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Okro value chain and marketing channel analysis in Nigeria

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Abstract

This study investigated the value chain and marketing channels of fresh okro in Nigeria. A multistage sampling technique was used to survey 253 participants (85 producers, 25 wholesalers, 143 retailers) to delineate channels, cost structure, margins, and factors influencing marketing performance. The most prominent marketing channel were producer → middleman → retailer → consumer (33.3%), followed by producer → retailer → consumer (29.2%), producer → wholesaler → retailer → consumer (20.8%), and direct sales by producers to consumers (16.7%). Producers grappled with average seasonal costs of ₦898,494, ultimately achieving gross margins of ₦479,506. This translated to a return on investment of 53.4%. Wholesalers and retailers, however, experienced lower ROIs, at 22.2% and 17.6%, respectively. Sensitivity loss simulations suggested that a reduction of post-harvest losses by 50% would result in a 9–10% increase in the quantities sold and gross margins would increase by 5 -- 5.4 percentage points. On the other hand, a reduction of 20% in transport costs would result in lower margin increases (0.2–1.7 percentage points). Regression with R2 = 0.65 and Farmer/ Marketer characterizes ($\beta1 = 0.30$, $p = 0.021$), Farm/firm attributed ($\beta2 = 0.55$, $p < 0.01$), Seasonality and perishability ($\beta3 = 0.45$, $p = 0.0005$), Gender and household ($\beta4 = 0.22$, $p = 0.039$), Transaction cost and logistic ($\beta5 = 0.20$, $p = 0.036$) were the most important variables that explained marketing outcome. Cogent strategies found to improving efficiency of okro value chain marketing included collaboration with local restaurants, direct selling to consumers, and cooperative marketing. To enhance the welfare and efficiency of producers, policymakers should focus on low-cost cold storage, aggregation hubs, targeted transport support, and digital price platforms.

Keyword: Okro; Value Chain; Marketing; Channel; Welch ANOVA

1. Introduction

Fresh okro (*Abelmoschus esculentus*) is an essential vegetable that is of great importance to smallholder farmers, as it provides a source of regular income. However, its perishability, market split seasonality, and production patterns lead to value chain challenges that affect producer income and consumer access (FAO, 2023). For example, a better understanding of a given marketing channel's costs and structure and identifying elements of successful marketing are some of the fundamental elements to consider in formulating plans to improve the welfare of producers and minimize the loss of food.Analyzing the value chain of perishables in horticulture illustrates a repeated pattern within a given unit of analysis in relation to poor aggregation, inadequate post-harvest processing, high costs associated with transportation, and insufficient market information, as well as limited vertical relations between producers and buyers (De Blasis, 2020; Ugwukah, 2022). In Nigeria, the above-mentioned problems are worsened by poorly developed rural infrastructure and less than optimal management of the cold chain; this determines the large number of distress sales, extreme volatility of prices, and small share of producers of the retail price (Corrie et al., 2024; FAO, 2022). It has been shown that market intermediaries, i.e., middlemen, wholesalers, and retailers, are key players in linking isolated

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producers with large urban centers, and although they reduce the number of transactions, they also retain a large margin when prices of producers are limited (McCouriston and Maclauren, 2023).

Recent studies emphasized three broad drivers that result in better marketing of perishables. Firstly, physical access to a market—measured by distance to the market and availability of transport—consistently influences both the volumes of perishables that are sold as well as the choice of marketing channels (Jew and Dougill, 2025). Longer market distances and worse road conditions increase time costs and reduce the market radius where fresh okro is economically viable, leading producers to prioritize trading with closer market participants, even at a price demarcated as 'sell,' or 'staking' worse than their opinion of the okro. There is a second key determinant to qualify for high-value marketing channels, and that is the quality of the fresh okra as well as the quantity produced. When grading and better varieties of fresh okra are used, paired with better agronomic practices, the chances of securing formal market buyers increase as well as the likelihood of producers improving their market price (Baiyeguahi et al., 2023). Lastly, market information systems and cooperative memberships, along with institutional relationships and information, help reduce search costs and improve the timely capture of market opportunities, which is of utmost importance in the marketing of highly perishable crops (De Blasis, 2020).

