



Profitability of Trade in *Moringa oleifera* (LAM) Fresh Leaves in Taraba State, Nigeria

Lobiya, John Kassa^{1*}, Ancha, Paul Ukper² and Tee, Terver Norbert²

¹Department of Forestry, College of Agriculture, P.M.B. 1025, Jalingo, Taraba State, Nigeria.

²Department of Social and Environmental Forestry, College of Forestry and Fisheries, University of Agriculture, Makurdi, Benue State, Nigeria.

Authors' contributions

This work was carried out in collaboration among all authors. Authors LJK, APU and TTN jointly designed the research but author LJK collected the data for the research and discussion of the results. Authors APU performed the statistical analysis, while author TTN read the work and made necessary corrections in the draft of the manuscript. Finally, all the authors met, read and approved the final manuscript in a day.

Article Information

DOI: 10.9734/AJRAF/2020/v6i430114

Editor(s):

(1) Dr. Lucia Bortolini, University of Padova, Italy.

Reviewers:

(1) Ismail Ukav, Adiyaman University, Turkey.

(2) SrinivasaRao Kasimayajula, Madanapalle Institute of Technology and Science, India.

(3) Schirley Costalonga, Universidade Federal do Espírito Santo, Brazil.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/55204>

Received 01 January 2020

Accepted 02 March 2020

Published 08 December 2020

Original Research Article

ABSTRACT

This study investigates the profitability of trade in *Moringa oleifera* (Lam) Fresh Leaves and also examine the Socio-economic characteristics of Traders in Taraba State, between June, 2018 and May, 2019. Applying a multistage Sampling approach, 342 and 97 traders were randomly selected and administered with questionnaire in the wet and dry seasons respectively, to elicit data, which were analysed using descriptive and inferential statistics. The results on the socio-economic variables showed that female traders (94.7%), age class 31-40 (36.3%), Married (65.5%), Household size of 8 members and above (69.6%) and non-formal education (51.8%) featured dominantly in moringa fresh leaves trade. Furthermore, Gross Margin (GM) analysis showed that the monthly income from *Moringa oleifera* (Lam) fresh leaves was highest (N372.50 ± 125.15) in Ibi Local Government Area (LGA), while Bali LGA had the least GM of (N 88.83 ± 91.40) in the wet season. In the dry season, Gashaka LGA had the highest GM of N 228.00 (± 78.55), while Jalingo LGA was the least with GM of N 57.50 (± 86.68). The comparison of GM and Quantity of leaves

*Corresponding author: E-mail: lobiyalobiya2016@gmail.com;

sold (QLS) in the dry and rainy seasons were not significantly different. The Rate of Returns on Investment (RORI), Gross Margin Index (GMI) and Unit Price (UP) in the rainy and dry seasons were significantly at 0.05 level of probability. It is therefore recommended that Government and Non-government organisations (NGOs) should educate the traders on the marketing of *Moringa oleifera* leaves; Government and NGOs should also make loans available at one-digit rate; Government should put in place a security outfit to curtail the incessant crisis in Taraba; and traders should form cooperative society to access loans with the Bank of Industry through the Anchor Borrower scheme.

Keywords: *Moringa* leaves; socio-economic characteristics; policy decisions; marketing.

1. INTRODUCTION

Moringa oleifera (Lam) is the most widely cultivated species of monogeneric family, the Moringaceae. The plant is indigenous to south Asia, where it grows in the Himalayan foothills from Northeastern Pakistan to North-Western Bengal, India [1]. *Moringa oleifera* (Lam) is the most widely known species out of the 12 from the Moringaceae. It is variously known as 'Haakoobisii' by Mumuye people, 'Zogale' in Hausa, 'Jeghlegede' in Tiv, 'Gegeredi' in Idoma, 'Gelgedi' in Igala, Gawara by Fulani, Oduduoyinbo or okochiegbu in Igbo, Chigbanwawa by Nupe and Ewele or Idagbomonoye ("the tree which grows crazily") in Yoruba, [2] and [3].

