

Appraisal of Foreign Direct Investments in the Oil and Gas Industry for Sustainable Livelihood in Abia State, Nigeria.

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Abstract— The Nigerian Oil and Gas Industry, which was birthed and dominated, since inception, by foreign direct investments (FDI) is the bulwark on which the Nigerian economy has rested for about six decades now. Despite the huge financial resources earned by the country, the communities where oil and gas hydrocarbons are found and exploited have not fared well. The objective of this study therefore, is the evaluation of the impacts of FDI in the oil industry on the livelihoods of households in the oil-bearing communities of Abia State. A hypothesis was formulated to guide the study, namely: FDI in the oil and gas industry in Nigeria have not significantly impacted on the sustainable livelihoods of households. Two types of data were collected for this study. These are: discrete data (including data on oil and gas installations such as oil wells, pipelines, among others) and continuous data (examples include data on quantities of crude oil produced and exported, the volume and value of FDI inflows). A combination of the survey and participatory research appraisal methods was used to collect the primary data analyzed. A total of 392 copies of the questionnaire were administered in Umuorie, Owaza, Umuokwor/Obiga and Uzuaku/Imo River communities. Data for the study were also obtained from secondary sources such as publications by the Organization of Petroleum Exporting Countries (OPEC), Central Bank of Nigeria (CBN), Nigeria National Petroleum Corporation (NNPC), United Nations Conference on Trade and Development (UNCTAD), among others. Multiple regression technique was used in testing the hypothesis. The results showed that FDI-driven oil production operations have significantly impacted on the sustainable livelihoods of households in the oil-bearing communities of Abia State. The study recommends an immediate clean-up and remediation of oil-impacted soil, the urgent cessation of gas flaring through the process of leap-frogging by oil companies, to low-carbon, environmentally-friendly clean technologies and an environmental sensitive index (ESI) mapping of all areas of operation of oil companies, before and especially, after oil spills.

Key Words— Foreign Direct Investment, Niger Delta, Oil and Gas Industry, Sustainable Livelihoods

1.0 INTRODUCTION

FOREIGN Direct Investments (FDI) is one of the most important purveyors of industrial and development capital, particularly, for developing countries in dire need of catalysts for economic growth and development. It is a veritable instrument for the socio-economic development of countries especially, in situations where domestic capital formation is persistently inadequate to stimulate growth and development due to such socio-economic malaises as low savings, low productivity, low consumption and high propensity for ostentatious consumption. FDI refers to investments made for the acquisition of long-term interests in a business entity which has its origin and carries on its business in a country or countries other than that of the investor (International Monetary Fund, IMF, 1993). The interests acquired are usually intended to enable the investor to control the management of the entity or to significantly influence its decisions and operations.

FDI plays crucial roles in the socio-economic development of both the investing and the recipient countries. The experience of a small number of fast-growing East Asian newly industrialized economies has strengthened the belief that attracting FDI could bridge the resource gap of low-income countries and avoid further build-up of debt while directly tackling the causes of poverty (UNCTAD 2004). Since FDI can create employment and act as a vehicle for technology transfer, provide superior skills and management techniques, facilitate local firms' access to international markets and

increase product diversity, FDI can therefore be an engine of economic growth and development in Africa where the need for it cannot be overemphasised (Ngowi 2001; McKinsey 2005). The evidence on growth and poverty reduction is best approached by looking at two countries that have huge reduction in poverty; China and India. A vast majority of the world's poor live in these countries but both countries achieved significant reductions in poverty during 1980-2000 when they grew rapidly by opening up to foreign investment (Bhagwati and Srinivasan 2002).

FDI has been a prominent feature of the Nigerian oil and gas industry particularly, since the post-World War II period when Shell D'Arcy Exploration Company was granted the license to prospect for crude oil in the country (Kato, 2011). The advent of Shell was soon followed by the presence of other companies namely, Mobil, Chevron, Safrap, Esso, Total, BP, and so on, who brought enormous investments into the industry. Thus, the prominence of FDI in the Nigerian oil and gas industry is because the exploration and production of oil and gas in Nigeria are financed majorly by oil transnational corporations (TNCs). FDI have been largely instrumental for the procurement of crude oil and natural gas exploration and exploitation equipments and installations such as flow-stations, pipelines (running into thousands of kilometers in length), oil wells, oil fields, gas fields and compressor stations as well as export terminals. As at January 2013, this huge FDI flow into the oil and gas industry in Nigeria has been

responsible, in the main, for the provision of the 27 crude oil terminals, 130 flow stations, 218 oil fields (in production), 97 oil fields (not producing), 3 petrochemical plants, 2,800 producing oil wells and a network of pipelines covering more than 16,000 kilometers (oil and products) in length (DPR, 2015).

However, the local communities, including Owaza, Umuorie, Umuokwor and Uzuaku in Ukwa West Local Government Area of Abia State, where crude oil and gas hydrocarbons are embedded have not fared any better. Their environments have been negatively affected by oil and gas production operations; and, their livelihoods disrupted (Osuji and Nwoye, 2007). For instance, the mangrove and rainforests which are prominent in this environment are gradually but steadily being decimated. Oil production operations have equally brought about the contamination of both surface and underground water sources. These have resulted to the intensification of the poverty which characterizes the living experiences of the people of the study area. This is because of the loss of soil fertility occasioned by oil spill incidents (Ibekwe, 2016) and gas flares, and have resulted ultimately, to the reduction in household incomes (Inoni, Omotor and Adun, 2006).

The present study has, therefore, become necessary, at this time, when the Nigerian government is searching for solutions to the myriads of livelihood challenges which confront the mass of the Nigerian people presently. Several poverty alleviation programmes including the National Poverty Alleviation Programme (NAPEP) and the Subsidy Reinvestment Programme (Sure-P) have been embarked upon by the government of the Federal Republic of Nigeria without much success. The plight of households in the oil- and gas-bearing communities is pathetic given the fact that the huge revenues the Nigerian state and the oil companies derive from hydrocarbon deposits found in these communities are not reflected and seen in the socio-economic development of these communities. This study therefore, contributes to the search for solutions to the challenges faced by these communities by appraising the role of FDI in the oil and gas industry towards enhancing or militating against the sustainability of livelihoods of households in the study area. It takes a critical look at the relationship between FDI-induced oil and gas production operations and the sustainable livelihood challenges of households in these communities with a view to recommending solutions to the challenges faced by these communities.

