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Impact of Changing Livelihood Strategies of Host Communities through Establishment of Universities: A Case of Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria

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Abstract

The establishment of universities has been recognized for its contribution to the socio-economic change and enhancement of rural populations' livelihoods in emerging nations, such as Nigeria. This study sought to examine how Niger Delta University (NDU) has affected the host communities' livelihoods in Bayelsa State, Nigeria. The research employed a systematic sampling procedure to choose respondents from the 11 host communities within the study area. Descriptive statistics (frequency and percentage) were used to evaluate the demographic composition of the respondents and their means of livelihood both before and after NDU was established. The association between the respondents' livelihood strategies and their demographic characteristics was examined using chi-square test. Exploratory factor analysis was used to examine the benefits of NDU to the host communities. Findings showed that before the university was established, 28% of respondents made their living as farmers and 13% as fishermen/women. However, after the institution was established, the percentage of farmers and fishermen/women decreased to 18.75% and 10%, respectively. Before the establishment of the university, the percentages of respondents in civil/public service and commercial transportation were 8.75% and 0.25%, respectively. These percentages increased to 21.75% and 2%, respectively. Findings indicated a relationship between the demographic traits of the respondents and their evolving livelihood strategies. Findings further revealed that the university created jobs, and expanded the demand for housing, provided healthcare services, and increased market for commodities. The study concluded that there is a significant relationship between the respondents' changing livelihood strategies and their demographic traits.

Key words: Changing Livelihoods, Civil Service, Farming/fishing, Host Communities, Niger Delta University

1. Introduction

Globally, universities generate a substantial amount of cash and have a huge economic impact on their surrounding areas (Akpotor, 2018; Atchoarena & Holmes, 2005). This is owing to their enormous size and the large number

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of people they attract from the nearby settlements. This frequently leads to urbanization, which continues to be the most important environmental and socioeconomic phenomena influencing changes in livelihoods worldwide (Gonfa, 2019; World Social Report, 2020). Undoubtedly, population growth and economic development in West Africa are driving increasing food demand, but these same variables are also having a concerning effect on the labour and capital supply that West African farmers and agro-processors get (FAO, 2015, 2017). Additionally, the effects of this type of urbanization may influence investments in key staples like maize, wheat, and rice, which continue to be crucial components of agri-food systems worldwide, as well as general growth and the decline in poverty (Kruseman et al., 2020). The development of universities may also have an impact on urbanization, which in turn affects how rural residents' patterns of livelihood are shifting from farming to nonfarm pursuits.

Natural population expansion and rural-urban migration, often driven by private development interests, intensify demand for institutional, commercial, and industrial infrastructure, reshaping livelihoods (Cattaneo et al., 2022; Rajack-talley, 2016; World Economic Forum, 2017). In West Africa, universities have emerged as primary catalysts of urban expansion and new city development which strengthens institutional capacities in research and entrepreneurship while addressing regional challenges like agriculture and health (Medina-Bueno et al., 2024; Oyinlola et al., 2024). However, this urbanization coupled with land-use shifts from croplands, forests, and grazing areas disrupts traditional income sources, compelling communities to adopt diversified livelihood strategies for survival (Barau et al., 2019; Talema & Nigusie, 2023; Tunde & Ajadi, 2018; Yusuf et al., 2019). While universities drive economic transformation through innovation ecosystems and industry partnerships, their growth underscores the need for policies balancing development with equitable land-use planning and socioeconomic resilience.

The evolving socio-economic dynamics in Nigeria and other emerging nations have elevated livelihood security as a critical priority, particularly amid intersecting challenges like environmental degradation, insecurity, and political instability that exacerbate food scarcity and vulnerability (Matthews-Njoku & Nwaogwugwu, 2014; Michael et al., 2021; Mohammed et al., 2020; Nyiatagher et al., 2019). Sustainable livelihood frameworks emphasize integrated approaches that address poverty reduction, resource stewardship, and development resilience through strategies such as vocational training, financial inclusion, and community-led initiatives (Auta et al., 2023; Chen & Vanclay, 2021). Livelihood outcomes—encompassing income stability, well-being, food security, and adaptive capacity—are shaped by access to assets like skills, social networks, and natural resources, which remain limited in

many developing regions (de Bruin et al., 2021; Odubo, 2021; Reed et al., 2013). Effective interventions demonstrate how income-generating activities, gender-inclusive programmes, and decentralized training can empower communities to rebuild economic independence while fostering environmental sustainability (Auta et al., 2023). However, systemic gaps in market access, resource availability, and policy alignment persist, underscoring the need for tailoured, participatory solutions that strengthen local capacities and resilience against future shocks.

In Nigeria, particularly in the states of the Niger Delta, farming is the most frequent kind of employment. Climate change, demographic shifts, economic pressures, oil exploration, socio-political tensions, and land reclamation for higher education institutions have all had a significant impact on people's livelihoods (Atchoarena & Holmes, 2005; Nixon et al., 2023; Odubo, 2021; Yusuf et al., 2019). The shifting contexts in which fishermen/women and farmers work create concerns about the long-term viability of the region's native activities, which are predominantly populated by cultivators who live in a totally different way. The primary challenges in terms of the Niger Delta's farming systems' sustainability include mobility, livestock diversity, livelihood diversification, and the preservation of customs and indigenous knowledge. The extent to which these concerns impede indigenous livelihoods will determine the region's agricultural systems' long-term viability.