Cost-structure analyses facilitate specific policy recommendations by determining which cost elements are most damaging to margins. For okro in Delta State, labor and input costs are the most significant variable costs for producers, while costs related to transport and handling are significant for intermediaries. In the same context, sensitivity analyses indicate that post-harvest loss mitigation (improved crates, drying/processing, temporary cold storage) ex post are more effective than transport cost mitigation in terms of margins. The increase in available and marketable products, along with greater price stability, are the main benefits of loss mitigation (Ugwukah, 2022; FAO, 2022).The choice of channel is a product of both the economics of the situation and the risk that is involved. In order to obtain immediate payment and avoid the risk of spoilage, producers with small surpluses often sell to middlemen or local retailers, while larger producers, or those with better connections, can sell to wholesalers or buyers in the city for better prices (Onuwa et al., 2022). It is, therefore, perfectly rational to find middleman-dominated chains given storage and liquidity constraints and not simply market inefficiencies. However, the informal systems that provide liquidity and market access can be preserved, and value created for primary producers, by enhancing producer aggregation (collection centers and cooperatives) and formal contracting.

Restricted access to high-value markets and inefficient channel configurations exacerbate profitability challenges, particularly for smallholders with limited surplus production. Therefore, this study stems from its provision of an empirical grounded analysis of okro value chain and marketing channel, associated cost framework, and the key determinants of marketing outcome. These insights are intended to inform the design of intervention that seek to bolster producers wellbeing, reduce post-harvest losses, and improve both the efficiency and fairness of the horticultural market system in Nigeria.

1.1. Study Area

Isoko North Local Government Area is the study area. It is located on Latitude 50°32'23"N and Longitude 60°14'30"E. The study area is involved in vegetable production, and also a commercial hub for farm produce.