Study area

The study area covers oil- and gas-bearing communities in Ukwa West Local Government Area of Abia State, including: Owaza, Umuorie, Ozar, Umunteke, Umuokwor and Uzuaku/Imo River communities. The Ukwa West Local Government Area with headquarters at Okeikpe is one of the 17 local government areas in Abia State. The local government area lies approximately within Longitudes 7° 11' 0" and 7° 22' 0" East of the Greenwich meridian and Latitudes 4° 52' 30" and 5° 9' 0" North of the Equator. It has a total area of about 271 km² and is bounded to the east by Ugwuagbo Local Government Area and by Ukwa East Local Government Area

to the south-east. It is also bounded to the north and north east by Aba North and Aba South Local Government Areas respectively. To the south and south west of the local government is Rivers State. The people of Ukwa West LGA are mainly of the Igbo ethnic origin with projected populations, based on the 2006 Nigerian census figures, of about 101, 619 persons in 2010 and 116, 610 in 2014 respectively. This is made up of about 52, 334 females (or 51.5 percent) and 49, 285 males (or 48.5 percent) in 2010; and about 60, 054 females and 56, 556 males in 2014 respectively.

Fig. 1 shows the map of Ukwa West Local Government Area with the oil- and gas-bearing communities of Owaza, Umuorie, Umuokwor, Ozar and Imo River/Uzuaku, among others, clearly delineated. Inset is the map of Abia State showing Ukwa West LGA and that of Nigeria respectively.

2.0 LITERATURE REVIEW

There are divergent views regarding the importance and contributions of FDI to the socio-economic development of countries. These views are polarized into two major divides, namely: the proponents and the antagonists. The exact role of FDI in terms of its contribution or otherwise to the socio-economic development of countries is critical for the sustainability of households' livelihood options. It is believed that livelihoods of households will be impaired, destroyed or made unsustainable in situations where the socio-economic development of the country or community is not enhanced through the economic activities of FDI and *vice versa*.

The dominant view emanating from the literature, however, is that of FDI as a panacea for the development challenges of developing countries: a tool for economic growth, poverty reduction and for the take-off or sustenance of technological and economic development of host-countries. Proponents of FDI (OECD, 2002; Asiedu, 2006; Sackey, Compah-Keyeke and Noah, 2012) contend that it plays a critical role in the socio-economic development of both home- and host-countries. These scholars argue that FDI has salutary effects on the socio-economic development of, particularly, developing countries. For example, the OECD (2002) policy brief avers that FDI is a very important ingredient in the socio-economic development of host-countries; and, argues that FDI, for instance, "triggers technology spillovers, assists human capital formation, contributes to international trade integration, and so forth, of host-countries", given appropriate host-country policies. Accordingly, the brief further contends that "beyond strictly economic benefits, FDI may help improve environmental and social conditions in the host country by, for example, transferring 'cleaner' technologies and leading to more socially responsible corporate policies" (OECD, 2002).

Similarly, the UNCTAD (1999) sees the socio-economic benefits of FDI inflow to a developing country in terms of 'bundle of assets'. That is, FDI usually comes as a package comprising: capital, modern and up-to-date technology, access to international markets for goods and services, advanced skills and management techniques and environmental protection. However, to benefit from this package or bundle of assets, the host country government must take appropriate policy measures including those necessary to protect infant

industries which may be crowded out by inward FDI; and, those related to strong bargaining and regulatory capabilities of the government to avoid market abuse or unequal distribution of the benefits by TNCs (UNCTAD, 1999).

In this regard, Anowor, Ukwani, Ibiam and Ezekwem (2013) have argued that FDI correlates positively with economic growth. These authors used an econometric tool to examine the contributions of FDI to economic growth particularly as related to the manufacturing sector in Nigeria and employed time series data of the choice variables for the period 1970 – 2011. The finding of the study is that FDI and other variables such as the degree of trade openness and domestic investment are positively related to growth. Therefore, the Nigeria government should take policy actions necessary to attract more FDI into the country.

Likewise, Sackey, Compah-Keyeke and Noah (2012) studied the effects of FDI on the economic growth of Ghana. Using various econometric methods such as the Dickey Fuller (DF) and the Augmented Dickey Fuller (ADF) tests and Vector Auto Regression (VAR) on time series data for the period 2001 – 2010, the study found a long run relationship between the variables and FDI. The study concluded that FDI is positively related to economic growth in Ghana. In the same vein, Ibekwe (2015) examined the relationship between FDI and firm-level productivity in Nigeria's manufacturing sector for the period 1981 – 2012. The scholar used econometric tools and the multiple regression technique to test for linear relationships between the variables. Among others, the result of the study confirmed earlier findings that FDI, domestic investment, exchange rate and the degree of trade openness are related to the manufacturing sector output growth in Nigeria.

Other scholars who have extolled the virtues of FDI and its salutary impacts on the socio-economic development of countries include: Bezuidenhout and Naude (2008) in a study of the relationship between FDI and trade in the Southern African Development Community (SADC). The major finding here is that there is a causal relationship between SADC's exports and inward FDI. It also confirmed that political instability is a significant negative determinant of FDI to the SADC.

Olokoya (2012) examined FDI and economic growth in Nigeria focusing essentially, on the drivers or determinants of FDI and their impact on economic growth in Nigeria. The Ordinary Least Square (OLS) regression technique was employed in this study to test the time series data for the period, 1970 – 2007 and after correcting for auto-correlation with the Cochrane-Orcutt iterative method, the result showed that the effect of FDI on economic growth in Nigeria is exaggerated. That is, FDI is found not to be as important for economic growth in Nigeria as the existing literature on the subject suggest.

At the other side of the divide are scholars, mostly of Latin American origin, who believe that FDI work against the sustainable development goals of host countries. For example, Chudnovsky and Lopez (2008) in a study of the role of FDI in the sustainable development of Argentina averred that FDI was a significant feature of the Argentinean economy during the structural reforms of the 1990s. The study concluded

however, that FDI has not been the panacea for the country's economy. On his part, Agosin (2008) reviewed the role of FDI generally in Latin America and attempted to provide an answer to the question of whether FDI laid the required foundation for the economic growth of host-countries. The result of the study is that FDI has not performed the role of effectively engendering the take-off or sustenance of economic growth, as theoretically posited, in Latin America. It therefore concluded that developing nations need to note that policies aimed at attracting FDI do not necessarily translate to economic growth.

