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Seasonal vulnerability to poverty among cashew farmers in Ogbomoso, Oyo state, Nigeria

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Abstract: This study analysed the seasonal vulnerability to poverty among cashew farmers in Oyo State. There was a purposive selection of Ogbomoso Agricultural Development Project (ADP) in 5 local government areas. A total of 250 respondents were interviewed. However, 221 respondents were used because of the absence of 29 respondents during the off-season. Relative Poverty Ratio (RPR) descriptive statistics, household vulnerability index (HVI), and Multinomial Logistic Regression Model (MLR) were used to analyse data collected. Result showed that (77%) of the male respondents were highly vulnerable to poverty while 69.61% married had low Vulnerability to Poverty (VTP) and 21.62% of those with 6-10 household members were moderately vulnerable. The mean (HVI)were1.48 (±4.53) and 1.22 (±1.81) for off and on-seasons cashew production respectively. The MLR result showed that cashew production season (p=0.031) and age (p=0.014) were negatively significant to VTP. Marital status (p=0.005), household size (p=0.001) and total expenditure (p=0.002) were positively significant to VTP. Conclusively, majority of cashew farmers were poor and highly vulnerable to poverty. It is therefore recommended that establishing community-based financial institutions that offer affordable loans, credit, and savings options will help farmers to manage their investment and cash flow.
Keywords: Cashew farmers, Household vulnerability and Multinomial Logistic Regression Model

INTRODUCTION

Agriculture is the most comprehensive word used to represent the many ways crop plants and domestic animals put up with the global human population by providing food and additional products. The English phrase agriculture derives from the Latin *ager* (field) and *colo* (cultivate), signifying, when combined, the Latin agriculture: field or land tillage (Dorian Harris, 2019).In Africa, agriculture is a major driver of growth and prosperity, reducing poverty and ensuring food security at both the business and social levels. Agriculture's income has a much greater effect on reducing poverty than GDP growth in the other sectors (Kamil *et al.*, 2017). According to Oyaniran (2020),(Nigeria Agriculture is broadly divided into four sectors)these includes crop production, fishing, livestock and forestry, while The biggest segment is crop production which accounts for- 87.6% of total output in the sector. Others include livestock, fishing and forestry at 8.1%, 3.2% and 1.1%. Moreover, this aspect employs more than 36% of the country's labour force, ranked as one of the biggest employers in the country.

Studies argue that it is unsatisfactory to measure people's welfare based only on their income, consumption or expenditures at the cost of threats and risks that limit the productive abilities of many Jha and Sinha (2013). As people's vulnerability increases under-development, it also significantly initiates them to chronic poverty. Majority of the villagers lives in areas disposed to various risks and threats, which has continually caused substantial losses to their welfare. This is due to damages to their assets, increased coping costs and weak wealth creation process when the threats occur. Rural dwellers are also vulnerable to being trapped in chronic poverty if they experience risks and inadequate long-term income-generating capacities. A link exists among vulnerability, adverse agro-ecological and climatic environments, such as flood, drought, natural disasters, health hazards and illness, harvest failure and social risks like the weak rule of law resulting in crime, violence and insecurity, political unrest, unfavourable government policy and corruption (Azam & Imai, 2009). Also, pests, loss of jobs, price fluctuation, wage variability, changes in subsidies or prices, income transfer, reduction in community support and entitlements, and exposure to disease that prevents work affect household vulnerability to poverty (Oladejo, 2015).

Therefore, the cultivation of cash crops such as cashews allows farmers and farm workers to increase their living standards, thereby reducing the level of food insecurity. Furthermore, the cash crop production offers farmers new opportunities for investment and improved management of their farms, which will help to stimulate agriculture innovation and increase yields. Like other farm activities cash crop agriculture requires the management of various types of risk, such as soil degradation and price variability. Communities with increased specialization in cash crops will express a drop in incomes when harvests fail due to pests or drought when prices crash, or they drop market access. Such a drop in income will have repercussions for their vulnerability to poverty. Communities that Vulnerability to poverty is therefore, the risk that a household will fall under the poverty line, if currently non-poor, or if presently poor, will stay in poverty or fall deeper into poverty.

