

**DRAFT REPORT**  
**THE PEELED NUT COMMODITY CHAIN (CC) IN NIGERIA**

**BY**

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**NIFOR seed garden at Badagry, Lagos, Nigeria.**

**MAY, 2008.**

## **Abstract**

For several years, Nigerians have been transporting huge quantities of coconuts to their country. The study was to find out on the coconut Commodity Chain (CC) in Nigeria and why huge quantities of coconuts are transported to Nigeria each year.

Findings are that, coconuts in general are used for various functions/purposes in Nigeria but the Ghanaian coconuts are usually consumed raw and alone or are consumed raw and together with other foods. Ghanaian coconuts command premium price in Nigeria because they taste better than the Nigerian coconut although the WAT varieties are the prominent varieties in Ghana and Nigeria. Ghanaian coconuts may also be an input for some industries in Nigeria.

Coconut wholesalers who transport from Ghana to the Nigerian border earn a higher added value compared to wholesalers who transport the nuts from the Nigerian border to the Northern part of Nigeria.

Nigeria and probably Niger Republic will continue to be a major destination point for Ghanaian coconuts even when the WAT is finally replaced by the hybrids. It is therefore recommended that the coconut sector of Ghana is expanded to meet this continuous international demand.

May, 2008.

# THE PEELED NUT COMMODITY CHAIN IN NIGERIA

## **Background of the study**

The consumption of coconuts is widespread in Nigeria. However, the Lethal Yellowing Disease (LYD) of coconut has been a major problem for Ghana and Nigeria. The disease first occurred in 1932 and 1917 in Ghana and Nigeria respectively. In Ghana, the LYD is also called the Cape Saint Paul Wilt Disease (CSPD) because it was first noticed at Cape Saint Paul in the Volta Region of Ghana whilst in Nigeria; it is called the Awka Wilt Disease because it was first noticed in the Awka area (Anambra state).

It is not exactly known when Nigerian wholesalers started transporting huge tonnes of coconuts from Ghana to Nigeria but it is speculated that trading activities of these wholesalers became prominent since 1999. Prior to 1999, what actually happened regarding the activities of the Nigerian traders is obscure.

The primary objective of this research was to find out about the coconut sector of Nigeria and why huge tonnes of peeled coconuts are exported, each year, from Ghana to Nigeria.

The secondary objectives of this research are:

1. to find out about the coconut Commodity Chain (CC) in Nigeria.
2. to find out about the shared value between stakeholders in the coconut Commodity Chain (CC) in Nigeria.

Before the secondary objectives are tackled, a brief history of the LYD in Nigeria, the work of the Nigerian Institute for Oil palm Research (NIFOR) and some general comments about the coconut sector of Nigeria are presented.

Bronze leaf wilt (“Awka wilt”) of coconut palm was first observed in Nigeria by Johnson (1918, 1919) in the Awka area following a severe epidemic in 1917. This disease was termed “bud rot” and by an Agricultural Ordinance of 1916, farmers had to fell more than 5,000 palms as a control measure. Another outbreak occurred in the latter half of 1951, principally in the Awka-Onitsha area of the then Onitsha Province, but was this time called “bronze leaf wilt” (Bull 1955).

After the epidemics in 1917 and 1951, most of the coconut palms in the Eastern part of Nigeria (Awka and Awka-Onitsha areas) have been wiped out and no replanting has been done. Since 2003, the disease has been active in Lagos state. Lagos state has about 80% of the total coconut plantation in Nigeria. Plantation in the Lagos state is concentrated in four government local areas.

1. Badagry local government area
2. Ojo Local government area
3. Ibeju-Lekki government area
4. Etinosa local government area

Apart from the main coconut plantations in Lagos state, it is common to see a few trees (5 trees) in compound holdings.

The coconut variety in Lagos state is the WAT which are over 60years old. Because of the age of these plantations, yields have reduced coupled with farmers' unwillingness to expand their plantations. The implication is that Nigeria will continue to depend on foreign sources to satisfy its demand for coconuts.

In Badagry (in Lagos), coconut oil is produced by the wet extraction method, using locally produced nuts and the oil is consumed in this area because of the small quantity of oil produced.

To combat the effect of LYD, the Nigerian Institute For Oilpalm Research (NIFOR) has been engaged in plant selection to come up with some tolerant varieties. NIFOR claims that the tolerant variety in Nigeria now is the **Malayan green dwarf**.

Regarding the identification of the particular insect vector of the LYD, NIFOR has not done any substantial work but has started screening insects to identify the probable insect vector of the LYD. So far NIFOR has been collaborating with the University of Lagos in research activities and has also expressed interest in collaborating with Ghana.

In 2003, NIFOR sourced 174 seedlings of different new varieties from Ghana for purposes of research. In the next few years, the seedlings will start bearing so as to monitor their performance. NIFOR has 3 substations for oil palm and coconut namely,

1. Abak substation
2. NIFOR substation
3. Badagry substation

These substations have seed gardens which supply coconut seedlings to interested people but the demand for coconut seedlings is rather very low in Nigeria. Picture 1.1 shows some seedlings at the NIFOR seed garden.

