

Market Analysis of Cowpeas-Leaves: An Indigenous Vegetable in North West Province, South Africa

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ABSTRACT The study uses North West Province as a case study to make a market analysis of pumpkin leaves as an indigenous vegetable in South Africa. The study utilizes an adapted Porter's model to address: threat to enter, competitive buying power, supply, and substitutes to the production/harvesting, marketing, and consumption of cowpea-leaves. The regression analysis shows that the adapted Porter's model used in the study is appropriate in analysing the competitiveness of the marketing of cowpea-leaves in the study area. The model rejected the hypothesis that no significant relationship exists between socio-economic characteristics and marketing of cowpea-leaves. The study found that there are no formal or informal institutional structures available to the marketers of cowpea-leaves in the study area. The study concludes that, should the income of the current households consuming cowpea-leaves increase, they are likely to substitute other types of vegetables for this vegetable.

INTRODUCTION

In South Africa, many livelihoods depend on the production and marketing of crops. The large and rich biodiversity of indigenous plants of South Africa offers a valuable source for investigation into new crops (Reinten and Coetzee 2002). Marketing is defined as the aggregate of functions involved in transferring and moving goods from producer to consumer. Marketing is not just about selling; it requires a clear and perfect understanding of what consumers want. Marketers must be able to deliver products to consumers, at a profit, through the most appropriate channels. This includes the planning, pricing, promotion, and distribution of products and services for consumers, both present and potential (Lekunze et al. 2013). Consumer-focused marketing is the single most important factor determining the success of an enterprise. It involves the flow of goods and services from the point of initial agricultural production until they are in the hands of the ultimate consumers. Marketing is much more than simply knowing how to dispose of agricultural commodities. Dinello et al. (2000) argue that marketing is the most critical element in the profitable production of agricultural crops. The sum total of functions involved in the transfer of crops from the farmer to the buyer is referred to as marketing. Orchard and Nwerume (2003) reported indigenous crops as plants that have evolved naturally within the confines of the boundaries of a particular environment. While

much research has been conducted by many researchers (Gari 2005; Walingo 2009) who worked on the nutritional composition and promotion of indigenous food crops, most studies on marketing (Adenew, 2009; Karaan et al. 2005; Milagrosa and Slangen 2006; Orchard and Ngwerume, 2003) have focused on the value of marketing indigenous crops. However, studies on the institutional marketing structure of indigenous crops, especially in the North-West Province have not covered the local level. As a result, marketing of indigenous vegetables remains a challenge in the North-West of South-Africa. This is a familiar situation in many countries of Africa.

This article focuses on cowpea-leaves as an example of indigenous vegetables produced/harvested marketed, and consumed in selected areas of the North-West Province of South Africa. Despite the contribution and importance of indigenous vegetables (Low 1986), statistics on the actual number of producers/harvesters, marketers, and consumers of indigenous vegetables are unknown. What is known is that indigenous vegetables have in the past played a role in sustaining people living in rural areas. Marketing of these vegetables is taking place: someone is harvesting/producing and marketing these vegetables and someone is buying and consuming them. What happens to indigenous vegetables from the point of production/harvesting to the point where they are consumed, is unknown. As Gold et al. (2004) put it, this ushers in a series of unanswered questions such as how many times the product changes hands from

the farm to the final consumer? How do the producers/harvesters get their product to the market? What are the costs and potential returns in the marketing of indigenous vegetables? Who are the buyers and consumers of indigenous vegetables? Who are the competitors? What strategy should be applied in order to be successful in the marketing of indigenous vegetables? Which policies exist in the promotion and marketing of indigenous vegetables? These are the many questions that must be answered in order to address the marketing challenges faced by cowpea-leaves participants in the study area. This article aims to provide answers to the production/harvesting, marketing, and consumption of cowpea-leaves, as an example of indigenous vegetables, using Porter's Competitive Model. The article hypothesized that there is no significant relationship between socio-economic characteristics and marketing of cowpea-leaves. Application of the Porter's model on the threat to enter the cowpeas-leaves market, threat of rivalry, threat to buying power of consumer, threat to supply, and threat to substitute cowpea-leaves is used to explain the production/harvesting, marketing and consumption of cowpea-leaves in selected areas of the North-West Province of South Africa. The model has been used in evaluating the competitiveness of the South African agri-business industry, with the objective of conducting a comprehensive analysis on the competitiveness of the industry. This will answer the above questions and provide sound understanding of the marketing structure for cowpea-leaves in the study areas.