The Niger Delta University (NDU), established in 2000 by the Government of Bayelsa State with a proposed take-off site at Ogobiri and relocated to Amassoma in 2001, has significantly influenced host communities through its operational impacts, though tensions persist over unmet corporate social responsibilities (CSR) (Okaba et al., 2012; Pelesai, 2012). While the university's presence has reshaped livelihood strategies—introducing new economic opportunities through employment, infrastructure, and market dynamics—it has also exacerbated challenges such as land disputes, cultural erosion, and heightened insecurity linked to industrial actions (e.g., ASUU strikes) that disrupt community stability (Imbazi & Michael-Olomu, 2021; Michael-Olomu & Imbazi, 2021). As a result, this study examines how households of host communities adapted their income-generating activities before and after the establishment of the university. The study objectives were to examine how households' livelihoods evolved before and after the establishment of NDU, analyze relationships between demographic characteristics and livelihood strategies, and identify benefits arising from the university's presence in the study area.

2. Conceptual Framework and Literature Review

The Sustainable Livelihoods Approach (SLA) serves as the theoretical basis for this research. Since its inception in the late 1990s, SLA has played a pivotal role in recognizing the diversity and emphasizing the interrelationships between the various factors that either restrict or improve livelihood opportunities (DFID, 1999a; Horsley et al., 2015; Natarajan et al., 2022). The DFID is a British state development cooperation agency that originally championed the idea and employed it as their primary means of reducing poverty (DFID, 1999b; Natarajan et al., 2022). This approach is employed in this study to enhance knowledge of disadvantaged people's livelihoods, especially in the host communities of NDU, which are primarily rural farming/fishing communities. It also served to plan development initiatives and evaluate the extent to which NDU has contributed to the maintenance or changing of livelihoods in the host communities. According to Mohammadi et al. (2021), this method views individuals as agents with specific livelihood objectives depending on their talents, resources, and actions. People employ a variety of livelihood methods to satisfy their everyday requirements in order to meet the established livelihood goals.

Numerous studies (Fitrianto, 2021; Guo et al., 2023; Michael et al., 2021) had employed the SLA to comprehend how various individuals live in various locations at different times. Diverse interpretations of the term "livelihoods," which means "the means of gaining a living," have been found in studies. As a result, livelihood is a multifaceted phenomenon that takes into account people's resources and the obstacles they encounter in satisfying their needs as applied in this study. Because external elements like the political and vulnerability setting have an impact on livelihood sustainability, this approach is used in this study (Olivier, 2019; Serrat, 2008). Nonetheless, the concept of Sustainable Livelihoods that is most frequently used was developed as a method of considering the goals, parameters, and order of importance for development initiatives (Fitrianto, 2021; Mdee, 2002). The approach is a sophisticated portfolio of the various endeavours and exchanges that individuals engage in to earn a livelihood.

The variety of practical applications of the approach is demonstrated by the following areas of application: village or rural livelihood studies (Matthews-Njoku & Nwaogwugwu, 2014; Nnodim & Chinyer, 2020; Sapkota, 2021), household economics and gender analyses (World Social Report, 2020), farming system research, flooding and sustainable livelihoods (Nnodim & Chinyer, 2020), socio-environmental change analysis (Tunde & Ajadi, 2018), political ecology, sustainability science, and resilience frameworks (Reed et al., 2013), as well as urban agriculture and sustainable

livelihoods (Olivier, 2019). For about three decades, research and practice using this approach focused on development of the people, as well as the development organizations' policies and initiatives. The SLA framework is particularly relevant for understanding the evolving political and physical environment of the study area because it systematically examines both the essential components of livelihoods and contextual influences such as the establishment of higher education institutions that impact them. The creation of NDU may disrupt long-standing ecological and land-use patterns, putting food and water supplies under jeopardy and thus impacting people livelihoods. The advantages of university services can reduce poverty and increase opportunities for livelihood in host areas. As a result, this affects households' capacity to cope with additional demands or disruptions.

This study makes use of the concept of SLA to better understand how people acquire resources that are typically influenced by "natural, human, social, physical, and financial capital" (Ahundu, 2021). Concerning access to these assets, the sustainable livelihood context, includes its history, geography, and macroeconomic conditions, as well as institutional and social processes like land tenure and organizational structures are examined in several studies (Mohammadi et al., 2021; Tshuma & Mashoko, 2010). Additionally, SLA combines actions people choose to undertake to achieve their livelihood goals. Therefore, the basis for interventions aimed at decreasing poverty might be an improved understanding of people's livelihoods, which are meant to be preserved and developed, as well as the interaction of variables that affect them are core to this approach.