Moringa oleifera is now widely cultivated and has become naturalized in many locations in the tropics [4]. The plant is used in fighting malnutrition, famine, poverty, and unemployment. Furthermore, *Moringa oleifera* products are useful for machine lubrication, manufacture of perfume and hair care products, income to many families and water purification. The plant can also serve as medicine, fuel wood, dye, soil and water conservation, livestock forage and green manure [5] and [6].

Moringa leaves have long been known to indigenous cultures for their nutritional and medicinal benefits, but only in recent years has this translated into dried leaf powder being used in nutritional supplements and medical treatments available to a broader public. There is no other tree leaf in the world with *moringa's* combination of protein, vitamin A, other vitamins, potassium, and calcium. *Moringa* is a tree with many uses and excellent potential for commercial purposes [7].

Adikuru, et al. [8] opined that *moringa* has the potential to significantly add to household income and improve quality of life in Nigeria, if it is grown

and utilized for industrial development. This requires the creation of *moringa* value-chain involving production, processing, marketing and investment. To this end, critical issues which are germane to the exploitation of *moringa* for commercial utilization must be identified and addressed [8].

The plant provides excellent economic opportunities for agricultural producers, traders and processors thereby making it effective in tackling micronutrient insecurity while equally holding the promise of sustainable economic returns to the farmers [9]. The tree crop of which leave, seed, bark and pods are of economic importance could be grown as a relatively cheap, all year round, high quality food for both humans and animals [10]. CJP [11] reported that the current volume of *moringa* sold internationally is not sufficient to qualify it as a commodity on the global market, and hence the trade statistics for *moringa* products are only available in an aggregated form. The global market for *moringa* products is considered substantial, however, with current estimates of over US\$4 billion a year.

Singh, et al. [12] in an investment analysis, found out that *moringa* is a highly profitable enterprise and is an attractive proposition. Singh, et al. [12] in a study on the financial feasibility analysis revealed that the investments on *moringa* farm of one hectare can be recovered in around one year and six months. The Benefit Cost Ratio (BCR) was more than 10, the Net Present worth (NPW) was more than Rs 25 lakhs, and the Internal Rate of Return (IRR) was 89 per cent, with finance. BCR, NPW and IRR were around 12, Rs 26 lakhs and 95%, without finance. They concluded that investment in drumstick enterprise is an attractive and highly profitable proposition.

Singh, et al. [12] also indicated on Sensitivity analysis that if the returns decrease by 50% and cost rises by 20%, the investment on *moringa*

would be a better alternative than several other orchard enterprises.

Moshijadi, et al. [13] in a study found out that moringa has strong potential to generate income in Limpopo province but the marketing of the crop needs to be improved, since this crop offers a significant opportunity for the poorest people to enhance their livelihoods without requiring large capital and sophisticated management. Venkatesan, et al. [14] in a study found out that 80% of the production of moringa leaves in India, fetches higher share of foreign exchange to the country and growing at a rate of 26-30% annually and that the export of moringa leaves is a big business in Tamil Nadu, Andhra Pradesh, Karnataka and Odisha.

There are a lot of profits tied to trade in *Moringa oleifera* (Lam) Fresh Leaves in Taraba if properly and religiously harnessed by all stakeholders. Terver, et al. [2] found out trade in moringa leaves generated higher financial benefits than the other leafy vegetables.

According to Terver, et al. [2] and Moringanews [15], there is dearth of information on trade in *Moringa oleifera* leaves in Taraba State and particularly its profitability. This situation does not encourage Government and Non-Governmental Organizations to (NGOs) towards making policies and programs that will address the problems of trade in *Moringa oleifera* (Lam) leaves in Taraba State. This study aims therefore to attempt to: identify the socio-economic characteristics of traders and further investigate the profitability of trade in *Moringa oleifera* Leaves in both dry and rainy seasons in Taraba State to provide useful information to stakeholders for policy decisions.