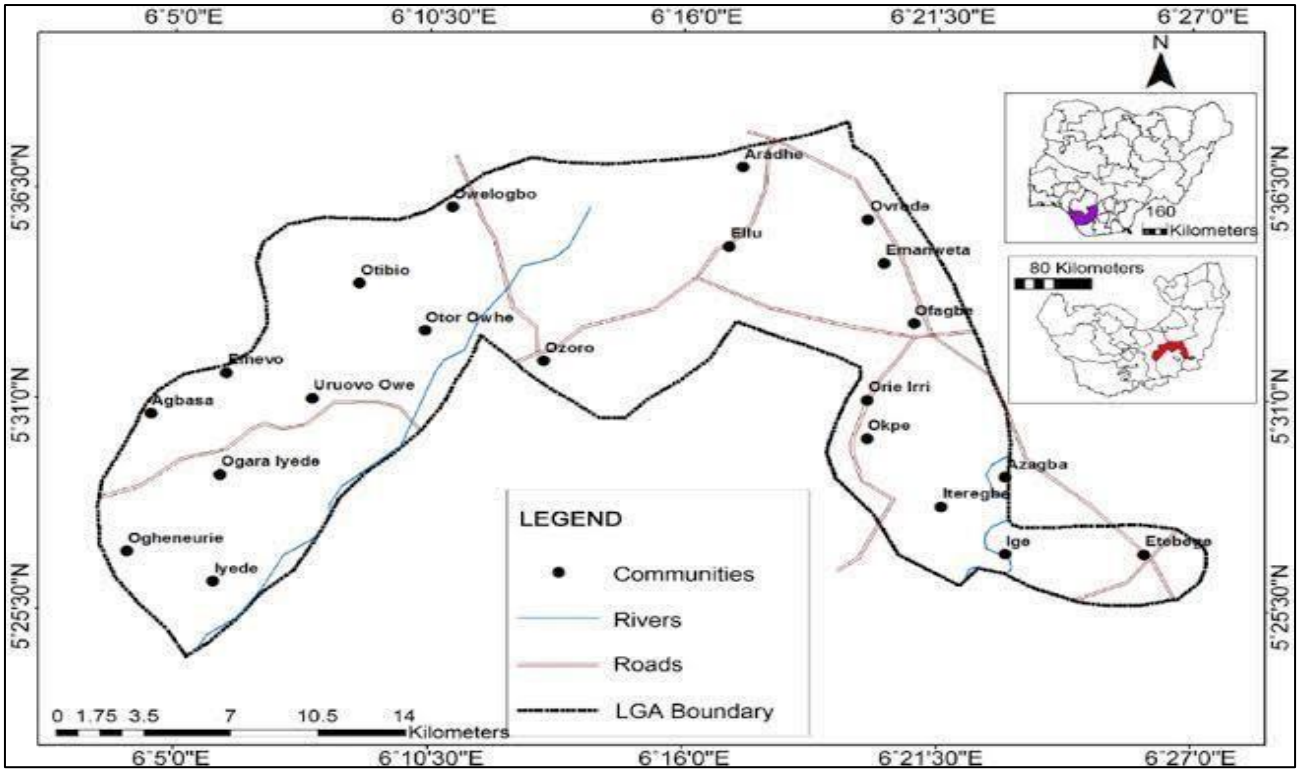


Figure 1 Map of Isoko North Local Government Area of Delta State, Nigeria

1.2. Sampling procedure

The study population involved all participants in the fresh okro value chain (producers, wholesalers, and retailers) in the study area. Multistage sampling techniques were employed.In Stage 1, community selection was carried out using purposive selection of major okro-producing and trading communities within Isoko North LGA for the purposes of capturing geographical and market diversity.In Stage 2, community actors were listed within the chosen communities. The community actors included Okro producers, wholesalers, and retailers, and this was done based on the market association lists and key informant documentation. Local records from the agricultural lists of market traders, and registers of community leaders from the sampled communities in the study area made up the sampling frame. For the sample frame, the total number of respondents was 739. Using the Cochrane formula, 253 respondents were selected. This was represented as:

as:

$$n = \frac{n_0}{1+\frac{(n_0-1)}{N}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots Equation\ 1$$

$$n_0 \frac{Z^2pq}{e^2} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots Equation\ 2$$

Where
N represent sampling frame (including
n represent the sampling size with a finite population
n_0 is the sample size for infinite population
Z is the critical value (1.96) of the required 95% confidence level
P is the specified proportion in the population (0.50), assuming maximum variability

q =1-p, and

e is the desired level of accuracy (5%)

The selection of respondents (producers and retailers) in Stage 3 was done by systematic random sampling from the consolidated lists. For wholesalers, due to their smaller and more concentrated population, they were sampled using

purposive sampling from the entire list to ensure active bulk traders were included (target n = 25). The total sample size of respondents, N = 253 respondents, was distributed as 85 producers (33.6%), 25 wholesalers (9.9%), and 143 retailers (56.5%). The replacement rule was that, where a selected respondent was unavailable or unwilling to take part, the next eligible person on the list was contacted, and this continued until the quota for that subgroup was completed.

Those included were actors who traded and/or produced new okra in the last season and agreed to participate. While those excluded were individuals who were not participants in the last season of okro production/trading or who were not able to give plausible recollective data.

1.3. Data collection

Structured questionnaire for data collection covered socioeconomic variables, production and marketing costs, quantities, prices, channel participation, post-harvest losses, and marketing strategies. Enumerators who are local language speakers were trained for the purpose of conducting the interviews.

Secondary data were obtained from Journal, Publications, Statistical and Government reports

1.4. Ethical considerations

Informed consent, voluntary participation, confidentiality, and the anonymization of responses.

1.5. Data analysis

Data were entered into statistical software, cleaned, and checked for consistency. Analyses included descriptive statistics by actor type, group comparisons (Welch ANOVA and pairwise tests), cost and margin calculations, sensitivity scenarios, and regression models to identify determinants of marketing channel choice in the study area.

2. Results and Discussion

2.1. Socioeconomic characteristics of respondents in the study area.

The result in Fig. 2.0 revealed that fresh okro marketers in the sample were mostly women, which was consistent with evidence from West Africa, where women dominate horticultural retailing (Quisumbing et al., 2021). This suggested the importance of gender-responsive interventions for addressing women's limited access to credit, time, and market information. With an average of 48 years, the age structure was skewed toward older and middle-aged adults with very few youths. This was consistent with the generally low youth participation in agriculture, which was attributed to land and capital constraints (Yeboah et al., 2020). This discovery could inhibit the rate of innovation, and highlighted the need for youth-focused agribusiness and innovation-dissemination knowledge programs.

The result further showed that most marketers possess 6-10 years of experience. This suggested that they have a high degree of market knowledge that could be complemented by training in business management and collective marketing (Yitayew et al, 2021; Ragasa & Mazunda, 2018). Households with 4-6 members provide family labor but also have high consumption demands. This according to Gupta (2020) could lead to distress sales in the absence of adequate storage or financing.

There is an apparent complexity behind multiple household formations and classifications of social unit members that may remain hidden due to the high proportions of older people reporting "single" status. This had consequences for extending social protection and credit targeting beyond formal "head of household" classifications (Baroah et al., 2020; Njuiki et al., 2022). The absence of formal education and over 80% having only primary education. This severely limited the use of written contracts and the application of digital technologies (Rahman et al., 2024). That is why training must be hands-on and delivered in the language of the participants and use audio-visuals (Herman et al., 2023).

