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Akintoye, Oluyemi Ayorinde, Olorundami, Tokunbo, Nkpena, Charles Ojong, Ubong, Edet Harrison, Ukata, Sammy Uka, Remi, Omoogun, Fakoya, Adeoti Folashade, Akintoye, Taiwo Adesola, Ukata, Freeda Samuel, Onuoha, Edwin, Effiong, Ekei, Agbo, Yvonne Nkan, Ekunmakama, Destiny Chidinma, Odungide, Eno Willy and Ejuno, Mercy Oka (2024) A Retrospective Assessment of the Nigeria Liquefied Natural Gas Project andHousehold Members' Employment in Bonny Local Government Area,Rivers State. Journal of Environmental and Tourism Education, 7 (2). pp. 397-420.

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Journal of Environmental and Tourism Education Vol. 7 No. 2 (Special Edition) September 2024
Vol. 7 No. 2 (Special Edition) September 2024
JOURNAL OF ENVIRONMENTAL AND TOURISM EDUCATION
ISSN: 2659-0794 (PRINT) ISSN:2659-0808(ONLINE)
Content Available at: https://jeate.net/index.php/Jete/issue/archive

A Retrospective Assessment of the Nigeria Liquefied Natural Gas Project and Household Members' Employment in Bonny Local Government Area, Rivers State

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Keywords:
Liquefied Natural Gas, Niger Delta Area, Socio-economic, Employment

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Abstract

This 2012 study used a survey approach, applying random sampling method, to assess the contributions of Nigeria Liquefied Natural Gas (NLNG) project to household income, in comparism to other donors . The study also focused on NLNG's contributions to employment as well as gained insights into the contributions of other employers.With a The questionnaire used was verified and has a Cronbach Alpha internal consistency of 0.81. A total of 2,167 questionnaires were distributed to household heads, of which 1,980 (91.4%) were well-filled and analyzed. The findings indicate that income from petroleum companies, including NLNG and other petroleum resources developing companies,

	form a substantial proportion of household income, though there exists no significant variation in total household income ($p>0.05$). Considerable funds were received from family members outside the study area. Interview responses revealed NLNG's major contribution lies in vocational training programs, in addition to joint initiatives with other industry players. Correspondence Analysis tables from 1993, 1995 and 1996, and graphs from 1995, 1996, 1997 and 1998 illustrated the direct and indirect employment impacts of individual sectors on employment provision in the study. NLNG was also shown to have made considerable efforts at provision of trainings, scholarships and agricultural inputs. The study discovered that high expectations may have been placed on petroleum companies for local development, while government contributions at local, state, and federal levels remain limited. Recommendations were provided to address the observed problems.

Introduction

It is an axiom, that the Nigeria Liquefied Natural Gas (NLNG) project has significantly influenced the economic and social landscape of Nigeria, particularly in Bonny Island, Rivers State. It is widely believed that, since its establishment, the NLNG has not only boosted Nigeria's position in the global liquefied natural gas (LNG) market but has also played a crucial role in local employment generation as Nigeria faces persistent unemployment challenges, especially among the youth, the importance of understanding the contributions of resource exploring and exploiting institutions in Nigeria. Gaining insights into the contributions for instance of the NLNG to job creation in the region cannot be overstated (Akintoye et al, 2016; Ibrahim & Uche, 2021; Okoro & Abah, 2023). While there are diverse opinions about the socio-economic, and especially Corporate Social Responsibility (CSR) efforts of the NLNG Ltd, Akintoye (2014) has notably indicated, that the NLNG project has performed comparatively well, compared to other organizations in CSR-related activities, especially in the provision of seral developmental facilities in the Bonny LGA. Research has indicated that large-scale industrial projects like the NLNG can create a multitude of jobs directly and indirectly, enhancing the livelihoods of local communities (Adeyemi et al., 2022; Eze et al., 2020). The development of NLNG has reportedly generated thousands of jobs,

not only within the plant itself but also in related sectors, thereby stimulating local economies (Nwogbo et al., 2024; Okwu et al., 2022). Moreover, this project has prompted investment in infrastructure and services, further benefiting the local population (Chukwu & Nduka, 2023; Solomon & Ihenacho, 2022). However, questions remain unanswered, regarding the sustainability and quality of these employment opportunities, where at all they are adequately provided. It is assumed, that while NLNG has contributed to job creation, issues such as job security, wage levels, and skill mismatches within the local workforce present ongoing challenges (Akinyemi & Olufemi, 2021; Onwuegbuchunam & Eze, 2023).

A comprehensive analysis of these factors is necessary to assess the overall impact of NLNG on employment in Bonny Island. According to O'Rourke and Connolly (2003) because of the massive oil exploration in the Niger Delta, the ramifications for human health, local culture, indigenous self-determination, and the environment are severe. As is the case in most oil-producing regions of less developed countries, the economic and political benefits are given significantly more weight by the government, than the resulting damage to the environment and human health.

Surprisingly, employees of the NLNG have often reported lower incidences of diseases, whereas Indigenous residents face higher health challenges. This disparity underscores the need to explore socio-economic determinants influencing health in the area, including environmental factors and access to healthcare (Chukwu & Nduka, 2023; Mbah & Eze, 2024).These arguably, are strongly correlated with types of employment, total household income, and nutrition levels. Could NLNG and other multi-national staff, since they are better paid andable to benefit from better health care and nutrition). Chukwu & Nduka, 2023; and Mbah &Eze, 2024, have also indicated that local employment not only boosts economic resilience but also contributes to improved health outcomes in communities. Rationally, the NLNG should not be saddled with the sole responsibility of developing the study area. There are also other multinationals and Nigerian companies operating in the area. Others are local, state, and federal governments that collect tax and royalties from workersand companies respectively. What are the levels of contributions of these to employment, compared to that of the NLNG Ltd, despite commendations of the NLNG project by Akintoye (2014)

Based on the foregoing, this research is designed, to investigate the complex issues surrounding employment provision and disparities in Bonny Island, particularly in the context of the Nigeria Liquefied Natural Gas (NLNG) project. Despite the potential economic opportunities presented by NLNG and other petroleum-related companies, either Indigenous or non-indigenous, to the local populations, the population has continued to face significant challenges, which impede their socioeconomic well-being. This study is further, mandated by the noticeable fact that a substantial portion of the local workforce remains unemployed or underemployed, raising questions about the efficacy of local content policies and the actual job creation capabilities of the petroleum sector (Ibrahim et al., 2021; Adeyemi & Ibe, 2022).

The study is also very important since there are high levels of dissatisfaction regarding land acquisition and compensation practices that have bred distrust within the community. This skepticism can affect the effectiveness of engagement strategies between NLNG management and local populations (Okoro & Abah, 2023; Nwogbo et al., 2024).