Zarsky and Gallagher (2008) in their study examined the role of FDI in Mexico's information technology (IT) sector especially after the 1994 North American Free Trade Agreement (NAFTA). The scholars adduced sufficient evidence to conclude that FDI failed to grow the Mexican economy through the establishment of a dynamic IT hub to serve the Americas including the United States of America. Rather, FDI established pockets of IT enclaves in the sector. This means that the opportunities for the expected technological and environmental spillovers and the possible diffusion of clean technology were lost.

On a general note, these scholars contend that FDI is in business to contribute to the generation of the maximum profit possible for the home-corporation and government. Consequently, it is constrained by the profit motive while contributing to the socio-economic development of the host country. Its ability to engender economic and technological development of the host country is dependent on the profit objective not being in jeopardy (Amin, 1997).

Moreover, empirical evidence generated by these scholars in their studies of several countries in Latin America (Chudnovsky and Lopez, 2008; Agosin, 2008; Zarsky and Gallagher, 2008) suggests that FDI often creates pockets of economic 'enclaves' in the host economy, the benefits of which are confined to an international sector not connected to the wider economy of the country. Other sectors in which FDI does not have interest are neglected, and, as a result become moribund and disarticulated from the rest of the society. Also, FDI put many local companies out of business through a process of crowding out (Zarsky, 1999; Gallagher & Zarsky, 2003).

Finally, these scholars believe that FDI, which is brought into a country largely through the instrumentality of TNCs, is an agent of international capitalism. And the capitalist mode of production is, by its logic and dynamism, driven by the profit maximization motive – this is the singular, most powerful and all encompassing propeller – which makes it to be competitive and highly-innovative. It is also in constant mutation of its character in order to resolve inherent contradictions and pursue the profit objective undisrupted. TNCs therefore, take actions, some of which may be inimical to the sustainable development goals of host countries, necessary for making profits and remaining in business.

This debate notwithstanding, it is generally believed in mainstream FDI literature that FDI exert tremendous impact on key components of the socio-economic development of host-countries. This impact is seen on the domestic investment growth of host-countries, employment generation directly and

or indirectly and the diffusion and transfer of modern technology to host-countries. Other benefits of FDI to host-countries include the introduction of more efficient environmental management systems as well as increasing the international trade competitiveness of host-countries.

2.1 FDI in the Nigerian oil and gas industry

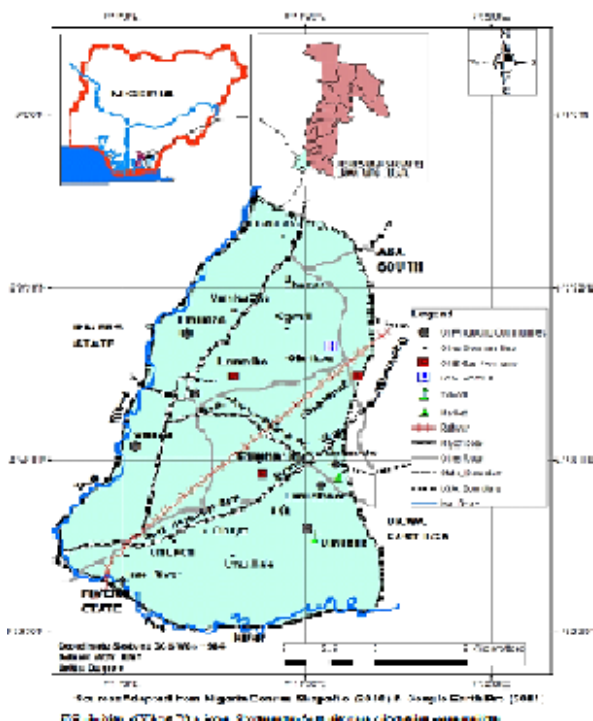
The Nigerian oil and gas industry has been dominated since inception by FDI. This is because the industry was founded and nurtured by international private capital from Europe and North America. The process of engrafting the oil industry in Nigeria into the international oil industry can be said to have started in 1908 when a German business firm, the Nigerian Bitumen Company, was first granted the license to carry out oil prospecting and exploratory activities in some parts of the area now known as Nigeria. Activities in this sector became more vigorous and defined especially in the post-World War II era with the advent of Shell D'Arcy Oil Exploration Company which had been granted the right to explore for oil in the region in replacement of the German firm whose operations had ceased at the onset of World War I (Kato, 2011). The bright prospects of finding oil in the region soon attracted other international companies, namely, Safrap, Esso, Texaco, among others. The investments by these foreign companies began to pay back in 1956 when Shell D'Arcy discovered oil in Otuabagi Community in the then Oloibiri Council in the now Ogbia Local Government Area of present day Bayelsa State. Oil exports started in 1958 with an initial production quantity of about 5100 barrels per day (Kato, 2011).

It is a widely recognized fact that oil and gas exploration and production activities in the study area have brought about challenges which have made it difficult for households in the area to earn their livelihoods in a sustainable manner (UNDP, 2006; UNEP, 2011). It has been pointed out severally in the literature that oil and gas production operations are the major culprits for the livelihood challenges facing communities and households in the oil- and gas-bearing communities. For example, Osuji and Nwoye (2007), while appraising the impact of petroleum hydrocarbons on soil fertility in Owaza community in the study area, argued that oil exploration and production activities have "decimated terrestrial and aquatic biota, which constitute the people's major source of livelihood". The result of this appraisal is a confirmation of the evidence of severe hydrocarbon contamination resulting in high soil acidity, low electrical conductivity and high temperature and moisture content. The consequences of these are greatly reduced soil fertility, low yield and decline in farm income leading to higher levels of poverty and impoverishment for households.

Ndubuisi and Asia (2007) in a study of environmental pollution in the oil-producing areas of the Niger Delta agreed with the above assertions and averred that oil spills have destroyed farmlands and polluted surface and underground water. These scholars contended that oil spill incidents have caused serious problems on fishing activities and even led to the death of human beings through fire outbreaks and explosions as well as blow-outs. Thus, households in the oil-bearing communities have become impoverished by oil and gas production operations as a result of declining farm crop yield and low fish catch.