The sample mean income of ₦586,914 laid inside the largest category (₦400,000—800,001). This income distribution was strongly concentrated in the middle bracket (78%), with few marketers at the high end. The high income concentration in one band suggested limited upward mobility within the value chain for most participants. Limited access to higher-value markets, seasonal price volatility, thin margins, and limited credit or capital to scale up are possible constraints.

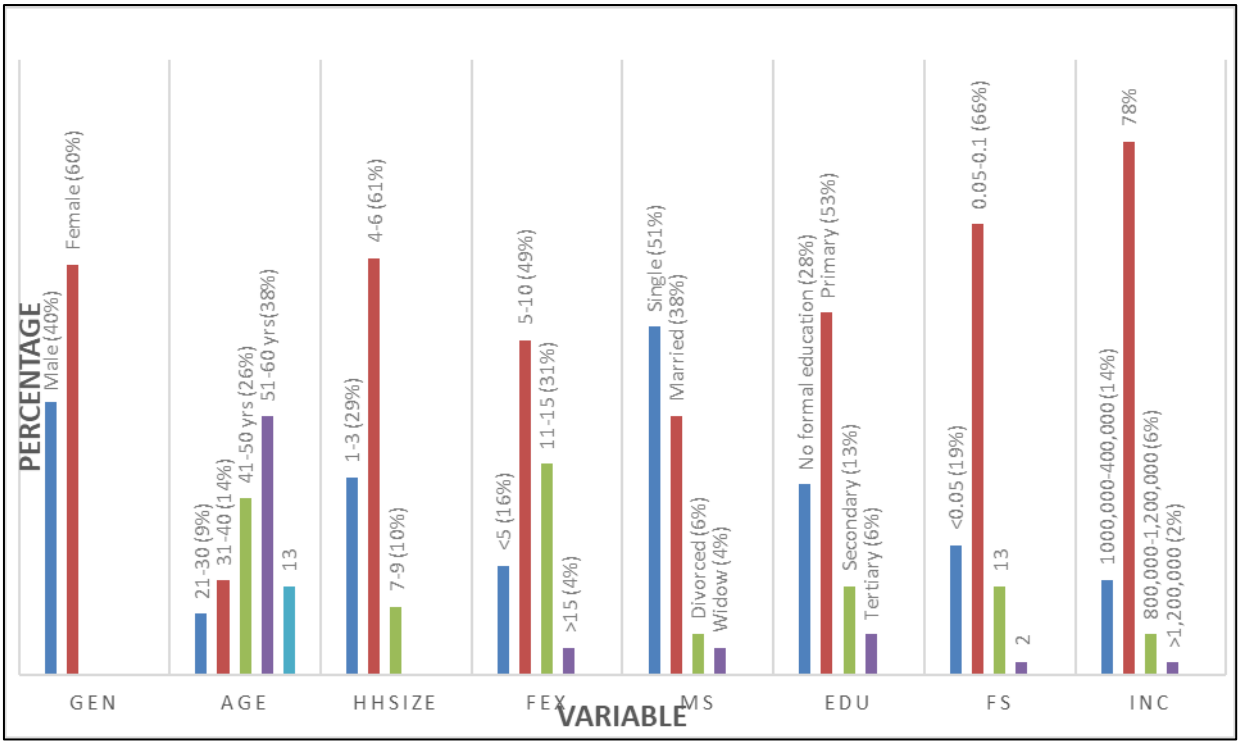
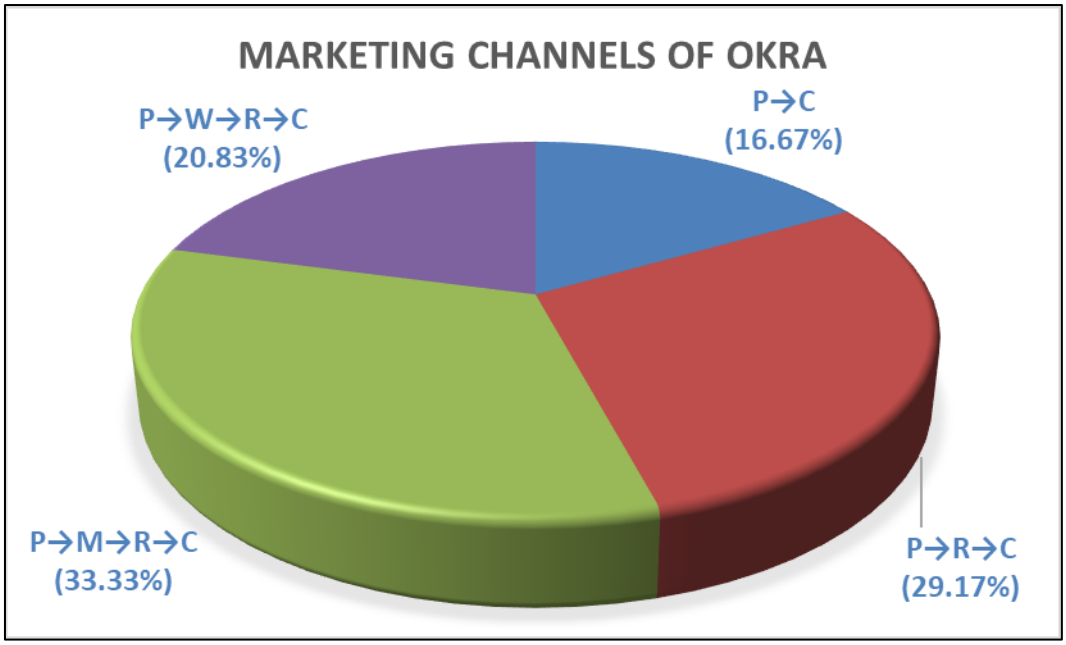