Study Area

The study area is Bonny Local Government Area (LGA). It includes the whole of Bonny Island and the mainland area of Rivers State. It is located, about 40 kilometres to the South eastern part of Port Harcourt, which is the state capital. The Nigeria LNG project site is located on Bonny Island, especially around Old Finima. It is located on the outer southern section of the Niger Delta complex. Bonny Island is a trapezoid-shaped landmass with the following coordinates: North-westward; Latitude 4o33'N and Longitude 7o08' E: North eastward; Latitude4o 30'N and Longitude 7o 20' E: South westward; Latitude 4 o 22'N and Longitude 7 o 20' E; South westward Latitude; 4 o 22 'N and Longitude 7 o 08' E (Joint Industry Company,2002).

Figure 1 displays, a map of Rivers State Showing Bonny Local Government Area, while plate 1 shows the NLNG complex at Old Finima, on Bonny Island (Akintoye, 2014). Apart from Bonny Island, the other areas enclosed within the boundary of Bonny L.G.A include part of the mainland of Rivers State. Thus, the total land area for Bonny Island is about 250 square kilometers, while the mainland area totals about 200 square kilometers. This means that the study area, Bonny Local Government Area (LGA), encompasses Bonny Island and a portion of the mainland in Rivers State, Nigeria.

Geologically, Bonny LGA exhibits characteristics similar to the Niger Delta region, featuring a coastal alluvial plain estimated to be around 500,000 years old. The stratigraphy of Bonny Island reveals various soil types at different depths, including silty, clayey sand, and coarse sand, indicative of complex sedimentary processes. The Niger Delta comprises two major formations: the low-lying delta proper and the higher inland plateau composed mainly of Miocene-Pleistocene sediments derived from crystalline bedrocks.

Bonny Island experiences two distinct seasons: a wet season with heavy rainfall averaging over 4,000 mm annually, lasting about 330 days, and a dry season. Temperatures typically exceed 23°C, with a long-term average of around 28°C. The area experiences predominantly southwest and westerly winds.

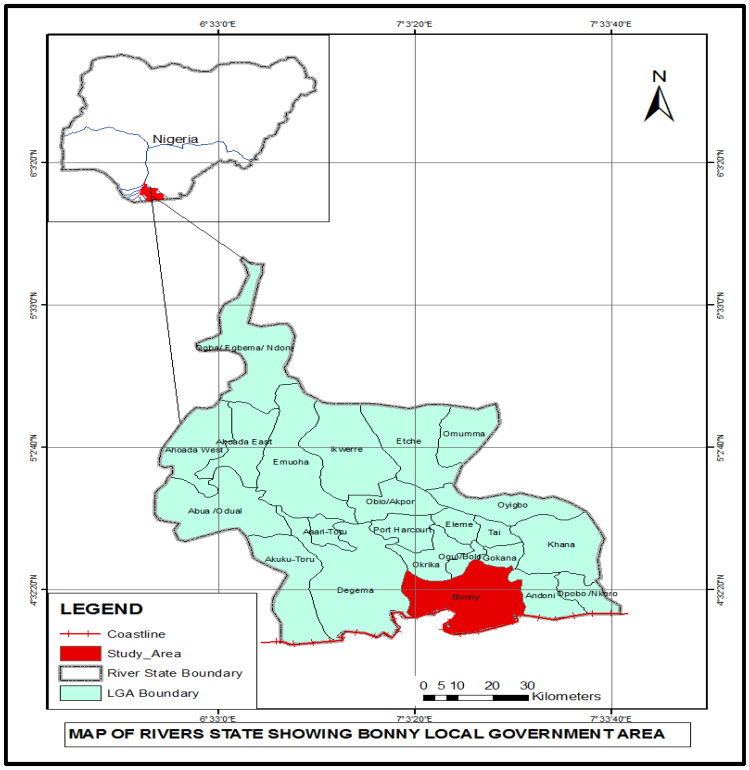


PLATE 1: The Nigeria Liquefied Natural Gas Project Complex

Source: GIS Laboratory, Dept of Geography and Environmental Management University of Port Harcourt, Port Harcourt (2010).

Air quality on Bonny Island is generally good, despite some industrial activities contributing to air pollution. Monitoring indicates that pollutants are present at low concentrations compared to national and international standards. Mangrove forests and coastal vegetation primarily cover the area, with some degradation attributed to industrial developments like the NLNG plant (Akintoye, 2014).

Fishing remains the predominant socio-economic activity, supplemented by small-scale agriculture, including crops such as cassava and yam. The discovery of oil and gas has diversified local economic activities, enhancing the island's economic importance. Civil service roles and jobs at the NLNG plant have emerged, increasing pressure on accommodation and local services due to an influx of workers and associated businesses. Overall, the dynamics of Bonny LGA highlight the interplay between industrial development, environmental changes, and local socio-economic activities, necessitating careful management to balance economic growth and environmental sustainability. Table 1, shows projected populations, household numbers, and school Population in Bonny L.G.A. In Table 2, the age distribution of sampled respondents in the study area is displayed.

PLATE 1: The Nigeria Liquefied Natural Gas Project Complex

TABLE 1: Projected Population, Household Numbers, and School Population in Bonny Local Government Area

S/N	Variables	2001	2005	2010	2015	2020	2025
	Total						
1	Population*	81,061	89,861	*102,071*	114,697	127,970	140,815
2	Labor camps**	3,500	-	-	-	-	-
3	Households	13,952	15,467	*17,568*	19,741	22,027	24,237
4	Primary	23,346	25,880	*29,395*	33,033	36858	40,555
5	Secondary	8,511	9,435	*10,717*	12,043	13438	14786
6	Labour Force	41,017	45,470	*51,648*	58,037	64757	71252
	Incremental increase over 2001						
7	Population	0	8,800	*21,009*	33,636	46,918	59,754
8	Households	0	1,515	*3,616*	5,789	8,075	10,285
9	Primary	0	2,534	*6,051*	9,687	13,512	17,209
10	Secondary	0	924	*2,206*	3,532	4,926	6,274
11	Labour Force	0	4,453	*10,631*	17,020	23,740	30,235

* Exclude Populations within Labor Camps.
** Includes JIC operators and Temporary Contractors' Compounds
(Based on a 2.83 % annual growth rate, as utilized by the National Population Commission up to 1988).
Source: Joint Industry Companies (2002)

