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## EDITORIAL

Over the last two decades, the Journal of Sustainable Development focused on communication about agricultural and developmental (human and community) related information among agricultural stakeholders and between agricultural and non-agricultural stakeholders, effectively and positively improving the lives and livelihoods of agricultural practitioners and as well stimulating development of rural communities via our bi-annual publications (June and December editions).

This edition of the Journal of Sustainable Development is dedicated to selected papers from the Triennial Congress (Entebbe 2021) of the Sustainable Livelihoods and Development Network for Africa (SLIDEN AFRICA) themed "Resilience and Recovery of African Livelihoods and Food Systems beyond Emergencies"

Africa, like other continents of the world is economically impacted by the outbreak of COVID-19 pandemic, where it disrupted access to food, livelihoods and other social needs due to measures put in place (such as total lockdown) to combat this outbreak

coupled with the spate of insurgents and terrorism in some African countries. Consequently, increased food insecurity, poverty, death and openly exposed the vulnerability of the African food systems in managing emergency situations as these. Hence, the need for stakeholders across fields to develop recovery system for African livelihoods and resilient food systems that can withstand future emergency situations without prejudice to lives or livelihoods of the African people.

Therefore, in this edition of the Journal of Sustainable Development, this subject is further explored by all the papers to varying degrees. Sector specific references were made to gendered access to resources, Inclusive participation, Economic security, Social intervention programmes, Spices and Bamboo production, Co-existence of farmers and pastoralists, Security measures for crime control in rural communities, and the roles of information communication and technology (ICT) In agroforestry Service delivery.

Prof. Kola Adebayo

DETERMINANTS OF VEGETABLE WOMEN FARMERS' ECONOMIC SECURITY IN BOKE  
REGION, GUINEA

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ABSTRACT

Vegetable production had been a major source of livelihood among women in Guinea. This study therefore, assessed the determinants of vegetable women farmers' economic security in the Boke region of Guinea. A multi-stage sampling procedure was used to select 180 respondents for the study. Data was elicited from the respondents with the aid of interview schedule and analysed using descriptive and inferential statistics. The results revealed that average household and farm size cultivated respectively were  $8.54 \pm 3.55$  persons and  $1.17 \pm 0.62$  ha. Personal land (71.7%), household (97.2%) and hired labourers (84.4%) were used by respondents. Almost all (95.0%) relied on personal savings for the finance of vegetable farming. Prominent constraints against vegetable production were inability to access credit at banks ( $\bar{x}=1.87$ ), lack of storage ( $\bar{x}=1.87$ ) and processing ( $\bar{x}=1.86$ ) facility. Vegetable enterprise was not profitable for 53.3% of respondents. Income from vegetable farming was neither adequate (99.4%) nor stable (100.0%). Average annual expenditure (\$4,664.92 $\pm$ 1723.75) was higher than annual income (\$704.49 $\pm$ 1,379.98). Almost all the respondents were economically insecure (98.9%) thus unsustainable livelihood and inability to cope with emergencies. Significant predictors of economic security among respondents were household size ( $\beta=-0.229$ ), use of personal land ( $\beta=-0.188$ ), use of rented or lease land ( $\beta=-0.205$ ), use of family land ( $\beta=-0.142$ ), use of family/ hired labour ( $\beta=0.159$ ), annual income (vegetable) ( $\beta=0.596$ ) and the number of vegetables grown ( $\beta=-0.150$ ). The study recommends that farmers be encouraged to form cooperatives in order to facilitate access to credit facilities, need for the establishment of cottage industries and promotion of value addition.

Keywords: Vegetable Production, Women Farmers, Income, Expenditure, Economic Security

INTRODUCTION

Agriculture is at the core of Africa's development because seven out of ten Africans derive their livelihoods from agriculture, and the continent has enormous agricultural potential and technologies that can be used to increase crop yield (Leautier, 2016). Agriculture contributes highly to economic growth in sub-Saharan Africa. It provides employment for the majority of the working population and contributes significantly to the Gross Domestic Product (GDP) in sub-Saharan economies (AGRA, 2015). It is thus recognized as an engine of growth and poverty reduction as it is the main occupation of the poor (SOFA Team and Cheryl, 2011).