Picture 1.1. Seedlings at the NIFOR seed garden



### **Coconut Commodity Chain (CC) in Nigeria**

The major stakeholders in the peeled nut Commodity Chain (CC) in Nigeria are the farmers (who supply the nuts in Ghana), transporters/wholesalers, retailers and processors. Peeled coconuts are transported from the Western region of Ghana by Nigerian wholesalers using Ghanaian registered trucks. The number of nuts carried per truck usually range between 50,000 to 100,000. The Ghanaian registered trucks cross the Nigerian border and offload just

a few meters from the border (Picture 1.2). For security reasons, the Ghanaian trucks are not allowed to move to other regions/areas of Nigeria apart from the Owode border. The offloaded nuts are then packed in sacks and each sack contains approximately 40 nuts (Picture 1.3). After packing into sacks, the nuts are ready to be transported to other parts of Nigeria.

Picture 1.2. A truck offloading coconuts at the Owode border in Nigeria



Picture 1.3.Coconuts packed in sacks ready to be transported to other areas.



There is no grading according to the size of the nuts. The wholesalers from Ghana may decide to sell the nuts to other wholesalers or retailers at the border or may decide to reload and transport the nuts to other regions of Nigeria (usually the Northern part of Nigeria and even to Niger Republic). In addition, a wholesaler who buys at the border may also transport the nuts to other areas in Nigeria and sell to retailers. The retailers finally sell to consumers. Picture 1.4. shows a retailer selling whole coconuts in Nigeria.

Picture 1.4. A retailer selling whole coconuts along the street in Nigeria.



Other retailers crack the nuts and slice the coconut meat into pieces and sell the sliced coconut meat alone or with other foods as it exist with “Abatsa” (Picture 1.5.).

Picture 1.5. A retailer packaging “Abatsa” with coconut slices.

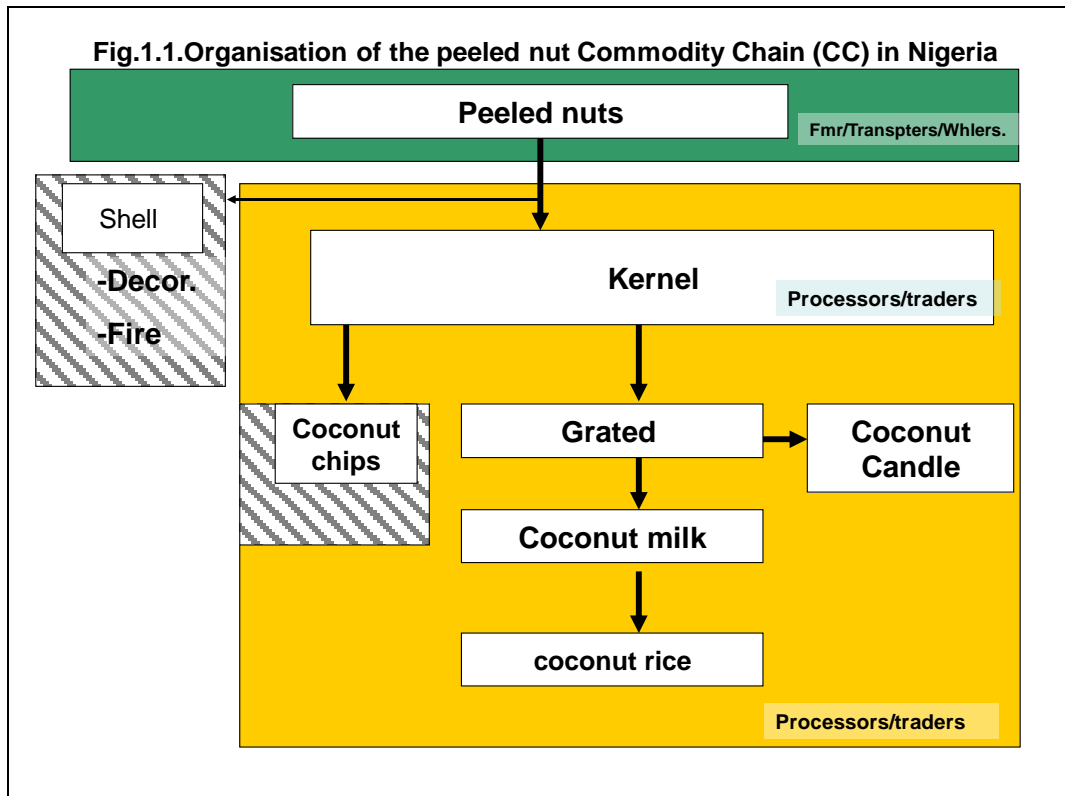




Picture 1.6. Packaged “Abatsa” ready for sale.



In general, the dry peeled coconuts are used in Nigeria for varied purposes including oil production, cocorice preparation (coconut milk is extracted from the grated coconut meat and used for the cooking of rice), coconut candles (a type of sweet made from grated coconuts and sugar), Abatsa (raw coconut slices eaten with boiled cassava that has been soaked overnight to reduce the starch content) etc. The coconut meat could also be eaten raw and alone. The coconut products mentioned above are either produced domestically for household consumption or on commercial bases. Coconut is also used as an industrial input in Nigeria as illustrated in Fig.1.1 below. Fig.1.1. shows the summary of the organisation of the peeled nuts Commodity Chain (CC) in Nigeria. The shells of the coconut serve as firewood and for making crafts/decorations.