TABLE 2: Age Distribution of Sampled Respondents in the Study Area

S/N	NAMES OF COMMUNITIES	20 TO 30 YEARS		31 TO 45 YEARS		46 TO 50 YEARS		51 YEARS AND ABOVE		SAMPLED FOR THE COMMUNITI	%
		FREQ.	%	FREQ.	%	FREQ.	%	FREQ.	%		
1	FINIMA	56	2.83	103	5.20	44	2.22	18	0.91	221	100
2	BANIGOS	6	0.30	10	0.51	4	0.20	2	0.10	22	100
3	BONNY MAIN TOWN	282	14.24	364	18.38	93	4.70	43	2.17	782	100
4	OGWEDE	4	0.20	6	0.30	2	0.10	2	0.10	14	100
5	ACHAMA	5	0.25	13	0.66	5	0.25	3	0.15	26	100
6	ISHILIONGON	6	0.30	6	0. 30	4	0.20	2	0.10	18	100
7	AGAJA	22	1.11	20	1.01	9	0.45	6	0.30	57	100
8	FINITASINGI	4	0.20	10	0.51	5	0.25	2	0.10	21	100
9	LIGHTHOUSE	9	0.45	6	0.30	4	0.20	6	0.30	25	100
10	JUMBO	6	0.30	4	0.35	5	0.25	4	0.20	22	100
11	PETERSIDE	44	2.22	38	1.92	13	0.66	6	0.30	101	100
12	EPELEMA	7	0.35	11	0.56	1	0.05	1	0.05	20	100
13	DEMA	3	0.15	4	0.20	1	0.05	1	0.05	9	100
14	IYOBA	2	0.10	2	0.10	1	0.05	0	0.00	5	100
15	KALIBIAMA	12	0.61	20	1.01	9	0.45	1	0.05	42	100
16	OLOMA	21	1.06	22	1.11	8	0.40	2	0.10	53	100
17	FIBIRI	4	0.20	9	0.45	4	0.20	3	0.15	20	100
18	KURUMA	66	3.33	67	3.38	28	1.41	6	0.30	167	100
19	ABALAMABIE	53	2.68	58	2.93	33	1.67	18	0.91	162	100
20	AKIAMA	59	2.98	82	4.14	36	1.82	16	0.81	193	100
	TOTALS	671	33.89	858	43.33	309	15.61	142	7.17	1980	100

SOURCE: Researcher's Fieldwork (2012)

Method

The study depended on both primary and secondary data. The collection was adopted. Interviews and Observations of relevant items, events, processes, and phenomena were equally relevant to this study.

Sample Population

The population of Bonny L.G.A, as of 1991 was 76,412 persons. This population will be 103,581 persons in the year 2001(based on a 2.83 % annual growth rate, as utilized by the National Population Commission up to (1988).

Nevertheless, this appeared to be slightly contentious, based on data presented by Joint Industry Companies (2002) which gives a population of about 85,000 persons in the same year 2001. The Joint Industry Companies (2002), consequently, argued that this is 18 %, less than the projections, based on the 1991 census. This suggests a growth rate of just 1 % or an error in the 2001 census. To avoid these conflicts in population estimates, data in Table 3, shows projected estimated and projected human population in Bonny L.G.A from the year 2001 to 2014.

TABLE 3: Estimated Population for Bonny LGA (Based on 2.83 Percent Annual Growth Rate)

S/N	YEAR	Estimated populated for Bonny LGA (2001-2014)	Annual Increase at 2.83 percent
1	2001	103,581* persons	2931 "
2	2002	106,512 "	3014 "
3	2003	109,526 "	3100 "
4	2004	112,626 "	3187 "
5	2005	115,813 "	3278 "
6	2006	119,091 "	3370 "
7	2007	122,461 "	3466 "
8	2008	125,927 "	3564 "
9	2009	129,491 "	3665 "
10	2010	133,156 "	3768 "
11	2011	136,924 "	3875 "
12	2012	140,799**"	3985 "
13	2013	144,784 "	4097 "
14	2014	148,881 "	4213 "

Source: Researcher's Fieldwork (2012)

*National Population Commission (NPC) 2001 Census Figure and projections
** Used for this retrospective study in 2014

3.2 Data Collection

The following are the methods adopted in the collection of the various primary data adopted for this study:-

3.2.1 Collection of Socio-economic Data

A total of 49 major communities were delineated for sampling (table 6). From these Nineteen (19) communities were purposively sampled (table 4). The selected communities include those on Bonny Island and others from the outlying communities, which are also within the Bonny local Government area.

Both stratified and simple random sampling methods were used in collecting data, through the administration of questionnaires within the purposively sampled communities. Houses/buildings were nominally considered (or re-numbered, during selection, sometimes on sketched maps, where proper street numbering does not exist.). The table of random numbers was used for the selection of households on the streets, in the purposively selected communities. However only 1980 questionnaires were returned, duly completed, and thus utilized in data analysis, for this study. Table 5 shows the sampling framework.

Table 4: Sample Population showing a list of communities in Bonny Local Government Area

S/N	NAME OF COMMUNITIES	S/N	NAME OF COMMUNITIES
1	Agaja	26	SangaAma
2	Ogwede	27	Oloma
3	Achama	28	Kuruama
4	Burukiri	29	Dema Abbey
5	Agajah	30	Fibiri
6	Abalamabie	31	Finima
7	Orupiri	32	Bonny
8	Amachunta	33	Banigos
9	Ayaminima	34	Ishiliongono
10	Okpoma	35	AdonyeAma
11	BeresiriAma	36	Fnitasingi
12	Aki ama	37	Lighthouse
13	Kuruma	38	Dema Abbey
14	Greens	39	Ererekiri
15	Jumbo	40	IsileOgono Allison
16	Peterside	41	George Kiri
17	Inyobaama	42	Iwo –Kiri
18	Epelema	43	Nanabie
19	Dema	44	Omokolo
21	Oguede	45	Orupiri
22	Iyoba	46	Mammah
23	OtobieAma	47	Ifoku
24	Kalibiama	48	Polokiri
25	Isile Ogono Jumbo	49	Green Iwoama

Source: Researcher's fieldwork (2012)

3.3 Data analysis techniques

Quantitative statistical methods adopted for the study include; Analysis of Variance (ANOVA), Pearson Correlation Analysis Model; Multiple Regression Analysis Model, and Correspondent Analysis. Correspondence analysis (CA) is a multivariate statistical technique. It is conceptually similar to Principal Component Analysis (PCA) but applies to categorical rather than continuous data. All data should be non-negative and on the same scale for CA to be applicable.

Also, the Correspondence Analysis (CA), a multivariate statistical technique was used to analyze data on contributions of employers (such as the NLNG, Local government, S.P.D.C, Mobil, NGOs, and so on to types of occupation in Bonny L.G.A. Although data over a decade were obtained, correspondence analysis tables on employment for 1993, 1995 and 1996 were displayed, while graphs for 1995, 1996, 1997 and 1998 were strategically presented.