MATERIAL AND METHODS

The areas chosen for the study were based on three criteria: intensities of household participation in small-scale agricultural production; the rural-urban divide; and population stability within a particular setting. A meeting was held with officials of the provincial Department of Agriculture and Ngaka Modiri-Molema District. Dr Ruth Segomotsi Mompatsi District was chosen as both urban and rural setting for the study. Areas chosen within these districts were Mahikeng and its surrounding areas as urban settings; and Ganyesa, including Tklakameng, as rural areas. The total population identified as

involved in indigenous vegetable production in the study area was 396. The population was divided into three categories based on the intensities of household participation in production/harvesting, marketing, or consumption. From the above categorisation, 216 participants were producers/harvesters, 127 were marketers, and 53 were consumers of indigenous vegetables. The size of the sample was limited to 109 producers/harvesters, 71 marketers, and 30 consumers, through simple random sampling from the total population of each category involved in indigenous vegetables. In order to obtain unbiased results, the names of all producers/harvesters, marketers, and consumers were written on pieces of papers and put into a bag. After shuffling the papers in the bag, draws were conducted in selecting producers/harvesters, marketers, and consumers to be interviewed, using a well-structured questionnaire. This was to ensure that each individual in the population had an equal chance of being selected. A total of 210 participants were interviewed, based on the categories outlined above. Primary data was obtained by the use of questionnaires; the data-collection method was personal administration. Data was collected on the following key household specifics: socio-economic and demographic variables. During the administration of the questionnaires, standardisation on all the measurements was conducted. In achieving this, 75 bundles of cowpea-leaves and beds were sampled during the data collection process. A scale and measuring tape were used to measure the weights of bundles and the length and width of the beds. The sum of the weights of cowpea-leaves was divided by 70 to find the mean. The result shows that 1 bundle of cowpea-leaves weighed approximately 0.35kg; and 1 bed of cowpea leaves was approximately 7.3m². These averages were used to convert bundles to kilograms (kg), and beds to hectares (Ha), by multiplying the mean by the number of bundles and beds given by the respondents during data collection. Both quantitative analysis and qualitative representation of data were performed. Graphs such as tables and bar charts were used where necessary to analyse the data. The software packages SPSS and Excel were used in analysing data. Regression equations based on modified four pillars of Porter's Model were specified and used for the regression analysis. The specified regressions include:

Threat to Enter Cowpea-leaves Market (Y)

It is determined by;

$$Y = A + X_1Ag + X_2Gd + X_3HHS + X_4Ms + X_5Dp + X_6Epl + X_7Edul + X_8Qtysld/yr + X_{10}Ns + X_{11}Inc/yr + X_{12}Pr + X_{13}Pf + X_{14}Qtysld/s + e \dots\dots\dots (1)$$

Where A is a constant; Y is the dependent variable (number of buyers); and e = error term and X_i is estimates of the elasticities or regression coefficients.

Ag = age, Gd= gender, HHS=household size, Ms=marital status, Dp=number of dependents, Epl= employment, Edul=educational level, Qtysld/yr= quantity sold per year, Ns=number of sellers, Inc/yr=income per year, Pr=price per unit, Pft= profit per season and Qtysld/s= quantity sold per season

Rivalry amongst Cowpea-leaves Marketers (Y)

Age (X_1), Gender (X_2), Household size(X_3), Marital status (X_4), Dependents (X_5), Employment (X_6), Educational level (X_7), Number of buyers (X_8), Price per unit (X_9), Quantity sold per year (X_{10}) and Quantity sold per season (X_{11})(2)

Hence; $Y = B + X_1 + X_2 + \dots X_n$, where B is a constant, X_n are the independent variables and Y is the dependent variable (Number of sellers).