Vulnerability analysis offers two primary benefits overall. First, it is explicitly dynamic; vulnerability analysis does not just focus on the current status and is forward-looking (*ex-ante*). Furthermore, it centres on a specific shock or series of surprises and the coping mechanisms that families and communities can implement to lower the likelihood of experiencing food insecurity Aliberand Hart (2015).From figure 1, the general household characteristics such as human capital, household asset, demographic variables, location characteristics and Network/group are always depends on household income which can lead to deprivation, lack of resilience, low human development and lack of basic needs of life which is affected by poverty strategies adopted by the households such as (engage in off farm activities borrowing of required resources or seeking assistance from friends and family, adoption of suitable coping strategies, change from enterprise, cultivating less area, diversify from agricultural production, changing eat habit and migrating from location) and how household addresses his welfare challenges such as (lack of information, credit unavailability, lack of farm inputs, price fluctuations, market failures and political instability) which also affect the intervening variables such as government policy, climatic condition and environmental hazard, these in turn determine the household expenditure and their vulnerability to poverty. Therefore, this study categorise the respondents based on their vulnerability status using their income, profile the socioeconomic characteristics of the respondents based on vulnerability to poverty and identify factors that makes cashew farmers vulnerable to poverty / identify factors that pre-disposes cashew farmers to poverty. The hypothesis of the research wasH_{o1}: There is no significant difference between cashew nut production and vulnerability to poverty among the respondents. H_{o2}: There is no significant difference between poverty incidence and vulnerability to poverty.

METHODOLOGY

The study was conducted in Ogbomoso of Oyo State. Oyo state has a population estimated at around 7.8 million as of 2016, the latest demographic estimates released by the National Bureau of Statistics (NBS, 2016). Ogbomoso has five Local Governments Areas (LGAs), namely, Ogbomoso North, Ogbomoso south, Oriire, Surulere and Ogo-Oluwa LGAs. Ogbomoso is approximately at the intersection of 8º 08'N and longitude 4º 16'E. It is about 105km Northeast of Ibadan (state capital), 58km Northwest of Osogbo, 53km South West of Ilorin and 57km North East of Oyo town. Ogbomoso is a derived savannah vegetation zone and a lowland rain-forest area. Cashews, yams, cassava, maize and tobacco are notable cash crops such as the region's cashew, cocoa, etc. agricultural produce. Most of the people are members of the Yoruba ethnic group.

Multistage sampling technique was used for data collection. All the 5 LGAs were used. The villages were selected based on proportionate to size of the villages in the LGAs. In all about 25 villages were used. Random selection of 10 farmers each was made from the list of all registered cashew-nut farmers in the selected villages which totalled 250 respondents. Data from 221 respondents was used based on consistency of information of data collected.

The data collected were analysed using Relative Poverty Ratio (RPR), Household Vulnerability Index (HVI) and Multinomial Logit regression model (MLR). The relative poverty ratio was used to categorize the respondents into high, moderate and low vulnerability to poverty based on their income. This categorization was based on a measure of per capita income (PCI) of households. The mean PCI for the households for on-season and for off-season cashew production was calculated, to be₦805,579.83 and ₦693,455.77 respectively. Households spending less than one third of the mean PCI were categorized as highly vulnerable, while those spending between one third and two third of the mean PCI were categorized as moderately vulnerable and households spending above the two third of mean PCI were categorised as low vulnerable.

a. Household Vulnerability Index (HVI): This uses a multidimensional approach to quantitatively determine the impact of a shock on a household using Fussy logic: For the population (N) made up of n households (hh) (₦= {hh1, hh2, hh3 …}), n is a subset of N households with some degree of vulnerability (internal vulnerability). Thus, when v ≤ n and v=0, this implies that there are no vulnerable households to poverty, whereas v=n implies that all households are vulnerable to poverty. Breaking down the vulnerability (X) into specific dimensions of impact (m) and giving a corresponding weight (wi, i=1… m) to each dimension, the weights can be predetermined or developed using an appropriate function. The weights correspond to the external component of vulnerability., The vulnerability of any given household (hhi =1…n) to the dimension of impact (jth j=1…m) can be expressed asX_{ij} and given a value between 0 and 1 such that 0=no impact and 1=full impact. A specific formula for calculating XijX_{ij} is discussed separately and is based mainly on the variable's probability distribution function. Each X_{ij} denotes the degree of vulnerability of household i to the jth dimension of impact, and $X_{ij}w_i$will be the corresponding weighted vulnerability. The sum of the weighted vulnerabilities across all dimensions will give the household's total vulnerability (Vhh) to a specific shock, that is: This is the **HVI** for that household, which is between 0 and 100.

