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Spatial Price Differential: An Analysis of Soyabeans Marketing in Benue and Enugu States, Nigeria

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Abstract
Spatial price differential not only gives indication of potential profit margin but also a means of assessing the level and direction of market integration. The study examined the spatial price differential in soyabeans marketing in Benue and Enugu States, Nigeria. Primary data were collected from 207 marketers who were randomly selected from four markets each from Benue and Enugu States. Data were analysed using descriptive statistics, spatial price differential model, 4-point likert scale, ANOVA, correlation and t-statistics. Results showed that soyabeans marketers were dominated by literate (91.7%), young adult (mean of 39 years) males with a mean annual income of ₦474,370. Result of spatial price differential showed that while Annune market had positive price spreads for all the 12 months; Aliade market had only one negative price spread in June whereas Daudu had negative price spreads for five months (March, April, May, August and September). The result of ANOVA showed that there was significant difference ($F=4.76$; $P\leq 0.01$) in price spreads among the three markets studied. Correlation result showed significant relationship between purchase price (0.68**), transfer cost (-0.708**) and price spreads. The major constraints to soyabeans marketing were low demand, poor road network, low access to credits, high transportation costs, few soyabeans processing companies and heavy imposition of levies and taxes. Positive and negative price spreads indicates ineffiency in soyabeans marketing and these could be occassioned by the above mentioned constraints. Credit facilities should be advanced to marketers in the study area. Again, provision of infrastructural facilities like good roads and storage facilities could increase the efficiency of soyabeans marketing in the study area.
Keywords: Soyabeans, Price differential, Price spreads, efficiency

INTRODUCTION

Agricultural marketing assumes greater importance in the Nigeria economy because excess production from the farm must be disposed off in order to earn some income with which farmers can purchase goods and services not produced by them (Adekanye, 1988). Olayemi (1982) observed that food marketing was a very important but rather neglected aspect of agricultural development. More emphasis is usually placed by government on policies that increase food production with little or no consideration on how to distribute the food produced efficiently and in a manner that will enhance productivity.

Furthermore, FAO (1997) stated that if available food could be evenly distributed (through efficient national and international markets), each person would be assured of 2,700 calories a day, which is the recommended daily calorie intake. However, since available food is not evenly distributed (due to marketing inefficiencies and other problems), there are shortages of food in some regions but excess in some other regions. Therefore, the issue of how much food gets to the households, which is fundamental in household's food security, is a function of food production level, food marketing efficiency and the households' income level (Ladele and Ayoola, 1997).

Spatial price difference, as an indication of potential profit margin and as a means of assessing the level and direction of market integration, is useful in highlighting the degree of market integration. Spatial pricing efficiency examines how prices in different markets over space are related, especially through transportation cost. When spatial trade is efficient, food shortages in deficit regions are transmitted to surplus regions via prices (Arndt, Schiller & Tarp, 1998) and arbitrage triggers flow of food across space. Through efficient spatial arbitrage, the risk of crop failure in some regions is shared over a large market area, and prices are more stable and food shortage may be prevented. Over space, according to Olukosi *et al.,* (2005), the law of market area stipulates that price spread between two markets that trade with each other should not exceed the cost of transfer of the products between the location.

In a perfectly competitive market, perfect information is assumed to prevail, and traders in each market know perfectly the situation in all markets, so that inter-market price differentials would reflect only transport and handling costs of transfer. Also in a perfectly competitive market, economic theory suggests the post-harvest price rise will be equal to the cost of stored grain, a price rise higher than the storage cost provides the opportunity for traders to make more than normal profits. Without spatial price analysis of the markets, price signals will not be transmitted from food deficit to food surplus areas, prices will be more volatile. In order to facilitate agricultural development process, analysis of marketing margin and pricing efficiency of foodstuff is

considered very pertinent and, it is expected that favourable pricing efficiency will stimulate more of the products concerned to be produced.

According to Adekunle, Ogunlade and Ladele, (2003), world production statistics acclaimed Nigeria the second largest producer of soyabeans in Africa after Zimbabwe and also, surprisingly, considered Nigeria a protein deficient country (Okuneye, 2002). Average consumption of animal protein in Africa is less than one quarter of what is consumed in Americas, Europe and Oceania, and represented about 17 percent of the recommended consumption level for all proteins (FAO, 2011). Evidence has shown that soyabeans carry twice the protein of meat or poultry and contain all eight essential amino acids needed for childhood development and is yet affordable. In other words, increased production and efficient distribution and marketing of soyabeans can be a panacea for malnutrition and Kwashiokor prevalent among children in rural areas. The differences in climatic conditions among agro-ecological zones in Nigeria make grain production capacity of each State to differ; coupled with poor road network which results in high transfer costs for food market transactions among regions of the country. Hence, according to Chirwa (2000), without spatial price integration of the markets, price signals will not be transmitted from food deficit to food surplus areas, prices will be more volatile, agricultural producers will fail to specialize according to a long-term comparative advantage and the gains from trade will not be realized.

Hays and McCoy (1977) analyzed the spatial and temporal aspects of marketing efficiency for the marketing system of millet and sorghum in the Northern part of Nigeria. They found that when the average of the positive and negative spreads got were taken, only three cases had positive spreads, which are; Katsina for millet, Katsina and Dandawa for sorghum. This means that on the average, inter-market price differentials are closely related to transfer costs. Similarly, Nuhu, Ani and Bawa (2009) analyzed spatial and temporal price efficiency associated with food grain marketing in Northeastern Nigeria and in the analysis, a model of spatial price relationship developed by Hays and McCoy (1977) was adopted and used to examine the spatial pricing efficiency for food grains in the study area. The result of their study revealed that except for Yola, price spread for cowpea was positive or equal to zero most of the time; spreads that were negative lasted only a short time, but in 2004, most of the price spread for Yola was negative. According to their report, Damaturu seems to have had more positive price spreads across the 5 years studied, followed by Gombe then Yola for cowpea. A search through the literature showed that little empirical studies have been carried out on this topic in the study area.