Threat to Buying Power of Consumers of Cowpea-leaves (Y)

It is determined by Age (X_1), Gender (X_2), Household size(X_3), Marital status (X_4), Employment(X_6), Educational level (X_7), Quantity sold per year (X_8), Amount spent per year (X_9), and Number of sellers (X_{10}).....(3)

Hence; $Y = C + X_1 + X_2 + \dots X_n$, where C is a constant, X_n are the explanatory variables and Y is the dependent variable (Number of buyers).

Threat to Supply Cowpea-leaves by Producers/Harvesters (Y)

It is determined by Age (X_1), Gender (X_2), Household size(X_3), Marital status (X_4), Employment(X_6), Educational level (X_7), Quantity sold per year (X_8), Profit per season (X_9), Costs of harvesting per year (X_{10}), costs of inputs per year (X_{11}) and Number of buyers (X_{12}).....(4)

Where; $Y = D + X_1 + X_2 + \dots X_n$, where D is a constant, X_n are the independent variables and Y is the dependent variable (output/yield).

Threats to Substitute Cowpea-leaves by Consumers (Y)

It is determined by Age (X_1), Gender (X_2), Household size (X_3), Marital status (X_4), Dependents (X_5) Employment (X_6), Educational level (X_7), income per year (X_8), quantity bought per year (X_9), and amount spent per (X_{12}).....(5)

Hence; $Y = E + X_1 + X_2 + \dots X_n$, where E is a constant, X_n are explanatory variables and Y is the dependent variable (Number of buyers).

In order to check for reliability and validity, questionnaires were scrutinised by other experts; suggestions made by the experts were incorporated into the final questionnaire. The questionnaire was face-evaluated again to check that it covers all aspects of the study. This process ensured the reliability of the study. Samples of the questionnaire were pre-tested in the field, so as to identify possible difficulties that might arise during the administration and completion of questionnaires. Difficulties identified during the pre-testing processes were incorporated into the final questionnaire. This was to ensure validity of the study. The data used in the study was both dichotomous and continuous (see Table 1).

RESULTS AND DISCUSSION

Table 2 identifies the types of indigenous vegetables in the study area, including cowpea-leaves; and the number of participants involved in their production/harvesting, marketing, and consumption.

From the Table 2, 87.2% of the sample 109 producers/harvesters said that cowpea-leaves are harvested, while 12.9% said that this was cultivated. From the sample of 71 marketers, 84.5% said that they do not sell cowpea-leaves, while 15.5% do market this vegetable. For those who consume indigenous vegetables, 90% of the 30 sample consumers do eat cowpea-leaves, while 10% prefer other indigenous vegetables to cowpea-leaves. The result further shows that the least-marketed indigenous vegetables are amaranths (10%) and cowpea-leaves (10%). The results also shows that 90% and 46.7% of consumers prefer pumpkin-fruit and bean-leaves, respectively, while 90% of them consumed amaranths and cowpea-leaves least, respectively. The findings is supported in a study by Otieno