In Guinea, rural women's contribution to agriculture and rural development is significant. Though nature and extent of women's involvement in agriculture varies greatly from place to place, there is hardly any activity in agriculture that women are not involved in (Manjari, 2014). These women cultivate both cash crops and arable crops, including vegetables.

Vegetables are an important source of micronutrients for human nutrition (Akamin *et al.*, 2017). They constitute cheap sources of nutrients such as proteins, vitamins, carbohydrates and other elements essential for human health and wellbeing, which are usually gotten from consumption of the leaves, stems or fruits either cooked or eaten raw.

Popular vegetable cultivated for commercial purpose in Africa include onions, lettuce, spinach greens, carrots, onions, tomatoes, hot and sweet pepper, green beans, okra and cucumber (Small Starter Africa, 2017). In Guinea, commonly grown vegetables include tomatoes, pepper, eggplant, onion, okra, lettuce, carrot and cucumber. Greenhouses, cold frames, and hotbeds are common structure used (Warid, 2018) for vegetable cultivation, making it possible to have fresh vegetables all year round.

Vegetable cultivation has the potential of improving the nutrition and economic status of a farming community (Anuradha and Laxmikant, 2015). Usually, it is undertaken by both men and women, but women's

contribution to vegetable cultivation is more significant. Past studies revealed that women are particularly more dominant in the marketing of the vegetables (Oluwasola, 2015) than in other aspects. Women vegetable farmers have been observed to be more technically efficient, owing to the fact that women give more consideration to vegetable production as it is directly linked to household food security particularly nutrient-rich traditional African vegetables (Akamin *et al.*, 2017). This suggests that women possess ample experience in vegetable cultivation.

Vegetable production can be vital to the economy of Guinea. Ghimire *et al.* (2018) noted that it is quite important in shaping the economic conditions of farmers engaged in it. This is because vegetables are capable of generating income even from a small plot of land in a short period of time and aids farmers to better living standard (Gurung *et al.*, 2016). Additionally, the importance of vegetable production matches or yet exceeds the value of cereal production (Joosten, 2015), contingent on the fact that vegetables have higher market value as well as high cost-benefit ratio relative to cereals (Bhandari, 2015). Presumably, it can thus be said that vegetable cultivation supports farmers' economic condition through the provision of food, generation of income, and provision of employment. (Asongwe, 2014). However, there is an array of constraints militating against vegetable production in the study area. PNIASA (2017) posited that though women farmers produce a lot of vegetables, they are however unable to purchase agricultural inputs essential for production. They are also confronted with the inability to access loans and small grants to scale up production (Cauwelier, 2017). In order to address such constraints, the government of Guinea has been supporting vegetable production by appealing to rural development Agencies such as West Africa Agricultural Productivity Programme (WAAPP), International Fund for Agricultural Development (IFAD), National Programme of Support to the Actors of Agricultural Subsectors (PNAFA), French Development Agency (AFD) to offer assistance to farmers in this line.

Despite government's efforts, some women that have the capacity for vegetable production have not fully optimise the benefit accruing from growing vegetables due to some factors yet unknown. More so, many

women that involved in vegetable production still send their children to sub-standard schools, had low standard of living and are unable to increase production. Another major observation in vegetable production is the inability of women farmers to keep records of their activities and cost of production hence, they are not able to determine whether they are economically secured or not. Though some women vegetable farmers believed that they are economically secured, but there are no empirical data to substantiate this claim. Likewise, data on predictors of women vegetable farmers' economic security are scarce in the study area.

It is envisaged that if it is empirically established that vegetable woman farmers are economically secured, more women would be encouraged to intensify production and those who are indifferent would be motivated to go into production. Hence, this study examined the determinants of economic security status of vegetable women farmers in Boke region of Guinea. The study was guided by these specific objectives:

1. examine the profitability of vegetable production in the study area.
2. determine the economic security status of women farmers in the study area.