Purpose of the Study

The objectives of the study were to:

i. assess the socio-economic characteristics of soyabeans marketers
ii. determine the spatial price differential of soyabeans in the study area; and
iii. identify the constraints to soyabeans marketing in the study area.

Research Hypotheses

Moreso, the following hypotheses were tested:

i. There is no significant difference in the price spreads across the markets surveyed; and
ii. There is no significant relationship between purchase price, transfer cost, distance and price spreads.

METHODOLOGY

The Study Area

The study area is Benue and Enugu States of Nigeria. These States belong to the North-Central and South Eastern zones of the country, respectively. Benue State, created on 3rd February, 1976, is located in the middle belt of Nigeria, approximately between latitudes $6^0$30′N and $8^0$10′N of the equator and longitudes $6^0$35′E and $8^0$10′E of the Greenwich meridian, at an elevation of 97 meters, above sea level in the southern guinea savannah agroecological zone. It has a landmass of 6.595 million hectares [Benue State Agricultural and Rural Development Authority, (BNARDA), 1998]. Benue State has a total population of 4,219,244 (NPC, 2006), and is made up of 413,159 farm families (BNARDA, 1998). Benue State derives its name from the River Benue; the second largest river in Nigeria. The State is made up of 23 Local Government Areas and is divided into three agricultural zones.

Enugu State was created on August 27, 1991, with the city of Enugu as its capital. Enugu State is located between latitudes $5^0$56′N and $7^0$6′N and longitudes $6^0$53′E and $7^0$55′E of Greenwich meridan [Enugu State Agricultural Development Project (ENADEP), 2009]. The State occupies a landmass of approximately 8,022.95km^2 and a population of 3,257,298 (NPC, 2006). It has 17 Local Government Areas and according to ENADEP (2012), the State is further divided into six agricultural zones. According to BNARDA (1998) and William, (2008), the predominant occupation of the people of Benue and Enugu States is farming. Marketing of all food stuffs especially farm produce are extensively carried out in several markets in the two States.

Sampling procedure

A two-stage sampling technique was adopted in selecting the respondents. First, from the two selected States, four markets each were purposively selected based on the relative predominant availability of soyabeans in the

area. The markets surveyed in Benue include Wannune, Lessel, Gbajimgba and NorthBank whereas Orie Orba, Ogbete, Eke Agbani and Orie Awgu were sampled in Enugu State. Subsequently, from each of the selected soyabeans markets, having obtained the sampling frame, 50 percent of respondents from each market were selected through simple random sampling technique. This gave a total of 97 and 110 respondents Enugu and Benue markets, respectively which summed up to 207.

Data collection

The study made use of primary data which were obtained through the use of structured questionaire administered to soyabeans marketers. A monthly time series data covering a duration of one year (2013) were collected on quantity and prices of soyabeans in selected markets of Benue and Enugu States.

Data analysis

Data were analyzed using both descriptive and inferential statistics. Descriptive statistics were used to realise objective i. Spatial price differential model was used for objective ii. Objective iii was achieved with a one sample t-test and 4-point likert type scale which is represented as:

Very strongly affected (VSA) - 4 points
Strongly affected (SA) - 3 points
Partially affected (PA) - 2 points
Slightly affected (SLA) - 1 point
Not affected (NA) - 0 point

Decision rule: if the mean score is ≥ 2.5; then the factor was accepted as one that sufficiently affected the marketing system.

MODEL SPECIFICATION

Spatial price model

Specifically, the price spread was computed as follows:

$PPij = Pi – (HCji + TCji + ASji)$

where:

PPij = the calculated parity price of 100kg bag of soyabeans from the ith market (Enugu) in relation to the jth market, where j (other markets in Benue State);
Pi = the actual wholesale price of 100kg bag of soyabeans at the ith market (Enugu);
HCij = handling costs involved in moving 100kg bag of soyabeans from the jth to the ith market;
TCij = transport cost for moving 100kg bag of soyabeans from the jth to the ith market; and
ASij = the charge for the assemblers service in moving 100kg bag of soyabeans from the jth to the ith market.

The actual price spread between any two markets was:

$PSij = PPij – Pj$

where:

PSij = the price spread for 100kg bag of soyabeans between the ith and the jth market; and
Pj = the actual wholesale price of 100kg bag of soyabeans in the jth market.

In a market which is perfectly competitive where grain was moving from the jth to the ith market, Pj will be equal to Pi after deducting the transfer costs and thus the actual price spread (PSij) would be equal to zero. A positive price spread would provide a potential opportunity for middlemen to realize excessive profit, while negative spreads indicate losses. The spatial price differential analysis examined the degree of equality in prices of a 100kg bag of soyabeans in Ogbete market (base market) after controlling the transfer cost relative to its value in the supplying markets. The supplying markets were Aliade, Daudu and Wannune whereas the reference market was Ogbete market in Enugu. Analysis was aimed at determining the efficiency of the marketing system over space. In this study, analysis was carried out between wholesalers who bought soyabeans from these three supplying markets in Benue State. Only eight soyabeans dealers bought soyabeans from Benue State. This number was low because Enugu State soyabeans marketers complained that Benue marketers in a bid to increase weight of soyabeans, added sand and stones and most importantly, they bought from other northern States (Taraba, Nasarawa, Plateau, Kaduna) where they could buy other foodstuffs like maize, millet beans and rice in large quantities and cheaper prices. In this study, what constituted assembling cost included cleaning cost, quality control, bagging, sewing, shaking, booking and weighing whereas handling costs were loading, offloading, revenue and LG fees and storage cost. Transportation costs includes produce levies paid at road blocks.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of soyabeans marketers

The socio-economic background of marketers considered in this study were gender, marital status, major occupation, age, marketing experience, annual income, soyabeans annual income, household size and education (Table 1). The analysis of these variables gave insight to the structure and performance of the market.

