



## **SOCIO-ECONOMIC PROFILE OF VEGETABLE MARKETERS AND ITS IMPLICATIONS FOR POST-HARVEST LOSS MANAGEMENT IN PLATEAU STATE, NIGERIA**

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### **ABSTRACT**

This study characterised vegetable marketers in Plateau State, Nigeria, using data from 360 marketers sampled across 16 markets in nine Local Government Areas (LGAs) during the 2022 cropping season. Descriptive statistics including frequency and percentages were employed. Results revealed that marketers were predominantly married females (60%) with an average age of 34.08 years, placing them squarely within their economically active years. Substantial proportion possessed primary (40%) or secondary (34%) education, and had accumulated an average of 13.11 years of marketing experience. The household sizes averaged seven persons, revealing substantial economic pressure and motivation for market participation. Educational qualification and years of experience were identified as the two primary socio-economic characteristics differentiating loss levels among marketers, with higher education and greater experience associated with lower loss rates. These findings accentuate the need for targeted capacity-building programmes, market literacy interventions, and gender-sensitive agricultural extension services to empower vegetable marketers and reduce post-harvest losses in Plateau State and comparable agrarian contexts.

**Keywords:** Socio-economic, Characteristics, Vegetable, Marketers, Post-harvest, Loss.

### **INTRODUCTION**

Vegetable marketing in sub-Saharan Africa is predominantly conducted by smallholder actors with limited capital, education, and access to modern post-harvest technologies (FAO, 2055). Plateau State, Nigeria, occupies a unique position as one of the country's foremost vegetable-producing zones, benefitting from a mild highland climate, mean annual rainfall of approximately 1,400 mm, and temperate conditions that support year-round vegetable cultivation (Adeoye, 2020). Despite this comparative advantage, post-harvest losses along vegetable marketing channels remain alarmingly high, with documented estimates exceeding 50% of total production in some commodity categories (Ali and Byerlee, 2021). A principal but underexplored dimension of this loss challenge concerns the human capital attributes of the marketers themselves. The socio-economic profile of market actors encompassing age, sex, education, marital status, household size, and marketing experience shapes their capacity to adopt loss-reducing practices, access market information, invest in preservation technologies, and navigate supply-demand dynamics. Yet, empirical evidence on the socio-economic characteristics of vegetable marketers in Plateau State and their relationship to loss behaviour remains sparse. This paper addresses that gap by profiling vegetable marketers in Plateau State and examining the extent to which their socio-economic characteristics differentiate loss outcomes along the marketing chain. The specific objectives are to: (i) describe the socio-economic characteristics of vegetable marketers in Plateau State; and (ii) identify which socio-economic attributes significantly differentiate vegetable loss levels among these marketers.

The demographic and socio-economic profile of agricultural marketers has been widely recognised as a determinant of market performance and loss management outcomes. Oladejo and Oladiran (2014) highlighted that individuals with low educational backgrounds are often responsible for managing farm produce along marketing chains, and that this lack of formal education contributes significantly to spoilage and post-harvest losses. Onuk *et al.* (2018) similarly established that low education levels among grassroots farm produce marketers hinder their access to profitable business deals with processing firms, thereby increasing the volume of produce that perishes unsold. Gender



dimensions are equally critical. Iyanda *et al.* (2014) and Firdaus and Gunawan (2012) documented women as the dominant actors in most rural agricultural marketing activities in Nigeria, making up a substantial portion of the vegetable marketing workforce. Repositioning social amenities in rural areas where approximately 78% of Nigerian farming activities occur can directly improve the livelihoods of women engaged in this sector (Wolford and Banks, 2019). The relationship between market experience and loss behaviour has also been examined, with Nakwe *et al.* (2018) establishing that experienced marketers tend to develop superior seasonal management strategies, enabling them to better anticipate and respond to loss-inducing market conditions.