Table 1: Measurement and description of variables and expected signs

<i>Variables</i>	<i>Description of the variables</i>	<i>Method of measurement</i>	<i>Expected signs</i>
<i>Threat to Entry (Y)</i>	Dichotomous	Yes = 1, No = 0	Negative (-)
Age (X_1)	Continuous	Number	Negative (-)
Gender (X_2)	Dichotomous	Male =1, Female = 0	Negative (-)
Household-size (X_3)	Continuous	Number	Positive (+)
Marital status (X_4)	Dichotomous	Yes =1, No =0	Positive (+)
Dependants (X_5)	Continuous	Number	Positive (+)
Employment (X_6)	Dichotomous	Yes = 1, No = 0	Negative (-)
Educational level (X_7)	Dichotomous	Yes = 1, No = 0	Positive (+)
Quantity sold per year (X_8)	Continuous	Figure	Negative (-)
Number of sellers (X_9)	Continuous	Figure	Negative (-)
Income per year (X_{10})	Continuous	Rand	Negative (-)
Price per unit (X_{11})	Continuous	Rand	Negative (-)
Profit per season (X_{12})	Continuous	Rand	Positive (+)
Quantity sold per season (X_{13})	Continuous	Figure	Positive (+)
<i>Threat to Rivalry (Y)</i>	Dichotomous	Yes = 1: No = 0	Positive (+)
Age (X_1)	Continuous	Number	Positive (+)
Gender (X_2)	Dichotomous	Male =1, Female = 0	Positive (+)
Household-size (X_3)	Continuous	Number	Negative (-)
Marital status (X_4)	Dichotomous	Yes = 1, No = 0	Negative (-)
Dependants (X_5)	Continuous	Number	Negative (-)
Employment (X_6)	Dichotomous	Yes = 1, No = 0	Negative (-)
Educational level (X_7)	Dichotomous	Yes = 1, No = 0	Negative (-)
Number of buyers (X_8)	Continuous	Figure	Negative (-)
Price per unit (X_9)	Continuous	Rand	Negative (-)
Quantity sold per year (X_{10})	Continuous	Rand	Positive (+)
Quantity sold per season (X_{11})	Continuous	Rand	Positive (+)
<i>Threat to Supply (Y)</i>	Dichotomous	Yes = 1: No = 0	Positive (+)
Age (X_1)	Continuous	Number	Positive (+)
Gender (X_2)	Dichotomous	Male = 1, Female = 0	Negative (-)
Household-size (X_3)	Continuous	Number	Positive (+)
Marital status (X_4)	Dichotomous	Yes = 1, No = 0	Negative (-)
Dependants (X_5)	Continuous	Figure	Positive (+)
Employment (X_6)	Dichotomous	Yes = 1, No = 0	Negative (-)
Educational level (X_7)	Dichotomous	Yes = 1, No = 0	Negative (-)
Quantity sold per year (X_8)	Continuous	Rand	Positive (+)
Profit per season (X_9)	Continuous	Rand	Positive (+)
Costs of harvesting per year (X_{10})	Continuous	Rand	Negative (-)
Costs of inputs per year (X_{11})	Continuous	Rand	Negative (-)
Number of buyers (X_{12})	Continuous	Figure	Positive (+)
<i>Threats to Buyers' Power (Y)</i>	Dichotomous	Yes = 1, No = 0	Positive (+)
Age (X_1)	Continuous	Number	Positive (+)
Gender (X_2)	Dichotomous	Male = 1, Female = 0	Positive (+)
Household-size (X_3)	Continuous	Number	Positive (+)
Marital status (X_4)	Dichotomous	Yes = 1, No = 0	Positive (+)
Dependants (X_5)	Continuous	Figure	Positive (+)
Employment (X_6)	Dichotomous	Yes = 1, No = 0	Positive (+)
Educational level (X_7)	Dichotomous	Yes = 1, No = 0	Positive (+)
Quantity sold per year (X_8)	Continuous	Rand	Negative (-)

et al. (2009) which revealed that the main vegetable crops grown by smallholder farmers in Kenya for both subsistence and commercial purposes are indigenous vegetables, commonly referred to as African Leafy Vegetables (ALVs). These vegetables can be sold at various market outlets, ranging from the farm gate, to retail, open-air markets, to wholesale and supermarket stores.