In a similar study of oil spillage and management problems in the Niger Delta, Udoudoh (2011) argued that oil spillage "constitutes the greatest threat to the region, making livelihood in the region very difficult". The study concluded that oil exploration and production operations in the Niger Delta region of Nigeria have rendered households homeless and jobless. Thus, the environmental degradation occasioned by oil production has culminated in poverty, restiveness and militancy as well as insecurity of lives of the people of the local communities.

These studies have confirmed that the negative impacts of oil pollution are not only pervasive but also multi-dimensional, affecting the socio-economic life (NDES, 1999; UNEP, 2011) of the people as well as their health conditions (Salako, Sholeye and Ayankoya, 2012). Furthermore, oil spills impact soil fertility negatively and result to the massive decline of agricultural productivity and, by extension, the incomes of rural households. In a study of the effect of oil spillage on crop yield and farm income in Delta State, Nigeria, Inoni, Omotor and Adun (2006) using a sample of 262 farmers drawn from 10 communities and 5 local government areas in Delta State, found that oil spills reduced crop yield, land productivity and depressed farm income. According to them, a 10 percent increase in oil spill reduced crop yield and farm income by 1.3 percent and 5 percent respectively. This finding is similar to the results of UNEP (2011) which assessed the impact of environmental pollution in Ogoniland, Niger Delta,



on the people's livelihood, health, water sources, among others.

Kadafa (2012) studied oil exploration and spillage in the Niger Delta of Nigeria. The scholar contended that oil spillage is as old as the industry itself with the first oil spill incident having occurred in Araromi in western Nigeria, reported in 1908. The study averred that oil exploration and production in Nigeria have exerted tremendous environmental and human consequences for the oil-bearing communities of the Niger Delta region. The social and environmental costs include extensive destruction of wild-life and biodiversity, loss of soil fertility, air and water pollution, among others. The study recommended more government investments in the sustainable development of the region.

3.0 METHODOLOGY

The Ex post facto research design is considered appropriate and adopted for this research. In addition, the survey method is used to sample the opinions of members of households in the oil- and gas-bearing communities of Umuorie, Owaza, Umuokwor/Obiga and Uzuaku/Imo River communities of Ukwa West Local Government Area of Abia State on the impacts of oil and gas production operations on the livelihoods of households in the study area. Furthermore, the sustainable livelihood approach (SLA) was used to gather, supplement and or cross-check the authenticity of data collected through the use of the questionnaire.

The SL methodology was used by Morse, McNamara and Acholo (2009) to study the likely effects, on households' livelihoods, of changes which the Diocesan Development Services (DDS) – a Catholic Church development agency – proposed to introduce to its micro-credit scheme in Ekwuloko and Edeke both in Igalaland, Kogi State, Nigeria. Specifically, the SLA, as used in this study, focused only on the use of: interviews (based on semi-structured questionnaire), individual (one-on-one) discussions, focused group discussions (FGD) and physical observation (see-it-yourself).

The purposive sampling technique was adopted to select four oil- and gas-bearing communities in Ukwa West Local Government Area of Abia State. The purposive sampling technique is a non-probability sampling technique adopted when the elements or members to be included as samples possess a unique characteristic(s) which distinguishes them from other members of the population. The researcher, thus, selects the items 'purposely' because they possess this unique characteristic thereby avoiding the probability of not selecting them if a probabilistic sampling technique was to be adopted. In this case, the four oil-bearing communities of Umuorie, Owaza, Umuokwor/Obiga and Uzuaku/Imo River were selected purposely because FDI-induced oil and gas production operation take place within the confines of their frontiers. Thereafter, a simple random sampling technique was used to select respondents from each of these communities to include in the sample population for the purpose of the questionnaire administration.

Based on the Taro Yamane (1967) formula, a sample size of 392 was determined which was subsequently distributed among the four study communities using the Bourley (1988) proportional allocation formula according to their respective

populations. Two types of data were collected for this study. These are: discrete data (including data on oil and gas installations such as oil wells, pipelines, among others) and continuous data (examples include data on quantities of crude oil produced and exported, volume and value of FDI inflow). Additionally, published and unpublished secondary sources including publications by the NNPC, CBN, OPEC, World Bank and UNCTAD, among others, were also used to gather data for the study.

4.0 DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

The findings from this study have clearly shown that FDI, through the operations of oil and gas companies in the study area, have impacted greatly on the sustainable livelihoods of households in the host-communities. For instance, there has been a gradual but steady decline in farm crop yield, resulting to a 38-percent decline in crop yield between 1970 and 2014. Consequently, household incomes have plummeted, thus, intensifying poverty levels in the study area. The problem is made worse by the fact that 66 percent of the people are farmers and fishermen who depend on land and its resources to earn a living sustainably (Ibekwe, 2016).

This fall in crop yield is attributed to the loss of soil fertility resulting from the frequent oil spill incidents and incessant gas flaring that have continued to take place in the oil-bearing communities of the study area. About 64 oil spill incidents with a total of about 5, 424 barrels of crude oil, were reported and investigated by the Joint Investigation Team (JIT) between 2011 and early-2015 in Umuorie, Owaza, Umuokwor/Obiga and Uzuaku/Imo River communities (Table 1). The JIT is composed of representatives of the host community, Department of Petroleum Resources (DPR), National Oil Spill Detection and Response Agency (NOSDRA), State Ministry of Environment (SME), Nigeria Police Force (NPF) and Oil company (in this case, SPDC).

Table 1: Recent oil spill incidents in the study area, 2011-2015

Year	Qty Spilled 0-20 bbl	Qty Spilled 21-100 bbl	Qty Spilled > 100 bbl	Number Total Spill of Spills	Spill Qty (Barrels)
2011	13	1	4	18	1,453.95
2012	16	5	4	25	2,072.54
2013	9	2	5	16	1,257.50
2014	3	0	1	4	354.80
2015	2	0	0	2	6.00
Total	42	8	14	64	5,424.32

Source: SPDC. (2015). Oil Spill Data: Historical spill incident data 2011-2015: Author's Compilation, 2015.

The continuous flaring of associated gas (AG) has contributed to the environmental pollution of the area as poisonous deposits settle on water bodies and circulate in the air. The heat from these flares also is responsible for the destruction of vegetation and crops several kilometers from the flare points as well as the killing of micro organisms in the soil around flare sites (Ndubuisi & Asia, 2007). The flares also contribute to bad health conditions of the people as they inhale these poisonous fumes and drink affected water. In total, gas flaring results to low agricultural productivity and fish catch causing the lowering of incomes of rural people as well as incidents of acid rain.