2. MATERIALS AND METHODS

2.1 Study Area

Taraba State was created on 27 August 1991, by the military government of General Ibrahim Babangida. It has 16 Local Government Areas (LGAs) which include: Ardo Kola, Bali, Donga, Gashaka, Gassol, Ibi, Jalingo, Karim Lamido, Kurmi, Lau, Sardauna, Takum, Ussa, Wukari, Yorro and Zing [16]. The State lies between latitude 8°00'00" N and 10°30'00" E and longitude 9°00'00" N and 11°30'00"E. Taraba State Covers a total land area of 54,428 km². It is bordered to the east by Adamawa State, to the north by Gombe, Bauchi and Plateau States and

to the west by Nasarawa and Benue States and Republic of Cameroon to the south [16]. Taraba is highly heterogeneous, with 80 ethnic groups: Mumuye, Jukun, Jengo, Kuteb, Chamba, Mambilla, Fulani, Tiv among others. The major occupation of the people of Taraba State is agriculture. Other primary activities in the area include: fishing, pottery, cloth-weaving, and dyeing, mat-making, woodcarving, embroidery and blacksmithing [16].

2.2 Study Population, Sampling Procedure and Sample Size

The study population comprised all the traders marketing *Moringa oleifera* (Lam) leaves in Taraba State, Nigeria. A multi-stage sampling procedure was adopted for the study in line with the work of Terver, et al. [2]. Stage 1: ten LGAs were purposively selected out of 16 LGAs (62.5%). Second stage: four Council wards were selected. Third stage: one market was selected based on the antecedent of trade in *Moringa oleifera* (Lam) leaves. Last stage: Traders were randomly selected based on the type of market as used by Awono, et al. [17]. Therefore, 342 traders formed the sample size of the study in wet season. During the dry season, 97 traders were captured because of the limited number of traders as a result of limited products (moringa leaves). Questionnaire were administered and data garnered from them on sources of moringa leaves, income generation on trade in *Moringa oleifera* leaves in Taraba State.

2.3 Study Design, Data Collection and Analysis

Survey design was adopted, using semi-structured questionnaire, interview and personal observations. Budgetary tools and descriptive statistics were applied for data analysis.

3. RESULTS

3.1 Socio-economic Characteristics of Traders

The results on Socio-Economic parameters of traders in *Moringa oleifera* (Lam) leaves in Taraba State is as shown in Table 1. These are discussed as follows:

Gender: Female dominated with 324 traders (94.7%) while their male counterpart was less with 18 traders (5.3%).

Age: The Age class of 31-40 years had 124 traders (36.3%) dominated *Moringa oleifera* leaves trade in Taraba state, followed by 41-50 with 72 traders (21.1%), 21-30 years had 69 traders (20.2%), 51 and above years had 48 traders (14.0%), while the age class of < 21 years had the least with 29 (8.5%) number of traders.

Marital Status: Majority 224 traders (65.5%) were married, 58 traders (17.0%) were single, 38 traders (11.1%) were separated, 16 traders (4.7%) were divorced, while 6 traders (1.8%) were widow/ers, which agrees with the findings of CJP [18] that majority of the traders 55% were married.

Household size: The greater proportion 238 traders (69.6%) had above 8 members, followed by household size of 4-7 with 90 traders (26.6%), while minority traders had household sizes of 1-3 with 5 traders (1.5%).

Education: Larger proportion of the traders 177 (51.8%) passed through non-formal education, 157 (40.1%) traders had primary education, 26 of the traders (7.6%) had secondary education, while minority 2 traders (0.6%) had tertiary education.

3.2 Estimated Monthly Income of Traders from Marketing of *Moringa oleifera* Fresh Leaves, in Wet Season

The results on estimated monthly income generated (Table 2) during the wet season showed that Ibi LGA had the highest GM of ₦ 372.50 ±125.15 and GMI of ₦ 0.3627±.07, while Bali LGA had the least GM of ₦ 88.83 ±91.40 and GMI of ₦ 0.1556±.11. On a general note, all the values having the same alphabet are not significantly different while those followed by different alphabets are significantly different. The $P < 0.05$ shows that there are no significant differences in all the variables measured in the estimated income generation during the wet season. This portends that marketing of the *Moringa oleifera* leaves in Taraba State is lucrative when properly harnessed. The highest income generated by Ibi LGA may be as a results of competition in the market as there was availability of the produce and many buyers were on ground to purchase the leaves, compare to other markets that had limited supply of the produce. Terver, et al. [2] in their study found out that trade in moringa garnered more income compared to other leafy vegetables in Jalingo markets, Taraba State.