The results in Table 1 showed that soyabeans marketing was dominated by males in both States (63.6% and 62.9% for Benue and Enugu States, respectively). However, females represented only about 36.7 percent. The low participation of women in soyabeans marketing corroborated the findings of Faith *et al.,* (2011) that men were the highest participants (89.24%) in cowpea marketing in Niger State. Also, Onu & Iliyasu (2008) who found that most of the surveyed traders in food grain marketing were men (80%). Not only do men dominate in soyabean marketing as observed in this study, they were also the major participants in soyabeans production as reported by Olorunsanya *et al.,* (2009) who found that 63% of soyabeans farmers sampled were males. This implied that men dominated both the production and marketing of the crop. This contradicted the general belief that soyabeans is a woman's enterprise. It was regarded as a man's cash crop while women were confined to the production of food crops (Sanginga *et al.,* 1999). They found that contrary to the widely quoted generalisation that African women provide between 60-80% of labour input in agricultural production, men contributed twice as much labour in soyabeans production. Although in Zimbabwe and Kenya, most legumes were culturally viewed as women's crops (Zamasiya *et al.,* 2014).

Analysis of marital status of respondents indicated that majority (82.6% and 75.2%, respectively) were married while few (9.2% and 17.1%) were single, 1.4% divorced and 6.3% widowed. As marital status is associated with stability of household, the result implied that soyabeans marketers were stable. Similar result was obtained by Oladopo *et al.,* (2007) that 79.5% of pineapple marketers in Nigeria were married. The result showed that all the soyabeans marketers in Enugu were traders whereas in Benue, although their modal occupation was trading; some were farmers, civil servants and students who also engaged in the business to supplement their earnings.

Analysis of age among respondents showed that the modal age range of respondents was between 26 and 55 years with a mean of 39 years. Similar modal age range of 30 to 50 years was found by Onu & Iliyasu (2008) among food grain marketers in Adamawa State. This indicated that the respondents were in their youthful and productive age with the relatively younger ones (18-25 years) and older ones (>70 years) being less involved in the enterprise. This is in line with studies carried out by Adejobi (2005) who found that the traders groups in Maiduguri were within the age range of 32 and 42 years. This group are quite energetic and active and are able to deal with exigences of travel and movement from market to market with regard to soyabean marketing.

The marketing experience is closely related to ones'chronological age. The result showed that their marketing experience was skewed towards ten years and above with a mean of 13 years. Marketing experience is believed to enhance ones' decision- making, behaviour and performance in the business (*John, 2003*). The average number of years of marketing experience obtained in this work is close to 12 years obtained by Sanginga *et al.,* (1999) of soyabeans producers. The close similarity in the mean years of experience in soyabeans marketing and production could be attributed to same time of increased awareness about the importance of soyabeans.

Analysis of annual income of respondents showed that their modal annual income ranged from ₦ 50,000 to ₦500,000 with a mean of ₦474,370. This figure translated to ₦39,530.83 per month which is higher than Nigeria's minimum wage of ₦18,000/month. This implied that soyabeans marketers were relatively not poor. Moreso, the result of annual income from soyabeans indicated that the marketers income varies mainly from ten thousand to ₦500,000 with an overall mean of ₦21,749.3. This translated to ₦10,145.77 per month which is below Nigeria's minimum wage of ₦18,000/month. This disparity from the general annual income could be attributed to the fact that majority of the marketers interviewed sell other grains alongside soyabeans.

The result showed that the modal household size ranged from one to ten with a mean of 7 persons. This relatively low number of persons in a household could be attributed to the recent improvements and adoption of different modern family planning methods by households. This is in line with the mean household size of six persons got by Faith *et al.,* (2011) in their study of cowpea marketing.

Analysis of education status of respondents showed that only about 8.7 percent of them had no formal education. However, majority (47.8%) had secondary education whereas only 15.5% had tertiary education. This result corroborated the findings of Onu & Iliyasu (2008) in their analysis of food grain marketing in Adamawa State that majority (56%) of the surveyed traders attended formal educational institutions. Education is one of the attributes that will enhance their decision-making, market performance and adoption of marketing innovations.