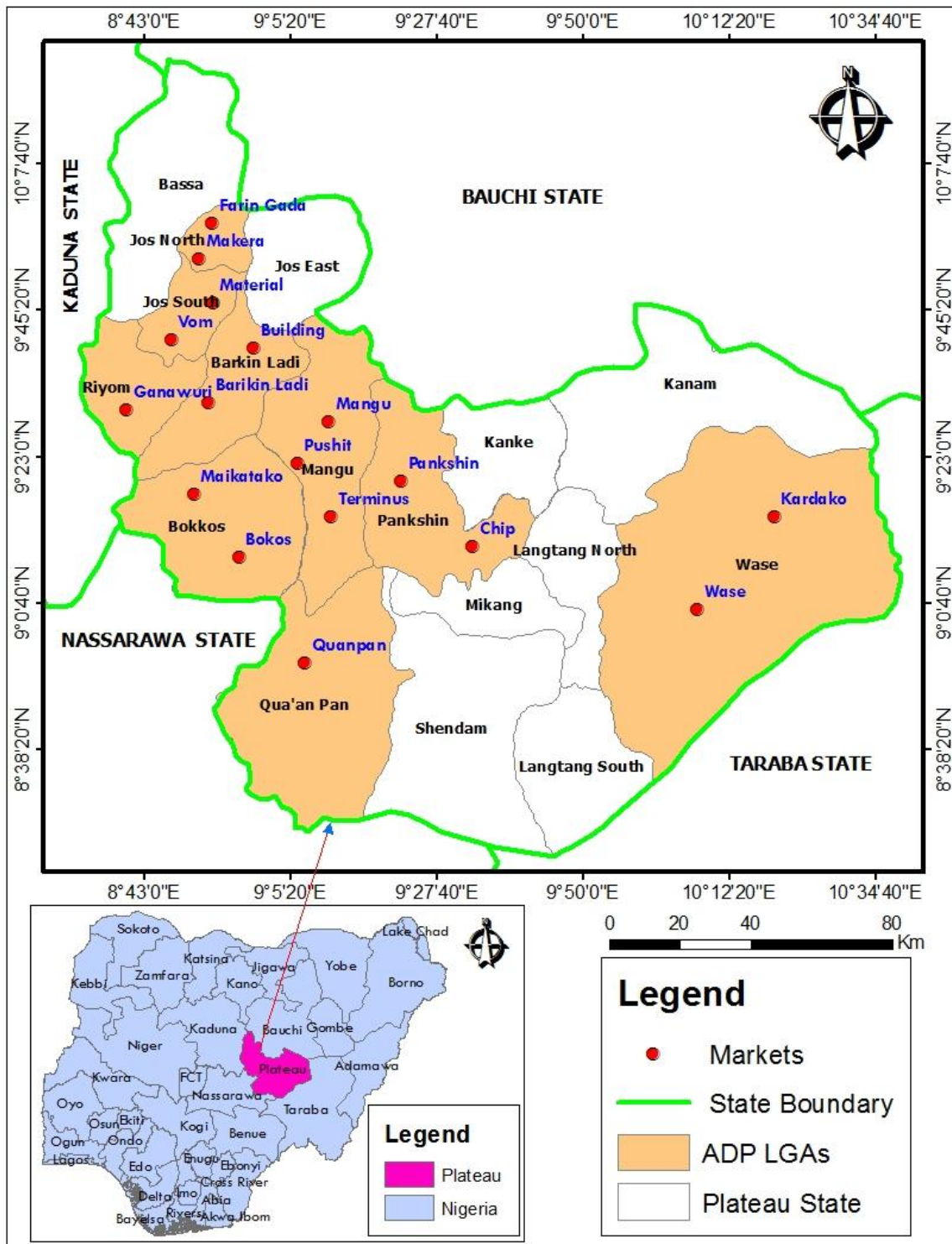
Schultz's human capital theory posits that education enhances productivity and the adoption of modern techniques. Applied to the context of vegetable marketing, this implies that better-educated marketers are likely to demonstrate lower loss rates by adopting recommended handling, storage, and preservation practices (Faraja, 2013). However, Antony (2020) and Kanyo (2019) challenged the blanket application of this thesis, arguing that the type and quality of education rather than years of schooling alone determine its impact on marketing outcomes.