However, Ghana coconut (coconut from Ghana) is noted for the sweet taste of the meat/kernel so it is widely consumed raw and alone or consumed together with bread or with soaked “gari” (gari is roasted grated cassava) or Abatsa although Nigeria coconut (coconut from Nigeria) may also be used for these same functions. Due to the premium taste of Ghana coconut, it always commands relatively high consumer price. Once Ghana nuts are exported to Nigeria, they may also be used for the various functions that the local nuts (Nigerian coconuts) perform probably with the exception of oil extraction. Coconut oil processors are located close to the coconut plantations at Lagos state therefore their bulk of input may come from the plantations-since the nut prices are low compared to the Ghana nuts and transportation cost may also be minimal or absent.

A food processing factory (name withheld) processes the coconut into coconut chips. It has 2-3 suppliers, who upon request provide cleaned refrigerated coconut meat/kernel (without the shell). There is the probability that Ghana nuts form part of the coconuts supplied to this factory because these supplies buy from various sources (we did not have the opportunity to talk to these suppliers).

Since the factory is a major stakeholder in the Commodity Chain in Nigeria, it is important to examine the current demand and future demand for meat/kernel in Nigeria. Currently the food processing factory requires 1-1.5 tonnes of kernel/meat per day for the processing of coconut chips which has very high demand in Nigeria but because of their current processing capacity, they are unable to even supply coconut chips to the whole of Lagos state let alone the whole of Nigeria. 1-1.5tonnes of meat per day is equivalent to an average of 1,107,143 (Table1.2) nuts per year (processing is done 5days per wk and calculation excludes holidays). This factory also pays an average of USD1.9 (USD1.8-USD2.0) per kg of meat bought from their suppliers. A kg of meat is approximately made up of meat extracted from a total of 4 nuts (WAT). Therefore a supplier can earn about USD47.50 from meat extracted from100 nuts (Table 1.1.).

**Table 1.1. Food Processing Factory purchase price for coconut meat**

<b>Range</b>	<b>USD per kg</b>	<b>number of nuts/kg</b>	<b>USD/meat from 100 nuts</b>
<b>Minimum</b>	1.8	3.571428571	<b>47.5</b>
<b>Maximum</b>	2.0		
<b>Average</b>	1.9		
<b>NB:</b>			
<b>Average weight of meat in a nut-0.28kg</b>			

The food processing factory intends to expand its processing facility so as to produce more coconut chips to meet the huge deficit in supply in Nigeria (Table 1.2.). After expansion, the company intends to produce five times the current production capacity and also produce for 7days per week instead of the current 5days/week production. The average nut requirement for this expansion is estimated to be about 40,357,143 nuts per year (Table 1.2.).

**Table 1.2. Current estimate of coconut requirement for this factory, Nigeria**

Range	Quantity of meat/day(kg)	Quantity of meat/week(kg)	Quantity of meat/year(kg)	number of nuts required/year
<b>Minimum</b>	1,000	5,000	248,000	<b>885,714</b>
<b>Maximum</b>	1,500	7,500	372,000	<b>1,328,571</b>
<b>Average</b>				<b>1,107,143</b>
<b>Future estimate when production increase by 5x7</b>				
Range	Quantity of meat/day(kg)	Quantity of meat/week(kg)	Quantity of meat/year(kg)	number of nuts required/year
<b>Minimum</b>	5,000	175,000	9,040,000	<b>32,285,714</b>
<b>Maximum</b>	7,500	262,500	13,560,000	<b>48,428,571</b>
<b>Average</b>				<b>40,357,143</b>
<b>NB: Average Weight of meat in a nut- 0.28kg Excludes holidays(12days) in Nigeria</b>				

Moreover, it is estimated that an average household size of 5-7 people in Nigeria consume between 3-4 coconuts per week. Using the 2005 population census, it is estimated that about 3,434,522,000 nuts per year will be required by the total population of Nigeria (Table 1.3).

**Table 1.3. Current estimate of National coconut requirement for Nigeria**

Range	Household requirement/week	Total Nigerian households (2005)	National nut requirement/week	National nut requirement/year
<b>Minimum</b>	3	18,871,000	56,613,000	<b>2,943,876,000</b>
<b>Maximum</b>	4	18,871,000	75,484,000	<b>3,925,168,000</b>
<b>Average</b>				<b>3,434,522,000</b>
<b>Average number of people in a household-7people</b>				

However, Nigeria also has some coconut plantation located in Lagos. It is hypothesized that the total number of coconut trees in Nigeria is about two million. The average number of nuts per year produced by the WAT variety is 40. Therefore one expects an average of about

80,000,000 nuts per year produced in Nigeria. Because of the age of the trees (over 60years) it is even possible that the nut yield per year will be on the decline.

From the ongoing discussion, it is likely that there will be a deficit in the total nut requirement of Nigeria every year for both industrial and domestic/commercial purposes (Table 1.4.). This deficit is probably over 3,355,629,143 nuts per year. All things being constant, if this factory is successful in its processing equipment expansion, the total nut demand for the whole of Nigeria may be over 3,394,879,143 nuts per year (Table 1.4.).