Results of the demographics analysis found that the majority of participants involved in indigenous vegetables are females; indicating that women dominate the indigenous-vegetable sector in each category. The study also found that household sizes of participants engaged in indigenous vegetables production/harvesting and marketing range from average to large; while

Table 2: Percentage distribution of indigenous vegetables among respondents

Indigenous crops	Production/ harvesters (n= 109)		Marketers (n= 71)		Consumers (n= 30)	
	Produce	Harvest	Yes	No	Yes	No
Amaranth (<i>hybridus</i>)	9.2	90.8	8.5	91.5	10	90
Cowpea-leaves (<i>Vigna unguiculata</i>)	12.9	87.2	15.5	84.5	10	90
Pumpkin-leaves	44.1	56	42.2	57.7	16.7	83.3
Pumpkin-fruit	64.2	11	84.5	15.5	90	10
Bean-leaves	57.8	42.2	43.7	56.3	46.7	53.3

those of consumers are fairly small. As costs of staple and exotic foods may be rising, households can use indigenous vegetables to substitute for non-indigenous foodstuffs thus ensuring food security. The fact that a greater proportion of producers/harvesters and marketers in the present study have an average to large number of dependants, has also resulted in larger household sizes. This has forced household heads to look for alternative sources of income so as to meet household food needs. Although consumers have smaller households and numbers of dependants than producers/harvesters and marketers, they are also feeling the pressure of inflation. Their current income levels cannot maintain their existing lifestyles. Indigenous vegetables can therefore substitute for the more costly "exotic" produce. This explanation is supported in a study which generalises that indigenous vegetables, of which cowpea-leaves is one, are valued for their sustenance role. This food type is associated with rituals, superstition, folklore, cultural history, and civilization. However, the technology of production, and the multitude of food products vary from place to place. They do have one common factor: they rely on local resources, and social and environmental conditions.

Results of the functional analysis on the threat to enter the cowpea-leaves market found that the number of buyers was negative, however, significant at $t = -0.52$; $p = 0.078$ indicating that the current number of buyers of cowpea-leaves has reduced new entrants in marketing by 25%. The implication may be that the number of people buying a particular product has a direct influence on the numbers of sellers of that product. If the demand increases without a corresponding increase in supply, prices will rise, and will result in increased returns. If the return is good, more and more people will enter the market, on condition that there are no barriers to

entry provided by existing suppliers. However, the current number of buyers of cowpea-leaves is very low. This affects the price negatively, resulting in lower profitability. This may have reduced the attractiveness of the cowpea-leaves market, thereby preventing new entrants into the market, indicated by the negative impact. As a result, any new entrant into the market will find it difficult to succeed, because of the limited number of buyers, and the low profitability. If the number of buyers in the market increases, this will attract sellers, who will be competing for market shares; threat to entry would be positive. This analysis is supported by Mbugua et al. (2004), Maundu et al. (1999), who commented that cowpea-leaves in general are compatible with a host of traditional or cultural diets of many dwellers of Nairobi. This product is relatively abundant, being cultivated all over Kenya. However, in the study area, cowpea-leaves are mostly harvested and not cultivated, as in the case of Kenya.

Rivalry in any market emerges as a result of competition among existing sellers of a particular product or substitutes for a particular product. Cowpea-leaves in the study area have no established sellers; since most of the crop is harvested and is seasonal. Analysis on cowpea-leaves with respect to rivalry among marketers, found that age and gender have a negative impact on rivalry among marketers of cowpea-leaves, which was significant at $t = -3.0$; $p = 0.000$ and $t = -3.44$; $p = 0.001$ respectively. The current age of marketers ranges from middle-aged to elderly. The market comprises mainly female participants. The implication is that younger individuals (both males and females) may not be attracted to the cowpea-leaves market, owing to lower returns. As a result, the current age and gender structure of marketers of cowpea-leaves has resulted in a 3% and 62% reduction in rival-