Individual, family or neigbourhood characteristics are independently related to livelihood strategies of both rural and urban households in Nigeria. This could also be influenced with the establishment of a university. Sources of livelihoods are essential components of humans. This livelihoods as mentioned by Odubo (2021), could encompass employment, income generation, sustenance, and occupational activities essential for survival, aligning with SLA that emphasize capabilities, assets, and adaptive strategies. In recent times, studies like Nwaogwugwu, (2019), Nyiatagher et al. (2019) and Tamuno et al. (2008) conducted on the human livelihoods highlight the causes of livelihood diversification choices of rural farmers/fishermen or the role of urban agriculture for livelihood improvement. For instance, Nyiatagher et al. (2019) analyzed rural livelihood diversification among households in Benue, Cross River and Kaduna States of Nigeria. The findings showed a relationship between the factors influencing livelihood diversification and gender, family size, credit availability, and poverty status. This suggests that there is a greater chance that any increase in the variables will have a favourable impact on the predicted livelihood diversification index.

Particularly in the developing countries like Nigeria, very few studies like Ahundu (2021) and Yusuf et al. (2019) have explored university impacts on host communities, and gaps still persist in methodological rigour. For example, Yusuf et al. (2019) employed descriptive statistics to assess Taraba State University's influence on livelihoods, relying on field observations, interviews, and questionnaires to document shifts from farming to non-agricultural activities after the establishment. However, their analysis lacked inferential statistical techniques to test hypotheses about livelihood diversification patterns, limiting insights into causal relationships between demographic factors and occupational transitions. Also, Ahundu (2021) assessed the changing livelihood strategies of the indigenous population on the Permanent Site of Usmanu Danfodiyo University, Sokoto (UDUS) using the sustainable rural livelihoods model. The study focused on land acquisition and compensation as well as the perception of the indigenous people regarding the establishment of the university. Findings revealed that there was a significant negative perception of the university by the indigenous population, and there was a significant change in livelihood strategies as a consequence of land acquisition and the establishment of the university.

Studies (Aderogba, 2018; Dokubo et al., 2022; Kemiki et al., 2016) also demonstrated the positive effects of universities on host communities concerning their physical development, access to vocational skill training, educational opportunities, and scholarship provision. Dokubo et al. (2022) investigated the contributions of the University of Port Harcourt and Rivers State University CSR to the host areas in Rivers State using descriptive statistics. The results showed that the host communities benefited from the educational development programmes, training in vocational skills, and humanitarian aid related to the environment of the universities. Kemiki et al. (2016) studied the influence of the Federal University of Technology, Minna main campus in Gidan-Kwano in Niger State and concluded that the institution changed the host community's physical development from 8.87% to 25.19% from 2005 to 2015. Other studies (Khatiwada et al., 2017; Nwaogwugwu, 2019; Onuwa et al., 2022) examined the association between socioeconomic determinants and poverty reduction in rural areas as well as changes in livelihood and livelihood diversification. These studies revealed a variety of attempts for diversification and derivable advantages. Findings also revealed that respondents made money from sources other than farming.

Consequently, the employment and economic standing of the host communities of NDU had been significantly hampered by the loss of livelihoods brought on by the establishment of the university. As a result, the goal of this study is to comprehend how the advent of NDU has caused host communities' livelihood strategies to change. This research is critical for

developing targeted interventions and advancing long-term livelihood management strategies that address systemic challenges and promote sustainable outcomes.

3. Materials and Methods

This study, conducted between March 17 and April 8, 2023, examined the impact of NDU on the livelihoods of its host communities in Bayelsa State, Nigeria. The research employed a questionnaire administered to residents across eleven host communities (as detailed in Table 1), providing insights into how institutional expansion intersects with local socio-economic dynamics. This methodology section sketches the study area's demographic and environmental context, participant selection processes, and the structured questionnaire design used to capture pre- and post-establishment livelihood shifts, aligning with broader studies (Feepee et al., 2023; Siloko, 2024) of resource conflicts and adaptive strategies in the Niger Delta.

3.1 Study area

The study area is located between latitudes 4° 47′ and 5° 10′ North and longitudes 6° 1′ and 6° 20′ East and has 11 communities that cut across Kolokuma/Opokuma, Sagbama, Southern Ijaw, and Yenagoa Local Government Areas (LGAs) of Bayelsa State, Nigeria (Figure 1). These communities—Aguddama/Ekpetiama, Agorogbene, Amassoma, Bolouebiama, Bumoundi-Gbene, Ogobiri, Oweikorogha, Ikibiri, Igbedi, Sampou, and Toru-Ebeni—were selected as host communities of Niger Delta University (NDU), as identified by Okaba et al. (2012). Otuan and Okpotubobo replaced Bolouebiama and Isamobou due to their geographic proximity to NDU and administrative alignment with Southern Ijaw LGA, ensuring alignment with the study's focus on host communities. The total population of the communities was estimated as 135,338 as projected to 2022 (see Table 1). The study area is characterized by a tropical, moist, and semi-hot equatorial environment with extensive precipitation (annual rainfall exceeding 2,000 mm in the Niger Delta), high humidity, and substantial solar radiation moderated by coastal cloud cover (Tejiri & Efe, 2020). Its mild breezes and low air pressure align with maritime influences, while temperatures remain semi-hot (22–33°C), typical of Nigeria's equatorial coastal regions (Weli et al., 2016).