## METHODOLOGY

### Study Area

Plateau State was created out of the then Benue-Plateau State on February 3, 1976 by the Murtala Mohammed Regime. Its capital is Jos. Jos the original name of 'Gwosh' was wrongly pronounced as 'Jos' by the Hausa who settled on the site and turned it into a trading centre. Plateau State gets its name from the Jos Plateau, a mountainous area in the north of the State with captivating rock formations. Bare rocks are scattered across the grasslands, which cover the plateau. The altitude ranges from around 1,200 meters (about 4000 feet) to a peak of 1,829 meters above sea level in the Shere Hills range near Jos. Plateau State has led to a reduced incidence of some tropical diseases such as malaria. The Jos Plateau, makes it the source of many rivers in northern Nigeria including the Kaduna, Gongola, Hadejia and Yobe rivers Located in North Central Nigeria, Plateau State occupies 30,913 square kilometers. Plateau State shares boundaries with Kaduna State to the North, Kaduna and Nasarawa States to the East, Benue to the South, and Taraba State to the East. Plateau State is located between latitude (9°21'82" – 9°45'50") North and longitude (8°37'31" – 9°51'74") East (Harris *et al.*, 2014; Solomon, 2024). Although situated in the tropical zone, the higher altitude gives Plateau State a near-temperate climate, with an average temperature between 13°C and 22°C. Harmattan winds cause the coldest weather between December and February, with the warmest temperatures usually occurring in the dry season months of March and April. The mean annual rainfall varies between 1,317 mm in the southern part to 1,460 mm on the plateau, with the highest rainfall during the wet season in July and August (Ojumu *et al.*, 2024).

The agricultural economy of Plateau State is predominantly agrarian, covering an estimated land area of 53,585.89 square kilometres, with about two-thirds being arable. Major food crops cultivated include Irish potatoes, sweet potatoes, chili pepper, tomatoes, various vegetables, cereals, legumes, roots and tubers, and tree crops such as coffee, cashew, citrus, mangoes, and guava (Elijah, 2020).



**Figure 1:** Map of the Study Area showing the Selected LGAs

**Sampling Technique and Sample Size**

A multi-stage sampling technique was employed in the selection of respondents for this study. In the first stage, nine (9) LGAs were purposively selected based on their vegetable marketing intensity. In the second stage, 16 markets were identified across the selected LGAs based on their prominence in vegetable marketing and thirdly marketers were proportionately selected. In the final stage,



proportionate random sampling was used to select 360 vegetable marketers from the identified markets. Data were collected using a structured questionnaire administered by trained research assistants. Market visits were conducted twice monthly over a 12-month period spanning the 2022 cropping season to capture seasonal variations.

#### **Data Analysis**

Descriptive statistics — including frequency counts, percentages, and means — were employed to characterise the socio-economic attributes of marketers. Chi-square tests of association were applied to determine whether specific socio-economic characteristics (age, sex, marital status, household size, educational level, and years of experience) significantly differentiated the estimated level of vegetable loss and waste along the marketing chain.

## **RESULTS AND DISCUSSION**

### **Socio-Economic Characteristics of Vegetable Marketers**

Results revealed that approximately 27% of marketers were below 25 years old, 26% were aged 25–34 years, 32% were within the 35–44 years bracket, and 15% were aged 45 years and above. The average age was 34.08 years, confirming that marketers were in their economically active years, consistent with findings by Adeoye (2020) for Nigerian vegetable marketers generally. Regarding sex distribution, 60% of marketers were female and 40% were male. This gender composition aligns with the broader literature on Nigerian agricultural markets (Bakari and Usman, 2015; Iyanda *et al.*, 2014). On marital status, 72% of marketers were married, 16% single, 7% divorced, and 5% widowed. The predominance of married marketers, who carry family responsibilities, implies substantial economic motivation for market participation and risk management. Average household size was approximately seven persons, signaling significant livelihood pressure. Regarding education, 18% had no formal education, 40% had primary education, 34% secondary education, and 7% tertiary education. Years of experience distribution showed that 34% had less than 10 years, 43% had 10–19 years, 13% had 20–29 years, and 8% had more than 30 years of experience, with an average of 13.11 years.



