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Determinants of Livelihood Diversification in Nigeria

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Abstract *Households in Nigeria face multiple livelihood pressures stemming from land fragmentation, declining agricultural productivity, and exposure to climatic and market shocks. In response, livelihood diversification has emerged as a critical adaptive strategy to stabilize incomes and build resilience. However, national evidence on the drivers of specific diversification strategies remains limited. This study addresses this gap by analyzing the socioeconomic and structural determinants across Nigeria's six geopolitical zones. Using the 2019 General Household Survey and a multinomial logistic regression model, it moves beyond a simple diversified/non-diversified dichotomy to provide a nuanced, nationally representative analysis. Descriptive findings reveal significant regional heterogeneity: northern households predominantly engage in agricultural diversification (farming with livestock, 26.8%), while southern households lean towards farming and trading (19.5%). The MNL results establish that the drivers of diversification are complex and strategy-specific. Education exhibits a dual role, strongly promoting high-return diversification while discouraging engagement in low-return informal activities. The MNL established that drivers are strategy-specific. Education promoted productive diversification (e.g., into Farming and Livestock, RRR = 1.589; p = 0.014) but discouraged low-return activities (e.g., Farming with Service/Hawking, RRR = 0.322; p = 0.008). Farm size was a critical push factor; land scarcity drastically increased the likelihood of specializing in non-farm livelihoods (RRR = 0.0015; p < 0.001). Shock exposure significantly reduced diversification capacity (RRR = 0.567 for Farming and Livestock; p = 0.004). Predictive margins confirmed rural households (18.7%, p < 0.001) and those with formal education (25.0%, p < 0.001) had higher diversification probabilities, though shock-affected households were severely constrained (10.4% vs. 19.2%, p < 0.001). The study concludes that livelihood diversification in Nigeria is a heterogeneous phenomenon shaped by the interplay of human capital, asset bases, and geographic context. Policy interventions must therefore be nuanced and multi-pronged, prioritizing human capital development, financial inclusion, and rural infrastructure, while being tailored to regional specificities to effectively promote resilient and sustainable livelihoods.*

Keywords *Livelihood Diversification, Multinomial Logit, Nigeria, Rural Livelihoods, Non-Farm Economy, Poverty, Sustainable Development.*

I. Introduction

1.1 Background

In developing countries such as Nigeria, rural households face numerous challenges including limited access to productive resources, fluctuating agricultural incomes, climate-related shocks, and poor market access. These challenges have necessitated a growing reliance on livelihood diversification as a critical survival and risk-management strategy. Livelihood diversification is broadly understood as the process by which households construct a portfolio of income-generating activities, both agricultural and non-agricultural, to improve their welfare and minimize exposure to shocks (Ellis, 1998).

While agriculture remains the dominant source of livelihood for most rural Nigerians, sole dependence on it has proven unsustainable due to the seasonality of production, land fragmentation, environmental degradation, and volatile market conditions (Ogundari *et al.,* 2020). Consequently, rural households increasingly engage in diverse income activities such as trading, artisanal work, salaried employment, and small-scale services in addition to farming. Diversification helps households stabilize income flows, absorb shocks, smooth consumption, and invest in future opportunities.

Despite the growing interest in livelihood diversification as a development and food security strategy, its patterns and determinants vary widely across demographic, geographic, and institutional contexts. Empirical studies show that the extent and type of diversification are influenced by factors such as gender, education, household size, land ownership, access to infrastructure, and regional conditions (Brugère *et al.,* 2018; Haggblade *et al.,* 2010). Yet, there is limited recent evidence from Nigeria that distinguishes among types of diversification and links them to household characteristics using a nationally representative dataset.

Understanding the structure and drivers of livelihood diversification is essential for effective policy formulation, especially within the framework of the Sustainable Development Goals (SDGs), where livelihoods are closely tied to poverty eradication, food security, and inclusive growth. By identifying the types and determinants of diversification among Nigerian households, this study contributes to a nuanced understanding of rural livelihood systems and provides insights for designing policies that enhance resilience and economic opportunity.

1.2 Research Problem

While diversification has long been regarded as a means to reduce poverty and improve household resilience, the effectiveness of various diversification strategies depends on the context in which they are implemented. In Nigeria, rural households adopt diverse combinations of livelihood strategies, yet the benefits and constraints of these pathways remain unevenly distributed. Some diversification forms especially informal or marginal ones may provide only short-term relief rather than long-term economic mobility.

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Furthermore, poorly diversified households are often still vulnerable to poverty and food insecurity due to inadequate access to enabling assets or services (Loison, 2016).

Current policy debates often advocate for diversification without specifying what forms are most beneficial, for whom, and under what circumstances. There is also insufficient differentiation between push and pull factors driving diversification whether households diversify out of necessity (to cope with risk) or opportunity (to pursue better returns). Without detailed empirical evidence, policy interventions risk being poorly targeted or ineffective.

Despite a growing body of research on rural economies in Nigeria, significant empirical and methodological gaps persist in the literature on livelihood diversification, limiting the formulation of evidence-based, nationally effective policies. While several insightful regional and sub-regional studies exist, as noted in the works of Adewuyi and Olubiyi (2022) in the North and Oluwatayo and Ojo (2022) in the Southwest, their findings are inherently context-bound and cannot be reliably generalised to the national level. The pronounced agro-ecological, economic, and cultural heterogeneities between Nigeria's regions mean that the drivers of diversification in the semi-arid, conflict-affected Northeast are likely fundamentally different from those in the oil-rich, urbanising South-South. The absence of a comprehensive, nationally representative analysis obscures the broader, cross-cutting determinants of livelihood choices and hinders a holistic understanding of the Nigerian rural economy's structure.

A second, critical gap lies in the methodological approach commonly employed. Many existing studies tend to analyse diversification through a binary lens, comparing households that diversify versus those that do not or by examining individual sectors in isolation. This approach fails to capture the complex reality that households do not make singular choices but rather select and combine *portfolios* of activities from a set of mutually non-exclusive options, such as pure farming, farming with petty trade, wage employment, or a combination of non-farm enterprises. To robustly model this decision-making process, more sophisticated econometric techniques are required.