Thus, oil spillage and gas flaring have been held majorly responsible for the livelihood challenges of households in the study area. These malaises are partly the direct consequences of the character and profile of the technology presently deployed by oil companies for their operations in the area. It is confirmed that this technology is old, out-dated and pollution-intensive. The pipelines are narrow in diameter and have been in use for periods longer than their expected useful life spans, having been laid between the 1960s and 1980s, leading to frequent corrosion and rupture (Adelana, Adeosun, Adesina & Ojuroye, 2011).

Moreover, parcels of farmlands have been appropriated by oil companies, with the active support of the Nigerian state through the enactment and enforcement of relevant laws, for the installation of crude oil exploration and production equipments and facilities. This includes lands acquired for right of way (RoW) which prohibits entry by members of the community into a piece of land covered by an oil prospecting and exploratory license up to but not exceeding 30.48 meters from the boundaries of the land or any part thereof (Oil Pipeline Act, 1956, as amended). This law remains in force even after the oil company had ceased operations in the community and provided the license has not been revoked. Thus, the people have been alienated from their land leading to the inefficient and unsustainable use of remaining resources and poor land-use practices (UNEP, 2011).

Despite these however, FDI-induced oil and gas production operations have impacted the sustainable livelihoods of households in the oil- and gas-bearing communities positively. This has been achieved through the provision of basic educational facilities like primary and secondary school buildings, learning and teaching aids as well as science laboratories, desks and chairs for the pupils, books and other facilities and equipments. Annually, scholarship awards are given to deserving indigenes of Umuorie, Owaza, Umuokwor/Obiga, Uzuaku/Imo River and other communities within the bounds of Ukwu West Local Government Area, and, in-fact, within the bounds of Abia State generally. The health sector has also benefitted from the presence of FDI-led activities in the area. For example, there is a fully-equipped hospital constructed and built by SPDC in Owaza but manned by government-employed and paid personnel. The hospital is one of the initial five centres for the SPDC-initiated Niger Delta Aids Response (NiDAR) project which is in collaboration with Family Health International, FHI (now FHI360) and implemented with several other partners.

Furthermore, the company has contributed enormously to community-driven development of the host-communities through the instrumentality of the Global Memorandum of Understanding (GMOU) introduced by the company in 2006. SPDC and its JV partners in the study area have also provided direct and indirect employment opportunities to members of the communities. Moreover, the payment of compensation for land acquired for oil production purposes by oil companies in the area, though often seen as unsatisfactory and inadequate by members of the oil-bearing communities, has also contributed significantly to sustainable livelihoods in these communities. These funds have been utilized by beneficiaries for the education and training of household members to

acquire skills necessary for sustainable livelihood. The monetary compensations have also enabled households to divert to other sources of earning a living.

FDI and sustainable livelihood indices in the study area

Tables 2-5 show the relationship between FDI and the indices of sustainable livelihood used for this study. For example, Table 2 shows the disaggregated annual inward FDI to Umuorie community for 15 years from 2000 to 2014. The highest volume of inward FDI to Umuorie in the 15-year period of more than US \$4.3 million was recorded in 2011 while the lowest amount of FDI into the community of US \$0.56 million was in 2000. It is important to point out that the flow of FDI into these communities was in terms of investments in oil production equipments and related installations. The table shows also employment opportunities – both direct and indirect – created by FDI in this community for the same period. The impact of these investments on crop yield, farm income of households, educational opportunities in terms scholarships awarded by the oil companies as well as their contributions to the health status of members of the community are equally highlighted. Similar information can be distilled from Tables 3 to 5 for Owaza, Umuokwor/Obiga and Uzuaku/Imo River communities of the study area.

Test of the hypothesis

H₀: FDI in the oil and gas industry in Nigeria have not significantly impacted on the sustainable livelihoods of households in the oil- and gas-bearing communities of Abia State, Nigeria.

H₁: FDI in the oil and gas industry in Nigeria have significantly impacted on the sustainable livelihoods of households in the oil- and gas-bearing communities of Abia State, Nigeria.

The hypothesis was tested using the multiple regression technique and based on data in Tables 2 to 5.

Table 6 shows that at 0.05 level of significance, at degrees of freedom 5 and 384, the critical F-ratio is 2.23. The calculated F-ratio is 17.147 with significance value of 0.000. Since the calculated F-ratio is greater than the critical F-ratio and the significance value less than 0.05 significance level used for this study, the null hypothesis is rejected. Therefore, the alternate hypothesis is accepted – that is, FDI in the oil and gas industry in Nigeria have significantly impacted on the sustainable livelihoods of households in the oil- and gas-bearing communities of Abia State, Nigeria. The independent variables show a composite effect on the dependent variable with correlation coefficient, R, of 0.427 and coefficient of multiple determination, R², of 0.183 or 18.3 percent. This means that 18.3 percent of the variation in sustainable livelihoods of households in the study area is accounted for by the variation in the FDI variables of oil well, oil and gas fields and so forth. It is therefore seen that FDI in oil and gas industry in terms of oil wells, oil and gas fields, gas compressor stations, flow stations and pipelines have significantly impacted the sustainable livelihoods of households in oil and gas bearing communities in Abia State.

Table 2: FDI and sustainable livelihood indices in Unmanned Community in the study area

Community Year	FDI (USD/Year)	Empl. Opp.	Crop Yield	Farm Inc.	Health Status	Edu. Opp.		
		(No.)	(kg)	(% of Farm Inc)	(No. of Patients)	(Scholarship)		
Unmanned	2000	560.9	1	3	360	26.00	0	1
	2001	538.5	1	3	360	26.60	0	0
	2002	921.0	0	1	365	27.95	0	0
	2003	936.5	0	0	320	26.30	0	2
	2004	921.0	1	0	350	26.20	0	2
	2005	1,451.0	0	2	300	26.20	40	0
	2006	2,000.0	0	1	300	22.8	90	1
	2007	2,050.0	0	2	300	22.0	20	1
	2008	1,032.0	1	2	270	20.7	24	0
	2009	1,100.1	1	0	270	20.7	28	0
	2010	1,276.1	0	0	255	20.25	27	0
	2011	1,276.1	0	0	255	20.25	27	1
	2012	3,206.5	0	2	255	20.25	17	1
	2013	2,000.0	1	0	240	20.4	20	1
	2014	2,000.0	0	2	240	20.4	20	1
Total	20,529.0	7	23	4,440.0	405.4	22.9	21	