**Table 1: Socio-Economic Characteristics of Vegetable Marketers**

Variables	Bokos Freq (%)	Barkin Ladi Freq (%)	Jos South Freq (%)	Mangu Freq (%)	Pankshin Freq (%)	Quan pan Freq (%)	Jos North Freq (%)	Riyom Freq (%)	Wase Freq (%)	Overall Freq (%)	Mean
<b>Age (years)</b>											
Less than 25	8(16.00)	1(3.45)	6(18.18)	19(40.43)	19(51.35)	11(34.38)	19(31.15)	7(22.58)	4(17.39)	94(27.41)	
25 – 34	9(18.00)	10(34.48)	14(42.42)	8(17.02)	6(16.22)	9(28.13)	18(29.51)	8(25.81)	7(30.43)	89(25.95)	
35 – 44	29(58.00)	13(44.83)	11(33.33)	17(36.17)	6(16.22)	5(15.63)	12(19.67)	8(25.81)	8(34.78)	109(31.78)	
45+	4(8.00)	5(17.24)	2(6.06)	3(6.38)	6(16.22)	7(21.88)	12(19.67)	8(25.81)	4(17.39)	51(14.87)	34.08
<b>Sex</b>											
Male	21(42.00)	14(48.28)	18(54.55)	18(38.3)	13(35.14)	10(31.25)	23(37.7)	10(32.26)	9(39.13)	136(39.65)	
Female	29(58.00)	15(51.72)	15(45.45)	29(61.7)	24(64.86)	22(68.75)	38(62.3)	21(67.74)	14(60.87)	207(60.35)	
<b>Marital Status</b>											
Single	2(4.00)	7(24.14)	2(6.06)	3(6.38)	7(18.92)	8(25.00)	15(24.59)	6(19.35)	5(21.74)	55(16.03)	
Married	36(72.00)	16(55.17)	30(90.91)	38(80.85)	28(75.68)	23(71.88)	40(65.57)	20(64.52)	15(65.22)	246(71.72)	
Divorce	7(14.00)	3(10.34)	1(3.03)	3(6.38)	1(2.70)	1(3.13)	4(6.56)	3(9.68)	1(4.35)	24(7.00)	
Widow	5(10.00)	3(10.34)	0(0.00)	3(6.38)	1(2.70)	0(0.00)	2(3.28)	2(6.45)	2(8.70)	18(5.25)	
<b>Household Size</b>											
Less than 5	10(20.00)	8(27.59)	9(27.27)	10(21.28)	11(29.73)	21(65.63)	30(49.18)	14(45.16)	5(21.74)	118(34.4)	
5 – 9 persons	29(58.00)	16(55.17)	16(48.48)	26(55.32)	20(54.05)	6(18.75)	19(31.15)	14(45.16)	14(60.87)	160(46.65)	7.01
10 – 14	5(10.00)	3(10.34)	5(15.15)	9(19.15)	3(8.11)	3(9.38)	10(16.39)	2(6.45)	2(8.70)	42(12.24)	
15+	6(12.00)	2(6.90)	3(9.09)	2(4.26)	3(8.11)	2(6.25)	2(3.28)	1(3.23)	2(8.70)	23(6.71)	
<b>Educational Qualification</b>											
Non-formal	11(22.00)	9(31.03)	6(18.18)	13(27.66)	4(10.81)	1(3.13)	6(9.84)	9(29.03)	3(13.04)	62(18.08)	
Primary	21(42.00)	9(31.03)	15(45.45)	23(48.94)	17(45.95)	6(18.75)	27(44.26)	9(29.03)	9(39.13)	136(39.65)	
Secondary	14(28.00)	9(31.03)	12(36.36)	8(17.02)	15(40.54)	20(62.5)	19(31.15)	9(29.03)	10(43.48)	116(33.82)	
Tertiary	2(4.00)	2(6.90)	0(0.00)	1(2.13)	1(2.7)	5(15.63)	8(13.11)	3(9.68)	1(4.35)	23(6.71)	
<b>Marketing Experience</b>											
Less than 10 Years	18(36.00)	9(31.03)	10(30.3)	22(46.81)	21(56.76)	16(50)	34(55.74)	16(51.61)	10(43.48)	156(45.48)	
10 – 19 years	14(28.00)	14(48.28)	16(48.48)	15(31.91)	9(24.32)	13(40.63)	20(32.79)	11(35.48)	4(17.39)	116(33.82)	13.11
20 – 29 years	12(24.00)	6(20.69)	4(12.12)	4(8.51)	5(13.51)	3(9.38)	3(4.92)	1(3.23)	7(30.43)	45(13.12)	
30+ years	6(12.00)	0(0.00)	3(9.09)	6(12.77)	2(5.41)	0(0.00)	4(6.56)	3(9.68)	2(8.70)	26(7.58)	

**Note:** Numbers in parenthesis are in percentage %, Freq= Frequency

**Source:** Field Survey (2022)

### Socio-Economic Factors Differentiating Vegetable Loss

Chi-square analysis revealed that age ( $\chi^2 = 13.281$ ,  $df = 9$ ,  $p = 0.146$ ), sex ( $\chi^2 = 5.987$ ,  $df = 3$ ,  $p = 0.112$ ), marital status, and household size did not significantly influence vegetable loss levels among marketers. However, educational qualification and years of experience were statistically significant determinants of loss differentials. Marketers with tertiary education and those with more than 20 years of marketing experience were more likely to record low or moderate loss levels, whereas those with no formal education and less than 10 years of experience were disproportionately represented among those recording very high losses (years of experience:  $\chi^2 = 39.403$ ,  $df = 9$ ,  $p = 0.000$ ).