Table 1: Socio-Economic Characteristics of Soyabeans Marketers

S/N	States Characteristics	Benue (110) Freq (percent)	Enugu (97) Freq (percent)	Total (207) Freq (percent)
1.	**Sex**			
	Male	70 (63.6)	61 (62.9)	131 (63.3)
	Female	40 (36.4)	36 (37.1)	76 (36.7)
2.	**Marital Status**			
	Single	10 (9.1)	16 (16.5)	26 (12.6)
	Married	91 (82.7)	74 (76.3)	165 (79.7)
	Divorced	1 (0.9)	2 (2.1)	3 (1.4)
	Widowed	8 (7.3)	5 (5.2)	13 (6.3)
3.	**Major Occupation**			
	Trading	82 (74.5)	97 (100.0)	179 (86.5)
	Farming	24 (21.8)	-	24 (11.6)
	Civil Servant	2 (1.8)	-	2 (1.0)
	Students	2 (1.8)	-	2 (1.0)
4.	**Age**			
	18-25	17 (15.5)	10 (10.3)	27 (13.0)
	26-40	51 (46.4)	40 (41.2)	91 (44.0)
	41-55	34 (30.9)	41 (42.3)	75 (36.2)
	56-70	7 (6.4)	6 (6.2)	13 (6.3)
	71-75	1 (0.9)	-	1 (0.5)
	Mean; S.D	$\bar{X}$; S.D=38.07; 11.92	$\bar{X}$; S.D=40.65; 10.22	$\bar{X}$; S.D= 39.28; 11.20
5.	**Marketing Experience**			
	1-10	56 (50.9)	51 (52.6)	107 (51.7)
	11-20	33 (30.0)	35 (36.1)	68 (32.9)
	21-30	12 (10.9)	10 (10.3)	22 (10.6)
	31-40	6 (5.5)	1 (1.0)	7 (3.4)
	41-50	2 (1.8)	-	2 (1.0)
	51-65	1 (0.9)	-	1 (0.5)
	Mean; S.D	$\bar{X}$; S.D =14.68; 11.25	$\bar{X}$; S.D =12.11; 7.10	$\bar{X}$; S.D =13.48; 9.60
6.	**Annual Income**			
	10,000-50,000	8 (7.3)	1 (1.0)	9 (4.3)
	50,001-500,000	74 (67.3)	73 (75.3)	147 (71.0)
	500,001-1,000,000	16 (14.5)	15 (15.5)	31 (15.0)
	1,000,001-3M	12 (10.9)	8 (8.2)	20 (9.7)
	Mean; S.D	$\bar{X}$; S.D = 489,040; 590,199	$\bar{X}$; S.D = 457,730; 1,129	$\bar{X}$; S.D =474,370; 553,451
7.	**SB Annual Income**			
	4,800-10,000	8 (7.3)	9 (9.3)	17 (8.2)
	10,001-50,000	36 (32.7)	54 (55.7)	90 (43.5)
	50,001-500,000	60 (54.5)	30 (30.9)	90 (43.5)
	500,001-1,000,000	4 (3.6)	4 (4.1)	8 (3.9)
	1,000,001-1.5M	2 (1.8)	-	2 (1.0)
	Mean; S.D	$\bar{X}$; S.D = 140,275.5; 241,33	$\bar{X}$; S.D=100,740.21; 153,67	$\bar{X}$; S.D=121,749.3; 205458
8.	**House Hold Size**			
	1-10	86 (78.2)	94 (96.9)	180 (87.0)
	11-20	20 (18.2)	3 (3.1)	23 (11.1)
	21-30	3 (2.7)	-	3 (1.4)
	31-40	1 (0.9)	-	1 (0.5)
	Mean; S.D	$\bar{X}$; S.D =8.64; 5.93	$\bar{X}$; S.D= 6.1; 2.85	$\bar{X}$; S.D = 7.4; 4.898
9.	**Education**			
	No Formal Edn	10 (9.1)	8 (8.2)	18 (8.7)
	Adult Edn	4 (3.6)	1 (1.0)	5 (2.4)
	Primary	23 (20.9)	30 (30.9)	53 (25.6)
	Secondary	50 (45.5)	49 (50.5)	99 (47.8)
	Tertiary	23 (20.9)	9 (9.3)	32 (15.5)
	Mean; S.D	$\bar{X}$; S.D =9.75; 4.57	$\bar{X}$; S.D =9.3; 4.28	$\bar{X}$; S.D =9.54; 4.428

Figures in parentheses are percentages.
Source: Computed from field data, 2014.

Result of Spatial Price Differential Analysis

In this analysis, positive price spread indicated value greater than transfer cost and vice versa for negative price spread. Assuming transfer cost was constant for all the months, the price spread for the 12 months of the year (2013) was summarized in Table 2. The result indicated great variability in soyabeans prices between the

base/reference market and the supplying markets. Analysis of transfer cost for soyabeans indicated that the mean transfer cost from Daudu market to Enugu was highest (₦2,510.0) and least from Aliade (1,547.5) to Enugu. However, Wannune had a mean transfer cost of ₦2,004.4 thus agreeing to the findings of World Bank (2009) that long distances reduce transportation costs. The highest transfer cost observed in Daudu could be as a result of multiple road blocks where marketers paid produce levies and some market fees. Specifically, the mean price spread nominally exceeded zero in all cases for Wannune & Aliade markets for the 12 months surveyed except for the month of June in Aliade where there was a negative price spread of - ₦0.4750. Specifically, Aliade had high positive price spread among the three markets which ranged from ₦458.46 in April to ₦1,354.3 in February 2013. Wannune market, although second in the series, had the highest (peak) price spread of ₦3,966.9 in May with its least price spread of ₦83.18 in March. Similarly, Ali and Iheanacho (2008) got high price spread of ₦741.69 per 100kg of maize in Peta, Borno State. Conversely, the price spreads got from the result was higher than the positive price spread got by Hays and McCoys (1977) who found a value of ₦9.12 for millet in Kafinsoli. Although considering the time value of money, the two results might not be different.

These positive price spreads implied imperfections in the market and a departure from competitive conditions. It was also an indication that there was mutually beneficial trade which further meant that changes in the price in one market had an effect on prices in the other market. These results indicated that these markets were spatially integrated although the market might not be efficient in the sense of there being unexploited opportunities for trade.This according to economic theory provided a potential opportunity for middlemen to realize excessive profits. The implication of this was that the cost of arbitrage would be low in these markets (Ali & Iheanacho, 2008). However, Hays & McCoys (1977) noted that positive price spreads might not only result from exploitative practices of traders but were likely to be as a result of the nature of production and defects in the marketing system. These positive price spreads meant that marketers made more than normal gain and a part could be considered as a premium for extra risk inherent in soyabeans marketing.