## METHODOLOGY

The study was carried out in Boké region, an administrative subdivision of Guinea. Boké is located 250 kilometres from Conakry, the capital of Guinea. Boké lies within geographical coordinates of 10° 55' 53" North, 14° 17' 21" West. It covers an area of 1,105,300 ha or 11,053 km<sup>2</sup>, with a population density of 26 inhabitant/km<sup>2</sup>. In 2017, the population of Boké was estimated to be 100,000 and it is the seventh most populous city in the country. The climate is tropical humid with an average annual rainfall reaching 2675mm, which usually lasts for about 3 months. It is the most cosmopolitan area of Guinea. The main economic activities practised by its population revolve around agriculture and mining. The main economic activity of most women is market gardening and most are organized into groups.

Multi-stage sampling procedure was used to select respondents for this study. Boké region has five prefectures namely; Boké, Boffa, Fria, Gaouwal and Koundara. Boké prefecture was purposively selected for this study due to its

high population of vegetable women farmers. Boké prefecture has ten communes, out of which 30% communes (Boké Centre, Kolaboui and Kamsar) were purposively selected because of the predominance of vegetable production by women farmers in the area. Boké Centre, Kolaboui and Kamsar respectively have fourteen, sixteen and twelve districts, from which 30% of the districts were randomly selected: Boké Centre (four), Kolaboui (five) and Kamsar (four) to give thirteen districts. A list of registered women farmers involved in vegetable production was obtained from vegetable production association at the district level, out of which 10% of women farmers were randomly selected from each district to give a total sample size of 180 respondents.

Interview schedule was used to obtained data, which were subjected to analyses using percentages, mean and linear regression model. The major variables of the study were measured as follows:

Profitability of vegetable production was determined by asking respondents to indicate their cost of production and the income they realised from vegetables sold. The profit made by each individual was determined by subtracting the cost of production for each respondent from the income realised. The mean profit was computed and used to categorise respondents as either having high and low level of profit.

Economic security of vegetable farmers was determined using the formula of Ayinde (2017) where economic security was operationalized as the difference between income flow and expenditure flow of households. The formula is given thus;

$$\text{Economic security} = \text{Income flow} - \text{Expenditure flow.}$$

To determine the income flow, the various sources of income and the actual income from each source were indicated. Respondents were further asked to indicate if their income was adequate and stable. Adequacy of income was measured using response options of "very adequate", "adequate" and "not adequate", with scores of 2, 1 and 0 assigned, respectively. For stability of income, it was measured using response options of "very stable", "stable" and "not stable", with scores of 2, 1 and 0 assigned, respectively. On expenditure, a list of probable expenses was drawn up and actual expenses were indicated by the respondents on a daily, weekly, monthly or yearly basis. The various responses of the respondents were harmonised into an annual income and expenditure flow. The economic security for each respondent was determined by subtracting expenditure flow from the income flow. Those whose economic security was below zero were regarded as being economically insecure, while those whose economic security equals or above zero were regarded as being economically secure.

Table 1: Summary of Sampling Procedure and sample Size

	Purposive selection of one prefecture	Purposive selection of 30% of 10 communes in boke prefecture	Districts in each selected commune	Random selection of 30% of each commune	Random selection of 10% in each district	10% of vegetable women farmers in the selected districts
Prefecture	Boke prefecture	Boke center	4=	150	15	
			14	115	12	57
				93	9	
				214	21	
Boke Region	Boffa	Kolaboui	5=	248	25	
			16	146	15	70
				172	17	
				134	13	
	Fria	Kamsar	4=	167	17	53
			12	135	14	
				138	14	
				73	7	
	Gaouwal	-	-	-	-	
	Koundara	-	-	-	-	
	Total	-	-	-	-	180

## RESULTS AND DISCUSSION

### Profitability of Vegetable Production

Table 2 shows that the vegetable production enterprise from which the respondents obtained the most profit from was pepper production ( $\bar{X}=406.85$ ), following this was tomato production ( $\bar{X}=252.38$ ). It suggests that pepper and tomato which are virtually eaten on a daily basis by people around the world are commercially more viable than other vegetables in the study area, which is the reason most of the respondents cultivate them. For instance, tomato is regarded as the main vegetable produced worldwide (FAO, 2016). Tomato is the preferred crop for vegetable farmers because they are more profitable than other vegetables and hence are valuable for smallholder low-income farmers (Ghimire *et al.*, 2018). The total average annual income realised from vegetable production was \$704.49±1,379.98.