$\sum_{j=1}^{m} Xwj / \sum_{j=i}^{m} wj = vhhi$… (2)

An assumption is that households exist in a homogenous context, and the sum of the weights is made such that:

$\sum_{j=1}^{m} Xj = 100$ (3)

where 0 represents no vulnerability while 100 represents the full impact of the vulnerability.

b. Multinomial Logistic Regression Model

A fairly simple generalization of the binary model is the multinomial logistic regression (MLR) model; both models primarily rely on logistic regression or logit analysis. For any response that is categorical in nature, logit analysis is, in many respects, the natural extension of standard linear regression. The regression model collapses when the response variable falls into this category. Discrete variables of this kind are addressed by adding one or more (0, 1) dummy variables when they arise among the explanatory variables. A convenient substitute is provided by logit analysis.

The logistic regression can be extended to models with multiple explanatory variables. Let k denote the number of predictors for a binary response Y by x_1, x_2……x_k, the model for log odds is $Lgit[P(Y = 1)] = \propto + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_k x_k \ldots$ (4)

The alternative formula, directly specifying $\pi(\mathbf{x})$, is

$$\pi(x) = \frac{exp\ (\propto + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_k x_k)}{1 + \text{ex}\ \ (\propto + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_k x_k)} \ldots (5)$$

The parameter β_i refers to the effect of x_i on the log odds that Y=1, controlling other x_j; for instance, exp(β_i) is the multiplicative effect on the odds of a one-unit increase in x_i at fixed levels of another x_j. If we have n independent observations with p-explanatory variables, and the qualitative response variable has k categories, to construct the logits in the multinomial case, one of the categories must be considered the base level and all the logits are built relative to it. Any category can be taken as the base level, so that we will take category k as the base level. Since there is no order, it is apparent that any category may be labelled k. Let πj denote the multinomial probability of an observation falling in the jth category. To find the relationship between this probability and the p explanatory variables, X_1, X_2,……,x_p, the multiple logistic regression model is

$$\log\left[\frac{\pi_j(x_i)}{\pi_k(x_i)}\right] = \alpha_{0i} + \beta_{1j} x_{1i} + \beta_{2j} x_{2i} + \cdots + \beta_{pj} \ldots (6)$$

Where j= 1, 2, …, (k-1), i = 1, 2, …, n. Since all the π's add to unity, this reduces to

$$log\left(\pi_j(x_i)\right) = \frac{exp(\alpha_{0i} + \beta_{1j} x_{1i} + \beta_{2j} x_{2i} + \cdots + \beta_{pj} x_{pi})}{1 + \sum_{j=1}^{k-1} \exp(\alpha_{0i} + \beta_{1j} x_{1i} + \beta_{2j} x_{2i} + \cdots + \beta_{pj} x_{pi})} \ldots (7)$$

For j = 1, 2, …, (k-1), the model parameters are estimated by the method of ML. We use statistical software to do this fitting.

In the MLR model, the estimate for the parameter can be identified compared to a baseline category. We defined bold letters as matrix or vector, let $\pi_j(x) = p(y = J|\boldsymbol{X})$ at a fixed setting **x** for explanatory variables, with $\sum_j \pi_j(\boldsymbol{X}) = 1$, for observations at that setting, we treat the counts at the *J* categories of *Y* as multinomial with probabilities, $\{\pi_1(X), \ldots, \pi_J(X)\}$, logit models pair each response category with a baseline category; often, the most common model is:

$$\log\frac{\pi_j(\boldsymbol{X})}{J(X)} = \propto_j + \boldsymbol{X}, \ldots (8)$$

where *j*= 1,…, (*J* -1), simultaneously describes the effects of **x** on these (*J*-1) logits. The effects vary according to the response paired with the baseline; these (*J*-1) equations determine logit parameters with other response categories. Since

$$\log\frac{\pi_a(\boldsymbol{X})}{\pi_b(\boldsymbol{X})} = \log\frac{\pi_a(\boldsymbol{X})}{\pi_J(\boldsymbol{X})} - \log\frac{\pi_b(\boldsymbol{X})}{\pi_J(\boldsymbol{X})} \ldots (9)$$

with categorical predictors, Pearson chi-square statistic x^2 and the likelihood ratio chi-square statistic G^2 goodness-of-fit statistics provide a model check when data are not sparse. When an explanatory variable is continuous, or the data are sparse, such statistics are still valid for comparing nested models differing by relatively few terms, Agresti (2002).