Conversely, in Daudu market, five months (March, April, May, August and September) out of the 12 months studied had negative price spreads. This could be as a result of its highest transfer cost owing to high transportation charges and other marketing charges, relatively low supply of soyabeans in the market as a result of an alternative nearby market (Gbajimgba) which held the same day. The traders that sourced soyabeans at Daudu could as well buy it from Gbajimgba at a reduced price but due to bad road network; they stopped at Daudu market as the road leading to the rural markets were not motorable especially during the rainy season. The predominance negative price spreads in Daudu market indicated the complexity of conducting profitable trades between Daudu and Ogbete especially in the absence of market information according to Roche & McQuinn, (2003). Inadequate market price information could have contributed greatly to increased risks associated with inter-market trade. Apart from the negative price spreads, Daudu market had its high positive price spread in November (₦742.95) and least in June (₦79.74).

Furthermore, the result of ANOVA (Table 2) showed that among the three Benue markets surveyed, there was significant difference ($F= 3.316$; $P \leq 0.05$) in their price spreads. This implied that differences in purchase price and transfer costs at these supplying markets were significantly greater than zero, hence their differences were not just by chance. This result was corroborated by the result of correlation analysis (Table 4). Specifically, the result of the posthoc of the ANOVA (Table 3) showed that the price spreads on Daudu market were significantly lower in Annune and Aliade markets. This implied that arbitraging soyabeans from Daudu market in Benue State to Enugu was the least profitable while Aliade market was the most profitable.

The result of correlation analysis (Table 4) showed that purchase price (0.681) was significantly related to price spread whereas transfer cost had a significantly inverse relationship (-0.708) with price spread. This result means that price spread increases with purchase price but decreases with transfer cost. However, it had no relationship with distance covered from the supplying market to the base market. However, at the individual markets, there was no significant difference in the price spread of marketers.

From the result, it was evident therefore that soyabeans market was inefficient due to the numerous positive price spreads got from the study. This is in accordance with the findings of Hays (1988), that imperfections in the marketing system results in price differentials greater than zero. These imperfections could be as a result of collusive behaviour of marketers in areas of market information hoarding.

Table 2: Spatial Price differential of soyabeans between Benue and Enugu Markets

Months	Markets	Variables	Buying price	Selling Price	Parity Price	Price Spread	Transfer cost	Distance from Enugu (Km)
January	Aliade (3)	Mean	8973.2	11825	10278	1,304.3	1547.5	220
		Std. Dev	1590.80	1523.98	1965.12	956.793	1028.60	
		Minimum	7142.86	9800.00	8410.00	76.67	1000.00	
		Maximum	10800	13000	12000	2,366.67	3090.00	
	Annune (4)	Mean	9422.5	12467	10462	1,039.8	2004.4	320
		Std. Dev	1623.30	1100.00	1790.33	804.113	985.204	
		Minimum	7500.00	11200	8720.00	-10.77	920.00	
		Maximum	12900	14500	13600	2,450.00	3090.00	
	Daudu (1)	Mean	7243.6	10250	7740.0	496.41	2510.0	290
		Std. Dev	1541.13	1767.77	1767.77	226.642	0.00000	
		Minimum	6153.85	9000.00	6490.00	336.15	2510.00	
		Maximum	8333.33	11500	8990.00	656.67	2510.00	
February	Aliade	Mean	8973.2	11875	10328	1,354.3		
		Std. Dev	1590.8	1436.14	1915.21	982.768		
		Minimum	7142.86	10000	8410.00	76.67		
		Maximum	10800	13000	12000	2366.67		
	Annune	Mean	9542.0	11819	9814.1	272.05		
		Std. Dev	1547.95	1558.41	2182.82	963.347		
		Minimum	7916.67	10000	7220.00	-1250.00		
		Maximum	11800	14000	12400	1700.00		
	Daudu	Mean	7243.6	10,000	7490.0	246.41		
		Std. Dev	1541.13	2121.32	2121.32	580.195		
		Minimum	6153.85	8500.00	5990.00	-163.85		
		Maximum	8333.33	11500	8990.00	656.67		
March	Aliade	Mean	9181.548	11583	10036	854.29		
		Std. Dev	1933.30	986.0141	1480.14	119.78		
		Minimum	7142.86	10833.33	8410.00	76.67		
		Maximum	11666.67	13000.00	12000	2640.47		
	Annune	Mean	9812.373	11900	9895.6	83.18		
		Std. Dev	1454.17	1387.84	2095.17	942.795		
		Minimum	7692.31	9166.67	6386.67	-1827.62		
		Maximum	11666.67	13000.00	12100	1500.00		
	Daudu	Mean	7243.590	9750.00	7240.0	-3.5900		
		Std. Dev	1541.13	2474.87	2474.87	933.749		
		Minimum	6153.85	8000.00	5490.00	-663.85		
		Maximum	8333.33	11500.00	8990.00	656.67		
April	Aliade	Mean	9256.0	11262	9714.4	458.46		
		Std. Dev	1265.96	1607.45	2110.86	1,122.36		
		Minimum	7857.14	9500.00	7624.29	-1125.71		
		Maximum	10800	13300	12300	1500.00		
	Annune	Mean	9711.0	1.2187E4	10183	471.56		
		Std. Dev	1490.17	1655.88	2356.21	1082.28		
		Minimum	6923.08	8500.00	5720.00	-1203.08		
		Maximum	11400	13500	12600	1500.00		
	Daudu	Mean	7451.9	9850.0	7340.0	-111.93		
		Std. Dev	1835.76	2616.30	2616.30	780.540		
		Minimum	6153.85	8000.00	5490.00	-663.85		
		Maximum	8750.00	11700	9190.00	440.00		
May	Aliade	Mean	9360.1	11608.	10061.	700.71		
		Std. Dev	1226.99	1363.10	1727.69	942.102		
		Minimum	7857.14	10000	8510.00	-656.67		
		Maximum	10800	13300	12300	1500.00		
	Annune	Mean	9519.2	11920	9915.9	3,966.9		
		Std. Dev	1324.65	1535.95	2083.63	931.751		
		Minimum	6923.08	9500.00	6720.00	-994.29		
		Maximum	11200	13500	12600	1800.00		
	Daudu	Mean	7660.3	10150	7640.0	-20.2600		
		Std. Dev	2130.39	2333.45	23334.5	203.067		
		Minimum	6153.85	8500.00	5990.00	-163.85		
		Maximum	9166.67	11800	9290.00	123.33		
June	Aliade	Mean	10074	11621	10074	-0.4750		
		Std. Dev	826.752	347.685	1164.76	554.347		
		Minimum	9166.67	11200	8410.00	-756.67		
		Maximum	10800	12000	11000	566.67		
	Annune	Mean	9926.2	12211	10207	280.43		
		Std. Dev	1641.10	1725.14	2299.70	1139.57		
		Minimum	6538.47	8000.00	5220.00	-1318.47		
		Maximum	11700	13400	12100	2080.00		
	Daudu	Mean	7660.3	10250	7740.0	79.7400		
		Std. Dev	2130.39	3181.98	3181.98	1051.60		
		Minimum	6153.85	8000.00	5490.00	-663.85		
		Maximum	9166.67	12500	9990.00	823.33		
July	Aliade	Mean	10461	12729	11182	720.36		
		Std. Dev	828.180	1034.98	1366.22	1190.74		
		Minimum	9583.33	11500	9826.67	-1006.66		
		Maximum	11400	14000	13000	1521.43		
	Annune	Mean	9744.6	12363	10359	613.91		
		Std. Dev	1641.69	1781.05	2432.25	1256.35		
		Minimum	6153.85	8500.00	5720.00	-1006.66		