This finding is consistent with Schultz's human capital hypothesis and supports the empirical conclusions of Atman *et al.* (2025), Yohanes (2015), Kasnakoglu (2015), and Kirtti-Ranjan and Phanindra (2021) that education significantly enhances marketing efficiency and the capacity to adopt loss-reducing practices. Regarding experience, the finding corroborates Nakwe *et al.* (2018), who observed that experienced marketers are better positioned to employ seasonal management strategies that reduce post-harvest losses.

**Table 2:** Cross-tabulation of Age of Marketers and Estimated Vegetable Loss and Waste along Market Channel in Plateau State

Vegetable Losses		Age				Total
		18 – 24	25 – 34	35 – 44	45+	
Low	Count	39	64	66	67	236
	Percent (%)	16.5	27.1	28.0	28.4	100.0
Moderate	Count	9	16	15	22	62
	Percent (%)	14.5	25.8	24.2	35.5	100.0
High	Count	2	3	5	4	14
	Percent (%)	14.3	21.4	35.7	28.6	100.0
Very High	Count	1	11	3	16	31
	Percent (%)	3.2	35.5	9.7	51.6	100.0
Total	Count	51	94	89	109	343
	Percent (%)	14.9	27.4	25.9	31.8	100.0

**Source:** Field Survey (2022)

**Table 3:** Effect of Marketers' Age on Estimated Vegetable Losses and Waste along Market Chain in Plateau State

Stat	Value	Df	Asymp. Sig. (2-sided)
Pearson $\chi^2$	13.381 <sup>a</sup>	9	0.146
N of Valid Cases	343		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 2.08.

**Source:** Field Survey (2022)

**Table 4:** Cross-tabulation of Sex of Marketers and Estimated Vegetable Loss and Waste along Market Channel in Plateau State

		Sex		Total
		Male	Female	
Low	Count	84	152	236
	Percent (%)	35.6	64.4	100.0
Moderate	Count	29	33	62
	Percent (%)	46.8	53.2	100.0
High	Count	6	8	14
	Percent (%)	42.9	57.1	100.0
Very High	Count	17	14	31
	Percent (%)	54.8	45.2	100.0
Total	Count	136	207	343
	Percent (%)	39.7	60.3	100.0

**Source:** Field Survey (2022)



**Table 5:** Effect of Marketers’ Sex on Estimated Vegetable Loses and Waste along Market Chain in Plateau State

Variable	Value	Df	Asymp. Sig. (2-sided)
Pearson $\chi^2$	5.987 <sup>a</sup>	3	0.112
N of Valid Cases	343		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.55

**Source:** Field Survey (2022)

**Table 6:** Effect of Marital Status for Marketers on Estimated Vegetable Loses and Waste along Market Chain in Plateau State

Stat	Value	Df	Asymp. Sig. (2-sided)
Pearson $\chi^2$	13.036 <sup>a</sup>	9	.161
N of Valid Cases	343		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 2.08.

**Source:** Field Survey (2022)

**Table 7:** Cross-tabulation of Marital Status for Marketers and Estimated Vegetable Loss and Waste along Market Channel in Plateau State

		Marital Status				Total
		Single	Married	Divorce	Widow	
Low	Count	42	168	16	10	236
	Percent (%)	17.8	71.2	6.8	4.2	100.0
Moderate	Count	9	45	4	4	62
	Percent (%)	14.5	72.6	6.5	6.5	100.0
High	Count	2	9	0	3	14
	Percent (%)	14.3	64.3	0.0	21.4	100.0
Very High	Count	2	24	4	1	31
	Percent (%)	6.5	77.4	12.9	3.2	100.0
Total	Count	55	246	24	18	343
	Percent (%)	16.0	71.7	7.0	5.2	100.0