There is, therefore, a pressing need for research that employs methodologies like multinomial logistic regression to simultaneously analyse the determinants of multiple, distinct livelihood strategies. This technique is uniquely suited for modelling scenarios where the dependent variable is a categorical outcome representing several exclusive livelihood portfolios. Unlike binary or linear models, it allows for the comparison of how factors like household assets, education, location, and market access influence the probability of a household adopting one specific strategy (e.g., wage-based diversification) relative to a base category (e.g., pure agriculture), while holding other factors constant. For instance, such an analysis could reveal whether access to formal credit consistently increases the likelihood of engaging in high-return enterprise diversification across all regions, or if its effect is muted in areas plagued by insecurity.

Furthermore, integrating such a model with nationally representative datasets, such as the Nigerian Living Standards Measurement Study (LSMS), would provide the statistical power and geographical coverage needed to disentangle the complex, multi-scalar drivers of diversification. This would enable policymakers to move beyond regional generalisations and identify the most potent leverage points, be they in human capital development, infrastructure, or financial inclusion for encouraging sustainable and remunerative livelihood pathways tailored to specific socio-economic and geographic contexts across Nigeria.

This study therefore addresses this knowledge gap by analyzing both the types of diversification practiced and the factors that influence household decisions to diversify in Nigeria. Using data from the General Household Survey (Wave 4), it explores socio-economic profiles of diversifiers vs. non-diversifiers, describes combinations of income sources, and identifies significant determinants using a Multinomial Logistic Regression framework.

1.3 Research Objectives

The specific objectives of this study are to:

1. Profile the socio-economic characteristics of Nigerian households by their level of livelihood diversification using descriptive statistics.
2. Describe the types and combinations of livelihood diversification practiced by households using descriptive statistics like frequency count, percentages, and mean.
3. Identify the determinants of livelihood diversification using Multinomial Logistic Regression model.

II. Literature Review

1 Conceptualizing Livelihood Diversification: A Multi-Dimensional Framework

Livelihood diversification remains a critical lens for understanding how households, particularly in the Global South, navigate complex and often volatile socio-ecological landscapes. Moving beyond its historical perception as a supplementary income source, contemporary scholarship frames diversification as a core household strategy for managing risk, building resilience, and pursuing upward mobility. It is fundamentally defined as the process by which households construct a portfolio of activities and capabilities, encompassing not only traditional farming and livestock rearing but also non-agricultural wage employment, self-enterprise, remittance-based income, and digital platform work (Scoones, 2015; Sakdapolrak and Wagner, 2022). Conceptualizing this phenomenon in the 21st century requires an appreciation of its dynamic nature, shaped by the interplay of global processes, local contexts, and household-level agency.

The impetus for diversification is increasingly understood through the dual framework of vulnerability and opportunity. On one hand, it is a strategic response to systemic vulnerabilities, including climate change-induced shocks, land fragmentation, and agricultural price volatility (Trani *et al.,* 2022). In this context, diversification serves as a crucial buffer, spreading risk across multiple, often uncorrelated,

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income streams to enhance household resilience and ensure basic consumption smoothing (Nguyen and Lu, 2023). On the other hand, diversification is driven by 'pull' factors, such as the expansion of urban consumer markets, improvements in rural digital connectivity, and new opportunities in the green and care economies. This duality underscores that diversification is not merely a survival tactic of the poor but can also be an accumulation strategy for the economically agile (Oseni *et al.*2021).

A sophisticated conceptual framework for analysing livelihood diversification must integrate three interconnected determinants: household capabilities, asset configurations, and the external institutional environment. Household capabilities refer to the demographic and human capital foundations, including the dependency ratio, the health of members, and crucially, their educational attainment and skillsets. In today's knowledge-driven economy, a household's capacity to access higher-return, skilled non-farm employment is heavily contingent on its human capital (Mutenje *et al.,* 2019). Furthermore, gendered divisions of labour and decision-making power within the household critically shape who diversifies, into what activities, and who controls the ensuing income (Khatun and Roy, 2022).

Asset configurations form the foundational resources that households can deploy or leverage. Modern analyses, informed by the Sustainable Livelihoods Approach, examine the pentagon of capital assets: natural (land, water), physical (tools, mobile phones), financial (savings, access to credit), human (skills, labour), and social (networks, trust). The specific composition of this asset bundle determines the *direction* and *quality* of diversification pathways (Sakdapolrak and Wagner, 2022). For instance, a household with access to digital infrastructure (physical capital) and financial literacy (human capital) may successfully diversify into e-commerce, whereas an asset-poor household may be confined to low-return, precarious informal labour phenomenon often termed "distress-push" diversification (Trani *et al.,* 2022). This highlights how pre-existing inequalities can be reproduced through segmented diversification outcomes.

Finally, the external institutional environment constitutes the macro-level scaffolding that enables or constrains household strategies. This includes market access, where proximity to urban centres and reliable transportation infrastructure reduces transaction costs and facilitates engagement with non-farm sectors (Oseni *et al.,* 2021). More recently, the role of digital platforms and mobile money services has emerged as a transformative institutional factor, creating new livelihood avenues in ride-hailing, online retail, and freelance services (Fischer, 2023). Concurrently, institutional support through social protection programmes, pro-poor credit schemes, and land tenure security remains pivotal in shaping the opportunity structure and empowering households to pursue more sustainable and remunerative diversification pathways (Nguyen and Lu, 2023).

2 *Contemporary Dynamics and Evolving Implications*

The outcomes of livelihood diversification in the contemporary era are complex and often double-edged. While it can demonstrably lead to increased income stability, reduced multidimensional poverty, and enhanced adaptive capacity to climate shocks, it does not automatically equate to equitable development (Khatun and Roy, 2022). The burgeoning "gig economy" and other forms of informal non-farm work can perpetuate precarious employment without social security, merely shifting vulnerability from the agricultural to the service sector (Fischer, 2023). Moreover, the benefits of diversification are not distributed evenly; structural barriers often prevent women, youth, and the ultra-poor from accessing the most profitable segments of the non-farm economy, thereby potentially exacerbating socio-economic stratification (Mutenje *et al.,* 2019).