		Maximum	11700	14000	13000	2500.00
	Daudu	Mean	8878.2	11558	9048.3	170.13
		Std. Dev	2764.96	1920.98	1920.98	843.99
		Minimum	6923.08	10200	7690.00	-426.66
		Maximum	10800	12900	10400	766.92
Aug	Aliade	Mean	10640	12792	11244	604.29
		Std. Dev	1128.73	1204.73	1701.87	1365.24
		Minimum	9583.33	11700	9410.00	-1423.33
		Maximum	12100	14500	13400	1500.00
	Annune	Mean	9902.3	12017	10012	109.92
		Std. Dev	1313.38	1033.93	1772.90	833.125
		Minimum	7692.31	10400	7604.62	-923.33
		Maximum	11700	13200	12200	1500.00
	Daudu	Mean	8878.2	10500	7990.0	-888.20
		Std. Dev	2764.96	2828.43	2828.43	63.4628
		Minimum	6923.08	8500.00	5990.00	-933.08
		Maximum	10800	12500	9990.00	-843.33
Sept	Aliade	Mean	9672.6	11792	10244	571.55
		Std. Dev	1317.17	1652.02	1477.88	1075.80
		Minimum	7857.14	9500.00	8450.00	-923.33
		Maximum	10800	13000	12000	1583.33
	Annune	Mean	9709.5	12030	10026	316.16
		Std. Dev	1356.97	1253.49	1538.26	668.629
		Minimum	7857.14	9500.00	8491.00	-739.77
		Maximum	12500	14000	13000	1463.33
	Daudu	Mean	9647.4	11700	9190.0	-457.44
		Std. Dev	1677.11	2404.16	2404.16	727.054
		Minimum	8461.54	10000	7490.00	-971.54
		Maximum	10800	13400	10900	56.67
Oct	Aliade	Mean	8943.4	11333	9785.8	842.37
		Std. Dev	1012.93	1450.69	1727.64	758.703
		Minimum	7857.14	9333.30	8283.30	76.67
		Maximum	10000	12800	11800	1800.00
	Annune	Mean	9748.7	12313.	10309	560.09
		Std. Dev	1330.25	1521.82	1911.37	1128.57
		Minimum	7857.14	9857.23	7220.00	-1006.67
		Maximum	12500	14500	13400	2333.33
	Daudu	Mean	8589.7	11350	8840.1	250.37
		Std. Dev	362.626	211.969	211.969	574.595
		Minimum	8333.33	11200	8690.23	-155.93
		Maximum	8846.16	11500	8990.00	656.67
Nov	Aliade	Mean	8467.3	11288	9740.1	1,272.9
		Std. Dev	2279.78	1785.06	1999.01	1069.23
		Minimum	5416.67	8700.50	7650.50	76.67
		Maximum	10800	12500	11500	2233.83
	Annune	Mean	9746.8	12189	10184	437.60
		Std. Dev	2539.21	2365.61	2670.65	1102.14
		Minimum	5000.00	7500.00	4720.00	-750.00
		Maximum	13300	15500	13200	2500.00
	Daudu	Mean	8782.0	12035	9525.0	742.95
		Std. Dev	634.586	756.604	756.604	122.018
		Minimum	8333.33	11500	8990.00	656.67
		Maximum	9230.77	12600	10100	829.23
Dec	Aliade	Mean	8.0655E3	10175	8627.5	562.03
		Std. Dev	1.83818E3	1545.69	1282.98	872.497
		Minimum	5416.67	8000.00	6950.00	-383.33
		Maximum	9583.33	11500	9950.00	1533.33
	Annune	Mean	9290.5	11458	9453.4	162.93
		Std. Dev	2139.88	1924.18	2191.64	633.849
		Minimum	5000.00	8000.00	5220.00	-1049.23
		Maximum	12500	14000	13000	1151.43
	Daudu	Mean	9166.7	12292	9781.7	615.00
		Std. Dev	1178.51	294.630	294.630	1473.14
		Minimum	8333.33	12100	9573.33	-426.67
		Maximum	10000	12500	9990.00	1656.67