TABLE 5: Sampling Framework for Communities in the Study Area

S/.N	NAME OF COMMUNITY	NUMBER OF HOUSEHOLDS SAMPLE	NUMBER OF QUESTIONNAIRES RETURNED	THE NUMBER OF WELL-FILLED QUESTIONNAIRES RETURNED	PERCENTAGES OF QUESTIONNAIRES RETURNED	PERCENTAGES OF WELL-FILLED QUESTIONNAIRES USED IN THE STUDY
1	NEW FINIMA (On the Island and Primary Host)	242	225	221	93.00	91.32
2	BANIGOS (On the Island and A village under Bonny LGA)	35	22	22	62.85	62.85
	BONNY MAIN TOWN (On the Island)	803	785	782	97.76	97.38
3	OGWEDE (On the Island and a village under Bonny Local Government)	24	14	14	58.33	58.33
4	ACHAMA(On the Island)	35	29	26	82.86	74.29
5	ISHILIONGON (In the Eastern part of Bonny Island, Separated by water but within Bonny Local Government)	25	24	18	96.00	72.00
6	AGAJA (Around Finima and a fishing port)	65	61	57	93.84	87.69
7	FINITASINGI (Around Finima)	23	21	21	91.30	91.30
8	LIGHTHOUSE (Around Finima)	30	27	25	90.00	83.33
9	JUMBO (On Bonny Island)	30	25	22	83.33	73.33
10	PETERSIDE (Western Axis across the River	108	106	101	98.15	93.51
11	EPELEMA (Not on the Island, but on the eastern axis)	25	22	20	88.00	80.00
12	DEMA (Eastern Axis)	15	10	09	66.66	60.00
13	ORUPIRI (GTS Community in Bonny LG	10	9	05	90.00	50.00
14	KALIBIAMA (Western Axix)	45	44	42	97.77	95.45
15	OLOMA (Eastern Axis)	60	58	53	96.66	88.33
16	FIBIRI (Western Axis)	25	24	20	96.00	80.00
17	KURUMA (Western Axis)	190	177	167	93.15	87.89
18	ABALAMABIE (On Bonny Island)	175	166	162	94.86	92.57
19	AKIAMA(On Bonny Island)	202	197	193	97.52	95.54
	TOTAL	2167	2046	1980	94.41	91.37

Source: Researcher's fieldwork (2012)

5. Findings

The findings of the study are presented as follows:-

5.1 Gender distribution of sampled respondents in Bonny Local Government Area

Preliminary findings show the gender distribution of the sampled respondents as displayed in table 6. This table if, projected into the present year 2024, could be very useful for gender-based employment and vocational training activities by any of the organizations operating in the study, despite possible changes in some trends. Vocational training needs are based on gender influenced preferences.

Table 6: Gender Distribution of Sampled Respondents in Bonny Local Government Area

S/N	Communities Sampled	Male		Female		Total	
		Freq.	%	Freq.	%	Freq.	%
1	Finima	129	58.37	92	41.63	221	11.16
2	Banigos	14	63.64	08	36.36	22	1.11
3	Bonny main town	469	62.53	293	37.47	782	39.49
4	Ogwede	08	57.14	06	42.86	14	0.71
5	Achama	19	73.08	07	26.92	26	1.31
6	Ishiliongon	11	61.11	07	38.89	18	0.91
7	Agaja	35	61.30	22	38.60	57	2.88
8	Finitasingi	13	61.90	08	38.10	21	1.06
9	Lighthouse	18	72.00	07	28.00	25	1.26
10	Jumbo	13	59.09	09	40.91	22	1.11
11	Peterside	68	67.33	33	32.67	101	5.10
12	Epelema	11	55.00	09	45.00	20	1.01
13	Dema	07	77.78	02	22.22	09	0.45
14	Iyoba	02	40.00	03	60.00	05	0.25
15	Kalibiama	28	66.67	14	33.33	42	2.12
16	Oloma	29	57.72	24	45.28	53	2.68
17	Fibiri	13	65.00	07	35.00	20	1.01
18	Kuruma	89	53.30	78	46.70	167	8.43
19	Abalamabie	99	61.11	63	38.89	162	8.18
20	Akiama	78	40.41	115	59.59	193	9.75
TOTAL		1173	59.24	907		40.76	100

Source: Researcher's Fieldwork (2012)

5.1 Household Incomes by Different Sectors in the Study Area

Table 7 shows the descriptive statistics for data collected on distributions of household incomes based on different sectors contributing. Figure 2, shows the comparative contribution of each source considered to total household income. These sectors are ranked based on data as NLNG (2^{nd}), Other petroleum development companies. These are aimed at providing insights into the contributions of different sectors to total household income in the area.

Table 7: Descriptive statistics of data on household incomes across the study area

Statistics	NLNG_direct_ indirect	Other-Pet_com	crop_Farming_	NTFPs_periwi k_ Collection	Fishing	Rents_royalties	Family_outside	Food-Processing	Marketing	Others
Mean	14338.88	20861.53	13817.53	12523.58	5831.55	8398.925	11561.43	2572.275	8553.4	5751.923
Standard Error	3863.851	8645.237	3884.699	3653.065	2487.657	2989.022	3533.483	1055.522	3156.58	2325.382
Median	0	0	0	0	0	0	0	0	0	0
Mode	0	0	0	0	0	0	0	0	0	0
Standard Deviation	24437.14	54677.28	24568.99	23104.01	15733.33	18904.24	22347.71	6675.704	19964	14522.01
Sample Variance	5.97	2.99	6.04	5.34	2.48	3.57	4.99	44565027	3.99	2.143
Kurtosis	9.576593	12.52073	1.69171	2.221792	11.24411	5.97975	3.469422	11.39319	8.55888	9.651334
Skewness	2.64167	3.532222	1.697861	1.824845	3.214032	2.486664	2.160465	3.277609	2.99300	3.105881
Range	124354	246671	87751	81236	77363	82346	76234	32133	85555	67432
Minimum	0	0	0	0	0	0	0	0	0	0
Maximum	124354	246671	87751	81236	77363	82346	76234	32133	85555	67432
Sum	573555	834461	552701	500943	233262	335957	462457	102891	342136	224325
Count	40	40	40	40	40	40	40	40	40	40
Confidence Level (95.0%)	7815.376	17486.64	7857.545	7389.021	5031.761	6045.868	7147.145	2134.994	6384.79	4707.49

Source: Researcher's Fieldwork (2012)

(1st), Crop/farming production (3rd), on-land and water bodies based NTFPs collection (4th), fishing (8th), rents and royalty (7th), family sources from Nigeria and Diaspora (5th), food processing, marketing (9th) and other sources (10th). This shows considerable contributions from the NLNG project