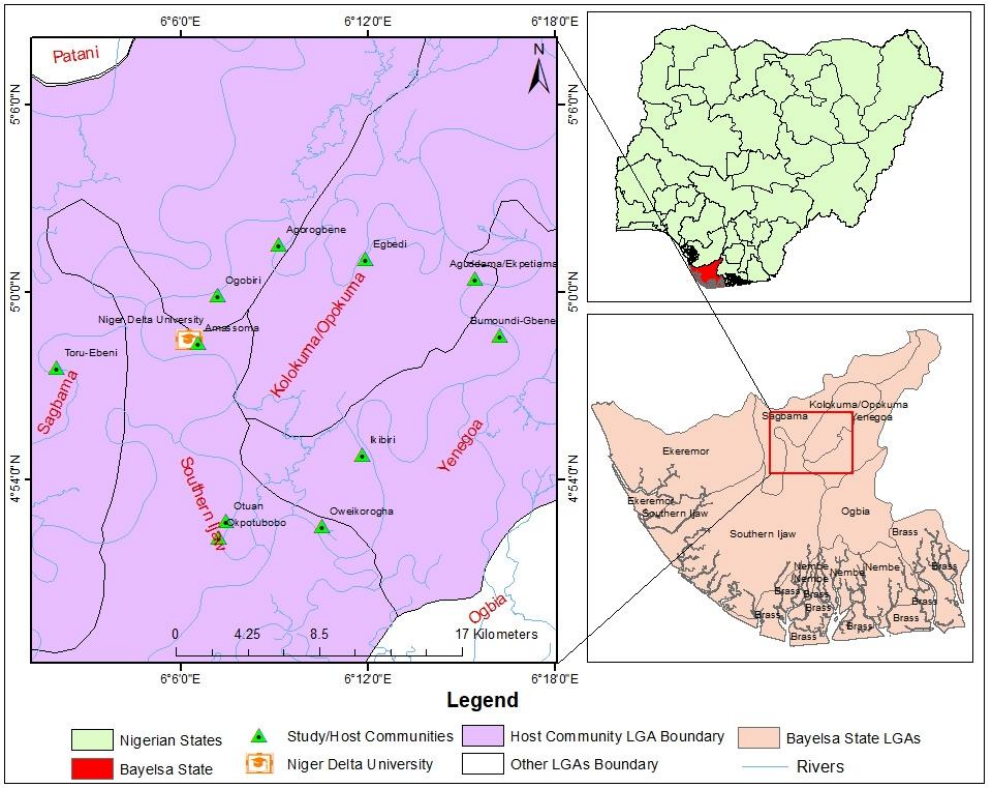

Figure 1: Study Area Map Showing the Host Communities

Source: Adapted from the Administrative Map of Bayelsa State (2023)

The settlement patterns in the study area, characteristic of Ijaw communities, typically follow linear configurations aligned with riverbanks, coastal shores, and waterways, reflecting their historical reliance on maritime trade and fishing traditions (Brisibe, 2014). The houses are thatched and constructed primarily of corrugated iron sheets or mud, except a few which are built of concrete blocks. The area's housing and settlement patterns reflect the sociocultural lifestyle of its residents, mainly Christians and Ijaws who share similar food, clothing, and occupation practices. Until recently, these settlements were inaccessible by road due to their whole encirclement by water. For the great majority of indigenous people, fishing is their main source of income (Tounaregha & Uyabara, 2022). Plantains, cassava, tomatoes, potatoes, and vegetables are some crops farmed locally. Poultry is raised in this area. Petty trade, which includes kiosks at the campus micro market and hawking inside the villages, provides a steady source of income for most indigenous people. Additionally, the employees of the institution do a wide range of informal and unskilled jobs, such as security and cleaning.

3.2 Methods

3.2.1 Data Collection

The researchers conducted reconnaissance visits to obtain a broad understanding of the area and to examine the economic activities and patterns of settlement of the indigenous people in the university's host towns. For this study, both primary and secondary sources of data were gathered. A questionnaire survey conducted between March 17 and April 8, 2023, was used to collect data on respondents' demographics, the benefits the university provided to host communities, and the sustainability of their livelihood strategies. Geographic Positioning Systems (GPS) were utilized to gather data on the host villages' locations and display the distribution pattern of those towns concerning the institution. The university website provided access to a variety of secondary data sources, including documents and bulletins.