Figure 2 Socioeconomic characteristics of fresh okro marketers in the study area

2.2. Marketing channels of fresh okro in Ughelli North Local Government Area

There were fresh okra distribution marketing channel insights within the study area and how they flow from producers to retailers and finally to consumers. The results from Fig. 3.0 showed that producers selling directly to consumers were 16.67% of the total selling/marketing activities, which represented the less frequent and more direct form of market participation. Further, 29.17% of producers sold their okra via retailers, which means that the retail market acted as an important intermediary in serving the consumers of fresh produce. The largest portion of the participants in the distribution channel were producers selling to middlemen, retailers, and then consumers, with 33.33% of the distribution. This showed the tendency of the producers to employ middlemen because of the benefits associated with the middlemen's positive networking, which assists in the control of the distribution and its timeliness. Lastly, selling direct from the producers to the wholesalers, then to retailers and consumers was 20.83%, which also showed a new possible channel for the marketing of fresh okro. The supply chain for okro needs middlemen to supplement the direct marketing strategies because of their significant role in adding to the direct marketing supply chain. Recent research indicates that the involvement of intermediaries has facilitated enhanced market access, reduced transaction expenses for producers, and improved consumer access to fresh vegetables (Ocholi and Udeh, 2024; Okonkwo and Michael, 2021). Furthermore, investigations have revealed that the efficacy of the okra marketing channel is influenced by market structure, competitive dynamics, pricing strategies, and the quality of the okra itself (Baiyeguahi et al., 2023). This implied that most of the marketing channels in the supply chain for okro were being utilized and suggests that there is still room for the producers in Ughelli North to develop relationships with the consumers through direct sales.



Note: P→C: Producers→Consumers; P→R→C: Producers Retailer → Consumers; P→M→R→C: Producers→ Middlemen→ Retailers→Consumers; P→W→R→C: Producer→ Wholesalers→ Retailers→ Consumers

Figure 3 Marketing channels distribution of Okro marketers

2.3. Comparisons of mean percentages by actor type

In Table 1.0, producers showed a substantially higher mean percentage (61%) than both wholesalers (27%) and retailers (29.4%). The mean differences were large: Producers − Wholesalers = 33 percentage points (95% CI: 24.5 to 43.3), Producers − Retailers = 31.6 percentage points (95% CI: 25.1 to 38.1). Both pairwise comparisons were highly statistically significant ($p < .0001$). The percentage measure implied that producers behaved very differently from both intermediaries (wholesalers and retailers). Producers scored much higher on this measure. The result further revealed that the effect sizes were large for those differences: Cohen's d = 1.59 (Producers vs. Wholesalers) and Cohen's d = 1.29 (Producers vs. Retailers). According to conventional benchmarks, these are very large effects, indicating the differences were not only statistically significant but practically meaningful. Wholesalers and retailers do not differ, as their mean difference = −2.3 percentage points, p = 0.61, 95% CI = (−11.5, 6.9), and Cohen's d = −0.10. This is a trivial, non-significant effect, and the confidence interval included zero, so no reliable difference was supported between those two groups. The lack of difference between wholesalers and retailers suggested that intermediaries as a category were similar with respect to the measured outcome and that the main split in the system was between producers and intermediaries.