Conceptualizing livelihood diversification today demands a dynamic and multi-scalar framework. It is a fluid and ongoing process, continuously reshaped by global trends like digitalization and climate change, local market structures, and the evolving asset base of households. A nuanced understanding that differentiates between adaptive, opportunity-led diversification and distress-driven, survivalist diversification is paramount. Future research and policy must focus on identifying and dismantling the structural barriers that prevent equitable access to sustainable and rewarding livelihood portfolios, thereby harnessing diversification's potential as a genuine engine for resilient and inclusive development.

3 *Regional Variations in Livelihood Diversification: The Nigerian Context*

The patterns and drivers of livelihood diversification in Nigeria are not monolithic; they are profoundly shaped by the nation's stark regional heterogeneities. These variations, arising from distinct agro-ecological endowments, historical pathways, and socio-economic structures, create a complex mosaic of diversification strategies across the country. Understanding these sub-national disparities is critical for effective, context-sensitive policy formulation.

The Agrarian North: Diversification Under Duress

The northern regions of Nigeria, characterised by a semi-arid climate and a predominantly agrarian economy, exhibit a distinct diversification profile heavily anchored in primary production. Households here are largely dependent on rain-fed agriculture, complemented significantly by livestock rearing, which serves as a traditional risk-spreading mechanism (Adewuyi and Olubiyi, 2022). However, diversification in this region is increasingly driven by acute 'push' factors. Escalating environmental stressors, including desertification, erratic rainfall, and recurring farmer-herder conflicts, have undermined agricultural productivity and food security, pushing households into distress-driven diversification (Okeke and Ume, 2023). Consequently, non-farm activities often consist of low-return, informal sector engagements such as petty trading, artisanal crafts, and seasonal rural wage labour. Limited access to education, financial services, and infrastructure further constrains the ability of northern households to access more lucrative, skill-based non-farm

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opportunities, often trapping them in a cycle of vulnerability (Adewuyi and Olubiyi, 2022).

The Diversified South: A Spectrum of Opportunities

In contrast, the southern regions, blessed with more favourable rainfall, oil-rich delta zones, and a higher degree of urbanisation, demonstrate a more complex and opportunity-oriented diversification landscape. While agriculture remains a component, its relative importance is lower. Proximity to major urban centres like Lagos, Port Harcourt, and Ibadan, along with better-developed infrastructure, creates robust demand for non-farm goods and services and facilitates market access (Oluwatayo and Ojo, 2022). This enables a wider spectrum of diversification pathways, including small-scale manufacturing, transport services, hospitality, and professional wage employment. The presence of the oil and gas industry, despite its volatility, has spawned ancillary service sectors and contributed to a cash economy that fuels local entrepreneurship (Nwosu and Eze, 2023). Furthermore, higher levels of educational attainment in the south equip a larger segment of the populace with the human capital necessary to compete for formal sector jobs and manage more sophisticated business ventures.

The Urban-Rural Continuum and National Policy Implications

Beyond the broad north-south dichotomy, a significant urban-rural continuum exists within each region. Even in the predominantly agrarian north, cities like Kano and Kaduna host vibrant informal economies that offer diverse livelihood options. Similarly, rural areas in the south continue to grapple with constraints related to market access and financial inclusion. These regional variations underscore the fallacy of one-size-fits-all national policies. Interventions designed to promote sustainable livelihoods must be geographically tailored. In the north, priorities include climate-smart agricultural practices, conflict resolution, and foundational investments in education and rural infrastructure to create a springboard for more sustainable diversification (Okeke and Ume, 2023). In the south, policy should focus on enhancing the business environment, supporting small and medium-sized enterprises (SMEs), and fostering skills development aligned with a modernising economy (Oluwatayo and Ojo, 2022). A nuanced, regionally disaggregated approach is essential to effectively harness livelihood diversification as a vehicle for poverty reduction and resilient economic development across Nigeria.

III. Materials and Methods

1 Data Source

This research utilized the 2019 Nigeria General Household Survey-Panel dataset, comprising 5,000 households sampled across Nigeria's six geopolitical zones.

2 Analytical Technique

Descriptive statistics summarize livelihood type prevalence. Multinomial logistic regression to identify determinants of diversification choice, with 'farming only' as the base category.

To empirically analyse the determinants of household livelihood strategy choice, a multinomial logistic regression model is specified. This approach is selected because the dependent variable—a household's primary livelihood portfolio—is categorical and encompasses multiple, mutually exclusive outcomes (e.g., 'Agriculture Only', 'Agriculture with Wage Labour', 'Non-Farm Enterprise').

The model estimates the probability that household i chooses livelihood strategy j relative to a base category 0. Formally, the log-odds of household i selecting strategy j over the base strategy is modelled as a linear function of explanatory variables:

$$\ln(P(Yi=j) / P(Yi = 0)) = \beta 0j + \beta 1jX1i + \beta 2jX2i + \cdots + \beta kjXki$$

Where: Yi is the categorical livelihood strategy chosen by household i.

P(Yi = j) is the probability of household i choosing livelihood strategy j.

P(Yi = 0) is the probability of household i choosing the base livelihood strategy (e.g., 'Agriculture Only').

X1i, X2i, …, Xki are a vector of k explanatory variables for household i, which may include household demographic characteristics, asset endowments, and locational factors.

β0j is the alternative-specific constant for livelihood strategy j.

β1j, β2j, …, βkj are the coefficients to be estimated, which represent the change in the log-odds of choosing strategy j over the base strategy for a one-unit change in the corresponding explanatory variable.

IV. Results and Discussion

1 Profiling of Respondents according to Diversification statuses

The profiling of respondents by diversification status reveals distinct patterns in household livelihood strategies and demographic spatial distributions. Gender composition shows male-headed households dominating across categories, yet the share of female-headed households is slightly higher in the non-diversified category (7.27%) than in the diversified category (6.85%). Though the absolute differences are modest, they align with evidence that gendered constraints like land access, credit, and extension services can limit diversification opportunities for female-headed households, particularly in rural Nigeria (Oyelade *et al.,* 2025).