The sample frame consists of the 11 communities in the study region, from which respondents were selected using systematic sampling technique and questioned using a standardized questionnaire (Table 1). In 2006, no population figures for the 11 communities were available. As a result, the proportion of people living in each settlement was recognized using data from the 1991 National Population and Housing Census, which were projected to 2022 (see Table 1). The projection was made using Newman's (2001) formula: $P_n = Po + (\frac{1+R}{100} \times Po)$ n and 2.92 percent average population growth rate of Bayelsa State. Where: P_n denotes population in the recent year, Po is the population in the base year, R denotes Annual growth rate (2.92%) and n is number of intermediary years (2022-1991= 31). The population figures for Otuan and Okpotubobo communities were unavailable in the 1991 census data, necessitating reliance on Google Earth imagery to estimate their populations relative to other study communities. These communities were selected as replacements for Bolouuebiama and Isamobou—originally listed by Okaba et al. (2012)—due to their geographic proximity to NDU and shared administrative affiliation with Southern Ijaw LGA, ensuring methodological consistency in the study's host-community analysis.

After determining the sampling frame, the sample size was determined using Yamane (1967) formula, Sample Size$= \frac{N}{1+N\,(e)^2}$, where N represents the total population of the 11 host settlements and e denotes the error margin (5%). This yielded a sample size of 400 respondents, with allocations proportional to each settlement's population size. A systematic sampling method was employed to administer the questionnaire, where participants

were selected at regular intervals from each settlement's population, ensuring demographic diversity and minimizing bias in the data collection process.

Table 1: Projected Population and Sample Size by Settlements

S/N	Settlements	Population 1991	Projection 2022	Sample Size
1.	**Agudama/Ekpetiama**	**1,881**	**4,167**	**12**
2.	**Agoro-gbene**	**2,029**	**4,495**	**13**
3.	**Amassoma**	**36,454**	**80,753**	**239**
4.	**Otuan**	**1,802**	**3,992**	**12**
5.	**Bumoundi-Gbene**	**1,852**	**4,103**	**12**
6.	**Ogobiri**	**2,305**	**5,106**	**15**
7.	**Oweikorogha**	**2,160**	**4,785**	**14**
8.	**Ikibiri**	**1,769**	**3,919**	**12**
9.	**Igbedi**	**4,884**	**10,819**	**32**
10.	**Okpotubobo**	**1,709**	**3,786**	**11**
11.	**Toru-Ebeni**	**4,250**	**9,415**	**28**
	Total	**61,095**	**135,338**	**400**

Source: NPC, Bayelsa (2022)/Authors' Compilation (2022).

3.2.2 Data Analysis

Using the IBM SPSS statistics software, descriptive (frequency and percentage) and inferential (Chi-Square and Factor Analysis) statistical approaches were used to analyze the collected data. Descriptive statistics were used to assess the respondents' demographic features and livelihood strategies of respondents before and after establishment of NDU. The relationship between demographic characteristics and livelihood strategies before and after the establishment of NDU was evaluated using the Chi-square (test of association) method. Hypothesis I. was tested to investigate the relationship between the respondents' demographic features and the livelihood strategies using chi-square. The strength of the association was measured using Cramer's V, which has a range of values from zero at the lowest to one at the highest (Bebeteidoh et al., 2020). The following is the chi-square statistic:

$$X^2 = (O - E)^2\text{E} \qquad (1)$$

Where:

- O = Observed (actual) value.
- E = Expected value.

The data acquired was also subjected to an exploratory factor analysis (EFA) using the varimax rotation tool to ascertain the scale dimensions. As applied in this study, researchers utilized EFA to determine the number of factors and elements for each construct and to assess the internal consistency of the components (Costello & Osborne, 2005; Sigudla & Maritz, 2023). The Kaiser-Meyer-Olkin (KMO) sampling adequacy metric was used to enable the execution of more complex data analysis. This study took into account KMO values of ≥ 0.50 since, according to Hadi et al. (2016) and Watkins (2018), values ≥ 0.50 suggest that the correlation matrix is factorable, whilst values less than 0.50 are typically regarded as unacceptable. To explain the variation in the dataset, the KMO criterion-based eigenvalues over 1.0 were retained using the Principle Component Analysis (PCA) (Alavi et al., 2020). Bartlett's sphericity test was utilized to determine if multicollinearity in the components under analysis was appropriate. EFA was used to determine the relationship between the variables (factors) that accounted for the university's influence on the livelihood strategies of rural households in the study's area. This was carried out in line with the findings of Mugizi et al. (2018), who investigated the relationship between the development of tourism and the means of livelihood adopted by rural households in Uganda's Murchison Falls Conservation Area.

4. Results

4.1 Demographic Characteristics of the Respondents

The demographic breakdown of the survey respondents is provided in Table 2. Of the 400 survey respondents, as shown in Table 2, findings reveal a predominantly working-age population (30.75% aged 27–36, 23.75% aged 37–46) with balanced gender representation (40.25% female, 59.75% male). These findings align with those of Michael-Olomu & Imbazi (2021), who documented that industrial actions and land disputes intensify socio-economic tensions, particularly among younger, economically active residents, as evidenced by the average respondent age of 38.5 years in host communities of NDU. These findings also revealed that 22% of respondents were single and 67.75% of respondents were married. This aligns with Yusuf et al. (2019), who found 82.4% marital prevalence in their study of Taraba State University's host communities, underscoring how institutional expansion reshapes socio-economic dynamics across Nigeria's tertiary education landscapes. Findings depicted in Table 2 also shows that 49.25% tertiary education attainment contrasts with systemic CSR gaps, as seen in the study of Victor (2021), whose findings documented an inadequate compensation for land acquisition and limited job opportunities, which fuel hostilities.

