96	95.5	49.00471
2006	30.3143	2474.75	92.4	49.51066
2007	27.7719	2389.16	89.3	49.99949
2008	35.12616	2201.07	86.3	50.47973
2009	41.01185	2357.87	83.4	50.94941
2010	38.069	2534.16	80.8	51.41002
2011	39.54043	2642.8	78	51.86312
2012	38.80472	2714.23	76.2	51.91345

Source: Central Bank of Nigeria (CBN) Statistical Bulletin, Volume 22, 2013;
World development Index, 2013; and
International Energy Agency (IEA) Database, 2013.