Table 3 presents the labour cost incurred for various vegetable production operations performed by the respondents. Manuring ( $\bar{X}=53.23$ ), land clearing ( $\bar{X}=50.47$ ), fertiliser application ( $\bar{X}=49.52$ ), bed making ( $\bar{X}=47.51$ ) and weeding ( $\bar{X}=45.63$ ) were prominent operations on which the respondents expended much labour cost on. This together

with average annual labour cost incurred on all vegetable production operations was \$150.39±183.60. Likewise, the cost incurred on the procurement of inputs is equally presented on Table 3, with motorcycle ( $\bar{X}=250.00$ ) and organic fertiliser ( $\bar{X}=156.84$ ) accounting for the larger chunk. The total average annual cost incurred on purchase of input was \$350.39±199.96. The total average cost of production (i.e. summation of the average annual labour cost and the average annual input cost) therefore adds up to \$477.39±302.37.

It was revealed (Table 4) that vegetable production was not profitable for more than half (53.3%) of the respondents. Since the profit margin that this category of respondents realises from vegetable production is less than or equal to zero ( $\leq 0$ ), it implies they are running their vegetable enterprise at a loss, or are unable to make gains/savings after the sale of their produce. This can make them economically insecure. In categorising 46.7% that operate profitable vegetable enterprise (Table 5), it was found that the greater proportion (82.3%) of them had low level of profitability, suggesting that majority of the respondents will not always have enough to finance their enterprises and cater for household demands. Their ability to withstand economic shocks is thus very slim.

It can be generally inferred from the finding of this study that the economic security of women vegetable farmers in the study area is threatened owing to the unprofitable and/or

low profitability of their primary occupation. This is contingent on the high cost of vegetable production.

Table 2: Annual income (\$) derived from vegetable production

Vegetables	Minimum	Maximum	Mean	SD
Tomato	8.75	6,300.00	252.38	586.95
Pepper	15.00	7,175.00	406.85	898.17
Eggplant	5.00	925.00	94.47	112.92
Cucumber	7.50	220.00	40.60	31.33
Okra	2.50	2,225.00	69.24	211.14
Onion	25.00	75.00	66.67	20.41
Total income	65.00	15,787.50	704.49	1,379.98

Source: Field survey 2019

Table 3: Amount (\$) expended on labour

Activities	Average cost (\$)
Land clearing (Manual)	50.47±57.00
Making of vegetable beds	47.51±41.04
Leveling	28.55±26.09
Manuring	53.23±52.05
Transplanting	20.16±42.85
Staking	0.00±0.00
Fertilizer application	49.52±57.37
Spraying (insecticides)	9.29±2.63
Weeding (manual)	45.63±24.22
Weeding (chemical)	0.00±0.00
Harvesting	43.23±35.95
Transportation	30.90±30.87
Marketing	0.00±0.00
Total cost of labour	150.39±183.60

Source: Field survey, 2019.

Table 4: Amount (\$) expended on inputs

Inputs	Average cost(\$)
Knapsack sprayer	29.53±13.69
Urea	39.95±23.90
NPK	71.62±41.84
Organic fertilizers	156.84±128.67
Tomato seed	10.38±4.32
Pepper seed	29.38±36.57
Eggplant seed	8.75±3.06
Okra seed	9.06±5.85
Cucumber seed	3.75±0.00
Herbicides	14.03±12.55
Insecticides	13.13±0.00
Pesticides	
Hoe	14.85±8.85
Cutlass	9.46±6.42
Watering can	19.86±51.12
Basket	38.68±22.87
Sacks	12.89±8.07
Transportation	250.00±176.78
Total cost of inputs	350.39±199.96
Total cost of production (cost of labour + cost of input)	477.39±302.37

Source: Field survey, 2019.