Table 2: Demographic Characteristics of Respondents

Variable/Categories	Frequency	Percentage
Gender		
Male	239	59.75
Female	161	40.25
Total	**400**	**100**
Age (Years)		
16-26	37	9.25
27-36	123	30.75
37-46	95	23.75
47-56	89	22.25
57 - 66	46	11.50
67 and above	10	2.50
Total	**400**	**100**
Marital Status		
Single	88	22.00
Married	271	67.75
Divorced	27	6.75
Widowed	14	3.50
Total	**400**	**100**
Level of Education		
No Formal Education	25	6.25
Primary	42	10.50
Secondary	94	23.50
Tertiary	197	49.25
Do not know or not answered	42	10.50
Total	**400**	**100**

Source: Authors Analysis (2023)

4.2 Livelihood Activities of Households before and after the Establishment of Niger Delta University

Residents of the host communities have undoubtedly been affected in many ways by the university's creation and the land development that followed as a result of the expansion of the university and the growing demand for housing. How these occurrences have combined to impact changing livelihood strategy across time is relevant to our study. According to Figure 2 livelihood of 28% of the respondents prior to the university's creation was related to farming, followed by fishing at 13%. The findings in this Figure also showed that the proportion of farmers and fishermen/women fell to 18.75% and 10%, respectively, following the establishment of the university. These results are consistent with those of Buor & Konkor (2016), who discovered that respondents' engagement in small-scale businesses surrounding the University in Bamahu, Ghana, boosted income earnings while farming decreased. Findings also revealed that the processing and sale of local gin (Ogogoro) decreased from 8.5% before the university's creation to 5.5% after its establishment. Thus, this may be due to the inability to modernize the local gin industry to a factory-brewed gin and enhance the processes of tapping raffia palm to raise production volume and revenue creation, which might minimize the rate of changing livelihood.

Other livelihood activities have grown, including foodstuff sales (8%), grocery and provision stores (9.25%), fish and meat sales (3%), and food preparation and sales (5.25%) of respondents compared to foodstuff sales (5.5%), grocery and provision stores (6%), fish and meat sales (2.75%), and food preparation and sales (3%) before the university's creation. One possible explanation for the rise in sales of food items, provisions/grocery, and food vending is that universities generate a sizable student and staff population, which raises the demand for food, groceries, and provisions. This, in turn, drives up sales for food vendors, grocery stores, and provision shops close to or within the university premises. These findings might result from various issues, such as the host communities' experiences with agricultural land loss, the rise of small-scale businesses, food vending, transportation, and the respondents' steadily rising incomes over time. These results support those of Khatiwada et al. (2017), who demonstrated that most households diverted their income from farming to non-farm activities by enhancing access to rural infrastructure development, loan availability, education, and vocational training in order to lower poverty in central Nepal's rural areas.

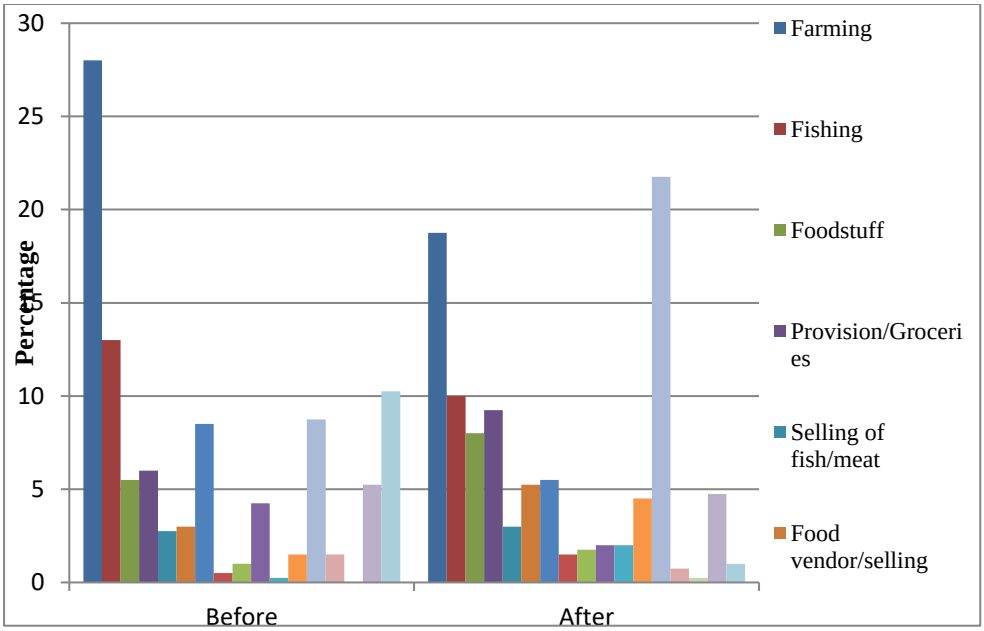

Figure 1: Livelihood Strategies of Respondents before and after the establishment of NDU
Source: Authors Analysis (2023).