**Table 1.4.Nut deficit in Nigeria**

<b>Variable</b>	<b>Current demand(Average)</b>	<b>Future demand(Average)</b>
Nigeria factory	1,107,143	<b>40,357,143</b>
Household	3,434,522,000	3,434,522,000
Total demand(Factory+Household)	<b>3,435,629,143</b>	3,474,879,143
National production	<b>80,000,000</b>	<b>80,000,000</b>
<b>Deficit in Nigeria</b>	<b>3,355,629,143</b>	<b>3,394,879,143</b>
<b>Deficit in Nigeria</b>	<b>&gt;3,355,629,143</b>	<b>&gt;3,394,879,143</b>

The current deficit is likely responsible for the mass export of coconut from Ghana. Ghana has a total of about 36,000 ha of coconut plantation (that is 5,760,000 coconut trees). The WAT variety produces about 40 nuts per year; therefore a total of 230,400,000 nuts are produced per year in Ghana and a large percentage of this total quantity (230,400,000) of coconuts gets to Nigeria. But despite this quantity of coconuts from Ghana to Nigeria, the Nigerian deficit will still not be nullified. Therefore in addition to the exports from Ghana, Nigerian wholesalers also import coconuts from Benin Republic. Nonetheless, little is known about the coconut sector of Benin. Pictures 1.7.-1.9. below show the activities of Nigerian transporters at the **Seme Border** in Nigeria. This border is the entry point of coconuts coming in from Benin.

Picture 1.7. Small trucks bring in the coconuts from Benin.



The coconuts are transported into Nigeria by small trucks (Picture 1.7.). Several coconuts are heaped and covered with woven palm branches (Picture 1.8). To transport the coconuts to other areas in Nigeria, the nuts are sorted for good ones and the good nuts are bagged in sacks (Picture 1.9.).

Picture 1.8. Coconuts offloaded and heaped into large groups



Picture 1.9. Bagged coconuts ready to be transported to other areas in Nigeria.



Therefore the dependence of Nigeria on outside sources for coconut supply will continue to persist.

## **Shared added value between stakeholders**

Shared added value between stakeholders will be discussed under the following subtopics:

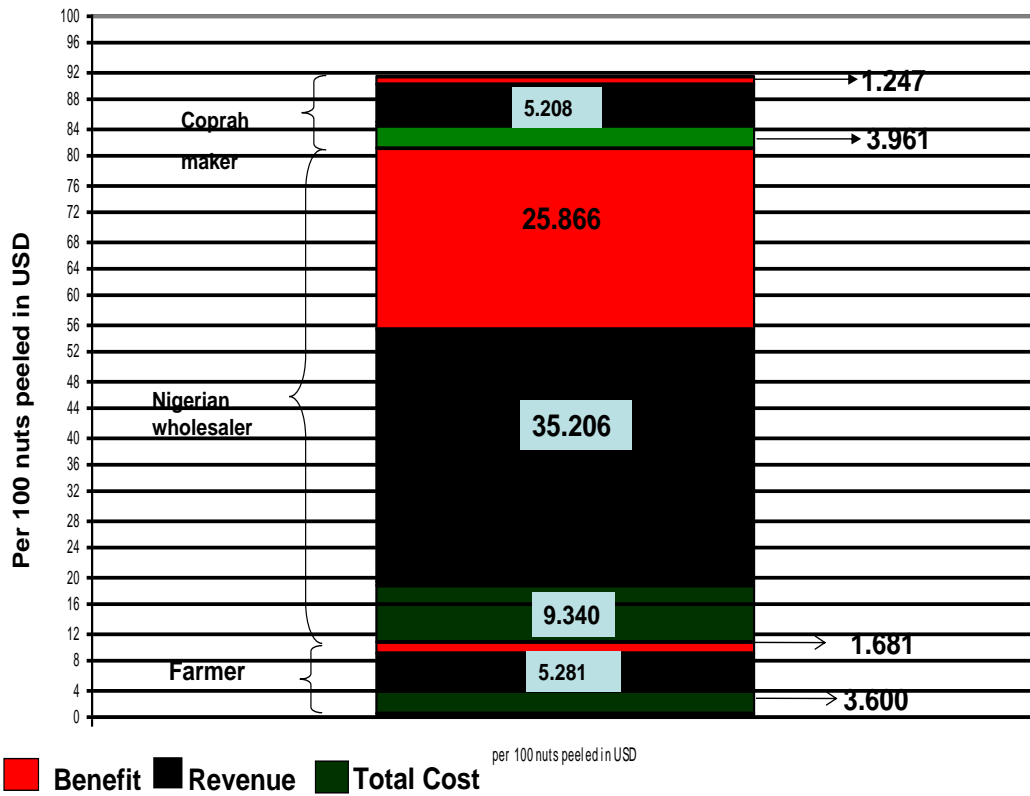
1. Shared added value between stakeholders when nuts are transported from Ghana (Western region) to retailers in Nigeria.
2. Shared added value between stakeholders when nuts are transported from Ghana (Western region) to the Nigerian border (assuming that the transporter/wholesaler sells the nuts at the Nigerian border).
3. Shared added value between stakeholders when nuts are transported from the Nigerian border (Owode border) to the Northern parts of Nigeria.
4. Comparison of the shared added value between the stakeholders who transport nuts from Ghana to the Owode border and stakeholders who transport nuts from the Owode border to the Northern part of Nigeria.