A relative risk involves comparing two groups regarding a given outcome's risk (or likelihood). In the context of logistic regression, we compute the relative risk as a ratio of the probability (risk) of a case falling into a comparison group to the probability (risk) of the subject belonging to the baseline group, conditioned on the predictors in the model (Osborne, 2015). The relative risk ratio (RRR) represents the predicted multiplicative change in the relative risk (the risk of falling into a comparison group relative to the risk of falling into the baseline group) per unit increase on an independent variable. In general, if an RRR is greater than 1, then this indicates that with increasing valves on the variable, there is an increased likelihood/ risk of a case falling into the comparison category and decreased risk of falling into the baseline. If the RRR is less than 1, then this indicates that with increasing valves on the variable, there is a decreased likelihood/ risk of a case falling into the comparison category and an increased risk of falling into the baseline. If the RRR equals 1, then there is no relationship between the variables and the risk of falling into the comparison group about the baseline group. Also note that if b = 0, then RRR = 1. If b > 0, then RRR > 1. If b < 0, then RRR < 1. Multinomial logit regression is used to analyse the objective.

RESULT DISCUSSION

Vulnerability categories of cashew farmers

Table 1 revealed the result of the household vulnerability index (HVI) score. The result indicates that about (43.89%) of the households had a low vulnerability level during the on-season. In comparison, 32.13% of the households had a low vulnerability level during the off-season. This category of households is vulnerable to poverty but still has the resilience to cope without external assistance, they have a lower probability of becoming poor in any event of shock, such as a fall in the price of the nut, low productive of the nut, which may be due to the climatic condition, death of the household head, etc. Also, 19.46% of the households and 16.74% of the households fall in the moderate vulnerable category during the on-season and off-season. These are households that have been hit so hard by disasters like flood situations or health challenges that they need assistance, and they need rapid response to be able to be liberated from a situation of poverty, they have recorded high levels of disasters in the past year. With some rapid response-type of assistance, the family may be liberated from poverty.

About 37% and 51.00% of households are highly vulnerable to poverty in both on-season and off-season. They are at an emergency vulnerability level, the circumstance of an intensive care situation, almost at a point of no return. However, the condition can be resuscitated only with the best possible expertise and robust welfare packages from governmental agencies and Non-Governmental Organizations (NGOs). The result shows that the majority of the cashew producers in Oyo state are at a high level of vulnerability during the off-season. At the same time, only a few households in the study area have low vulnerability to poverty during the off-season, while the reverse is the case during the on-season. This could result from unfavourable government policies (which encourage foreigners to invest and plant cashew trees in the state), instability or unfavourable price of cashew nuts, and poor or inadequate income management (money) by the respondents.

Table 1: Distribution of Respondents by Vulnerability Status

Vulnerability Status	On-season		Off-season	
	Frequency	Percentage	Frequency	Percentage
High	81	36.65	113	51.13
Moderate	43	19.46	37	16.74
Low	97	43.89	71	32.13
Total	221	100.00	221	100

Source: Field Survey, 2023.