Commercial transportation and employment in civil/public service, which were almost unknown before the establishment of the university, climbed from 0.25% and 8.75% of respondents to 2% and 21.75%, respectively. Remarkably, findings given in Figure 2 showed that the percentage of respondents who carved boats decreased from 1.5% to 0.75% following the founding of the institution. This further demonstrates the transition from primary, on-farm activities to secondary, and off-farm ones. The percentage of computer operators has climbed from 0% to 0.25% since the university was founded, most likely as a result of technological advancements. These results support those of Yusuf et al. (2019), who evaluated Taraba State University's effect on the livelihood of the people in ATC and its environs. Their findings showed that after the setting up of the university, respondents expanded their options for a living by engaging in non-farming activities. When questioned about their sorts of livelihoods before the university's establishment in 2000, 10.25% of the respondents were unable to reply or did not know. The results also demonstrated that, following the establishment of the institution in 2000, the percentage of respondents who did not know or could not answer about their forms of livelihoods decreased to 1%. Probably, the uncertainty likely stems from the 9.25% of respondents aged 16–26, as shown in Table 2, many of whom could be unemployed and dependent on parents a common scenario in Nigeria explaining their inability to articulate livelihoods before the university's establishment.

4.3 Association between Demographic Factors and Livelihoods Strategy of Respondents in the Host Communities of Niger Delta University

The study employed a Chi-Square test of association to investigate potential associations between demographic characteristics and the respondents' changed livelihood strategies before and after the establishment of NDU. Table 3 shows the findings of the analysis. A total of eight Chi-Square tests were conducted using four demographic components and two effect statements. P values less than 5% (0.05) were considered significant, and the alpha level was set at 0.05. Thus, it was determined that the eight tests were significant. Gender, for instance, had significant positive relationship on the respondents' changing livelihood strategies both before (X2.= 50.05, p = 0.0, Cramer's V = 0.35) and after (X2.= 91.5, p = 0.001, Cramer's V = 0.58) NDU was established. Before the establishment of the university, the age bracket had significant relationship with the livelihood strategy with X2.= 245.27, p = 0.001, Cramer's V = 0.36 and after the establishment, with X2.= 471.66, p = 0.001, Cramer's V = 0.49). This suggests that there is a greater chance that any rise in the coefficient values of these variables would have a positive impact on the predicted livelihood change index. These results are consistent with those of Nyiatagher et al. 2019), who found that in the states of Benue, Cross River, and Kaduna, livelihood diversification was positively correlated with gender.

Before the university was established, the livelihood strategy was strongly correlated with marital status (X2 = 118.05, p = 0.001, Cramer's V = 0.31), and after the university was established, (X2 = 192.29, p = 0.001, Cramer's V = 0.4). The livelihood strategy and education level were also significantly correlated, with X2 = 131.91, p = 0.001, Cramer's V = 0.36 before the university was established and X2 = 353.07, p = 0.001, Cramer's V = 0.57 after the university was established. Consequently, this suggests that the respondents' demographic characteristics are important to their livelihood survival methods both before and after the institution was founded. This indicates that more mature better educated, and economically engaged household members are more likely than younger ones to switch to different livelihood choices. This result is significant because it relates to an individual's productivity and years of active life, since age, sex, marital status, and educational attainment are all linked to active labour and the viability of livelihood choices. The above findings are consistent with those of Nwaogwugwu (2019), who discovered a significant relationship between rural families' livelihood strategies in southeast Nigeria and their socio-demographic features. The findings of all these tests showed that there is an association between the respondents' demographic characteristics and the

individuals' changing methods of livelihood; the Cramer's V test revealed that this relationship varies in its severity.

Table 3: Chi-square Association between Demographic Factors and Livelihood Strategy before and after the Establishment of Niger Delta University

S/No	Demography	Livelihoods Strategy	Chi-Square Test		Strength
			Value	**P-value**	**Cramer's V**
1	Sex	Before	50.045	0.001	0.354
		After	91.498	0.001	0.478
2	Age	Before	245.271	0.001	0.357
		After	471.657	0.001	0.486
3	Marital Status	Before	118.05	0.001	0.314
		After	192.294	0.001	0.4
4	Level of Education	Before	131.911	0.001	0.358
		After	353.065	0.001	0.573

Source: Authors Analysis (2023)

4.4 Sample Adequacy and Data Suitability for Factor Analysis

First, the KMO test and Bartlett's test of sphericity (Table 4) were used to assess the factorability of the ten statements/items in line with the work of Hadi et al. (2016). For the constructs in this investigation, the KMO sampling adequacy measure showed a value of 0.56, above the suggested threshold value of 0.5. As a result, the sampling demonstrated that the construct is sufficient for more investigation. Results of Table 4 also showed that the Bartlett's test of sphericity has a significant p-value of less than 0.01 for the construct. A significant value of less than 0.05 suggests that the data set could benefit from a factor analysis.