Table 1. Socio-economic characteristics of the traders in Taraba State

Characteristics	Category	Frequency (N= 342)	(%)
Gender	Male	18	5.3
	Female	324	94.7
Age (Years)	<21	29	8.5
	21-30	69	20.2
	31-40	124	36.3
	41-50	72	21.1
	51 and above	48	14.0
Marital Status	Single	58	17.0
	Married	224	65.5
	Widow/Widower	06	1.8
	Separated	38	11.1
	Divorce/Divorcee	16	4.7
Household Size	1-3	5	1.5
	4-7	91	26.6
	8-11	90	26.3
	12 and above	148	43.3
Educational Status	Non formal	177	51.8
	Primary	137	40.1
	Secondary	26	7.6
	Tertiary	2	0.6

Source: Field survey, 2019

Table 2. Estimated monthly income of traders from marketing of *Moringa oleifera* (Lam) leaves in wet season in Taraba State

A	B	C	D	E	F	G	H
LGA	Qty. sold(Kg)	Unit price(₦)	TVC(₦ '00)/Kg	TR(₦ '00)/Kg	GM(₦ '00)/Kg	RORI	GMI
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Ardo Kola	12.47±4.74a	50.06 ±.33 d	429.72±112.93ab	624.17±236.52bc	194.44±140.55c	43.52±21.61c	0.2877±.11 d
Bali	13.60±1.87ab	36.49±8.83 a	410.17±94.84a	499.00±155.33a	88.83±91.40a	20.96±20.34a	0.1556±.11 a
Gashaka	15.29±3.13cd	37.72±6.05 a	435.00±81.24	584.17±174.93ab	149.17±105.33bc	32.11±21.01b	0.2238±.13 c
Gassol	16.98±4.67cd	46.01±7.74 c	625.95±113.03e	758.10±161.91de	132.143±107.26ab	21.57±17.05a	0.1630±.11 ab
Ibi	22.33± 4.23e	45.21±5.43 bc	633.33±106.68e	1005.83±200.26g	372.50±125.15e	58.72±17.09d	0.3627±.07 e
Jalingo	13.85±5.74ab	47.81±6.18 cd	496.63±153.22cd	639.58±211.29bc	142.96±80.61abc	28.30±10.79ab	0.2150±.07 bc
Karim-Lamido	22.46±4.41e	39.43±2.14 a	609.58±101.96e	884.58±178.54f	275.00±89.00d	44.54±10.16c	0.3043±.06 d
Lau	16.53±4.00cd	42.73±5.51 b	547.06±109.52d	697.22±149.70cd	150.17±101.96bc	28.06±18.90ab	0.2015±.12 abc
Yorro	17.56±4.90d	47.66±4.51cd	652.28±162.13e	841.39±261.71ef	189.11±112.39bc	27.38±12.33ab	0.2075±.08 abc
Zing	14.48±4.58abc	47.52±5.02 cd	474.77±103.22bc	675.24±165.05bcd	200.48±96.45c	42.96±20.84c	0.2863±.10 d
Df	9	9	9	9	9	9	9
FStat	16.856	20.971	19.628	17.209	15.971	14.672	14.081
Pvalue	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Source: Field Survey, 2019. Key: QLS= Quantity of Leaves sold; TVC=Total Variable Cost; TR=Total Revenue; GM= Gross Margin; GMI=Gross Margin Index. Values within the same column with the same alphabet are not significantly different while those with different alphabets are significantly different at 5% probability level

Table 3. Estimated monthly income from marketing of *Moringa oleifera* (Lam) leaves in dry season in Taraba State