ry among sellers of cowpea-leaves. Hence, while existing traditional crops attract young and new entrants, the cowpea-leaves market does not attract young marketers who have the resources and energy for improvement within the sector. As a result, the number of marketers of cowpea-leaves is limited, thereby eliminating any threats of rivalry. Furthermore, the low prices and low profits of cowpea-leaves may have resulted in fewer established marketers and many marketers of alternative vegetables. This might increase inter-rivalry, further reducing the market base for cowpea-leaves, and pushing those who cannot compete to switch to the more lucrative substitutes which have many buyers and sellers of which better prices prevail and profitability is greater. Also, with respect to gender, males may travel to distant markets to sell cowpea-leaves where demand is higher than supply. This might reduce rivalry significantly amongst them. On the other hand, females do not travel frequently to distant markets to sell cowpea-leaves. This impacts positively on rivalry amongst them, because they will compete for the limited market share. This finding is consistent with a study which argued that maize and vegetable farming household heads in rural areas are, on average, older than their peri-urban counterparts. Rural farmers have been the main producers of indigenous vegetables such as cowpea-leaves for a longer period, before commercial peri-urban farming had fully developed.

Further analysis on rivalry among cowpea-leaves marketers found household-size to have a positive and significant impact at $t = 3.47$; $p = 0.001$; while number of dependants had a negative but significant impact at $t = -2.88$; $p = 0.007$. The implication is that current sizes of households in the study area, ranging from medium-to large-sized, have increased rivalry by 59% among marketers of cowpea-leaves, owing to the limited number of buyers of this vegetable. On the other hand, the number of dependants per household has resulted in a 46% decrease in rivalry among marketers of cowpea-leaves, because most dependants in the household may be of school-going age and do not engage in the selling of cowpea-leaves. This implies that, in a situation in which the household has more children below working age who do not contribute to marketing, but significantly increase household consumption, there is a need to occupy a greater share of the market so as to meet

household-food needs. The analysis is supported by Quirien et al. (2001), who commented that local and indigenous foodstuffs offer a potential resource that is currently underutilised, but which can provide a solution to the challenge of household food-security; and can formulate a food-security strategy based on the utilisation of indigenous knowledge in the production and marketing of indigenous crops.

The analysis on rivalry amongst marketers of cowpea-leaves also found marital status to have a negative but significant impact ($t = -1.71$; $p = 0.095$) on the marketing of cowpea-leaves. This is an indication that the current marital structure of marketers will result in 12% reduction in rivalry among cowpea-leaves sellers. The implication is that as more and more people become single and unemployed, the number of marketers of cowpea-leaves may reduce, while that of other traditional crops will increase, resulting in low intra-rivalry but increasing inter-rivalry among marketers of cowpea-leaves. Furthermore, those who are single as a result of separation may have many dependants to sustain. They may be facing difficulties in meeting their household food needs. As a result, they will turn to the environment as a means of sustaining their families, especially if they have many dependants who do not bring in an income. For those who are married and living together, these indigenous vegetables have a cultural significance. Consuming them may provide some level of fulfillment. However, as the level of income of these indigent households increases, the impact on marital status by the marketing of cowpea-leaves may turn negative. Consumers may substitute the cowpea leaves with alternative crops that bring better returns. This is in line with the findings which generalises that indigenous foods are valued for their sustenance role; and are associated with rituals, superstition, folklore, cultural history, and civilization.

Analysis on the rivalry amongst marketers of cowpeas leaves also shows that quantity sold per season and quantity sold per year influence marketing positively; this factor was significant at $t = 2.0$; $p = 0.017$ and $t = 1.5$; $p = 0.043$, respectively. This is an indication that any change in the quantity sold per season and quantity sold per year will result in a 3% and 4% increase in the number of sellers of cowpea-leaves, resulting in increased rivalry. This is substantiated by the previous analysis on the demographics sec-

Table 3: Threat to entry, rivalry, buyer's power, supply and substitution to cowpea leaves