Profiled socioeconomic characteristics

The profiled age of the respondents is presented in Table 2. The result revealed that 34.39% of the respondents were between 41-50 years, the highest among all the age groups, while 28.51% were between 31-40 years. Only 8.14% of the respondents were above 60 years, which is the lowest across the age groups. The mean age of the respondents was about 45 years, which indicates that farmers are still in their active years and, hence, are agile to withstand the rigours involved with cashew production and distribution. Result also shows that most cashew producers were highly vulnerable to poverty during the off-season but had low vulnerability to poverty during the on-season. Furthermore, most of the respondents were male, accounting for 75.57%., while the females were 24.43%. This indicates that males were more involved in cashew nut wholesale marketing than their female counterparts. This finding agrees with that of Aliber, and Hart (2015), who found out that more men were dominant in agricultural activities than women in Nigeria. Table 2 further shows the marital status of the cashew producers The result revealed that the majority (65.61%) of the respondents were married, 13.12% were separated, 19.46% were single, and only 1.81% were widowed. This indicates that most of the respondents were married, implying a higher chance of involving family labour in cashew production. The table also showed that (32.58%) of the respondents have between 1 -10 years of experience, 16.74% of the respondents have between 11 -20 years of experience, 17.65% of the respondents have between 21 -30 years of experience, 32.31% of the respondents have between 31 -40 years of experience, while 0.90% of the marketer have above 40 years of farming experience. The average farming experience was 20.38 years. It is expected that the higher the years of farming experience, the better the marketing skills acquired. It was deduced from the study that more respondents with more than 30 years of experience had low vulnerability to poverty. In comparison, the majority of the respondents with 1-10 years of experience were highly vulnerable to poverty during the off-season. This implies that increase in years of experience position the marketer to cope better during the off-season.

Table 2: Distribution of profiled socioeconomic characteristics of cashew farmers

Social-economics features		Pooled		High vulnerability		Moderate vulnerability		Low vulnerability	
		F	%	On-season	Off-season	On-season	Off-season	On-season	Off-season
Age (years)	<=30	27	12.22	9(11.11)	13(11.50)	5(11.63)	8(21.62)	13(13.40)	6(8.45)
	31-40	63	28.51	23(28.40)	36(31.86)	15(34.88)	7(18.92)	25(25.77)	20(28.17)
	41-50	76	34.39	27(33.33)	34(30.09)	12(27.91)	17(45.95)	37(38.14)	25(35.21)
Mean =44.91	51-60	37	16.74	14(17.28)	20(17.70)	7(16.28)	4(10.81)	16(16.49)	13(18.31)
	>60	18	8.14	8(9.88)	10(8.85)	4(9.30)	1(2.70)	6(6.19)	7(6.86)
Gender	Male	167	75.57	62(76.54)	87(76.99)	33(76.74)	27(72.97)	72(74.23)	53 (74.65)
	Female	54	24.43	19(23.46)	26(23.01)	10(23.26)	10(27.03)	25(25.77)	18(25.35)
Marital status	Single	43	19.46	14(17.28)	21(18.58)	8(18.16)	8(21.627)	21(21.65)	14(19.72)
	Married	145	65.61	54(66.67)	73(64.60)	27(62.79)	23(62.16)	64(65.98)	49(69.61)
	Separated	29	13.12	11(13.58)	16(14.16)	7(16.28)	5(13.51)	11(11.34)	8(11.27)
	Widowed	4	1.81	2(2.47)	3(2.65)	1(2.33)	1(2.70)	1(1.03)	0(0.00)
Year of	1-10	72	32.58	25(30.86)	47(42.74)	11(25.58)	5(13.51)	36(37.11)	30(42.25)
experience	11-20	37	16.74	16(19.75)	17(15.04)	5(11.63)	8(21.62)	16(16.49)	12(16.90)
Mean=20.38	21-30	39	17.65	13(16.05)	18(15.93)	10(23.26)	10(27.03)	16(16.49)	11(15.49)
	31-40	71	32.13	26(32.10)	30(25.40)	17(39.53)	14(37.84)	28 (28.87)	17(33.94)
	Above 40	2	0.90	1(1.23)	1(0.88)	0.00(43)	0(0.00)	1(1.03)	1(1.41)
Educational	Non-formal	10	4.52	2(2.47)	2(1.77)	1(2.33)	3(8.11)	7(7.22)	5(7.04)
status	Primary	9	4.07	2(2.47)	4(3.54)	3(6.98	2 (5.41)	4(4.12)	3(4.23)
	Secondary	20	9.05	4(4.94)	6(5.31)	3(6.98)	4 (10.81)	10(10.31)	7(9.86)
	Modern	17	7.69	20(24.69)	36(31.86)	21(48.84)	14(37.84)	28(28.87)	19(26.76)
	Vocation	20	9.05	11(13.58)	12(10.62)	2(4.65)	2(5.41)	7(7.22)	6(8.45)
	Tertiary	85	38.46	36 (44.44)	44(38.94)	11(25.58)	12(32.43)	38(39.18)	29(40.85)
	Koranic	11	4.98	7.41(7.41)	9(7.96)	2(4.65)	0(0.00)	3(3.09)	2(2.82)
	Total	**221**	**100**	**81(100)**	**113(100)**	**43(100)**	**37(100)**	**97 (100)**	**71 (100)**