A	B	C	D	E	F	G	H
LGA	Qty. sold(Kg)	Unit price(₦)	TVC(₦ '00)/Kg	TR(₦ '00)/Kg	GM(₦ '00)/Kg	RORI	GMI
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Ardo Kola	9.00 ± 4.16a	50.00 ± 0.00b	380.00 ± 155.56a	450.00 ± 208.17a	70.00 ± 53.54ab	16.53± .67ab	0.14±0.05ab
Bali	14.10 ± 3.45b	42.00± 4.22ab	456.00 ± 89.22ab	587.00± 128.41ab	131.00±73.40abc	28.97± 3.53b	0.22±0.09b
Gashaka	17.4 ± 4.56b	40.00 ± 0.00a	468.00 ± 105.69ab	696.00 ± 182.43b	228.00 ± 78.55d	45.68 ± 8.24c	.32±0.04c
Gassol	14.17 ± 3.49b	50.00 ± 0.00b	551.67 ± 102.85bc	708.33 ± 174.30b	156.67 ± 79.12cd	27.26± 0.17b	0.21±0.06b
Ibi	14.36 ± 3.64b	50.42 ± 0.93b	560.91 ± 125.02bc	723. ± 180.18b	162.73 ± 61.82cd	28.43 ± 6.14b	0.22±0.04b
Jalingo	15.87 ± 4.47 b	43.13± 4.79ab	623.15 ± 135.09c	680.63 ± 197.60b	57.50 ± 86.68a	7.99 ± 12.30a	0.06±0.10a
Karim-Lamido	14.29 ± 3.99b	48.57± 3.78ab	574.29 ± 137.22bc	692.86 ± 202.95b	118.57±71.51abc	19.54± .87ab	0.16±0.06b
Lau	13.60 ± 4.53b	47.84± 4.75ab	516.00 ± 153.69bc	614.00± 222.47ab	98.00± 06.54abc	20.89±23.29ab	0.15±0.15ab
Yorro	8.44 ± 3.13a	50.00 ± 0.00b	335.56 ± 118.12a	422.22 ± 156.35a	86.67 ± 50.50abc	26.19± 4.64b	0.20±0.10b
Zing	14.20 ± 5.01b	50.00 ± 0.00b	565.00 ± 162.22bc	710.00 ± 250.33b	145.00 ± 89.35bc	23.13±10.41b	0.18±0.07b
Df	9	9	9	9	9	9	9
FStat	3.76	1.94	4.77	2.86	3.55	5.60	5.73
Pvalue	0.05	0.05	0.05	0.05	0.05	0.05	0.05

Source: Field Survey, 2019. Key: QLS= Quantity of Leaves sold; TVC=Total Variable Cost; TR=Total Revenue; GM: Gross Margin; GMI=Gross Margin Index. Values within the same column with the same alphabet are not significantly different, while those with different alphabets are significantly different at 5% probability level

Table 4. Comparison of wet and dry seasons marketing variables in Taraba State

Paired Samples	Mean \pm SD	Paired means difference	r- value	P-value	t-Test	df	P-value	Decision
Dry GM	119.28 \pm 87.32	-25.72 \pm 141.75	0.13	0.20	-1.79	96	0.08	NS
Wet GM	145.00 \pm 23.89					96		
Dry RORI	22.93 \pm 15.13	-9.31 \pm 26.48	0.10	0.34	-3.46	96	0.01	Sig.
Wet RORI	32.24 \pm 23.26					96		
Dry GMI	0.17 \pm 0.01	-0.05 \pm 0.16	0.08	0.44	-2.92	96	0.01	Sig.
Wet GMI	0.22 \pm 0.13					96		
Dry UP	47.25 \pm 8.74	14.35 \pm 13.09 \pm 13.09	-0.14	0.18	3.42	96	0.01	Sig.
Wet UP	42.70 \pm 8.62					96		
Dry QLS	13.79 \pm 3.69	-0.11 \pm 5.33 \pm 5.33	0.18	0.08	0.21	96	0.84	NS
Wet QLS	13.68 \pm 4.57					96		

Source: Field Survey, 2019; Key: GM=Gross Margin, RORI=Rate of Returns on Investment, GMI= Gross Margin Index, UP= Unit Price; QLS; NS= Not significant and Sig. = Significant at 0.05 level of probability