Variables	Cowpea-leaves	Variables	Cowpea-leaves	Variables	Cowpea-leaves	Variables	Cowpea-leaves	Variables	Cowpea-leaves
Threat to enter cowpea-leaves market		Threat of rivalry among cowpea-leaves marketers		Threat to buying power of consumers of cowpea leaves		Threat to supply among producers/harvesters of cowpea-leavesconsumers		Threat to the substitution of cowpea leaves by	
Constant	37.82 (38.09)	Constant	3.69 (0.49)***	Constant	54.67 (27.32)**	Constant	252.81 (138.49)*	Constant	9.41 (380.59)**
Age	-0.12 (0.33)	Age	-0.03 (0.01)***	Age	-10.89 (15.49)	Age	-4.66 (1.21)	Age	-271.54 (199.36)
Gender	-7.31 (10.68)	Gender	-0.62 (0.18)***	Gender	-0.11 (1.66)	Gender	-44.68 (36.73)	Gender	-24.18 (20.42)
Household-size	12.99 (10.05)	Household-size	0.59 (0.17)***	Household-size	-2.70 (6.06)	Household-size	-9.71 (7.66)	Household-size	-94.14 (78.78)
Marital status	-2.84 (3.99)	Marital status	-0.12 (0.07)*	Marital status	-0.87 (1.66)	Marital status	-14.33 (18.16)	Marital status	-22.45 (21.31)
Dependants	-9.45 (9.44)	Dependants	(0.16)* (0.16)*	Employment	(17.43) (17.43)	Dependants	10.78 (9.32)	Employment	7.79 (220.84)
Employment	0.45 (1.49)	Employment	-0.04 (0.03)	Educational level	-0.65 (0.53)	Employment	3.19 (5.87)	Educational level	-8.22 (6.93)
Educational level	-12.32 (6.86)	Educational level	(0.01) (0.01)	Quantity bought per year	0.15 (0.10)	Educational level	-6.18 (17.76)	Income per year	(2.63)* (2.63)*
Number of buyers	-0.25 (0.48)*	Number of buyers	0.01 (0.01)	Amount spent	-0.99 (1.02)	Quantity sold per year	-9.02 (0.73)	Quantity bought per year	1.05 (1.51)
Income received per year	-0.05 (0.01)	Price per unit	-0.004 (0.002)	F	20.07	Profit per season	2.14 (13.08)	Amount spent	-6.04 (13.33)
Price per unit	0.40 (0.84)	Quantity sold per year	0.03 (0.02)*	P	-0.03	Costs of harvesting per year	-0.10 (0.10)	F	254.88
Profit per season	-0.02 (0.03)	Quantity sold per season	0.04 (0.02)*	R	0.50 ^b	Costs of inputs/year	-0.79 (1.95)	P	-0.05
Quantity sold per season	1.43 (0.87)	F	0.47	R ²	0.25	Number of buyers	-4.41 (2.95)	R	0.53 ^b
F	25.51	P	0.56	DW	2.00	F	136.01	R ²	0.29
P	0.01	R	0.79 ^b			P	0.10	DW	1.50
R	0.42 ^b	R ²	0.63			R	0.32 ^a		
R ²	0.18	DW	2.04			R ²	-0.01		
DW	2.00					DW	1.81		

Significant <0.01***; significant, <0.05**; significant, <0.10*

tion, which shows that most of the participants marketing cowpea-leaves are unemployed; they needed alternative sources to meet their food-security needs. Hence, there will be many sellers of cowpea-leaves, and many sellers of alternative vegetables which might not be accompanied by a corresponding increase in the number of buyers. This will result in inter-rivalry and intra-rivalry among marketers of cowpea-leaves. This finding is confirmed by Nieuwoudt and Groenewoud (2004), and Vuuren (2006), who commented that agriculture has the potential to increase income levels of rural and peri-urban communities and to create employment opportunities in those communities. Marketing of 'exotic' vegetables has decreased the popularity of indigenous crops, because many people are not aware of the nutritional value of the crops, regarding them as inferior. However, increasing quantities sold per season will eventually increase the quantity sold per year. This will have a positive and significant impact on its marketing. The implication is that, since the majority of suppliers of cowpea-leaves harvest them, the leaves are usually abundant during good seasons. As a result, there will be an increase in supply which is not accompanied by a corresponding increase in the number of buyers. Also, during this season, exotic vegetables may also be in abundance and their prices may also be low. This will result in inter-rivalry in the market affecting the sales of cowpea-leaves negatively. The analysis also found that the constant has a positive and significant impact on the number of sellers of cowpea-leaves ($t=7.53$; $p=0.000$), indicating the current level of cowpea-leaves marketing.