Source: Computed from field data, 2014.

Table 2: Result of ANOVA showing the differences in the price spreads across the supplying markets

Market	Group	Sum of Squares	Df	Mean Square	F	Sig.
Among the 3 markets	Between Groups	3,296,021.200	2	1,648010.600	3.316**	0.049
	Within Groups	16,400,000	33	497,008.718		
	Total	19,700,000	35			

** - Significant at 5%
Source: Computed from field data, 2014.

Table 3: Result of Post-hoc of ANOVA showing the mean difference in price spread among markets in Benue State

Dependent Variable	(I) Market	(J) Market	Mean Difference (I-J)	Std. Error	Sig.
Price Spread					
	Aliade	Annune	77.55	287.810	0.789
		Daudu	677.13*	287.810	0.025
	Annune	Aliade	-77.55	287.810	0.789
		Daudu	599.58*	287.810	0.045
	Daudu	Aliade	-677.13*	287.810	0.025
		Annune	-599.58*	287.810	0.045

*. The mean difference is significant at 0.05 level.
Source: Computed from field data, 2014.

Table 4: Correlation between price spread, purchase price, transfer cost and distance

Variables	Correlation coefficient	Sig. (2-tailed)
Purchase price (₦)	0.681***	0.005
Transfer cost (₦)	-0.708***	0.003
Distance (Km)	-0.480	0.070

***- Correlation is significant at the 0.01 level (2-tailed).
Dependent Variable: Price Spread
Source: Computed from field data, 2014.

Constraints to Soyabeans Marketing

The result of the constraints to soyabeans marketing is presented in Table 5. The result showed those factors with asterisks (*) as the ones that significantly affected soyabeans marketing in the study area. In other words, they were the critical problems faced by soyabeans marketers. The result showed low household demand of soyabeans as the major constraint to soyabeans marketing. According to them, household demand for it was so low that it discouraged many marketers from trading the crop. When compared with other foodstuffs like rice, beans, millet, maize, soyabeans had the least household demand as it could not be consumed directly like these foods. Its only household demand came from few families and local processors who had the technical knowledge of processing it to liquid soya milk or soya milk powder. This low demand subsequently led to low prices and even spoilage thus accounting to negative marketing margins observed earlier.

Similarly, another major problem to soyabeans marketing as found by the study was poor road network. This posed major challenge as roads leading to where this crop was produced were not motorable. This made movement rather too difficult and hindered the smooth evacuation of soyabeans to major cities. These bad roads not only increased the transportation fare but as well posed danger to the lives of the marketers. Similar result was obtained by Akor (2009), who identified bad road as an obstacle to marketing of agricultural commodities in Benue State. Also, Negassa (1998) and Tostao (2002) noted that poor road network adversely affected marketing of agricultural commodity.

Another major constraint observed in the study was low access to credit. Many of the marketers had little or no access to credit. This had resulted to low participation and had restricted their operations to small-scale level. Some of them had no capital base; some only bought on credit but had no capital for expansion of the business. The difference in their capital base could account for their wide variations in market shares and inequality in sales and income distribution. This contributed to high concentration of sales in the hands of few marketers and inefficient marketing structure got earlier in this study.

Similarly, poor utilization of soyabeans had also been identified as a major hinderance to efficient marketing of soyabeans. The present household utilization of soyabeans had been absymally low. Soyabeans, although highly nutritious, had not reached the level of serving a full meal in most families. Again, only few individuals knew how to process it into soya milk or soya powder. Not until there were other ways of preparing it into meals, household demand would still be low and the marketing would not only lack full participation of marketers but would maintain low turn-over. If not for the massive industrial demand for soyabeans, its' marketing would have been unattractive and unprofitable because of low household patronage.

Among major constraints to soyabeans marketing in the study area was high transportation cost. Due to the nature of the roads, transportation charges were found to be too high and in most cases, too exhorbitant. Sometimes, the transportation fare were so high as to absolutely absolve all the profit that would accrue to the marketers. This result corroborated the findings of Babatunde and Oyatoye (2000) who found that 86.5% of maize marketing problems in Kwara State as transportation cost. In a similar way, heavy imposition of

taxes/levies at road blocks was another major obstacle to soyabeans marketing identified in the study. Traders were forced to pay levies/taxes at several road blocks which led to multiple taxation. This was one of the major factors that traders considered before making choices on their supplying markets. It was discovered in the course of the study that traders in Enugu travelled to far north in buying soyabeans instead of buying from Benue State that was closer to them because of these numerous road blocks and levies at Benue State. Akor (2009), got similar results that heavy levies/produce was another major problem in grain marketing in Benue State.