3.3 Estimated Monthly Income of Traders from marketing of *Moringa oleifera* Fresh Leaves, in Dry season

The results presented in Table 3 on estimated monthly income generated during the dry season. The results show that Gashaka LGA had the highest GM of ₦ 228.00 \pm 78.55 and GMI of ₦ .32 \pm 0.04 while Jalingo LGA had the least GM of ₦ 57.50 \pm 86.68 and GMI of ₦ 0.06 \pm 0.10. One would have expected Ibi LGA that recorded the highest GM in wet season, lead in dry season. Perhaps because of communal crisis between the Tivs and Jukuns in Wukari during the period could have contributed to that, as many people left their homes for safety. All the values having the same alphabet are not significantly different while those followed by different alphabets are significantly different. The $P < 0.05$ shows that there are no significant differences in all the variables measured in the estimated income generation during the dry season. This is clear that the marketing of the *Moringa oleifera* leaves in the Taraba State is profitable.

3.4 Comparison of Wet and Dry Seasons Marketing Variables

The results in Table 4 on Comparison of Wet and Dry Seasons marketing variables. The results revealed that there are no significant differences in the GM ($r = 0.13$, $p > 0.05$) and QLS ($r = 0.10$, $p > 0.05$) in both seasons but there were significant differences in the RORI ($r = 0.08$, $p < 0.05$), Gross Margin Index (GMI, $r = -0.14$, $p < 0.05$) and Unit Price (UP, $r = 0.18$, $p < 0.05$) in both seasons. As the GM and QLS are increasing in the wet season, they were also increasing in the dry season, but as the RORI, PI and UP are

increasing in the wet season, they were decreasing in the dry season. This signifies that trade in *Moringa oleifera* leaves in the area has potentials to generate income for the rural population, hence the need to encourage trade in the leaves in the area. This will also go a long way in reducing the rate of unemployment, thereby alleviating poverty in the State. It will also reduce dependency on the white collar jobs that are a mirage in this present dispensation.

4. DISCUSSION

Female dominates the trade in *Moringa oleifera* Fresh Leaves in Taraba State. This results further corroborates the findings of CJP [18], Agbugba and Shelaby [19] and Osondu, et al. [20] that females were the dominants. This may be attributed largely to the tradition of the people and also most of the female have not passed through formal education that will warrant their taking up white collar jobs. It could also mean that since female might not have the much strength to engage in other activities that is labour intensive.

Age: The Age class of 31-40 years dominated *Moringa oleifera* leaves trade in Taraba state. This means *Moringa oleifera* leaves trade is dominated by the youths in Taraba State who are still young and energetic for the rigours involved. Furthermore, this age class form part of productive workforce in every society, because they are still agile. If necessary platform and machinery are provided for them, they can boost their family economic wellbeing, reducing poverty to the barest minimum in the area. They can still travel far to get the products for marketing, but the aged may not because law of diminishing

returns has started setting in. On the other hand, Mohammed [21] indicated that more than half (70%) of vegetable marketers were within the age of 21 to 40 years. The young (Youths) that of school age may at their various institutions for study and the elderly one may not have the strength to endure the rigour associated with marketing in the area.

Marital Status: Majority of the traders were married. This also corroborates the findings of Kainga [22] that more than half (73%) of the respondents are married and of Vivian, et al. [23] that the vegetable marketing enterprise is dominated by the married. Married people tends to look for alternative source of income to augment the economic gaps created by poverty in the area. This may be the reason why married people are more involved in the *Moringa* leaves trade in the State.

Household size: The greater proportion of household size had above 8 members. Household size between 8 and above members were majority. This contradicts the result found out by CJP [18] that household size of 1-3 had the highest percentage. This implies that most of the marketers had more people in their household indicating that larger households contributed more to family labour and equally entails greater populace to feed. This is an indication that the more people are in household, the more basic amenities are needed, and hence the need to embark on trade to carter for the population are in the family. The larger family size, portends more labour supply which is a major characteristic of small scale traders in Taraba State.