### **1. Shared added value between stakeholders when nuts are transported from Ghana to retailers in Nigeria.**

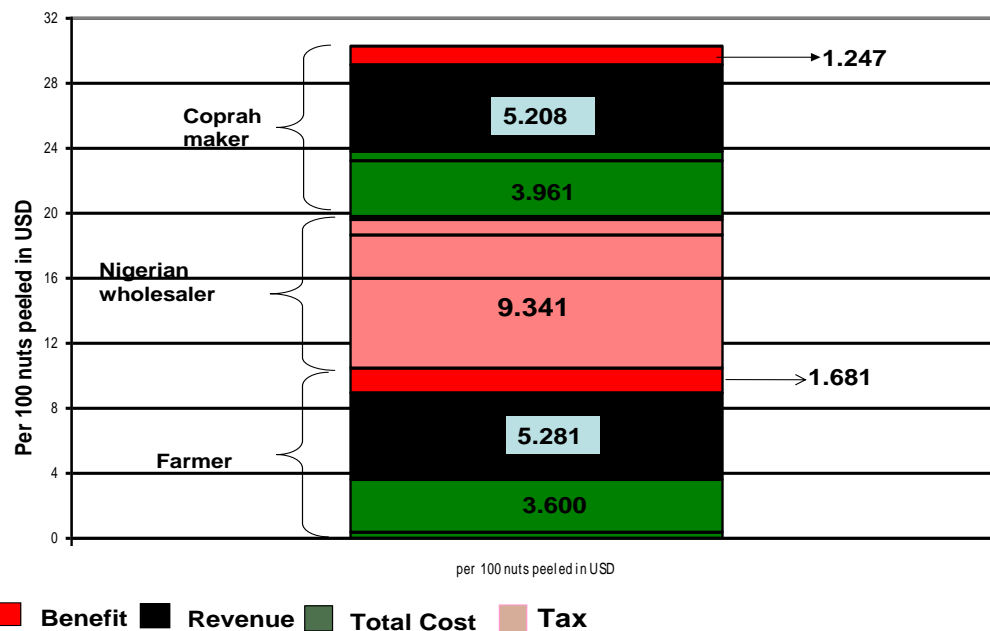
Graph 1.1. below shows the total added value of the peeled nuts Commodity Chain (CC) between stakeholders when coconuts are transported from Ghana to retailers in Nigeria. The farmer/landowner receives an added value (profit) of USD1.681 per 100 nuts, the Nigerian transporter/wholesaler receives USD25.866 per 100 nuts and the copra maker receives USD1.247. The Nigerian wholesaler receives the highest share of added value among the three stakeholders under comparison but this added value may slightly reduce (but will still be highest among the stakeholders) when the taxes paid at Togo and Benin borders and any other cost incurred in these two countries are included in the calculation. The total added value for this Commodity Chain (CC) is about USD92 per 100 nuts. Out of this USD92, some of the value stays in Ghana in the form of taxes (Aflao border tax and Local government tax) paid by the Nigerian transporters to Ghanaian tax authorities, and the cost of the nuts (which becomes the income of the farmer/landowner). Graph 1.2 shows that USD9.341 per 100 nuts is the total tax paid by the Nigerian transporters/wholesalers to Ghanaian tax authorities.