The threat to buying power describes the ability of consumers to put firms under pressure. The marketing of cowpea leaves is determined by the buyer's price sensitivity, existence of substitutes, and uniqueness of products. The regression analysis on the threat to buying power of consumers of cowpea-leaves found no variable to be significant, except the constant at ($t=2.0$; $p=0.058$), showing the current level of cowpea-leaves consumption. The findings show a positive effect on the purchasing power of cowpea-leaves. This indicates that any positive changes hindering the buying power of cowpea-leaves may result in an increase in the number of buyers of cowpea-leaves by 54.67%, other factors remaining constant. Furthermore, a

study by Timothy et al. (1998) found that during periods when marketers are unable to raise their prices, producers' revenues are always low. Hence, a further regression analysis on the threat to supply cowpeas-leaves reveals no single variable to be significant except the constant ($t=1.83$; $p=0.07$) reflecting the current levels of cowpea-leaves supply in the study area. The current level of cowpea-leaves supply indicates that any positive change in the factors hindering the increase in output/yield of cowpeas-leaves will result in a more than proportional increase in the output. Otieno et al. (2009), in a study comparing rural and peri-urban areas, argue that promoting market-orientation among agricultural producers, more so, the smallholder farmers, of which indigenous vegetables is a sector, in both the rural and peri-urban areas of developing countries is pivotal for the development of effective agribusiness value chains that could supply adequate food. In this regard, indigenous vegetables supply is determined by the purpose for which it is supplied, and the bargaining power of the suppliers. As a result, indigenous vegetables can become a success if the inputs markets, raw materials, labour and services involved in this sector are well-organised and properly managed.

Analysis on substitutes for cowpea-leaves shows that income per year was found to have a negative but significant impact ($t=-1.90$; $p=0.071$); indicating that the current income level of cowpea-leaves consumers has resulted in a 51% reduction in the rate of substitution of this indigenous vegetable for other crops. By implication, the current consumers of cowpeas leaves have very low incomes; they may be unable to buy existing exotic vegetables. Hence, they cannot easily substitute cowpeas leaves for other vegetables. However, if the current level of income improves, substitution of cowpeas leaves can turn positive, should they now be able to afford vegetables which they could not afford in the past. The study also found constants to be positive and to have a significant impact ($t=0.02$; $p=0.07$), indicating that substitution of cowpea leaves is taking place at 9.41% in the study area.

CONCLUSION

The article aimed at analysing the marketing of cowpea-leaves as an example of indigenous

vegetables produced/harvested, marketed, and consumed in selected urban and rural areas of the North-West Province of South Africa. The article hypothesized that there is no significant relationship between socio-economic characteristics and marketing of indigenous vegetables. The study analyses the demographic, marketing, and production factors, and their influence on the marketing of cowpea-leaves, using the Porter's competitive model. It was evident from the analysis that cowpea leaves are being marketed in the study area, especially among low-income households in the rural areas. Demographic factors such as age, household-size, gender, marital status, employment, and number of dependants per household have impacted either positively or negatively on the marketing of cowpea-leaves in the study area. The regression analysis shows that the adapted Porter's model used in the study is appropriate in analysing the competitiveness of the marketing of cowpea-leaves in the study area. The regression analysis rejected the hypothesis that no significant relationship exists between socio-economic characteristics and marketing of cowpea-leaves. The study found that there are no formal or informal institutional structures available to the marketers of cowpea-leaves in the study area. The study concludes that, should the income of the current households consuming cowpea-leaves increase, they are likely to substitute other types of vegetables for this vegetable.

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