Table 1 Welch ANOVA post-hoc pairwise comparisons of mean percentages by actor type (Producers, wholesalers and retailers)

Comparison	n1	n2	Mean 1(%)	Mean 2 (%)	Mean diff. (%)	t	df	P (two tailed)	95% CI diff (%)	Cohen"s d	95% CI d
Producers-Wholesalers	85	25	61	27	33	7.26	44	<.0001	24.5, 43.3	1.59	[1.09, 2.10]
Producers-Retailers	85	143	61	29.4	31.6	9.60	198	<.0001	25.1, 38.1	1.29	[0.99, 1.58]
Wholesalers-Retailers	25	143	27.1	29,4	-2.3	-0.51	40	0.61	(-11.5, 6.9)	-0.10	-0.54, 0.34

Notes: - "Mean diff" = Mean1 − Mean2 (percentage points). ;- Cohen's d computed with s = sqrt[(s1^2 + s2^2)/2] (Welch-style standardizer). ; - Confidence intervals and dfs are approximate because SDs were approximate and unequal-variance corrections were used. ; - All values rounded to reflect the precision of the supplied inputs.

2.4. Cost structure of okro value chain and marketing in Isoko North LGA

Table 2.0 revealed that producers bore the lion's share of input and labor costs of about 90% of the input cost and 89% of labor cost in the chain at production (Amount: ₦50,300 for inputs; ₦84,294 for labor). High producer share of inputs and labor is typical for labor-intensive horticulture (okra), where seed/seedling, fertilizers, agrochemicals, and manual labor drive on-farm costs. That concentration implied that producer returns were highly sensitive to production efficiency and input prices. Studies on food loss and waste emphasized that post-harvest losses for perishable horticultural crops are often concentrated in the midstream (aggregation/wholesale and transport) and that investments in transport, packaging, and handling reduce losses and increase chain efficiency (Li and Liu, 2019).

Transportation costs were concentrated with wholesalers (₦42,000; 68% of transport cost share), with retailers carrying a smaller but non-trivial share (₦13,800; 22%). Producers' direct transport cost is small (₦5,670; 9%). Heavy transport costs at the wholesale level causes wholesalers to aggregate smallholder output and move large volumes to urban markets; aggregation and long-distance hauling raise their transport bills. High transport burdens increase final marketing margins and reduce producer and consumer welfare if pass-through is incomplete. Empirical studies of Sub-Saharan horticultural chains showed similar patterns where production bears most input/labor costs. while the midstream carried transport and most spoilage risk; interventions combining aggregation, improved transport, and cold/packaging reduce losses and raise farmer incomes (Shabhazi et al, 2025, Stathers et al, 2024).

Post-harvest losses (expressed as % loss and share of total loss) are largest at the wholesaler node (6.5% loss; ~57% share of observed losses), followed by retailers (3.5%; ~29%) and producers (2.2%; ~18%). Largest post-harvest losses at the wholesaler node: handling, sorting, aggregation, and longer holding/transport times at the wholesale stage increase mechanical damage, spoilage, and shrinkage for a highly perishable crop like okro. Where wholesalers lack adequate cold or rapid logistics, losses spike and value is destroyed. Value-chain and market transformation literature (Hidayati et al, 2021, Kilemile et al, 2025; Bisht et al, 2024) highlighted that as supply chains modernize, share of costs shifts (more investment in logistics, grading, and cold-chain), and actors' bargaining power and margins change—underscoring why targeting only one node is often insufficient for welfare gains.

Table 2 Average cost per season of fresh okra production and Marketing by actors

Items	**Producers**		**Wholesalers**		**Retailers**	
Variable cost	Amount	%	Amount	%	Amount	%
Input cost (₦)	50,300	90.31	3200	5.75	2,000	3.59
Labour (₦)	84,294	88.74	8,500	8.95	2,200	2.32
Cost of Transportation(₦)	5,670	9.22	42,000	68.33	13,800	22.45
Post-harvest loss (%)	2.2	18.03	6.5	57.28	3.5	28.69

2.5. Sensitivity Analysis of Okra value and chain and Marketing channel

The sensitivity analysis result in Table 3.0 highlighted the importance of reducing transport costs and post-harvest losses to improve the profitability of okra production and marketing in Nigeria.Key takeaways included the following:

- Reducing transport costs by 20% can increase gross margins by 0.2-1.7 percentage points across actors.
- Halving post-harvest losses can raise sold quantities by 9-10% and gross margins by 5-5.4 percentage points.
- Increasing post-harvest losses by 50% reduces sold quantities by 9-10% and gross margins by 5.2-10.7 percentage points.
- Given these results, stakeholders might prioritize interventions addressing post-harvest losses over transport costs since loss reduction has a bigger impact on margins (5-5.4% vs 0.2-1. 7%).The results can inform targeted interventions to support the value chain.