Table 5: Distribution of the respondents based on their level of profitability (\$)

Profitability category (N=180)	Freq.	%	Min.	Max.	Mean	SD
Profitable (> 0)	84	46.7	-747.50	13,714.38	227.09	1,221.06
Not profitable ( $\leq 0$ )	96	53.3				
Profitability level (N=84)						
Low	69	82.3	1.75	13,714.38	560.19	1,596.92
High	15	17.7				

Source: Field survey 2019

#### Economic Security

Table 6 presents the distribution of the respondents based on their responses to adequacy and stability of the income realised from vegetable production. While income realised from vegetable production was found to be inadequate for almost all the respondents (99.4%), it was observed to be unstable for all of them (100.0%). This finding is obviously not unconnected with the high cost of vegetable production that made the respondents vegetable enterprise unprofitable as earlier revealed, coupled with the different constraints they face. Furthermore, since vegetables are mostly grown in the study area on a seasonal basis, it implies that most vegetable farmers largely depend on rainfall for water. According to FAO (2009), water and its access is usually the crucial factor in vegetable production, thus in the absence of irrigation it is unfeasible to harness the possible income realisable from dry season when profits are at the peak.

The respondents' annual expenditure flow was ascertained as shown in Table 7. Shelter ( $\bar{X}=\$2,349.17\pm727.55$ ) constituted the highest share while health-related expenses ( $\bar{X}=72.78\pm112.66$ ) formed the least. Other expenses were on feeding ( $\bar{X}=\$1,932.50\pm1,383.03$ ),

transportation ( $\bar{X}=\$184.05\pm56.83$ ), children's need ( $\bar{X}=114.69\pm62.77$ ) and clothing ( $\bar{X}=158.59\pm59.74$ ). The general average annual expenditure was  $\$4,664.92\pm1,723.75$ . These results indicate the women vegetable farmers have a diversity of needs to meet. Hence, it behoves them to engage in other means of livelihood to augment their income in order to satisfy these needs.

Result on the women vegetable farmers' level of economic security in Table 8 reveals that nearly all (98.9%) the respondents were economically insecure. It infers that income realised from vegetable production is inadequate to meet their household needs. The mean economic security score of  $\$-3,960.43$  further suggests that most of the respondents were running their vegetable enterprise at a loss and hence economically insecure. A respondent becomes economically insecure when household needs cannot be met or when the amount of money spent is higher than the income realised from vegetable production. Findings from this study do not align with Anuradha *et al.* (2015) who asserted that vegetable cultivation has a vast potential of improving the nutrition and economic status of the farming community.

Table 6: Adequacy and stability of income derived from vegetables production

Variables	Very adequate		Adequate		Not adequate	
	Freq.	%	Freq.	%	Freq.	%
Adequacy of income	0	0.0	1	0.6	179	99.4
Stability of income	Very stable		Stable		Not stable	
	0	0.0	0	0.0	180	100.0

Source: Field survey, 2019.

Table 7: Annual expenditure flow of respondents (\$)

Items	Min	Max	Mean	SD
Feeding	530.00	17,320.00	1932.50	1383.03
Shelter	180.00	3,600.00	2,349.17	727.55
Transportation	7.50	270.00	184.05	56.83
Children needs	23.25	375.00	114.69	62.77
Health	4.38	875.00	72.78	112.66
Clothing	37.50	375.00	158.59	59.74
Total mean expenditure	2,038.13	20,732.50	4,664.92	1,723.75

Source: Field survey, 2019.



Table 8: Distribution of respondents based on their level of economic security (\$)

Level of economic security	Freq.	%	Minimum	Maximum	Mean	SD
Economically secure ( $\geq 0$ )	2	1.1	-20,086.25	13,718.75	-3,960.43	2,231.85
Economically insecure ( $< 0$ )	178	98.9				