The urban–rural breakdown reveals a clear structural divergence: non-diversified households are more rural (56.56%) than urban (44.43%), while diversified households are even more rural (58.37%). This suggests that diversification in the rural context is not necessarily a shift away from agriculture but may involve multiple agricultural activities or the addition of petty trade and informal services. This contrasts with urban diversification, which more often involves wage employment and formal sector activities (Oyelade *et al.,* 2025)

Geopolitical zone patterns show notable differences, among non-diversified households, the largest shares are South-South (22.91%), South-West (21.33%), and South-East (16.75%), with the lowest in North-Central (9.95%). Among

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diversified households, the top shares are North-East (28.62%), North-Central (22.46%), and South-East (20.38%), while the South-South (6.42%) and South-West (10.41%) have much smaller proportions. The zonal reversal between the two categories is particularly striking: diversification is more prevalent in the northern zones (especially North-East and North-Central), while non-diversification is concentrated in the southern zones. This may reflect structural differences in livelihood systems as northern households may diversify between crop, livestock, and petty trade to hedge against climatic variability, while in the south, oil-related activities, artisanal fishing, or plantation work may dominate, offering fewer diversification channels, also, possible explanation for this could also be disparity between educational attainment between the two regions, educated individuals (mostly concentrated in the South) have been shown to concentrate more on "white collar jobs" (Olawuyi and Adedokun, 2023)

Similarly, Adeyemi *et al.,.* (2025) report that in Nigeria's North-East and North-West, households with both farm and non-farm income sources recorded higher Household Dietary Diversity Scores (HDDS) and lower vulnerability to seasonal food gaps, high share of diversified households in North-East aligns with their interpretation that in highly shock-prone, agro-ecologically marginal areas, diversification is a survival necessity. Conversely, the concentration of non-diversified households in South-South and South-West may reflect a dependence on mono-income streams linked to regional economic specializations and relatively higher educational attainment which while profitable in good years may heighten vulnerability when disrupted.

TABLE 1 Profiling of Respondents' Selected Socio-economic Characteristics According to Diversification statuses

Variables	Freq.	Percent
Not Diversified	**633**	**100**
Male	587	92.73
Female	46	7.27
No formal Education	491	77.57
Had formal Education	142	22.43
Urban	275	44.43
Rural	358	56.56
North central	63	9.95
North east	85	13.43
North west	99	15.64
South east	106	16.75
South-south	145	22.91
South west	135	21.33
Diversified	**1,153**	**100**
Male	1,071	93.15
Female	79	6.85
No formal education	821	71.21
Had formal education	332	28.79
Urban	480	41.63
Rural	673	58.37
North central	259	22.46
North east	330	28.62
North west	135	11.71
South east	235	20.38
South-south	74	6.42
South west	120	10.41

Author's Computation, 2025

2 *Distribution of Livelihood Diversification Strategies in the study area*

The distribution of livelihood diversification strategies presented in Table 2 provides critical insights into the economic resilience and adaptive strategies of households. The data revealed a strong reliance on agricultural activities, with significant variations in diversification patterns that aligned with broader theoretical frameworks on rural livelihoods (Ellis 2020; Barrett *et al.* 2021).

Farming Only (23.46%) and Farming and Livestock (22.50%) constituted nearly half (45.96%) of all livelihood strategies, reinforcing agriculture as the primary economic activity. This finding supports Ellis's (2000) argument that rural households in developing economies remain heavily dependent on farming despite increasing diversification trends. The high percentage of Farming with Livestock combinations aligns with studies demonstrating that mixed farming systems enhance risk mitigation by balancing crop and animal production (Moll *et al.* 2007).

Limited Non-Agricultural Diversification evident in sole reliance on non-agricultural activities (9.23%) and service/hawking (4.04%) remains relatively low, suggesting structural barriers to entry into alternative livelihoods (Loison, 2015). The minimal engagement in trading (1.92%), transportation (1.86%), and professional services (0.96%) alone indicates constrained opportunities in secondary and tertiary sectors, consistent with findings of Owuor *et al.* (2019) in Sub-Saharan African economies.

The presence of Farming combined with Service/Hawking (3.21%) and Farming combined with other Non-Agricultural (5.45%) suggests a gradual shift towards hybrid livelihoods, corroborating Scoones's (2019) assertion that rural households increasingly supplement agriculture with informal sector engagements. However, the scarcity of triple-strategy combinations (e.g., Farming, Livestock and Service/Hawking, 3.21%) implies that complex diversification remains uncommon, possibly due to resource limitations as submitted by Asfaw *et al.,* (2017).

Finally, the dominance of agriculture-based livelihoods mirrors findings in Ethiopia (Dercon and Krishnan 2020) and Kenya (Owuor *et al.* 2019), where farming persists as the primary income source despite climate and market volatilities. The limited uptake of non-farm activities contrasts with South Asian economies, where rural diversification into manufacturing and services is more pronounced (Haggblade *et al.,* 2020).

3 *Determinants of Livelihood Diversification*

The multinomial logistic regression model, using farming alone as the base outcome, reveals substantial heterogeneity in the determinants of livelihood diversification among households. The results demonstrate that human capital, demographic characteristics, asset endowments, and exposure to shocks significantly influence the choice of livelihood strategies. The likelihood ratio test (LR $\chi^2(90) = 1248.46$, $p < 0.001$) and a pseudo R^2 of 0.3835 indicate that the model explains a substantial proportion of the variation in livelihood choices.