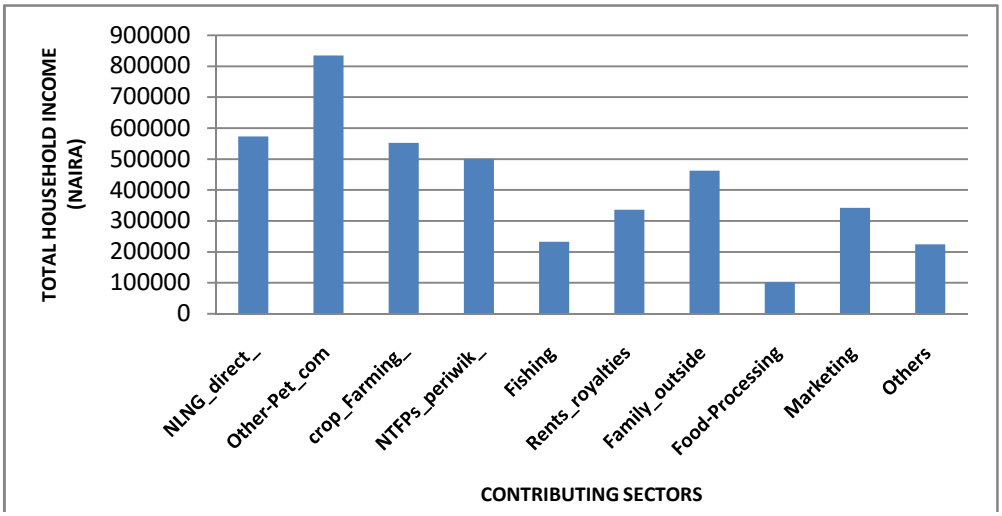


Figure 2: Distribution of Household Income According to Different Sectors

5.2 Variations in the contributions of different sectors to total household income in the study area

Table 8 presents the results of ANOVA analysis on data collected on contributions to total household income. This is meant to know if there are significant variations in the household income from different sources. The p-value is 0.079948, while the F-value is 1.732307986. Since the level of significance shows that P<0.05, it means there is no significant difference.

Table 8: Analysis of Variance Results on contributions of different sectors to total household income in the study area

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
NLNG_direct_indirect	40	573555	14338.875	597173741.7
Other-Pet_com	40	834461	20861.525	2989604968
crop_Farming_	40	552701	13817.525	603635376.1
NTFPs_periwik_ Collection	40	500943	12523.575	533795304.6
Fishing	40	233262	5831.55	247537517
Rents_royalties	40	335957	8398.925	357370168.2
Family_outside	40	462457	11561.425	499420163.4
Food-Processing	40	102891	2572.275	44565026.61
Marketing	40	342136	8553.4	398561274.1
Others	39	224325	5751.923077	210888721.8

ANOVA

Source of Variation	*SS*	*Df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	10124328604	9	1124925400	1.732307986	0.079948	1.903965
Within Groups	2526086494	389	649379561.6			

5.3 Contributions of different sectors to employment types and sources in the study area

Correspondence Analysis aims to illustrate the relationships between two nominal variables in a low-dimensional space using a Correspondence table. It does this by plotting category points, where the distances between these points indicate the relationships among the categories; similar categories are positioned close together. Additionally, projecting points for one variable onto the vector toward a category point of the other variable helps describe the relationship between the two variables.

Table 9, shows the results of the correspondence analysis on types of occupation and sources of employment in Bonny LGA in 1993. There was no indication of NLNG and other petroleum developing companies, as providers of employment. In Table 10 (1995) NLNG was not indicated, until in Table 11 (1996) was NLNG noticeably involved.

The contributions of other sectors which include Transportation, Farming, Fishing, NTFPs collection, Civil service, Food processing/ restaurant ownership or management, Contracting, Unemployed (Non-students) Laborers/unskilled field workers, Marketing, Miltancy, Administrative/Clerical work/Technical (Contracted), Artisan, Students (unemployed), Others (service providers, nanny /housemaid, hair barber, tailor, Administrative/clerical/management /Technical (Permanent) and the employment provided can be seen in figures 4 (A) to 4(D).

For instance in Figure 4(A)- 1995, a correspondence analysis graph, the state government (employer is associated with civil service jobs). Also, SPDC (employer) is associated with contracting (a source of employment. In Figure 4(B)-1996, unemployment (no employer) and unemployment were associated, while the State government provided some civil service jobs. In Table 4(C) 1997 SPDC, Mobil, and NLNG, were influencing patronage of fishing products, transportation, farming products, and NTFPs Also figure 4(D) for 1998 indicates that laborers/fieldworkers, administrative staff began to get more patronage, from NLNG, SPDC, and Mobil where few workers employed can earn substantial incomes compared to local employments. These were based on data collected from respondents.

TABLE 9: Correspondence Analysis Results Table on Types of Occupation and Sources of Employment in Bonny LGA(1993)

Correspondence Table

1993 Type of Occupation	1993 Source of Employment/Employer													
	Local government	State government	Federal government	Own business	NLNG	SPDC	Mobil	NGOs (Local)	NGOs (international)	Oil and gas service providers	Private investors (Individual)	Corporate org. (insurance, banks, stock brokers, etc)	Unemployed	Active Margin
Transportation	0	0	0	3	0	0	0	0	0	0	0	0	0	3
Farming	0	0	0	4	0	0	0	0	0	0	0	0	0	4
Fishing	0	0	0	5	0	0	0	0	0	0	0	0	0	5
NTFPs collection	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Civil service	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Food processing/ restaurant ownership or mgt	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Contracting	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unemployed (Non-students)	0	0	0	0	0	0	0	0	0	0	0	0	12	12
Labourers/unskilled field workers	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Marketing	0	0	0	4	0	0	0	0	0	0	0	0	0	4
Militancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Administrative/Clerical work/Technical (Contracted)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Artisan	0	0	0	4	0	0	0	0	0	0	0	0	0	4
Students (unemployed)	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Others (service providers, nanny /housemaid, hair barber, tailor,	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Administrative/clerical/management /Technical (Permanent)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active Margin	1	3	0	23	0	0	0	0	0	0	0	0	13	40

TABLE 10: Correspondence Analysis Results Table on Types of Occupation and Sources of Employment in Bonny LGA(1995)