Source: Field survey 2019

#### Contributions of Vegetable Production to Economic Security

Multiple linear regression analysis in Table 9 shows that economic security was significantly determined by household size ( $\beta=-0.229$ ), land ownership..., labour source, annual income from vegetable production ( $\beta=0.596$ ) and number of vegetables grown ( $\beta=-0.150$ ). The study earlier observed that most of the respondents possessed fairly large household sizes of an average of eight persons, suggesting higher family responsibilities that can negatively affect their economic security. The large household sizes can be relevant in the provision of family labour but if family labour does not suffice there will be need to patronise other sources of labour which can

lead to an increase in production cost. Additionally, vegetable farmers who own their farmland would have lower expenditures. In fact, owning farmland has been found to greatly benefit the livelihood of vegetable farmers particularly their yield capacity (Rai *et al.*, 2019). On its part income is an important factor as it determines the ability of farmers to incorporate new production technologies, access livelihood assets and shape their living standards (Amusat, 2018). With respect to number of vegetables grown, it is assumed that the cultivation of different vegetables might contribute to economic security of the respondents even though this might not always be the case owing to other factors affecting production.

Table 9: Contribution of selected independent variables to economic security

Variables	Beta	t-value	p-value
(Constant)		-0.218	0.828
Age	0.056	0.711	0.478
Formally educated	0.051	0.897	0.371
Household size	-0.229	-3.224	0.002**
Farming experience in years	-0.021	-0.270	0.787
Farm size	-0.085	-1.081	0.281
Use of personal land	-0.188	-2.476	0.014*
Use of rented or lease land	-0.205	-2.807	0.006**
Use of family land	-0.142	-2.144	0.034*
Use of community land	0.020	0.343	0.732
Use of family labour	-0.088	-1.470	0.144
Use of family and hired labour	0.159	2.160	0.032*
Use of personal savings	-0.011	-0.192	0.848
Annual income from vegetable	0.596	6.728	0.000**
Number of vegetables grown	-0.150	-2.501	0.013*
Knowledge	0.042	0.613	0.541
Involvement	-0.014	-0.232	0.817
Benefit	-0.068	-0.993	0.322
Constraints	0.061	1.035	0.302
Diagnostics statistics			
F value		12.939	
Sig.		0.000	
R		0.769	
R <sup>2</sup>		0.591	
Adjusted R <sup>2</sup>		0.546	
Std. Error of the estimate		15045.21	

Source: Field survey, 2019. \*\* = Significant at 0.01, \* = Significant at 0.05

## CONCLUSION AND RECOMMENDATIONS

Nearly all the women vegetable farmers were economically insecure, as income realised from vegetable production was clearly inadequate to meet their household needs. Income realised from the sale of vegetables fell below household expenditures. The high cost of vegetable production, coupled with severe financial-related constraints meant that the vegetable enterprise of most of the respondents was not profitable and were thus

unable to make gains/savings after the sale of their produce. Economic security was significantly determined by household size, land ownership, labour source, income from vegetable production and number of vegetables grown. Access to credit facilities that can address the financial needs of the respondents as well as training on how they can become profitable in their enterprise should be undertaken by relevant stakeholders.

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## **About SLIDEN AFRICA**

SLIDEN AFRICA (Sustainable Livelihoods and Development Network for Africa) with its Secretariat at the Livelihoods Support and Development Centre is a non-governmental, non-profit making organization based in Nigeria with offices in Kenya and Ghana. It is made up of a network of partners that comprises knowledgeable and experienced professionals in the Agriculture, Development Studies and related fields.

SLIDEN AFRICA was established in 2000 against the philosophy of is the empowerment of poor people in Africa through poverty alleviation, livelihoods development, skill enhancement and gender parity in development, research and networking. It aims at contributing significantly to the attainment of increase in level of education, reducing poverty, ensuring gender equity and environmental sustainability in Africa.

## **Strategy and Programmes**

In achieving this goal, SLIDEN AFRICA has a pro-poor strategy which encompasses educational development, community development, livelihoods development, capacity building and skill acquisition, among others. These strategies are embedded in our programmes which are:

**Research and Development Programme:** Consultancy; Business Development Support

**Livelihood Development Support Programme:** Capacity Building and Skill Acquisition; Microcredit and Livelihood Finance; Information for Development Project

**Community Development Programme:** Community-Assisted Development Initiatives; Community Development Consultancies

**Educational Development Support Programme:** SLIDEN and friend Educational Support Project; SLIDEN and U Educational Project

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