For households combining farming and livestock, both education and age significantly increase the probability of

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adopting this mixed livelihood strategy, while sector and shock status reduce it. Education shows a positive and significant effect (RRR = 1.589; *z = 2.46; p = 0.014*), indicating that each additional unit of educational attainment raises the likelihood of combining crop farming with livestock rearing by about 59% relative to farming alone. Similarly, age exerts a modest but significant positive influence (RRR = 1.013; *z = 2.12; p = 0.034*), suggesting that older farmers are more likely to engage in livestock as a risk-spreading strategy. Conversely, households in urban sector are significantly less likely to diversify into livestock (RRR = 0.550; *z = −3.29; p = 0.001*), while exposure to shocks reduces the probability by about 43% (RRR = 0.567; *z = −2.87; p = 0.004*). These findings imply that education and experience enhance the capacity to adopt more productive and resilient agricultural systems. The results are consistent with the findings of Habib *et al.* (2022) and Hoq *et al.* (2022), who reported that higher education and maturity enable households to adopt profitable agricultural diversification strategies.

TABLE 2. Distribution of Respondent by Most Common Types of Livelihood Diversification

Variables	Frequency	Percentage
Farming Only	366	23.46
other non-agric alone	144	9.23
Service or hawking alone	63	4.04
Trading alone	30	1.92
Transportation	29	1.86
Livestock	18	1.15
Professional services	15	0.96
Bar restaurant or food	14	0.90
Processor	11	0.71
Farming and Livestock	351	22.50
Livestock and Trading	13	0.83
Farming and Processor	22	1.41
Livestock and other non-agric	51	3.27
Farming and Service or hawking other no..	50	3.21
Farming and Transportation	17	1.09
Service or hawking and other non-agric	31	1.99
Farming and other non-agric	85	5.45
Livestock and Service or hawking	27	1.73
Farming and Service or hawking	23	1.47
Farming and Trading	12	0.77
Livestock and Professional services	8	0.51
Farming and Livestock and Service or hawking	50	3.21
Farming and Livestock and Transportation	22	1.41
Farming and Processor and other non-agric	16	1.03
Farming and Transportation and other non-agr	14	0.90
Farming and Livestock and Trading	12	0.77
Livestock and Service or hawking and others	10	0.64
Total	**1,191**	**100**

Author's Computation, 2025

For households combining farming with service or hawking, and other non-agricultural activities, household size and education play significant but opposite roles. Household size positively affects participation (RRR = 1.098; *z = 1.98; p = 0.048*), implying that larger households are more likely to diversify into multiple income sources to meet their consumption needs. In contrast, education has a strong negative effect (RRR = 0.322; *z = −2.66; p = 0.008*), suggesting that more educated individuals tend to avoid such informal and low-return activities. This aligns with the argument that education promotes access to formal employment and higher-return opportunities, reducing dependence on petty trade or informal services. Similar findings were observed by Habib *et al.* (2022) and Hoq *et al.* (2022), who emphasized the selective nature of education's effect on diversification.

Among households engaged in farming and other non-agricultural activities, farm size exhibits a negative but statistically insignificant effect (RRR = 0.941; *p = 0.454*), while distance to market and shock exposure show borderline significance. The marginal significance of market distance (RRR = 1.005; *z = 1.96; p = 0.050*) suggests that proximity to market opportunities slightly enhances participation in such mixed livelihoods. Similarly, exposure to shocks tends to increase the likelihood (RRR = 1.488; *z = 1.75; p = 0.081*), implying that households may turn to non-agricultural activities as a coping mechanism against adverse events. These patterns echo findings by Njeru *et al.* (2023) and Adepoju and Oni (2022), who reported that market access and risk exposure often shape households' engagement in non-farm pursuits.

The combination of livestock and non-agricultural activities is significantly influenced by farm size, which shows an exceptionally strong negative relationship (RRR = 0.00067; *z = −6.73; p < 0.001*). This indicates that households with limited or no farmland are far more likely to depend on non-farm enterprises alongside livestock production. Other variables such as education, income, and gender are statistically insignificant, suggesting that land scarcity rather than human capital drives this livelihood choice. This finding supports the conclusions of Hassan *et al.* (2021) and AbdulaiandCroleRees (2022), who identified small landholdings as a

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key determinant of livestock specialization coupled with non-farm diversification.

For households specializing in livestock alone, both farm size and education are highly significant and negatively associated with participation. Smaller farm size increases the probability of livestock specialization (RRR = 0.0027; $z = -6.21$; $p < 0.001$), indicating that households with limited land assets tend to focus on livestock as a primary livelihood. Education also has a strong negative effect (RRR = 0.128; $z = -2.54$; $p = 0.011$), implying that more educated individuals are less likely to depend solely on livestock production. These results are consistent with Abdulai and CroleRees (2022), who noted that livestock specialization is often driven by necessity rather than choice among less educated, resource-poor households.

For the other non-agricultural only category, farm size again exerts a highly significant negative influence (RRR = 0.0015; $z = -11.68$; $p < 0.001$), while state has a positive and significant effect (RRR = 1.039; $z = 2.27$; $p = 0.024$). This suggests that households with smaller or no farmland and those located in more urbanized states are more inclined toward non-agricultural livelihoods. The results affirm that locational advantages and land scarcity are major drivers of complete non-farm transition, consistent with Adepoju and Oni (2022) and Njeru *et al.* (2023).

Households that depend solely on service or hawking are strongly influenced by farm size and sector. Farm size is highly significant and negative (RRR = 0.0030; $z = -8.71$; $p < 0.001$), reaffirming that land-poor households rely on low-capital informal activities. Sector is also significant and negative (RRR = 0.352; $z = -2.73$; $p = 0.006$), indicating occupational or locational barriers to entry. Education negatively affects participation, though marginally (RRR = 0.448; $z = -1.69$; $p = 0.092$). These results resonate with Hoq *et al.* (2022) and Habib *et al.* (2022), who found that education reduces participation in informal hawking or service activities.

The trading alone category is significantly influenced by farm size, household size, and education. Farm size negatively affects the likelihood of trading-only livelihood (RRR = 0.0007; $z = -4.90$; $p < 0.001$), suggesting that households with less farmland depend more on commerce. Household size also has a negative and significant effect (RRR = 0.644; $z = -3.26$; $p = 0.001$), implying that smaller families are more likely to operate trading businesses. Education is negative and significant (RRR = 0.277; $z = -2.04$; $p = 0.041$), indicating that better-educated individuals prefer more formal employment over small-scale trading. These outcomes correspond with Olabisi *et al.* (2021) and Mekonnen *et al.* (2023), who similarly reported that lower education and small household size predict engagement in informal trade.