Factors influencing cashew farmers vulnerability to poverty

Table 3 revealed the multinomial logistic regression model (MLR) for factors influencing vulnerability to poverty using the vulnerability status of the respondents. The result showed that season of cashew nut production (β= -1.3160, std. err = 0.6051, p<0.01), age (β= -0.0292, std. err = 0.0119, p<0.01) and per capital income (β= -4.01e-07, std. err = 1.83e-07, p<0.01) were negatively significant. This implies that for each one-unit increase in on-season of cashew nut production, age and per capital income, the vulnerability status of the respondents reduces. Thereby, respondents can fall into the moderate vulnerability category.

The marital status (β= 0.7131, std. err = 0.2561, p<0.001), household size (β=0.2456, std. err = 0.0772, p<0.001), and total expenditure of the household (β= 1.05e-06, std. err = 3.36e-07, p<0.001) were positively significance. The positive slope suggests that married respondents, increased household size, and increased household expenditure were at greater risk of vulnerability. Meanwhile, gender, years of respondents' experience, primary occupation, secondary occupation, savings and access to the required quantity of the nut were statistically insignificant.

The second section of the multinomial regression helps to determine which independent variables significantly predict the risk of a respondent belonging to the 'low vulnerability' category (i.e., the comparison group) versus the 'high vulnerability' (i.e., baseline) category, conditional on the predictors. Gender (β= -0.2276, std. err = 0.0911, p<0.01), household size (β= -0.9265, std. err = 0.3654, p<0.1) and primary occupation (β= -2.1263, std. err = 1.2596, p<0.1) were negatively significance. This suggests the respondents with more male, higher number of household and primary occupation were at low risk of being vulnerable to poverty.

The relative risk ratio (RRR) in Table 6below represents the predicted multiplicative change in the relative risk (the risk of falling into a comparison group relative to the risk of falling into the baseline group) per unit increase on an independent variable. The RRR for age and household size indicates that for each one-unit increase on these variables, the risk of falling into the 'moderate vulnerability' category relative to the risk of belonging to the 'high vulnerability' category is predicted to change by the factors of 0.971 and 0.782. This effectively means that an individual with an increase in age and household size (as opposed to lesser) was at lower risk of falling into the 'moderate vulnerability' category and at increased risk of being in the 'high vulnerability' category.

The RRR for the season of cashew nut production and marital status indicates that for each one unit increase on this variable, the risk of falling into the moderate vulnerability category relative to the risk of belonging to the high vulnerability category is predicted to change by a factor of 1.421 and 2.038. This effectively means that an individual with greater season of cashew nut production and married (as opposed to lesser) was at higher risk of falling into the moderate vulnerability category and decreased risk of being in the high vulnerability category.

The RRR for per capita income and total expenditure indicates that for each unit increase in these variables, the risk of falling into the moderate vulnerability category relative to the risk of belonging to the high vulnerability category is predicted to change by the factors of 1.000 and 1.000. This effectively means that an individual with greater per capita income and total expenditure has no relationship between the variables and the risk of falling into the 'moderate vulnerability' category about the 'high vulnerability' category.

Consequently, the RRR for gender, household size and primary occupation implies that for each unit increase in these variables increases the risk of falling into the moderate vulnerability category relative to the risk of belonging to the high vulnerability category is predicted to change by the factors of 0.797, 0.397 and 0.120. This means that respondents with large household size, that has a primary occupation and a male gender is most likely to be highly vulnerable. Meanwhile, the RRR for per capita income indicates that for each unit increase on this variable, the risk of falling into the low vulnerability category relative to the risk of belonging to the high vulnerability category is predicted to change by a factor of 1.000. This shows that an individual with greater per capita income has low vulnerability category and at the risk of falling into the moderate vulnerability categories.