Source: (i) Author's Field Work and Computation, 2015 (ii) Index Manual, Nigeria - Foreign Direct Investment

Table 5: Multiple regression analysis of the impact of HDI on sustainable livelihood of households in the oil and gas mining areas within a study area

Source of Variation	SS	df	MS	F	Sig.
Regression	29.109	5	5.822	17.117	0.000 ^a
Residual	130.351	354	0.340		
Total	159.460	359			

^a. Predicted Variable: Sustainable Livelihood

^b. Dependent Variable: Sustainable Livelihood

^c. Predictors: (Constant), Pipelines, Oil and gas field, Gas compressor stations, Oil wells, Flow stations

Variables	Nonstandardized Coefficients		t	Sig.
	B	Std. Error		
(Constant)	3.584	0.125	28.261	0.000
Oil wells	-0.083	0.028	-2.973	0.003
Oil and gas fields	-0.064	0.025	-2.422	0.016
Gas compressor stations	0.068	0.020	3.376	0.001
Flow stations	0.052	0.025	2.319	0.017
Pipelines	0.126	0.014	8.779	0.000

^a. Dependent Variable: Sustainable Livelihood

Table 3: FDI and sustainable livelihood indices in Unmanned Community in the study area

Community Year	FDI (USD/Year)	Empl. Opp.	Crop Yield	Farm Inc.	Health Status	Educational Opp.		
		(No.)	(kg)	(% of Farm Inc)	(No. of Patients)	(Scholarship)		
Unmanned	2000	26,943.8	5	3	280	26.0	0	2
	2001	27,610.3	0	2	260	26.0	0	1
	2002	43,705.1	0	8	260	26.0	0	1
	2003	49,294.5	7	1	245	20.95	13	7
	2004	43,705.1	1	1	245	20.95	0	5
	2005	126,420.0	1	4	210	21.00	100	0
	2006	141,110.9	7	6	145	14.50	94	13
	2007	191,002.9	0	2	200	20.00	110	0
	2008	144,440.5	13	5	210	21.00	90	7
	2009	141,002.9	0	0	270	20.7	104	1
	2010	106,627.5	3	1	270	20.7	105	0
	2011	106,627.5	2	4	240	20.4	107	2
	2012	191,002.9	1	5	225	21.75	95	3
	2013	112,664.5	5	4	225	21.75	111	3
Total	1,706,551	22	57	1,835	227.1	19.24	21	

Source: (i) Author's Field Work and Computation, 2015 (ii) Index Manual, Nigeria - Foreign Direct Investment

Table 4: FDI and sustainable livelihood indices in Unmanned/Obige in the study area

Community Year	FDI (USD/Year)	Empl. Opp.	Crop Yield	Farm Inc.	Health Status	Educational Opp.		
		(No.)	(kg)	(% of Farm Inc)	(No. of Patients)	(Scholarship)		
Unmanned/Obige	2000	200.4	0	1	360	26.0	0	0
	2001	202.7	0	0	240	20.4	0	0
	2002	261.0	11	0	245	20.95	0	13
	2003	293.0	1	0	240	20.4	0	0
	2004	261.0	0	0	230	20.30	0	1
	2005	1,230.0	0	1	210	21.00	24	1
	2006	1,194.1	0	0	200	20.00	10	0
	2007	1,404.0	0	0	200	20.00	14	0
	2008	2,016.5	0	0	270	20.70	14	0
	2009	1,164.0	2	0	220	22.00	19	0
	2010	1,455.1	0	0	255	20.25	17	1
	2011	1,170.1	0	0	240	20.40	21	0
	2012	1,753.3	0	1	240	20.40	5	0
	2013	1,170.0	1	1	245	20.95	7	7
	2014	1,104.7	0	1	210	21.00	11	1
Total	13,964.3	4	3	4,440	405.4	20.8	0	

Source: (i) Author's Field Work and Computation, 2015 (ii) Index Manual, Nigeria - Foreign Direct Investment

Table 5: FDI and sustainable livelihood indices in Unmanned/Obige/Obige in the study area

Community Year	FDI (USD/Year)	Empl. Opp.	Crop Yield	Farm Inc.	Health Status	Educational Opp.		
		(No.)	(kg)	(% of Farm Inc)	(No. of Patients)	(Scholarship)		
Unmanned/Obige/Obige	2000	200.7	2	0	290	29.0	0	2
	2001	200.0	1	2	290	29.0	0	1
	2002	471.0	7	1	245	20.95	0	1
	2003	270.7	0	1	245	20.95	0	13
	2004	270.7	0	0	245	20.95	0	4
	2005	1,474.7	1	0	210	21.00	25	7
	2006	1,350.7	2	0	245	20.95	26	1
	2007	1,350.7	0	0	215	21.50	15	0
	2008	1,770.0	2	1	270	20.70	24	1
	2009	1,230.1	1	2	220	22.00	15	0
	2010	1,074.1	2	2	270	20.70	19	7
	2011	1,230.1	1	4	270	20.70	21	0
	2012	3,206.5	1	2	240	20.4	15	4
	2013	1,170.0	7	0	245	20.95	20	13
	2014	1,200.1	0	0	240	20.4	20	0
Total	22,620.0	27	22	4,470	450.4	20.1	22	

Source: (i) Author's Field Work and Computation, 2015 (ii) Index Manual, Nigeria - Foreign Direct Investment

Table 6: Model Summary

Model	R	Adjusted R Square	Minimum Variance Inflation Factor	Maximum Variance Inflation Factor
1	0.825	0.815	1.171	1.5525

^a. Predictors: (Constant), Pipelines, Oil and gas field, Gas compressor stations, Oil wells, Flow stations

On the other hand, Table 8 shows the relative contribution of each of the independent variables to the sustainable livelihoods of households in the study area. Oil well shows a significant t-value of -2.973 (p= 0.003<0.05); Oil and gas field also shows negative significant t-value of -2.422 (p = 0.016<0.05). Gas compressor station shows a positive significant t-value of 3.376 (p =0.001<0.05). Flow station shows a negative t-value of -2.319 (p = 0.017<0.05) Pipelines show a positive t-value of 5.279 (p=0.000<0.05).