Finally, for households involved solely in transportation, farm size, education, and state are the main determinants. Farm size is strongly negative and significant (RRR = 0.0079; $z = -6.95$; $p < 0.001$), suggesting that land-poor households rely on transport services as a livelihood. State has a positive and significant effect (RRR = 1.047; $z = 2.00$; $p = 0.045$), reflecting spatial differences in access to transport opportunities. Education is also negative and significant (RRR = 0.189; $z = -2.07$; $p = 0.039$), implying that less educated individuals dominate the transport sector. These findings are consistent with Rahman and Mishra (2023) and Gani *et al.*,. (2022), who found that limited education and land constraints push rural households into informal transport work.

Overall, the results reveal that farm size, education, and age are the most influential determinants of livelihood diversification, while state and shock exposure contribute to locational and contextual variations. Farm size consistently exhibits a strong negative relationship with non-farm activities, highlighting land scarcity as a push factor into alternative livelihoods. Education displays a dual effect encouraging productive diversification (e.g., crop and livestock systems) but discourages engagement in low-return informal work (e.g., hawking, transport). The state effect underscores spatial inequalities in access to non-farm opportunities. These findings align with the theoretical expectations of Ellis (2000) and Barrett *et al.* (2021), emphasizing that livelihood diversification is shaped by the interplay between human capital, asset endowment, and contextual opportunities.

TABLE 3. Determinants of Livelihood Diversification

Livelihood activities	RRR	Std. Err.	Z	P>z	[95% Conf.	Interval]
Farming and Livestock						
Farm size	.9568	.0661	-0.64	0.523	.8356	1.0955
Sector	.5498*	.0999	-3.29	0.001	.3849	.78501
State	.9955	.0103	-0.44	0.662	.9754	1.0159
Gender	1.3521	.4289	0.95	0.342	.7261	2.5175
Age	1.0128**	.0061	2.12	0.034	1.0001	1.0248
Household size	1.0387	.0323	1.22	0.222	.9773	1.1040
Education	1.5891**	.2988	2.46	0.014	1.0991	2.2972
Income res.	.9999	6.5700	-1.78	0.075	.9999	1.0000
Distance to market	1.0034	.0020	1.68	0.093	.9994	1.0073
Shock status	.5667	.1121	-2.87	0.004	.3846	.8351
_cons	.1751	.1043	-2.93	0.003	.0545	.5625
Farming, Service/hawking and other						
Farm size	1.0073*	.0982	0.07	0.941	.8322	1.2192
Sector	.5999	.1744	-1.76	0.079	.3393	1.0606
State	.9971	.0171	-0.17	0.866	.9640	1.0312
Gender	4.4908	.0001	-0.01	0.995	4.4826	1.5937
Age	1.0132	.0099	1.34	0.181	.9939	1.0328
Household size	1.0982**	.0521	1.98	0.048	1.0002	1.2052

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Education	.3217*	.1374	-2.66	0.008	.13929	.7431
Income res.	.9999	1.0000	-0.91	0.363	.9999	1.0001
Distance to market	.9962	.0033	-1.14	0.254	.9897	1.0027
Shock status	.9116	.2729	-0.31	0.757	.5069	1.6393
_cons	1.0407	2.8700	0.01	0.995	9.8536	8.8952
Farming and other non-Agric						
Farm size	.9408	.0767	-0.75	0.454	.8019	1.1038
Sector	1.1205	.2730	0.47	0.641	.6949	1.8065
State	1.0122	.0120	1.02	0.310	.9888	1.0361
Gender	.4224	.2610	-1.39	0.163	.1258	1.4183
Age	.9988	.0077	-0.16	0.877	.9838	1.0141
Household size	1.0211	.0397	0.55	0.585	.9465	1.1023
Education	.6791	.1832	-1.43	0.152	.4003	1.1524
Income res.	.9999	4.7800	-0.04	0.970	.9999	1.0000
Distance to market	1.0044*	.0024	1.96	0.050	.9999	1.0094
Shock status	1.4876	.3385	1.75	0.081	.9524	2.3235
_cons	.3367	.3033	-1.21	0.227	.0576	1.9680
Livestock and Other non-Agric						
Farm size	.0007***	.0007	-6.73	0.000	.0001	.0056
sector	1.8467	.7858	1.44	0.149	.8020	4.2520
State	1.0223	.0216	1.04	0.297	.9807	1.0656
Gender	1.4723	.9896	0.58	0.565	.3943	5.4973
age	.9956	.0142	0.31	0.760	.9681	1.0239
household size	1.0836	.0663	1.31	0.189	.9612	1.2216
Education resd	.87863	.3969	-0.29	0.775	.3624	2.1298
Income Resd	.99999	7.7100	-0.01	0.989	.9999	1.0000
Distance to Market	1.0029	.0044	0.67	0.503	.9943	1.0116
Shock status	.7641	.3239	-0.63	0.526	.3328	1.7540
Constant	3477	.4563	-0.80	0.421	.0265	4.5510

	RRR	Std. Err.	Z	P>z	[95% Conf.	Interval]
Livestock alone						
Farm size	.0027***	.0026	-6.21	0.000	.0004	.0175
Sector	1.431	.7169	0.72	0.474	.5363	3.820
State	1.038	.0253	1.55	0.121	.9900	1.089
Gender	1.5011	1.324	0.46	0.645	.2662	8.462
Age	1.0166	.0164	1.02	0.307	.9849	1.049
Household size	1.0725	.0782	0.96	0.337	.9297	1.237
Education red	.1279**	.10362	-2.54	0.011	.0261442	.6258
Income red	.9999	.0000	-0.57	0.565	.9999689	1.000
Dist. market	1.0019	.0052	0.36	0.718	.9916277	1.012
Shock status	.4824*	.2624	-1.34	0.180	.1660884	1.401
Cons	1.0678	.8555	0.04	0.970	.0354438	32.17
Other non-Agric						
Farm size	.0015***	.0008553	-1.68	0.000	.0005	.0045
Sector	.9182	.2871	-0.27	0.785	.4974	1.6950
State	1.038**	.0174	2.27	0.024	1.0050	1.0737
Gender	2.0091	1.0311	1.36	0.174	.7346	5.4966
Age	1.0099	.0107	0.92	0.355	.9890	1.0312
Household size	.93467	.0540	-1.17	0.242	.8346	1.0467
Education res	.6416	.2322	-1.23	0.220	.3156	1.3043
Income resd	.9999	6.9001	-0.90	0.370	.9999	1.0000
Dist. market	1.001	.0036	0.48	0.630	.9946	1.0088
Shock status	1.3246	.4213	0.88	0.376	.7104	2.4702
_cons	2.7874	2.8260	1.01	0.312	.3821	20.331