The Table 3, also contains the results from a likelihood ratio chi-square test, comparing the model's fit with the complete set of predictors with an intercept-only, or null, model (no predictors). If significant, it is inferred that at smallest amount one population regression slope is significantly different from zero. Based on the estimation of the LR test from the table, it showed that the model reveals the complete set of predictors denotes a significant improvement in fit relative to a null model ($LRx^2(28) = 350.56$, <.001). This implies that at least one population slope is non-zero. The whole model containing the predictors represents a 41.88% improvement in fit relative to the null model.

Table 3: Multinomial Logistic Regression Model (MLR)

Variables	RRR	Coefficient	Std.Err	Z-value
High vulnerability		**Base outcome**		
Moderate vulnerability				
Season	0.2700	-1.3160*	0.6051	-2.17
Age	0.9712	-0.0292*	0.0119	-2.45
Gender	0.9590	-0.0420	0.0271	-1.55
Marital status	2.0383	0.7131**	0.2562	2.78
Household size	0.7825	0.2456**	0.0772	3.18
Years of experience	1.0000	0.0008	0.0234	0.04
Primary occupation	1.4207	0.3477	0.3602	0.97
Secondary occupation	1.0692	0..0656	0.2714	0.24
Savings	1.0000	5.63e-08	5.53e-07	0.10
Total household expenditure	1.0000	1.05e-06**	3.36e-07	3.13
Access to the required quantity of cashew nut	0.9610	-0.0402	0.2424	-0.17
Constant	2.3467	0.8631	0.7338	1.18
Low vulnerability				
Season		36.7139	607.0829	0.06
Age	1.0296	0.0289	0.0264	1.10
Gender	0.7972	-0.2276*	0.0911	-2.50
Marital status	1.8920	0.6410	0.4993	1.28
Household size	0.3973	-0.9265*	0.3654	-2.54
Per capita income	1.0000	-2.27e-06***	3.62e-07	-6.26
Years of experience	0.8892	-0.1145	0.645	-0.18
Primary occupation	0.1198	-2.1263*	1.2596	-1.69
Secondary occupation	1.0060	0.0101	0.6374	0.02
Savings	2.0000	-1.83e-06	1.45e-06	-1.26
Total household expenditure	1.0000	6.96e-07	9.47e-07	0.73
Access to the required quantity of cashew nut	1.7806	0.5702	0.5357	1.06
Constant	4.70e-19	-42.1872	607.0949	-0.07
Prob > chi2		0.0000		
Pseudo R^2		0.4183		
LR chi2(28)		350.56		
Observation		221		

* Significance at 10% level, ** Significance at 5% level and *** Significance at 1% level\

CONCLUSION

The study shows that the proportion of cashew farmers being highly vulnerable to poverty and those with low vulnerability to poverty was 36.65% and 43.89%, respectively, during one season. Comparing the off-season and on-season of cashew production, majority of cashew farmers were highly vulnerable to poverty during the off-season. This could contribute to baseline information for cashew marketing, a new initiative to help cashew farmers better cope with the poverty they are facing. Because cashew nut marketers in the study area are highly vulnerable to poverty, the study therefore recommends that the government and development partners take immediate action to enhance the resilience of these poor cashew nut marketers. For examples,

- Establish microfinance programs or community-based financial institutions that offer cashew nut marketers affordable loans, credit, and savings options. This can help them manage their cash flow, invest in their businesses, and cope with fluctuations in the market.
- Provide training and workshops on market trends, value addition, quality improvement, and post-harvest handling techniques. Equipping cashew nut marketers with knowledge about better practices and market dynamics can improve the quality of their products and enable them to negotiate better prices.
- Introduce agricultural insurance schemes that cover risks like crop failure, weather-related losses, and market price fluctuations. This can provide a safety net for cashew nut marketers during challenging times.
- Develop policies that prioritize and promote the interests of cashew nut marketers. This could involve reducing bureaucratic hurdles, ensuring fair trade practices, and supporting sustainable farming practices.

Finally, this study suggests that future research focuses on understanding how cashew nut marketers/ farmers are affected by relevant policies.

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