**Graph.1.1. Shared value of the peeled nut commodity chain**  
**Total value**

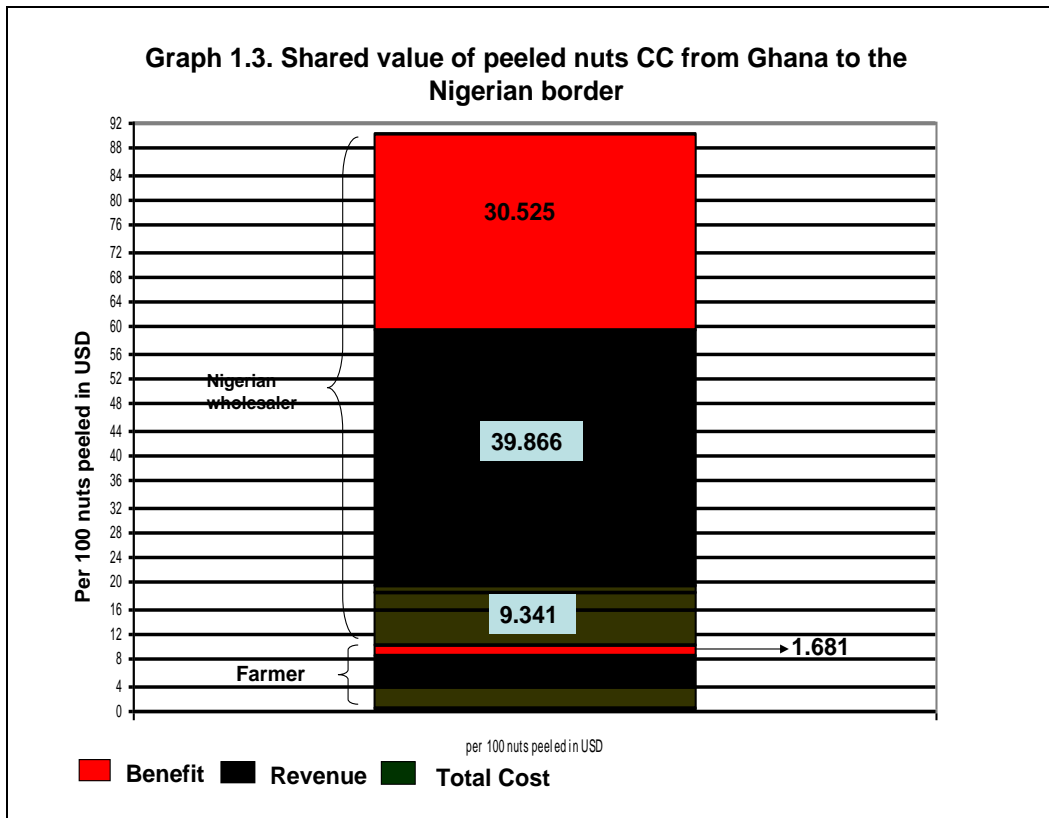


**Graph 1.2. Shared value of the peeled nut Commodity Chain**  
**Value staying in Ghana (tax)**



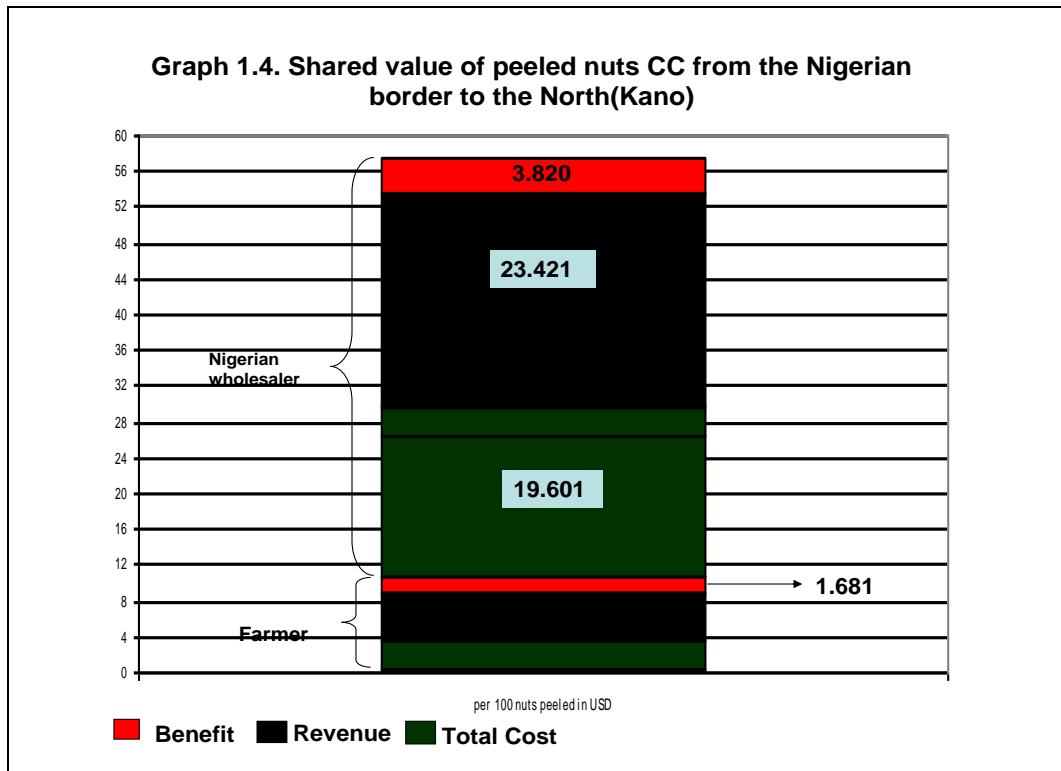
**2. Shared added value between stakeholders when nuts are transported from Ghana (Western region) to the Nigerian border. (Assuming that the transporter/wholesaler sells the nuts at the Nigerian border).**

Graph 1.3. shows the distribution of shared added value of peeled nuts between stakeholders from Ghana to the Nigeria border. This wholesaler again sells to another wholesaler. The added value earned by this wholesaler is USD30.525 per 100 nuts traded.



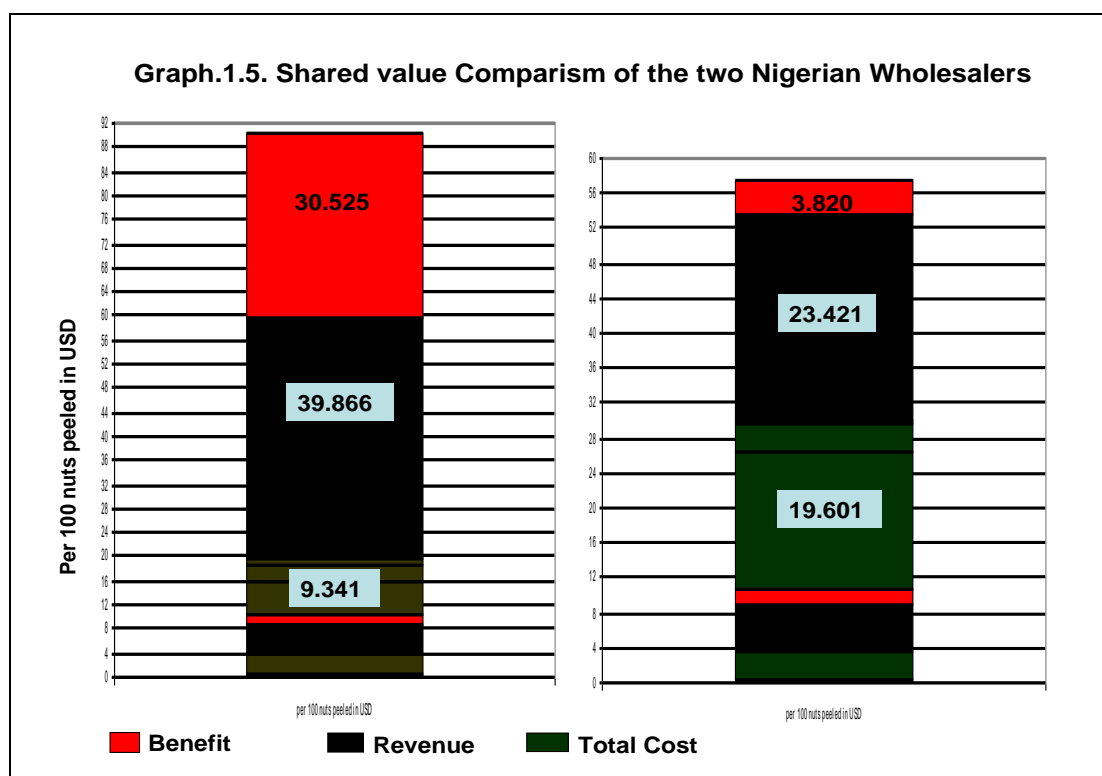
**3. Shared added value between stakeholders when nuts are transported from the Nigerian border (Owode border) to the Northern parts of Nigeria.**