Education: Larger proportion of the traders passed through non-formal education. This corroborates the results of Kainga [22] that majority the respondents had no formal education. The result differs from the results presented by CJP [18] that majority of the traders had Primary education while Mohammed [21], who found that majority of vegetable traders had secondary education. Thus, educational level affects market information interpretation; hence, it has the ability to affect quality transaction in the process of marketing. The less educated a society is the less information gathering and interpretation of variables to enhance their marketing potentials. This portends high illiteracy among traders of *Moringa oleifera* leaves in the area. However, it is an indication that *Moringa oleifera* trade in an attractive source of livelihood for the illiterates in Taraba State. Trade in

Moringa oleifera leaves will provide income for this illiterates in fisting household bills. Thus, it can be observed that educational level affects market information and interpretation; hence, it has the ability to affect quality transaction in the process of marketing. The less educated a society is the less information gathering and interpretation of variables to enhance their marketing potentials.

Income: Income generated from trade in *Moringa oleifera* fresh leaves during the wet season was higher than that generated during the dry. This is largely due to large volume of the leaves in the wet season when compare with that of dry season.

5. CONCLUSIONS

The study unveiled that trade in *Moringa oleifera* (Lam) Fresh Leaves in Taraba State, is profitable which orchestrated the following recommendations: Government and NGOs should encourage the female by giving them one digit loans to boost trade in *Moringa* leaves in Taraba State; Government should intensify efforts by educating the traders in value chain in *Moringa oleifera* leaves trade in the in Taraba State, as educating the traders on value addition is key to every economic activity.; Government should put in place a security outfit that will address the issues of insecurity in Taraba State, this will reduce the apprehension of the traders that if I travel to get the produce from a far place, it is at the expense of my life; the traders should form cooperative societies to benefit from the loans that are available at the Bank of Industry (BOA) at one digit interest rate and Policy makers/NGOs should formulate policies that will be favourable to the traders. For example, when loans are to be granted, stringent conditions like Certificate of Occupancy (C of O) should not arise and other bottle necks.