Correspondence Table

Occupation involved in 1995	Source of Occupation in 1995													
	Local government	State government	Federal government	Own business	NLNG	SPDC	Mobil	NGOs (Local)	NGOs (international)	Oil and gas service providers	Private investors (Individual)	Corporate org. (insurance, banks, stock brokers, etc)	Unemployed	Active Margin
Transportation	0	0	0	1				0	0	0	1	0	0	2
Farming	0	0	0	3				0	0	0	0	1	0	4
Fishing	0	0	0	2				0	0	0	0	0	0	2
NTFPS collection	0	0	0	2				0	0	0	0	0	0	2
Civil service	0	2	0	0				0	0	0	0	0	0	2
Food processing	0	0	0	1				0	0	0	0	0	0	1
Contracting	0	1	0	0				0	0	0	1	0	0	3
Unemployed (Non-Students)	1	0	0	0				0	0	0	0	0	8	9
Laborers/ field workers	1	0	0	0				0	0	0	0	0	0	1
Marketing	0	0	0	3				0	0	0	1	0	0	4
Militancy	0	0	0	0				0	0	0	0	0	0	0
Transportation	0	0	0	0				0	0	1	1	0	0	2
Artisan	0	0	0	3				0	0	0	1	0	0	4
Students	0	0	0	0				0	0	0	0	0	0	0
Others (service provider etc)	0	0	0	1				0	0	0	1	0	0	2
Adm/ management cadre	0	0	0	0				0	0	1	0	1	0	2
Active Margin	2	3	0	1 6				0	0	2	6	2	8	4 0

TABLE 11: Correspondence Analysis Results Table on Types of Occupation and Sources of Employment in Bonny LGA (1996)

Correspondence Table

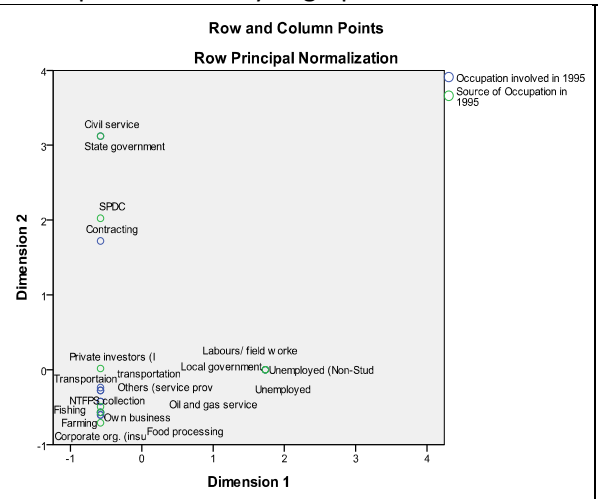
1996 Type of Occupation	1996 Source of Employment/Employer													
	Local government	State government	Federal government	Own business	NLNG	SPDC	Mobil	NGOs (Local)	NGOs (international)	Oil and gas service providers	Private investors (Individual)	Corporate org. (insurance, banks, stock brokers, etc)	Unemployed	Active Margin
Transportation	0	0	0	3	0	0	0	0	0	0	0	0	0	3
Farming	0	0	0	5	0	0	0	0	0	0	0	0	0	5
Fishing	0	0	0	3	0	0	0	0	0	0	0	0	0	3
NTFPs collection	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Civil service	1	3	0	0	0	0	0	0	0	0	0	0	0	4
Food processing/ restaurant ownership or mgt	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Contracting	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unemployed (Non-students)	0	0	0	0	0	0	0	0	0	0	0	0	8	8
Labourers/unskilled field workers	0	0	0	0	5	0	0	0	0	0	0	0	0	5
Marketing	0	0	0	4	0	0	0	0	0	0	0	0	0	4
Militancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Administrative/Clerical work/Technical (Contracted)	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Artisan	0	0	0	2	1	0	0	0	0	0	0	0	0	3
Students (unemployed)	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Others (service providers, nanny /housemaid, hair barber, tailor,	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Administrative/clerical/management /Technical (Permanent)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active Margin	1	3	0	20	6	0	0	0	0	1	0	0	9	40

than local households, creating stark disparities amid widespread poverty. This gap has led to increased prostitution aimed at accessing these higher incomes. Most mid- and senior-level positions in these companies require advanced training, which residents often lack, though some well-educated indigenes have successfully obtained these roles.

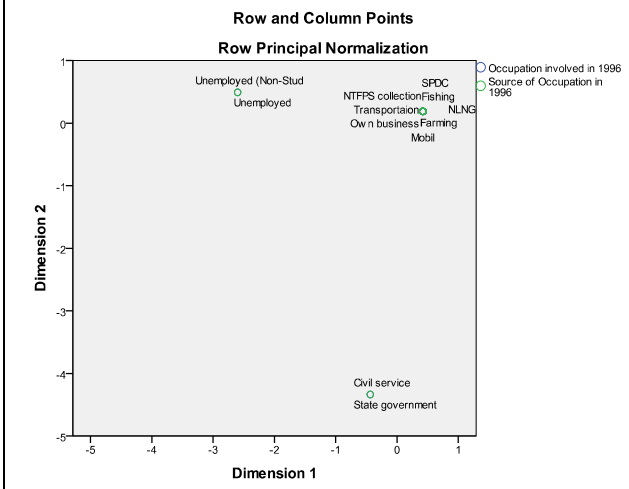
The Shell Petroleum Development Company is involved in crude oil transport, while Mobil focuses on condensate projects; NLNG and Mobil are the main industrial processors on Bonny Island. Although these companies contribute to local vocational training efforts, the benefits are unevenly distributed, with women reportedly receiving more support than men. The phases of the NLNG project's construction, operation, and so on were characterized by different levels of employment.

Outlying communities, which also suffer from pollution and are the hosts of the gas-gathering pipelines, who suffer neglect and reduced fishing yields, feel isolated compared to Bonny town. Young residents increasingly prefer education over traditional fishing, aiming for jobs in the oil sector. This is also the case since it is widely believed that environmental degradation has diminished fishing skills and community resilience.

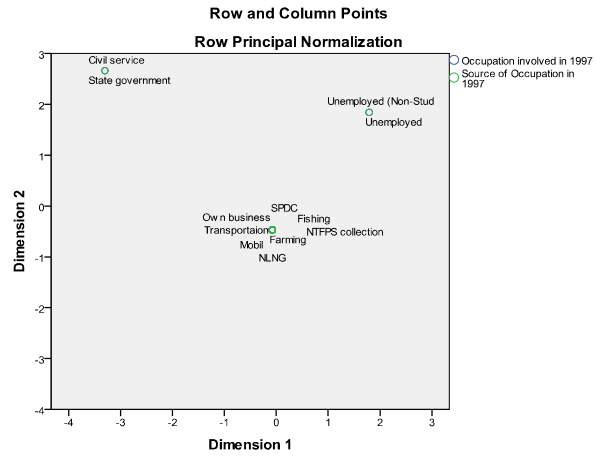
Correspondence analysis graphs



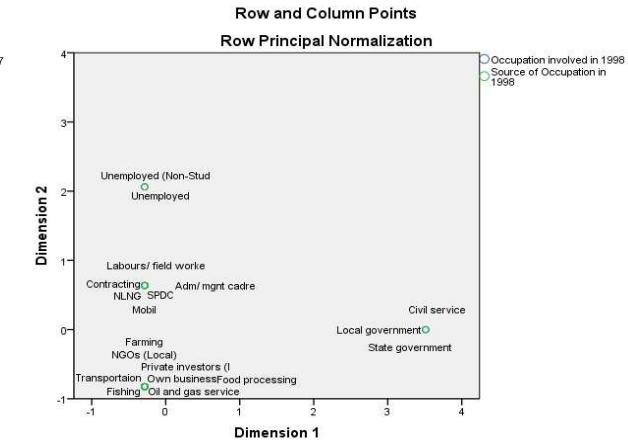
Figures 4 (A) Correspondence analysis graph 1995