Graph 1.4. reveals a wholesaler who buys coconuts from Owoder border in Nigeria, transports the nuts to the Northern part of Nigeria and earns an added value of USD3.820 per 100 nuts with a corresponding total cost of USD19.601 and revenue of USD23.421.



#### 4. Comparism of the shared added value between the stakeholders who transport nuts from Ghana to the Owode border and stakeholders who transport nuts from the Owode border to the Northern part of Nigeria.

From Graph 1.5. the Nigerian transporter who buys from Ghana and sells at the Nigerian border relatively incurs the lowest cost per trip per 100 nuts traded and relatively earns the highest revenue which corresponds to a higher added value. The higher added value is due to the high border wholesale price of about USD15.946 per 100 nuts as against USD5.501 per 100nuts, which is the cost of nuts in Ghana. The wholesaler who buys from the Owode border and sells at the Northern part of Nigeria sells to retailers at USD23.421 after he had bought the nuts at the border at USD15.946. It is therefore profitable transporting nuts from Ghana and selling to other wholesalers in Nigeria than transporting nuts from the border to the Northern part of Nigeria. However, each of these methods may have their advantages and disadvantages.



To conclude on the shared added value, all the Nigerian transporters/wholesalers generally earn high added value because of the high demand for Ghana coconuts and this has culminated into a high retail or consumer price of Ghana coconut in Nigeria (Table 1.5.).

**Table 1.5. Average retail prices of coconuts in Nigeria (2007)**

Ghana nuts in Ghana Price/nut		Ghana nuts in Nigeria Price/nut		Nigeria nut in Nigeria Price/nut	
GH¢	USD	Naira	USD	Naira	USD
0.2	0.22003895	100	0.797321001	70	0.558125

## **Conclusion and Recommendation:**

High quantity of coconuts from Ghana and probably from other countries are entering Nigeria because of the following factors -

1. the destruction of coconut plantation by the LYD therefore low quantity of nut production in Nigeria and lack of interest on the part of farmers to replant or expand their plantations.
2. old plantations (over 60 years old).
3. probable export of nuts to Niger republic.
4. high domestic use of coconut meat in Nigeria (cocorice, raw chewing etc), oil processing and relatively high industrial (Factory) and commercial use of the coconut.
5. the relatively high income generated by stakeholders (wholesalers/retailers, processors etc.) in the sector in Nigeria.

## **The future of the coconut industry in Ghana and Nigeria**

In Nigeria and Ghana, the West African Tall (WAT) variety is widely planted (dominant variety). Wholesalers/transporters prefer the WAT nuts to the hybrid because of the hard shells which hardly cracks during the long distance transportation from Ghana to Nigeria. Secondly, the WAT nuts have relatively low physiological processes therefore do not germinate early compared to the hybrid varieties. In addition, consumers in Nigeria prefer the Ghanaian WAT nuts because it is sweeter than the Nigerian WAT nuts and the hybrids. The Ghanaian nuts are sweeter due to the fact that the nuts are well matured than the Nigerian WAT nuts. In Ghana, the nuts are allowed to mature and drop to the ground by themselves whilst in Nigeria the nuts are plucked by farmers at the perceived state of maturity. As a result of the level of maturity, consumers and transporters in Nigeria are able to differentiate Ghana nuts from Nigeria nuts. The Ghana nuts have darker shells compared to the Nigeria nuts.

With the advent of the LYD which is gradually destroying the coconut sector in the Western region of Ghana, researchers are working around the clock to develop other hybrids (some new hybrids that were developed were susceptible to the LYD) which will be tolerant to the disease.

**The major questions now are-**

**1. Will consumers in Nigeria still demand Ghana coconuts when the WAT plantations in Ghana are completely replaced by the hybrids?**

**2. Will transporters/wholesalers continue to transport coconut from Ghana to Nigeria?**

Nigerian consumers/households may demand less of the hybrid varieties for raw/direct consumption since the hybrid is less sweet. But for the preparation of cocorice and coconut candle etc., the hybrid nuts may still be suitable. It is difficult to estimate the total quantity demanded for WAT nuts for raw/direct consumption in Nigeria. However, it is certain that the food processing company does not have any preference for any particular variety of coconut so their demand for coconut from either Nigeria or outside of Nigeria will continue to exist. The implication is that Nigeria and probably Niger Republic will continue to depend on outside sources to satisfy their coconut demand for some years to come until there is pragmatic effort to increase the coconut hectarage in Nigeria.