Table 4: Result of Factor Analysis for the Construct

Construct	**Kaiser-Meyer-Olkin Measure of Sampling Adequacy**	**Bartlett's Test of Sphericity**
Benefits of NDU	0.563	0.000

Source: Authors Analysis (2023)

4.5 Perception of Respondents on the Benefits of Niger Delta University on the Host Communities

This section provides an empirical support for the reliability of the construct developed to determine the benefit associated with the establishment of NDU on the host communities. Table 5 shows the benefit of the establishment of the university on the people of the host communities. Findings in this Table showed that four principal components (PCs) with eigenvalues higher than 1 were retained. Findings revealed that four PCs accounted for 60.57% of the dataset's overall variability which is above the acceptable threshold of 60% (Sigudla & Maritz, 2023). Thus, the results explicitly demonstrate that the items proposed in this model are relevant in this research setting and in the context of the benefit of the university on the changing livelihood settings of the people.

According to the findings, NDU assisted rural households make ends meet and provided various forms of community assistance. In light of the highly related components, a closer examination of each column in Table 4 was conducted to reveal or define each component. The results of PC 1 showed that university activities produced jobs, improved resident educational opportunities, grew the market for local goods (crafts, fresh food, fuel wood, building materials, and cultural entertainment), increased demand for local services (waiting, guiding, security, and housekeeping), provided medical care, and increased demand for land, as indicated by coefficients ranging from 0.57 to 0.74. According to the second PC, which had coefficients ranging from 0.51 to 0.77, university activities enhanced the supply of potable water, agricultural extension services, and scholarships. With a coefficient of 0.84, PC 3 loaded favourably on rising demand for student housing rentals, as seen in Table 4. Strong loadings were found for item two (Educational Opportunities) in the fourth factor. As a result of cross-loading between PCs 1 and 4, item 3 (providing educational opportunities) is not included as a contributing item in any of the components that may be influenced by multiple latent variables. These results support the findings of Dokubo et al. (2022) and Kemiki et al. (2016), who found that universities affect physical development, increase the consumer base, generate jobs, and offer educational opportunities to their host communities.

Table 5: Four Principal Components Derived by Factor Analysis with Loadings for Individual Factors and Percent Variance Explained

S/No	Benefits of Niger Delta University	Component				Communalities
		1	**2**	**3**	**4**	
1	Provision of Jobs	**0.74**	0.16	-0.09	0.15	0.60
2	Increased educational opportunities for residents	**0.65**	-0.11	-0.04	**0.52**	0.71
3	Increased Market for sales of goods/agricultural produce and demand for services	**0.62**	-0.05	-0.09	0.38	0.54
4	Increase in Agricultural extension services	-0.40	**0.51**	0.35	0.33	0.64
5	Provision of medical care	**0.57**	0.29	-0.25	-0.47	0.69
6	Provision for increased land for projects	-0.09	-0.06	0.23	0.29	0.15
7	Provision of portable water	0.05	**0.76**	-0.18	-0.12	0.62
8	Increased demand for the renting of houses by students/staff	0.24	-0.01	**0.84**	-0.09	0.76
9	Increased demand for land	**0.56**	0.05	0.48	-0.39	0.70
10	Provision of scholarships by the University	-0.07	**0.77**	0.05	0.20	0.64
11	% of Eigenvalues	2.22	1.55	1.22	1.07	
12	% explained variance	22.18	15.50	12.22	10.67	

Source: Authors Analysis (2023)

05. Conclusion and Recommendations

This study looked at how NDU affects the host communities' livelihoods in Nigeria's Bayelsa State. The research indicated that, following the establishment of NDU, households in the host communities of the study communities changed their livelihood strategies from agricultural to non-agricultural ones. The findings indicated a relationship between the respondents' evolving livelihood strategies and their demographic traits. Findings further indicated that university-related activities generated job opportunities, increased the market for regional commodities, raised the demand for regional services, offered healthcare, and raised the need for land, drinkable water, agricultural extension services, scholarships, and student housing rents. To this end, the study based on its major findings, concludes

that there is a relationship between the demographic traits of the respondents and the livelihood strategy before and after the establishment of the university.

Based on the study's findings and conclusion, the following recommendations were made: all tiers of the Bayelsa State government should create and truly put into effect policies that would promote agricultural employment, because increasing the number of individuals engaged in farming activities can support equitable rural growth and improve the number of jobs in the state, encouraging people to continue in farming-related activities. This might be achieved by improvements in education, infrastructure, and access to financial loans, as well as training programs aimed at providing farmers with skills pertinent to agriculture-related employment in their community. Fishing-based livelihoods declined after the university was established. This may be because of the sand filling of the area where the university is located, which may have an impact on the livelihood change pattern and type of employment that residents of the oil-bearing areas are engaged in. Consequently, university stakeholders should build innovations that will serve as models for aquaculture growth in the area. This way, producers and traders may leverage productive specialization to produce more products to the market that meets their everyday needs thereby limiting their likelihood to change to non-farm and non-fishing activities.

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