Table 3 Sensitivity analysis using 3 Transport scenario and 3 Loss Scenario

Actors	Variables	Baseline (0% change)	Transport -20%	Transport +20%	Loss -50%	Loss +50%
Producer	Qty sold	520	520	520	570	470
	Δ Revenue	1,378,000	1,378,000	1,378,000	1,510,500 (+9.6%)	1,245,500 (-9.6%)
	Δ Transport	5,670	4,536 (+25%)	6,804 (-20%)	5,670	--
	Δ Gross margin	479,506 (53.4%)	480,640 (53.5%)	478,372 (53.3%)	527,506 (58.7%)	431,506 (48.1%)
Wholesalers	Qty sold	496	496	496	531	461
	Δ Revenue	1,636,800	1,636,800	1,636,800	1,752,300	1,521,300 (-7.1)
	Δ Transport	42,000	33,600	50,400	42,000	42,000
	Δ Gross margin	297,800 (22.2%)	306,200 (22.9%)	289,400 (21.6%)	369,300 (27.6%)	226,300 (16.3%)
Retailers	Qty sold	356	356	356	389	3323
	Δ Revenue	1,424,000	1,424,000	1,424,000	1,556,000 (+9.3)	1,292,000 (-9.3)
	Δ Transport	13,800	11,040 (+20)	16,560 (-20)	13,800	13,800
	Δ Gross margin	213,600 (17.6%)	216,360 (17.9%)	210,840 (17.4%)	241,200 (19.9%)	186,000 (15.4%)

2.6. Regression result on Variables influencing marketing channels choice of Okra in Ughelli North Local Government Area

The model explained a substantial share of variation in marketing channel choice ($R^2 = 0.65$). Statistically significant positive predictors ($p < 0.05$) in Table 4.0 were farmer/marketer characteristics (coef = 0.30, t = 2.31), farm/firm attributes (coef = 0.55, t = 3.10), seasonality & perishability (coef = 0.45, t = 3.50), gender & household dynamics (coef = 0.22, t = 2.06), and transaction cost & logistics (coef = 0.20, t = 2.11). Access to finance, market information access, cooperative membership, and storage & handling facilities were not statistically significant.

Farm/firm attributes were positive and strong. This implied that larger-scale or better-equipped farms/operations were more likely to select the channels associated with higher values of the outcome variable (more likely direct, bulk, or formal high-value channels, i.e., those linked to wholesale, processing, or supermarket levels). This fitted the prevailing evidence that larger-scale and better-quality capacity facilitates access to high-value buyers (Gao et al., 2023). Perishability and seasonal supply constraints negatively and strongly affected channel choice. In practice, greater perishability pushes suppliers to sell to informal off-takers (middlemen) who pay the highest and move the products the fastest, rather than to off-takers who have more formal arrangements. In recent literature, logistics, perishability, and seasonal supply were determining factors in choosing a channel for perishable horticulture; a weak cold chain and high transport costs usually trap sellers to local collectors or low-margin channels (World Bank, 2019; Widadie et al., 2024).

Farmer/marketer attributes (education, experience) were also positive. Higher levels of education, experience, and business acumen helped meet buyer requirements and improve access to better channels. This is consistent with findings that education and experience raise the likelihood of participating in the remunerative market (Das and Bhattacharya, 2024). Gender and household structures also proved very important in determining marketing channels. The roles of households and the gendered nature of constraints create market access and restrict/limit choice of

channels (mobility, control of proceeds, and labor availability). According to Igwe et al. (2025), gender and intra-household constraints routinely shape market access and bargaining power; women's mobility, input control, and time use influence the channels they access.

Further, the result revealed transaction cost and logistics to be positive. More favorable transport and lower transaction costs facilitate access to and profitability of more distant/formal markets. Empirical syntheses on the transformation of food systems underline that market integration, transport infrastructure, and firm capacity collectively determine who reaped the benefits of higher-value markets (Reardon and Vos, 2023; World Bank, 2019).