ACKNOWLEDGEMENT

I would like to acknowledge my wife for her morale and financial support during the research and also the management of College of Agriculture, Jalingo, Taraba State for prompt payment of my monthly salary.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Sharma V, Paliwal R, Sharma P, Sharma S. Phytochemical analysis and evaluation of antioxidant activities of hydroethanolic extract of *Moringa oleifera* Lam. Pods. *Journal of Pharmacy Research*. 2011; 4:554-557.
2. Tee Terver, Norbert Lobiya, Kassa J, Anokwu Benneth O. Income benefits of moringa vis-à-vis other leafy vegetables to female traders in jalingo markets, Taraba State, Nigeria. *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*. 2014;19(7):55-60. e-ISSN:2279-0837. ISSN:2279-0845 Available: www.iosrjournals.org
3. Mojisola F, Oyewole F, Franscisca T. Adetoro, Nkiru TM. Level of acceptability of *Moringa oleifera* diversified products among Rural and Urban dwellers in Nigeria M World Academy of Science, Engineering and Technology. *International Journal of Agricultural and Biosystems Engineering*. 2014;8(12). *International Scholarly and Scientific Research Innovation*. 2014;8(12):1407. Available: scholar.waset.org/1307-6892/10001379 International Science Index, Agricultural and Biosystems Engineering. 2014;8(12). Available: waset.org/Publication/10001379
4. Sachan A, Meena AK, Kaur R, Pal B, Singh B. *Moringa oleifera*: A review. *J. Pharm. Res*. 2010;3:840-842.
5. Moringanews. Moringanews / Moringa Association of Ghana authors and scientific editors Dr Armelle de Saint Sauveur et Dr Mélanie Broin Moshibudi Paulina Mabapa, Kingsley Kwabena Ayisi, Irvine Kwaramba Mariga, Ramasela Charlotte Mohlabi and Richard Sello Chuene. *International Journal of Agricultural Research*. 2018;12(4):160-171.
6. Dawit S, Regassa T, Mezgebu S, Mekonnen D. Evaluation of two *Moringa* Species for adaptability and growth performance under Bakoconditions. *J Natural Sciences Research*. 2016;6:76-82.
7. Leon P, Cantaves S. Jr. Moringa export market potentials for smallholders farmers in Haiti, Segun Foundation Antiviral Research. 2015;60:175-180.
8. Adikuru NC, Okafor OE, Ojiako FO, Ibeawuchi II. Prospects and challenges in the utilization of *Moringa oleifera* Lam. for agroecosystem sustainability in Nigeria. *Journal of Agriculture and Rural Development*. 2011;14(2):661-665.
9. Nadeau E, Zakaria M. The sahel's tree of life: The story of CLUSA's Moringa VC project in Niger. Working paper prepared for the National Cooperative Business Association (NCBA) and the Cooperative League of the USA (CLUSA); 2012. Available: http://www.huffingtonpost.com/annette_frost/moringa-the-tree-of-life_b_1645858.html (Accessed on 24 Aug 2012 04:34:37 GMT)
10. Foidl N, Makkar HPS, Becker K. The potential of *Moringa Oleifera* for agricultural and industrial uses. In: What development potential for Moringa products? Dar Es Salaam; 2001. Available: http://www.moringanews.org/bibli_o_en.html (Accessed on January10, 2012)
11. CJP. Centre for Jatropha Promotion & Biodiesel; 2013. Available: www.jatrophaworld.org/global_moringa_meet_81.html
12. Singh R, Prajapati MR, Savani J. Economics of production of drumstick (*Moringa oleifera*) in Vadodara District of Gujarat Ijabr. 2017;7(2):322-328.
13. Moshibudi PM, Kingsley KA, Irvine KM, Rafaela CM, Richard SC. *International Journal of Agricultural Resaerch*. 2017; 12(4):160-171.
14. Venkatesan N. Sekhar C, Murugananthi M, Vidhyavathi A. Marketing and price spread analysis of Moringa in Tamil Nadu, India. *Horticulture International Journal*. 2012;2(4). Researchgate.
15. Stevens CO, Ugese FD, Baiyeri KP. Utilization potentials of *Moringa oleifera* in Nigeria: A preliminary assessment. *Int Lett Nat Sci*. 2015;40:30-7. Available: <https://doi.org/10.18052/www.scipress.com/ILNS.40.30>
16. Adisa A. History of Taraba State. *Nature;s Gift To The nation*; 2011. Available: <https://www.cometonigeria.com/region/north-east/taraba-state/>
17. Awono A, Ndoye O, Schreckenber Tabuna H, Isseri F, Temple L. Production and marketing of safou (*Dacryodes edulis*) in cameroon and internationally: Market development issues. *Forest Trees and Livelihood*. 2002;12:125-147. A.B Academic Publishers-Printed Great Britain
18. Agbugba IK, Shelaby A. Marketing analysis of some selected vegetables in

- Port Harcourt Metropolis, Rivers State, Nigeria. IOSR Journal of Agricultural and Veterinary Science (IOSR-JAVS). 2018;2(2). e-ISSN:2319-2380, ISSN:2319-2372.
Available:www.iosrjournal.org
19. Osondu CK, Nwadike FC, Ijioma JC, Udah SC, Ugboaja CI. Marketing performance of salad vegetables: The case of cabbage marketing in Abia State, Nigeria. International Journal of Agricultural Science. Research and Technology in Extension and Education Systems (IJASRT in EESs). 2014;4(3):151-162.
20. Mohammed BT. Socio-economic analysis of melon production in Ifelodun Local Government Area, Kwara State. Economics, Nigeria J. Dev. Agric. 2011; 3:362-367.
21. Kainga PE. Marketing margin and determinants of net return of watermelon marketing in Yenagoa Metropolis of Bayelsa State, Nigeria. J. Exp. Biol. Agric. Sci. 2013;1(4):242-247.
22. Vivian BF, Bismark A, Abdul- Halim A, Osei BY. Do marketing margins determine local leafy vegetables marketing in the Tamale Metropolis. African Journal of Business Management AJBM. 2016;10(5): 98-108.
DOI:10.5897/AJBM2015.7978
Article Number: 575D4D957514 ISSN 1993-8233
Available:http://www.academicjournals.org/
23. Adugna GT. Analysis of fruit and vegetable market chains in Alamata, Southern Zone of Tigray: The case of onion, tomato and papaya, MSc thesis submitted to the Department of Agricultural Economics, School of Graduate Studies, Haramaya; 2009.

© 2020 Kassa, et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/55204>