Figures 4 (B) Correspondence analysis graph 1996



Figures 4 (C) Correspondence analysis graph 1997



Figures 4(D) Correspondence analysis graph 1998

Figures 4 (A, B, C, D): Correspondence analysis graphs produced from the correspondence analysis tables for some selected years

Previous studies highlighted the focus of petroleum resources companies on vocational training, infrastructure construction, and development over local employment. Respondents noted that the influx of non-indigenous workers has led to increased competition for resources, rising living costs, and various social issues, including crime and cultural disrespect.

5.4 Contributions of NLNG in Recent years in Bonny Local Government Area

Nigeria LNG Limited (NLNG) has long been dedicated to supporting education and human capital development, and its scholarship programs serve as a testament to this commitment. With a strategic focus on fostering academic excellence, improving access to quality

education, and addressing the needs of vulnerable communities, NLNG has created a range of scholarship initiatives aimed at making a positive impact on individuals and society at large. These programs, which include the Post Primary, Undergraduate, Overseas Postgraduate, and Internally Displaced Persons (IDP) scholarships, each target different educational stages and demographic groups across Nigeria (NLNG, 2024).

The Undergraduate Scholarship, which was established in 1998, initially served the communities directly surrounding NLNG's operations, but it was expanded nationwide in 2003 to include students from all across the country. To date, the program has benefitted 3,416 students, and it continues to support them by providing N150,000 annually for the duration of their university education. This scholarship scheme represents a significant investment in the future of Nigeria, with a total of N768.9 million allocated to the program.

Another important initiative is the Post Primary Scholarship, launched in 2012, which is designed to support exceptional pupils from NLNG's host communities in accessing quality secondary education. This program provides vital assistance to students who might otherwise struggle to afford the costs of secondary schooling. Since its inception, 342 students have benefitted from the scholarship, and over N825 million has been invested in helping these young people continue their education.

The Overseas Postgraduate Scholarship, introduced in 2012, is another key component of NLNG's educational support programs. Each year, the company sends 15 students to pursue postgraduate studies at prestigious universities in the United Kingdom. The scholarships, which are valued between USD45,000 and USD67,500, have been awarded to 78 students so far, with a total investment of N1.308 billion. This initiative provides Nigerian students with the opportunity to gain advanced education and exposure to global academic standards, enhancing their skill sets and preparing them for leadership roles in Nigeria's future development.

Through these four key scholarship programs, NLNG plays a crucial role in empowering the next generation of leaders, professionals, and skilled workers in Nigeria. The company's investment in education is not only an investment in individual futures but also in the broader development of the nation. By focusing on diverse educational needs—ranging from secondary education for youth in host communities to postgraduate training for high-potential students—NLNG is helping to build a more educated, skilled, and resilient population.

5.5 Economic Empowerment Initiatives by Nigeria LNG (NLNG)

Nigeria LNG Limited (NLNG) plays a significant role in fostering economic empowerment within its host communities. Through a variety of targeted initiatives, NLNG seeks to address key issues such as youth unemployment, agricultural productivity, sustainable livelihoods, and community engagement. These programs aim not only to provide immediate benefits but also to create long-term economic growth, improve the livelihoods of local residents, and enhance social stability in the regions surrounding the company's operations.

One of the most impactful initiatives is the Youth Empowerment Scheme (YES), launched in 2004. YES was specifically designed to equip young people, aged 18 to 35, with the skills needed to gain economic independence and become active contributors to their communities. The program targets NLNG's host communities, where youth unemployment can be a significant challenge. YES offers vocational training in various fields, such as catering, hairdressing, fashion design, photography, woodwork, and welding. By providing young people with practical and marketable skills, NLNG aims to reduce the dependency on traditional employment and encourage entrepreneurship. Over 1,000 youths have benefitted from the scheme, with many graduates successfully establishing their own businesses or gaining employment in their respective trades. The success of the program was recognized in 2019, when NLNG was awarded the Best Company in Poverty Alleviation at the SERAS Africa CSR Awards for its efforts to empower young people and reduce poverty through skills training and job creation.

In addition to youth empowerment, NLNG is also committed to enhancing the economic capacity of rural entrepreneurs through Nigerian LNG Agro-Enterprise Development Action (NAGENDA). NAGENDA is an agricultural development program that focuses on increasing the income potential of farmers in rural areas. By providing training in modern farming techniques, improving access to quality inputs, and connecting farmers to larger markets, NAGENDA helps transform subsistence farming into more profitable commercial agriculture. The program's primary focus areas include cassava cultivation, poultry farming, and piggery. Through strategic partnerships with development agencies like the International Fund for Agricultural Development (IFAD) and the International Institute for Tropical Agriculture (IITA), NLNG ensures that farmers in host communities receive the necessary support to make the shift from traditional farming to more sustainable and profitable agricultural practices.

Another crucial element of NLNG's economic empowerment efforts is its support for the fisherfolk communities in the Bonny Kingdom. Recognizing the importance of fishing as a primary livelihood for local communities, NLNG provides annual support to fishermen by offering materials and educational programs focused on sustainable fishing practices. This initiative not only helps local fishermen maintain their livelihoods but also promotes environmental responsibility by encouraging practices that reduce the over-exploitation of marine resources. The company's engagement with the fishing community has led to a reduction in conflicts over its operational exclusion zones and has improved the efficiency of fishing operations, ensuring that both the local economy and the environment can thrive.

Furthermore, NLNG has taken steps to foster a sense of ownership and pride among its host communities through its Right of Way (ROW) Maintenance Contracts. These contracts are awarded to land-owning families in the vicinity of the company's Gas Transmission System (GTS), providing them with employment opportunities related to pipeline surveillance, inspection, and maintenance. By involving local families in the monitoring and upkeep of the pipeline infrastructure, NLNG not only supports community livelihoods but also strengthens relationships with its host communities. The company incentivizes contractors by recognizing outstanding performance, particularly in areas like safety compliance and timely report submissions. Collectively, these initiatives reflect NLNG's holistic approach to economic empowerment (NLNG, 2024).