Table 4 Factors influencing marketing channel choice of okro in the study area

Variable	Coefficient	t-value	SE	P-value
Constant	1.50	4.00	0.373	< 0.01***
Farmer/marketer characteristics	0.30	2.31	0.130	0.021**
Farm/firm attribute	0.55	3.10	0.177	<0.01***
Access to finance and working capital	0.10	1.19	0.084	0.234.
Seasonality and perishability	0.45	3.50	0.129	0.0005***
Gender and household dynamics	0.22	2.06	0.107	0.039**
Transaction cost and logistic	0.20	2.11	0.095	0.036**
Market information access	0.05	0.94	0.054	0.345
Cooperative membership	0.12	1.22	0.098	0.217
Storage and handling facilities	0.09	1.61	0.056	0.111

$R^2 = 0.65$; Adjusted $R^2 = 0.64$; Fvalue=10.59; n=253; 1%***; 5%**; 10%*

2.7. Current strategies to Marketing of okro in Isoko North Local Government Area

From results in Table 5.0, it showed that okra producers in Isoko North, owing to perishability, rapid cash returns, and quick and certain returns, kept digital channels and logistics optimization. This implied underuse and preferred value chain restaurant collaboration (3.87, 72.8%), direct sales (3.81, 70%), and cooperative marketing (3.70, 65.2%). Similar patterns were documented for highly perishable vegetables, proximate buyers, and the use of aggregation mechanisms to reduce transaction costs and enhance bargaining (Keulen et al., 2022; Ezeudu, 2024; Shepherd, 2024; Lee et al., 2021; Kebede, 2024). E-commerce and supply chain investments (2.92 and 37.6%) were low, and barriers of the last mile (refrigeration) inhibited digital perishables markets. Where dependable collection and delivery mechanisms were assured, digital markets for perishables succeeded (Nwala et al., 2025). Theoretically, the potential for increased producer income and access to urban markets existed through improved formal agreement structures with restaurants, enhanced cooperative capacity for quality control and collective bargaining, and improved targeted post-harvest (grading, improved crates, and collection point cold storage) measures. Piloting integrated digital platforms that include logistics partners—rather than promoting e-commerce in isolation—would address structural constraints and was recommended as a next step (Nwala et al., 2025; Kaddu et al., 2020).

Table 5 Current strategies of okra value chain marketing in Isoko North Local Government Area

Strategies	SA	A	UND	D	SD	Mean	Top-box (%)	Ranking
Collaboration with local restaurants	72 (28.5%)	112 (44.3%)	42 (16.6%)	19 (7.5%)	8 (3.2%)	3.87	72.8	1
Cooperative marketing	48 (19%)	117 (46.3%)	59 (23.3%)	21 (8.3%)	8 (3.2%)	3.70	65.2	3
Optimise supply chain and logistic	17 (6.7%)	70 (27.7%)	53 (21%)	55 (21.7%)	58 (22.9%)	2.73	34.4	7

local and organic	42 (16.6%)	95 (37.6%)	63 (24.9%)	42 (16.6%)	11 (4.3%)	3.45	54.1	4
Online sale and E-commerce	32 12.7	63 24.9	53 21	63 24.9	42 16.6	2.92	37.6	6
Direct selling to consumers	65 (25.7%)	112 (44.3%)	48 (19%)	17 (6.7%)	11 (4.3%)	3.81	70.0	2
Value addition	48 (19%)	72 (28.5%)	93 (36.8%)	27 (10.7%)	13 (5.1%)	3.45	47.5	4

Source: Survey data, 2025

Policy Implication/ Recommendations

The study suggested the following actions focused on enhancing okra value chain and marketing within Isoko North LGA:

- Focus on investment in rural roads and subsidized transport.
- Focus on the establishment of community collection and packaging centers with cooled/ice-box and crates.
- Focus on subsidized certified seeds with training in agronomy, pest management, integrated pest management, and grading.
- Focus on the installation of SMS and mobile messaging systems for prices and local market boards.
- Focus on the formation and strengthening of producer organizations and grants/credit for the purchase of transport and storage collective means.
- Focus on the establishment of contracts for agricultural production as well as warehouse receipts.
- Focus on incentivizing licensed aggregator/wholesalers to transport volumes and cold chain

3. Conclusion

The value-chain and marketing analysis of fresh okro in Isoko North LGA construed a market system characterized by intermediary-led channels that condition producers' risk and liquidity constraints. Despite producing high ROI per seasonal accounting, margins are at high stake due to post-harvest losses and transit costs. Postulation with empirical data, identify distance to market, yield and quality, seasonality/perishability, market information, and transport as crucial elements of the economy for reducing waste and enhancing profitability of the okro value chain in Delta State.

Compliance with ethical standards

Disclosure of conflict of interest

Authors declare no conflict of interest

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