	RRR	Std. Err.	Z	P>z	[95% Conf.	Interval]
Service/Hawking alone						
Farm size	.0029***	.0019	-8.71	0.000	.0008	.0110
Sector	.3523*	.1345	-2.73	0.006	.1666	.7448
State	1.026	.0204	1.31	0.190	.9871	1.067
Gender	1.0441	.6905	0.07	0.947	.2861	3.815
Age	.99549	.0127	-0.35	0.724	.9708	1.020
Household size	.94251	.0698	-0.80	0.424	.8151	1.0890
Education resd	.4477	.2133	-1.69	0.092	.1759	1.1390
Income resd	.9999	7.2000	-0.11	0.915	.9999	1.0000
Distance market	1.0031	.0043	0.84	0.402	.9951	1.0121
Shock status	1.7642	.6560	1.53	0.127	.8511	3.6565
_cons	22.673	28.1532	2.51	0.012	1.989	258.46
Trading alone						
Farm size	.0007***	.0010	-4.90	0.000	.0000	.0129

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Sector	1.078	.5254	0.16	0.876	.4153	2.802
State	1.037	.0255	1.48	0.140	.9881	1.088
Gender	2.561	1.7390	1.39	0.166	.6768	9.6910
Age	1.024	.0147	1.66	0.097	.9957	1.0533
Household size	.6438***	.0868	-3.26	0.001	.4942	.83876
Education resd	.2766 **	.1740	-2.04	0.041	.0805	.94948
Income resd	.9999	.0000	-0.50	0.619	.9999	1.0000
Distance market	.9964	.0056	-0.62	0.535	.9853	1.0076
Shock status	.7230	.3622	-0.65	0.517	.2708	1.9301
_cons	3.8600	6.076	0.86	0.391	.1765	84.423
Transportation alone						
Farm size	.0079***	.0055	-6.95	0.000	.0020	.0310
Sector	.5970	.2761	-1.12	0.265	.2411	1.4771
State	1.0461**	.0239	2.00	0.045	1.0001	1.0950
Gender	6.4607*	.0005	-0.02	0.986	.6476	.6185
Age	.9975	.0158	-0.15	0.878	.9670	1.0290
Household size	.8680	.09085	-1.35	0.176	.7070	1.0656
Education res	.1890**	.15240	-2.07	0.039	.0389	.91782
Income resd	1.0001	7.0300	0.85	0.396	.9999	1.0000
Dist. Market	1.0046	.0053	0.89	0.375	.9943	1.0151
Shock status	1.4305	.6615	0.77	0.439	.5779	3.5409
_cons	2.0307	1.6710	0.02	0.984	.4525	4.7640

TABLE 4. Marginal Effects of Determinants of Livelihood Diversification

	Delta method dy/dx	Std. Err.	Z	P>z	[Conf.	Interval]
Farm size	.0648***	.0059	10.95	0.000	.0532	.0764
Sector	-.0642***	.0197	-3.29	0.001	-.1037	.0262
State	-.0010	.0011	-0.90	0.366	.0033	.0012
Gender	.2020	24.0420	0.01	0.993	46.9195	47.3231
Age	.0013**	.0007	1.99	0.046	.00002	.0026
Household size	.0039	.0034	1.17	0.243	.0027	.0106
Education res.	.0773***	.0203	3.80	0.000	.0374	.1172
Income res	-1.246*	7.5007	-1.66	0.097	-2.7106	2.2607
Dist. to market	.0003	.0002	1.49	0.135	.0001	.0007
Shock status	-.0722***	.0218	-3.31	0.001	.1151	.0294
*** Significant at 1%		** Sig. at 5%		* Sig. at 10%		

7 *Marginal Effects of Determinants of Livelihood Diversification*

The marginal effects further quantify these relationships. Farm size (dy/dx = 0.0649, z = 10.95, p < 0.001) and education (dy/dx = 0.0774, z = 3.80, p < 0.001) significantly increase the probability of diversification, suggesting that both land ownership and schooling facilitate livelihood expansion beyond farming. Conversely, sector (dy/dx = -0.0650, z = -3.29, p = 0.001) and shock exposure (dy/dx = -0.0723, z = -3.31, p = 0.001) significantly reduce diversification probabilities, implying that sectoral barriers and vulnerability limit adaptive capacity. Age (dy/dx = 0.0013, p = 0.046) exerts a small but positive effect, suggesting experience encourages diversification, albeit modestly.

8 *Predictive Margins of Livelihood Diversification*

The computed predictive margins provide nuanced insights into the average predicted probabilities of livelihood diversification across key demographic and socio-economic strata in Nigeria. These results, detailed in Table 5, reveal several pronounced patterns. Households in the rural sector exhibit a significantly higher predicted probability of diversification (18.7%, p < 0.001) compared to their urban counterparts (13.5%, p < 0.001). This suggests that rural, and by extension agriculturally-linked, households engage more readily in diverse livelihood activities. The significantly higher level of diversification in the rural sector aligns with the established narrative that in agriculture-dependent economies, diversification is a fundamental risk-management strategy (Ogundeji *et al.,* 2022). This finding confirms that livelihood diversification in Nigeria is not a predominantly urban phenomenon but is a core characteristic of rural livelihoods, often driven by the seasonal nature of agriculture and the need to mitigate its associated risks.