**Source:** Field Survey (2022)

**Table 7:** Household Size for Marketers and Estimated Vegetable Loss and Waste along Market Channel in Plateau State

		Household Size				Total
		Less than 5	5 – 9 person	5 – 9 person	15+	
Low	Count	90	98	38	10	236
	Percent (%)	38.1	41.5	16.1	4.2	100.0
Moderate	Count	17	30	8	7	62
	Percent (%)	27.4	48.4	12.9	11.3	100.0
High	Count	5	7	2	0	14
	Percent (%)	35.7	50.0	14.3	0.0	100.0
Very High	Count	7	17	3	4	31
	Percent (%)	22.6	54.8	9.7	12.9	100.0
Total	Count	119	152	51	21	343
	Percent (%)	34.7	44.3	14.9	6.1	100.0

**Source:** Field Survey (2022)

**Table 8:** Effect of Household Size for Marketers on Estimated Vegetable Loses and Waste along Market Chain in Plateau State

Variable	Value	Df	Asymp. Sig. (2-sided)
Pearson $\chi^2$	12.817 <sup>a</sup>	9	.171
N of Valid Cases	343		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 2.08.

**Source:** Field Survey (2022)

**Table 9:** Cross-tabulation of Educational Level for the Marketers and Estimated Vegetable Loss and Waste along Market Channel in Plateau State

		Educational Level				
		Non-formal	Primary	Secondary	Tertiary	Total
Low	Count	1	66	66	103	236
	Percent (%)	0.42	27.97	27.97	43.64	100.0
Moderate	Count	1	22	37	2	62
	Percent (%)	1.61	35.48	59.68	3.23	100.0
High	Count	2	4	6	2	14
	Percent (%)	14.29	28.57	42.86	14.29	100.0
Very High	Count	14	16	1	0	31
	Percent (%)	45.16	51.61	3.23	0.00	100.0
Total	Count	18	108	110	107	343
	Percent (%)	5.25	31.49	32.07	31.20	100.0

**Source:** Field Data (2022)

**Table 10:** Effects of Educational Qualification of Marketers on Estimated Vegetable Loses and Waste along Market Chain in Plateau State

Stat	Value	Df	Asymp. Sig. (2-sided)
Pearson $\chi^2$	24.068 <sup>a</sup>	9	.004
N of Valid Cases	343		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is .73.

**Source:** Field Survey (2022)

**Table 11:** Cross-tabulation of Years of Experience for the Marketers and Estimated Vegetable Loss and Waste along Market Channel in Plateau State

		Years in Marketing Vegetables				
		Less than 10	10 – 19	20 – 29	30+	Total
Low	Count	2	48	82	104	236
	Percent (%)	0.85	20.34	34.75	44.07	100.0
Moderate	Count	1	19	29	13	62
	Percent (%)	1.61	30.65	46.77	20.97	100.0
High	Count	2	9	2	1	14
	Percent (%)	14.29	64.29	14.29	7.14	100.0
Very High	Count	16	14	1	0	31
	Percent (%)	51.61	45.16	3.23	0.00	100.0
Total	Count	21	90	114	118	343
	Percent (%)	6.12	26.24	33.24	34.40	100.0

**Source:** Field Survey (2022)

**Table 12:** Effects of Years of Experiences of Marketers on Estimated Vegetable Loses and Waste along Market Chain in Plateau State

Stat	Value	Df	Asymp. Sig. (2-sided)
Pearson $\chi^2$	39.403 <sup>a</sup>	9	.000
N of Valid Cases	343		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is .13.

**Source:** Field Survey (2022)



## CONCLUSION AND RECOMMENDATIONS

This study established that vegetable marketers in Plateau State are predominantly married females in their active economic years, with moderate educational qualifications and over a decade of marketing experience. Educational qualification and years of marketing experience are the two socio-economic characteristics that most significantly differentiate post-harvest loss levels among marketers. These findings carry important policy implications. The Ministry of Commerce and agricultural extension agencies in Plateau State should design and implement targeted capacity-building programmes for vegetable marketers, with particular emphasis on post-harvest handling, storage, and marketing literacy. Gender-sensitive extension services are essential given women's dominance of the marketing sector. Furthermore, farmer and marketer field schools that enable knowledge sharing and skills transfer should be institutionalised as sustainable mechanisms for reducing human capital-related post-harvest losses.

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