These programs go beyond corporate social responsibility (CSR) to address systemic issues like unemployment, poverty, and environmental sustainability, laying the foundation for long-term growth and prosperity in the regions where NLNG operates.

5.6 NLNG's Bonny Health Insurance Scheme for Affordable and Accessible Care

Nigeria LNG Limited (NLNG) plays an active role in improving healthcare services and promoting the well-being of residents on Bonny Island through two key health initiatives: the Bonny Community Health Insurance Programme (BCHIP) and the Bonny Malaria Elimination Project (BNYMEP). These programs are central to NLNG's corporate social responsibility (CSR) efforts and align with Sustainable Development Goal (SDG) 3—Good Health and Well-Being. Together, they work towards ensuring affordable healthcare access and addressing critical health challenges in the region (NLNG, 2024).

- Bonny Community Health Insurance Programme (BCHIP):
  - Aimed at providing affordable, sustainable, and quality healthcare to Bonny Island residents without out-of-pocket expenses.
  - Facilitated through a partnership between NLNG, the Rivers State Government, and Bonny Kingdom, covering three key health facilities on the island.
  - To date, 1,390 residents have enrolled, promoting access to Universal Health Coverage (UHC) and improving healthcare access for the local population.
- Bonny Malaria Elimination Project (BNYMEP):
  - Aims to make Bonny Island Nigeria's first malaria-free zone by eliminating the disease through a range of targeted interventions.
  - Conducted a detailed baseline assessment and a sub-national Malaria Indicator Survey to track malaria prevalence and assess the health system's capacity to combat the disease.
  - Collaborates with global health partners and the Rivers State Malaria Elimination Programme to implement core malaria interventions, including vector control and malaria monitoring (NLNG, 2024).

Together, these initiatives underscore NLNG's dedication to improving public health in its host communities, tackling pressing issues such as healthcare affordability and disease elimination. Through BCHIP and BNYMEP, NLNG is actively contributing to healthier and more resilient communities on Bonny Island.

6 .1 Summary of Findings

The research investigated the socio-economic and health impacts of the Nigeria Liquefied Natural Gas (NLNG) project in the Bonny local government area, particularly in Bonny town and New Finima. It utilized primary data from community members about employment benefits and secondary data from company publications, although the companies provided little unpublished information despite repeated requests.

The study found that petroleum companies, particularly NLNG, Mobil, and SPDC, offer significantly higher incomes than local households, creating stark disparities amid widespread poverty. This gap has led to increased prostitution aimed at accessing these higher incomes.

6.2. Conclusion

The findings of this study revealed that the NLNG project is a large-scale liquefaction project, still in the process of expansion. The NLNG project, along with the Mobil Oso condensate plant and S.P.D.C crude oil terminal, have had considerable positive and negative consequences on the socio-economic development of communities within Bonny L.G.A. There are considerably higher contributions by NLNG projects, compared with contributions by other petroleum resources development institutions, as well as local government, and federal and state government. However, the level of employment has been limited, due to the high technology, aspect of liquefaction and other processes in the petroleum resources development projects. However, the poverty level in the local government area under study is still generally very high.

The contributions of the local, state, and federal government in the local government need to be seriously improved, for development to reach the grassroots. Too many expectations may have been placed on the private sector, which of course are major agents of development themselves. The various programmes by NLNG are aimed at providing scholarships, agricultural inputs, boost health care and help communities have potentials to boost or preserve household incomes in Bonny LGA.

A key finding of this study includes the urgent need to address the high levels of distrust and dissatisfaction regarding compensation for acquired lands, which have left many community members feeling marginalized. This sentiment is compounded by the low levels of employment among residents, exacerbating their vulnerability to health issues and economic instability This agrees with findings by Okoro & Abah, (2023) and; Nwogbo et al., (2024). Could the contributions of the petroleum development organizations, the three tiers of government, and others be mere drops of efforts in an ocean of needs?

6.3. Recommendations

Generally, to mitigate these challenges, enhancing employment opportunities should be prioritized. The low levels of employment across various providers, particularly in the Indigenous population, underline the necessity for targeted job creation initiatives. Thus, the following recommendations are proffered to act as panaceas to the observed problems from

1. There has been a significantly noticeable lack of Local Content Policies, or rather effective enforcement in the petroleum industry in Nigeria. Thus, strengthening local content regulations is vital to ensure that a significant percentage of jobs and contracts are awarded to local businesses and residents (Akinyemi & Olufemi, 2021). This can enhance community engagement and provide a sense of ownership among the locals.
2. By implementing more effective, skill development programs, more jobs can be created. Implementing vocational training programs tailored to the needs of the

petroleum sector will equip residents with the skills required to secure employment within the industry (Eze et al., 2020; Anigbogu et al., 2023).

3. Collaborating with local governments and businesses through Public-Private Partnerships (PPPs) can create job opportunities and drive local economic development (Ugochukwu & Obinna, 2022).
4. All companies present in the study area should engage in more rigorous internship and apprenticeship schemes: This can best be done by establishing internship and apprenticeship programs within NLNG and its partners will provide hands-on experience for young graduates and school leavers, improving their employability (Nnadi & Amadi, 2022).
5. Stakeholders can also make adequate investments in infrastructure provision to the host communities and the pipeline communities through which harvested gases for liquefaction are transported from outside Bonny LGA. Advocating for improvements in local infrastructure, such as transportation and utilities for household members in all these areas, can attract new businesses and facilitate easier access to job opportunities (Onwuka & Chukwu, 2021).
6. A lot can be achieved through improved corporate social responsibility (CSR). The NLNG project is already well-noted for this. Enhancing CSR initiatives to support local communities through educational scholarships, healthcare programs, and infrastructure development can create a more skilled workforce (Dike & Obasi, 2023).
7. Community Awareness Campaigns can be fruitful if carried out by conducting outreach programs to inform residents about available job opportunities and required skills that can empower them to compete for these positions (Ifeanyi & Ugwu, 2024).
8. Women empowerment programs should be pivotal in the drive to improve gender equality and job opportunity equity. Thus, profound efforts can be made by targeting initiatives to empower women in the community through skills training and entrepreneurship can enhance gender equity in employment (Obi & Nwosu, 2021).
9. There is a dire need to increase support for agricultural initiatives, by Collaborating with local agricultural cooperatives to create jobs in food production and processing will diversify income sources and enhance food security (Chijioke & Ijeoma, 2022).
10. The consideration of long-term strategic planning is vital. This can better be done by developing comprehensive, long-term economic strategies that include stakeholder input is crucial to ensure job creation efforts align with community growth aspirations (Udo & Chigozie, 2024).

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