Furthermore, the analysis indicates a gender differential, with female-headed households having a predicted probability of 18.6% (p < 0.001) compared to 15.3% (p < 0.001) for male-headed households. The gender differential, wherein female-headed households exhibit a higher probability of diversification, requires nuanced interpretation. While the marginal effect is positive, this finding is contextualized by the work of Adebayo and Olagunju (2023), who observed that female-headed households often participate more in low-entry-barrier, low-return activities such as petty trade and services. Therefore, the higher probability likely reflects a higher incidence of engagement in at least one such activity, often driven by necessity, rather than an indication of superior diversified livelihood portfolios. It points to the segmented nature of diversification, where gender influences the type and quality of activities undertaken.

Educational attainment emerges as a powerful determinant; the probability of diversification more than

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doubles from 11.8% ($p < 0.001$) among respondents with no formal education to 25.0% ($p < 0.001$) among those with formal education. The powerful positive effect of formal education is a unanimous finding across recent empirical work. Adebayo and Olagunju (2023) for instance, in a study from Southwestern Nigeria, similarly identified educational attainment as a primary enabler for accessing higher-return, non-farm opportunities. This reinforces the conclusion that education enhances human capital, thereby facilitating a transition from necessity-based to opportunity-driven diversification and increasing overall livelihood complexity.

Finally, exposure to shocks presents a stark negative effect: households that experienced a shock have a drastically lower diversification probability of 10.4% ($p < 0.001$) compared to 19.2% ($p < 0.001$) for those who did not, indicating that vulnerability significantly constrains diversification capacity, this is strongly corroborated by Ogundeji *et al.,* (2022) in their study of smallholder farmers in North-Central Nigeria. They similarly conclude that climate shocks lead to asset erosion, which directly diminishes the household's risk-bearing capacity and capital required to invest in non-farm enterprises. This consensus underscores a critical poverty trap, where the households most in need of protective diversification are the least equipped to pursue it.

TABLE 5. Predictive Margins of Livelihood Diversification

Predictive variables	Margin Std. Err.	z	P>z	[95% Conf.	Interval]
Shock status					
No shock experienced	.1917*** .0137	13.97	0.000	.1648	.2186
Experienced shock	.104 *** .0132	7.85	0.000	.0780	.1299
Education (residual)					
No formal Educ.	.1181*** .0105	11.26	0.000	.0976	.1387
Had formal Educ.	.2499*** .0218	11.44	0.000	.2071	.2928
Gender					
Male	.1532***.0101	15.12	0.000	1.1333	.1730
Female	.1856***.0358	5.18	0.000	.1153	.2558
Sector					
Rural	.1871*** .0163	11.45	0.000	.1551	.2192
Urban	.1353*** .0121	11.20	0.000	.1116	.1590
*** Significant at 1%					

Source: Author's computation, 2025.

V. Conclusion and Policy Recommendations

This study provided a nuanced, nationally representative analysis of the determinants of livelihood diversification among Nigerian households, leveraging a Multinomial Logistic Regression framework to move beyond binary classifications. The findings robustly demonstrate that livelihood diversification is not a monolithic strategy but a heterogeneous phenomenon, the form and drivers of which are critically shaped by the interplay of human capital, asset endowments, demographic characteristics, and geographic context.

The analysis yielded several key conclusions. First, the structure of diversification is profoundly dualistic. While diversification is more prevalent in rural areas, it is often characterized by agricultural-combination strategies (e.g., farming with livestock) or engagement in low-return informal sectors. In contrast, urban and more educated households exhibit a tendency towards formal wage employment and higher-return enterprises. Second, education emerges as a pivotal but double-edged determinant; it significantly promotes diversification into productive, resilient agricultural mixes and formal non-farm employment, while simultaneously reducing the likelihood of engagement in distress-driven, informal activities such as petty hawking and unskilled transport services. Third, asset poverty, particularly limited farm size, acts as a powerful "push" factor, compelling households into specialized non-farm or livestock-based livelihoods, often as a necessity rather than a choice. Fourth, the capacity to diversify is severely constrained by vulnerability, as evidenced by the significantly lower diversification probability among shock-affected households, highlighting a critical poverty trap. Finally, pronounced regional disparities underscore the fallacy of a one-size-fits-all policy, with the northern zones exhibiting necessity-based diversification in response to agro-ecological and conflict-related stresses, while the southern zones display more opportunity-oriented patterns.

To effectively harness livelihood diversification as a vehicle for poverty reduction, enhanced resilience, and the achievement of SDGs 1 and 2, policy interventions must be targeted and multi-pronged. Policy should expand beyond basic literacy to incorporate vocational training and skills development programs tailored to the non-farm economy. This is crucial for equipping rural populations, particularly the youth, with the competencies required to access higher-return diversification pathways, thereby shifting diversification from a survivalist to an accumulative strategy.

Given the constraining effect of asset poverty, improving access to affordable credit, microfinance, and savings products is imperative. Financial instruments should be designed to enable investments in small-scale enterprises, improved agricultural inputs, and livestock, thereby relaxing the capital constraints that currently trap households in low-return activities. Also, public investment should focus on closing the rural infrastructure gap, including all-weather roads, reliable electricity, and market facilities. This would reduce transaction costs, stimulate local non-farm economic activities, and enhance the profitability of diversified livelihoods, especially in the underserved northern regions

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where the propensity to diversify is high but the returns are low.

National policies must be disaggregated to reflect regional realities. In the North, interventions should prioritize climate-smart agriculture, conflict mitigation, and foundational education to create a springboard for sustainable diversification. In the South, policy should focus on enhancing the business environment, supporting SMEs, and fostering skills aligned with a modernizing economy.

While female-headed households show a higher probability of diversification, this often segments them into precarious informal work. Policies must actively dismantle barriers to women's access to land, credit, and extension services. Furthermore, establishing shock-responsive social protection systems is essential to prevent vulnerable households from losing their diversification capacity and falling deeper into poverty during crises.

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