Table 8: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	29.109	5	5.822	17.117	0.000
Residual	130.351	354	0.340		
Total	159.460	359			

^a. Dependent Variable: Sustainable Livelihood

^b. Predictors: (Constant), Pipelines, Oil and gas field, Gas compressor station, Oil well, Flow Station

The regression model as deciphered from Table 9 is given as:
y = 3.584 – 0.083x1 – 0.064x2 + 0.068x3 – 0.062x4 + 0.126x5 + e
where:

- y = Sustainable Livelihood
- x1 = Oil Wells
- x2 = Oil and Gas Fields
- x3 = Gas Compressor Stations
- x4 = Flow Stations
- x5 = Pipelines

It is obvious from this model that the variation in the sustainable livelihoods (y) of households in the oil-bearing communities of Ukwu West LGA, Abia State, is accounted for by the variation of -8.3 percent in oil wells, -6.4 percent in oil and gas fields, 6.8 percent in gas compressor stations, -6.2 percent in flow-stations and 12.3 percent in pipelines. This means that oil wells, oil and gas fields and flow-stations exert negative influence on the sustainable livelihoods of households in the oil-bearing communities. On the other hand, gas compressor stations and pipelines have a positive impact on sustainable livelihoods of households in the area. Predictively, this can be expected to be replicated, under same or similar conditions in oil- and gas-bearing communities in Nigeria.

5.0 RECOMMENDATIONS

- i. The immediate cessation of gas flaring through the strict enforcement of the extant laws in respect of gas flaring in Nigeria. Gas flaring has been prohibited in Nigeria by the Associated Gas Reinjection Act, 1979 (as amended in 1984) and became operational in 1984. Section 3 allows companies to flare gas only if they have permission duly issued by the Minister of Petroleum Resources relating to specifically-mentioned oil field(s).
- ii. The urgent and effective clean-up of contaminated and oil-impacted soils, not only in the study area but the whole of the Niger Delta region.
- iii. Environmentally-friendly and pollution-reducing technologies should be deployed by oil and gas companies operating in Nigeria. This can be achieved through the processes of technology leapfrogging and transfer.
- iv. The government, through her agencies (NOSDRA, NESREA, among others) should ensure that environmental sensitivity index (ESI) mapping is prepared proactively wherever the oil companies are in operation. More importantly, an ESI mapping should be timely and regularly prepared by oil companies operating in the study area whenever there is an oil spill incident.
- v. The government, in concert with the oil companies and other stakeholders should implement a water-sanitation-hygiene programme in the study area. Such a programme should be patterned after the World Health Organization/United Nations International Children Emergency Fund (WHO/UNICEF) Water-Sanitation-Hygiene (WASH) programme and intended to reduce, if not eliminate, the challenges associated with the contamination of surface and underground water.

6.0 CONCLUSION

Evidence from this study has clearly demonstrated that FDI in the oil and gas industry in Nigeria has failed to ensure the sustainability of the livelihoods of households in the study area despite the enormous contribution to the socio-economic advancement of the country. The failure of FDI to trigger off the transfer and diffusion of clean, low-carbon and environmentally-friendly technology to the Nigerian oil industry explains, partly, the frequency of oil spill incidents and the incessant flaring of associated gas in the host-communities. These have impacted negatively on soil fertility

and water resources in the area resulting in persistent decline in farm yield and fish catch. Consequently, these have exacerbated the conditions of poverty, impoverishment and vulnerability that characterize the daily livelihood experiences of the people of the oil-bearing communities of Ukwu West Local Government Area of Abia State.

Table 5. OLS Results*

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.581	0.118		30.351	.000
Oilwell	-0.083	0.026	-.074	-2.975	.003
Oil and gas field	-0.064	0.026	-.071	-2.407	.016
Gas compressor station	0.068	0.020	.077	3.408	.001
Flow station	-0.062	0.020	-.073	-3.019	.002
Pipeline	0.123	0.024	.087	5.074	.000

* Dependent Variable: Sustainable livelihood

REFERENCES

- [1] Adelana, S.O., Adeosun, T.A., Adesina, A.O. and Ojuroye, M. O. (2011). Environmental pollution and remediation: challenges and management of oil spillage in the Nigerian coastal areas. *American Journal of Scientific and Industrial Research*, 2 (6), 834-845.
- [2] Agosin, M. (2008). Does foreign investment lay a foundation for economic growth? In Gallagher, K.P., Porzecanski, R., Lopez, A., & Zarsky, L. (eds.) (2008). *Foreign investment and sustainable development: Lessons from the Americas*. Washington, Heinrich Bell Foundation: Report of the Working Group on Development and the Environment in the Americas.
- [3] Amin, S. (1997). *Capitalism in the age of globalization*. London: Zed Books.
- [4] Amnesty International. (2009). *Nigeria: petroleum, pollution and poverty in the Niger Delta*. London: Amnesty International.
- [5] Andrew-Essien, E.E. (2006). Conflicts and controls in protected area management: A study of the Cross River National Park, Nigeria. *Unpublished Ph.D thesis*, University of Calabar.
- [6] Anowor, O.F., Ukwani, N.O., Ibiam, F.O. and Ezekwem, O.S. (2013). FDI and manufacturing sector growth in Nigeria. *International Journal of Advanced Scientific and Technical Research*, Issue 3, (5).
- [7] Asiedu, E. (2006). Foreign direct investment in Africa: The role of government policy, institutions and political instability. *World Economy*, 29 (1), 63-77.
- [8] Asiedu, E. (2013). Foreign direct investment, natural resources and institutions. London: The International Growth Centre. *Working Paper*.
- [9] Bezuidenhout, H. and Naude, W. (2008). Foreign investment and trade in the Southern African Development Community. *UNU – WIDER Research Paper No. 2008/88*.
- [10] Chudnovsky, D. and Lopez, A. (2008). Foreign investment and sustainable development. In Gallagher, K.P.,