Similarly, few soyabeans company was another identified constraint to soyabeans marketing. Since the crop had more of industrial than household demand, marketers were of the opinion that if more soyabeans processing factories were set up by government, individuals or corporate bodies, it would increase its demand and thus enhanced the efficiency of the marketing operations. For instance in Benue State, where soyabeans was predominantly produced, only two processing firms were operational at the time of the study. The surpluses were taken to other States with their attendant high transfer costs.

Dishonesty of buying agents was another problem identified only by Enugu State marketers. They identified the dubious characters and sharp practices of buying agents which ranged from unfaithfulness in supplying the agreed quantity of soyabeans, addition of sand and stones to increase weight of soyabeans to disappearing with traders' money. In other words, market conducts was characterized by unethical practices of cheating such as addition of stones/sand to soyabeans to increase weight and information collusion that led to uncompetitive market behaviour. This contributed to inefficiency in the marketing process. The addition of sand and stones to soyabeans observed in this study agreed with the findings of Ojo and Imoudu (2000) that adulteration of produce was one of the major problems of agricultural marketing in Nigeria.

However, poor market information was not found an insignificant constraint in soyabeans marketing. Recently, although, there were easy means of communication through the GSM, traders tended to hoard information. Some of them denied the researcher access to interview owing to the fact that they would not like to divulge their business information. This implied that lack of adequate market information actually contributed to marketing inefficiency. This result is in line with the findings of Balami & Bumba (1995) that low integration and positive price spread could be caused by lack of reliable information.

High transportation cost, low access to credit and heavy imposition of taxes/levies as major constraints to soyabeans marketing as found in this study corroborated the findings of Achike & Anzaku (2010) who also found these varables as critical factors affecting benniseed marketing in Nasarawa State. Similarly, Babatunde & Oyatoye (2008) identified transportation problem, inadequate market infrastructure, inadequate funding, shortage of processing facilities as major constraints to maize marketing in Kwara State. Conversely, low initial investment/capital was found not to be a significant factor hampering the marketing of soyabeans, whereas Achike & Anzaku (2010) identified it as an important constraints to benniseed marketing.

Table 5: Constraints of soyabeans marketing

S/N	Constraints	Benue Mean score	Rank	Enugu Mean score	Rank	Total Mean score	Rank
1	Low demand	3.2455***	1	3.3711***	1	3.3043***	1
2	Poor road	3.1091***	2	3.2165***	3	3.1594***	2
3	Low access to credit	2.8182***	4	3.0619***	5	2.9324***	3
4	Poor utilization	2.9000***	3	2.7526***	7	2.8309***	4
5	High transportation cost	2.5364**	6	2.7423***	6	2.6329**	5
6	Few SB processing companies	2.6818**	5	2.5258**	8	2.6087**	6
7	Heavy imposition of tax/levies/ produce	1.6364	NS	3.5258***	2	2.5217**	7
8	Dishonesty of buying agents	0.4909	NS	3.0722***	4	1.7005	NS
9	Low initial investment/ Capital	1.4545	NS	1.6186		1.5314	NS
10	Price fluctuautions	0.1727	NS	0.3505		0.2560	NS
11	Poor Storage Facilities	0.2000	NS	0.2474		0.2222	NS
12	Numerous middle men	0.3364	NS	0.0515		0.2029	NS
13	Poor Infrastructure	0.3909	NS	0.4742		0.4300	NS
14	No standard measure	0.6545	NS	0.0309		0.3623	NS
15	Poor seed quality	0.5455	NS	0.0206		0.2995	NS
16	Insect spoilage	0.0455	NS	0.0722		0.0580	NS
17	Competition	0.1364	NS	0.0515		0.1014	NS
18	Poor market information	0.4091	NS	0.2062		0.3140	NS

*** (**)- significant at 1%, (5%), NS- Not significant
Source: Computed from field data, 2014.

CONCLUSION AND RECOMMENDATIONS

This study had obtained some scientific evidences on the situation of soyabeans marketing in Benue and Enugu States with a view to assisting the industry in contributing to social and economic developments in the area and in the country at large. Result showed that soyabeans marketing was dominated by young, adults, married males with relatively low annual income. The socio-economic characteristics of marketers were clear evident of their poor resource situations which constrained their competitiveness in the industry leading to economic losses.

Trading of soyabeans in Daudu, Aliade and Annune were not spatially efficient since Aliade and Annune gave positive price spreads for almost all the 12 months surveyed while Daudu gave few negative price spreads and many positive price spreads. Positive price spreads with only few negatives got indicated inefficiency in marketing system of soyabeans which could be caused by low demand as a result of poor household utilization, poor roads, low access to credits, high transportation costs, few soyabeans companies, high imposition of taxes/levies and dishonesty of buying agents.

Credits should be given to marketers at less stringent conditions. Advancing credits to small-scale marketers could improve distribution of sales and income thereby enhancing the structural efficiency for development of competitive marketing system. Increasing the educational level of marketers through informal training could help in improving the structural marketing efficiency.

Government and relevant agencies should checkmate the number of road blocks and the activities of officers at these road blocks. The commission agents and the various unions operating at the market level should be properly regulated by government to make them behave responsibly to the plight of agricultural commodity marketers. Furthermore, there should be substantial benefits in developing better infrastructural facilities to effectively link production centres to market centres. Government should embark on massive construction and rehabilitation of roads for easy evacuation of produce from interior villages to urban centres. Marketing costs could be significantly reduced if better roads and marketing facilities were built. Government especially Benue should review their tax policy on internal revenue generation to ensure that marketers of agricultural commodities are relieved of multiple taxation which constitute a major problem affecting market efficiency on movement of produce between markets and States.

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