- Porzecanski, R., Lopez, A., and Zarsky, L. (eds.) (2008). *Foreign investment and sustainable development: Lessons from the Americas*. Washington, Heinrich Bell Foundation: Report of the Working Group on Development and the Environment in the Americas.
- [11] Department of Petroleum Resources, DPR (2015). Oil statistics – upstream. Retrieved on October 20, 2015 from: <http://www.dpr.gov.ng/index/statistics/>
- [12] Gallagher, K. P. and Zarsky, L. (2003). Searching for the holy grail? Making FDI work for sustainable development. *WWF Analytical Paper*.
- [13] Ibekwe, C.E. (2015). FDI and firm level productivity in Nigeria's manufacturing sector (1981 – 2012). *Unpublished B.Sc thesis*, Caritas University, Enugu.
- [14] Ibekwe, I.K. (2016). Appraisal of foreign direct investment in the oil and gas industry for sustainable livelihood in Abia State, Nigeria. *Unpublished Ph.D thesis*, University of Calabar.
- [15] Inoni, O. E., Omotor, D. G. and Adun, F. N. (2006). The effect oil spillage on crop yield and farm income in Delta State, Nigeria. *Journal of Central European Agriculture*, 7 (1), 41-48.
- [16] International Monetary Fund, IMF. (1993). *Balance of Payments Manual: Fifth Edition*. Washington: International Monetary Fund, IMF.
- [17] Joint Investigation Report, JIT. (2012). Joint investigation report for incident no.: 0532 907485 dated 22 December, 2012.
- [18] Kadafa, A.A.(2012). Oil exploration and spillage in the Niger Delta of Nigeria. *Civil and Environmental Research*, vol. 2 (3), 38-51.
- [19] Kato, G.K. (2011). Shell Oil Company in Nigeria: Impediment or catalyst of socio-economic development? *African Journal of Social Sciences*, 1 (1), 15-36.
- [20] Milieudefensie-Friends of the Earth. (2012). Oil spills in the Niger delta in Nigeria. Retrieved on May 30, from: <https://milieudefensie.nl/publicaties/factsheets/oilspills-in-the-niger-delta>.
- [21] Morse, S., McNamara, N. and Acholo, M. (2009). Sustainable livelihood approach: a critical analysis of theory and practice. *University of Reading: Geography Paper No. 189*.
- [22] National Bureau of Statistics, NBS. (2010). Nigeria – Harmonised Nigeria Living Standards Survey. Retrieved on 20 August, 2015, from: <http://www.nigerianstat.gov.ng/pdfuploads/HARMONIZED%20NIGERIA%20LIVING%20STANDARD%20SURVEY%202009%20Part%20A.pdf>
- [23] Ndubuisi, O.L. and Asia, I.O. (2007). Environmental pollution in oil producing areas of the Niger Delta basin, Nigeria: empirical assessment of trends and people's perception. *Environmental Research Journal*, 1 (1-4), 18-26.
- [24] Niger Delta Environmental Survey, NDE. (1999). Niger delta environmental survey: Environmental and socio-economic characteristics. Phase 1 report, vol. 1. Lagos: Environmental Resource Managers Ltd.
- [25] Nigerian National Petroleum Corporation (NNPC). (2012). *Annual statistical bulletin*. Abuja, Nigeria.
- [26] Olokoya, F.O. (2012). Foreign direct investment and economic growth: A case of Nigeria. *BVIMSR'S Journal of Management Research*, 4 (1).
- [27] Onwuka, E.C. (2005). Oil extraction, environmental degradation and poverty in the Niger Delta region of Nigeria: a viewpoint. *International Journal of Environmental Studies*, 62 (6), 655-662.
- [28] Organization for Economic Co-operation and Development, OECD. (2002). Foreign direct investment for development, maximizing benefits. Minimizing costs. *OECD Policy Brief*. Paris, France.
- [29] Osuji, L.C. and Nwoye, I. (2007). An appraisal of the impact of petroleum hydrocarbons on soil fertility: the Owaza experience. *Africa Journal of Agricultural Research*, 2 (7), 318-324.
- [30] Sackey, F.G., Compah-Keyeke, G. and Noah, J. (2012). FDI and economic growth in Ghana. *Journal of Economics and Sustainable Development*, 3 (10).
- [31] Salako, A., Sholeye, O. and Ayankoya, S. (2012). Oil spills and community health: Implications for resource limited settings. *Journal of Toxicology and Environmental Health Sciences*, 4 (9), 145-150.
- [32] Shell Petroleum Development Company, SPDC. (1996). People and the environment. *SPDC Annual report, 1996*.
- [33] Shell Petroleum Development Company, SPDC. (2007). The Shell sustainability report, 2006: Meeting the energy challenge. Retrieved on January 30, 2015 from: <https://www.unglobalcompact.org/system/attachments/1914/original/COP.pdf?1262614296>.
- [34] Simon, M.K. and Goes, J. (2013). Dissertation and scholarly research: Recipes for success. Retrieved on May 30, 2015 from: www.dissertationrecipes.com
- [35] Udoudoh, F.P. (2011). Oil spillage and management problems in the Niger Delta, Nigeria. *Journal of Environmental Management and Safety*, 2 (3), 137-155.
- [36] Ugochukwu, C.N.C., and Ertel, J. (2008). Negative impacts of oil exploration on biodiversity management in the Niger Delta area of Nigeria. *Impact Assessment and Project Appraisal*, 26 (2), 139-147.
- [37] United Nations Conference on Trade and Development, UNCTAD. (1999). *World investment report 1999: Foreign direct investment and the challenge of development*. New York and Geneva: UNCTAD.
- [38] United Nations Development Programme, UNDP. (2006). *Niger delta human development report*. Abuja, Nigeria: UNDP
- [39] United Nations Environment Programme, UNEP. (2011). *Environmental Assessment of Ogoniland*. Nairobi, Kenya: UNEP.
- [40] United States Energy Information Administration. (2013). Nigeria. Retrieved on August 15, 2014, from: www.eia.gov/
- [41] Zarsky, L. (1999). Havens, halos and spaghetti: Untangling the evidence about FDI and sustainable development. In OECD. (1999). *FDI and the environment*. Paris: OECD.
- [42] Zarsky, L. and Gallagher, K.P. (2008). Sustainable FDI in Mexico's IT sector: Missing links, dashed hopes. In Gallagher, K.P., Porzecanski, R., Lopez, A., and Zarsky, L. (eds.) (2008). *Foreign investment and sustainable development:*

Lessons from the Americas. Washington, Heinrich Bell Foundation: Report of the Working Group on Development and the Environment in the Americas.

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