It is however important that the coconut sector of Ghana is expanded with tolerant varieties to the LYD to meet the continuous demand both locally and internationally, otherwise the coconut sector of Ghana will eventually collapse because of the gradual destruction by LYD and old plantations of the WAT.

**Recommendation for future study:**

It is speculated that Niger Republic also has huge demand for coconuts therefore it is imperative that a study is conducted on the coconut Commodity Chain (CC) in Niger Republic. In addition, what happens in Benin and other West African countries regarding their coconut sector also deserve research.

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Mr. Arkurst, Western Region of Ghana.

[www.mbendi.co.za](http://www.mbendi.co.za)

[www.unhabitat.org](http://www.unhabitat.org)

## Appendices

### Appendix 1

#### Nigerian wholesaler who sells to retailers in Nigeria

Per double axle truck :50,000 nuts						
<b>Costs</b>						
<b>Fixed Cost</b>	initial value	final value	duration of use	value	value per 100 nuts	value per 100 nuts peeled USD
<b>Total fixed cost</b>	0	0	0	0	0	0
<b>Variable cost</b>	Quantity	Unit	price per unit	value	value per 100 nuts peeled GH¢	value per 100 nuts peeled USD
<b>Intermediate cost</b>						
nuts	500	100nuts	5	2500	5	5.500973672
transport	1	trip	1200	1200	2.4	2.640467363
<b>Labour</b>						
loading and counting agent	1	truck	350	350	0.7	0.770136314
	50	100nuts	0.5	25	0.05	0.055009737
<b>Taxes</b>						
District tax	1	cargo	120	120	0.24	0.264046736
Ghana Border tax			50	50	0.1	0.110019473
<b>Total variable cost</b>				<b>4245</b>	8.49	9.340653296
<b>Total costs</b>				<b>4245</b>	8.49	9.340653296
<b>Revenue</b>						
Nuts (wholesale)	50000	nuts	0.32	16000	32	35.2062315
<b>Total gross product</b>				<b>16000</b>	32	<b>35.2062315</b>
<b>Gross added value</b>				<b>11755</b>	<b>23.51</b>	<b>25.86557821</b>

NB: 1USD=0.90893GH¢=125.42NAIRA



## Appendix 2

### Nigerian Wholesaler transports from Owode to North

Per trailer truck(70,000nuts)							
Costs							
Fixed Cost	initial value	final value	duration of use	value	per100nuts(Naira)	Per 100nuts peeled(GH¢)	Per 100nuts peeled (USD)
<b>Total fixed cost</b>	0	0	0	0	0	0	0
Variable cost	Q'tity	Unit	price per unit(Naira)	value(Naira)	per100nuts(Naira)	Per 100nuts peeled(GH¢)	Per 100nuts peeled (USD)
<b>Intermediate cost</b>							
nuts	1750	40nuts	800	1400000	2000	<b>14.49417956</b>	15.94642003
transport	1	trip	235000	235000	335.71429	2.432951568	2.676720505
rope	1750	100bags	40	720	1.25	0.009058862	0.009966513
sacks	1750	bags	20	35000	50	0.362354489	0.398660501
<b>Interm total cost</b>				<b>1670720</b>	<b>2386.9643</b>	<b>17.29854448</b>	<b>19.03176755</b>
<b>interm cost-nuts</b>					<b>386.96429</b>	<b>2.80436492</b>	<b>3.085347518</b>
<b>Labour</b>							
loading	1750	truck	11	19250	27.5	0.199294969	0.219263275
counting	1750	truck	12	21000	30	0.217412693	0.2391963
security	1750	truck	5	8750	12.5	0.090588622	0.099665125
<b>Total Labour cost</b>				<b>49000</b>	70	0.507296284	<b>0.558124701</b>
<b>Taxes</b>							
Local govt tax	1	cargo		<b>1000</b>	1.4285714	0.010352985	<b>0.0113903</b>
<b>Total variable cost</b>				<b>1720720</b>	2458.3929	17.81619375	<b>19.60128255</b>
					0		
					0		
<b>Revenue</b>					0		
Nuts (wholesale)	1750	40nuts	1175	2056250	2937.5	21.28832622	23.42130442
<b>Total revenue</b>				<b>2056250</b>	2937.5	21.28832622	<b>23.42130442</b>
					0		
<b>Gross added value/profit</b>				<b>335530</b>	479.10714	<b>3.472132478</b>	<b>3.820021869</b>

NB: 1USD=0.90893GH¢=125.42NAIRA

### Appendix 3

#### Nigerian wholesaler who sells at the Owode Border

Per double axle truck :50,000 nuts						
Costs						
Fixed Cost	initial value	final value	duration of use	value	value per 100 nuts GH¢	value per 100 nuts USD
<b>Total fixed cost</b>	0	0	0	0	0	0
Variable cost	Quantity	Unit	price per unit	Total amount	value per 100 nuts peeled	value per 100 nuts USD
<b>Intermediate cost</b>						
nuts	500	100nuts	5	2500	5	5.500973672
transport	1	trip	1200	1200	2.4	2.640467363
<b>Labour</b>						
loading and counting	1	truck	350	350	0.7	0.770136314
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Ghana Border tax			50	50	0.1	0.110019473
<b>Total variable cost</b>				<b>4245</b>	8.49	9.340653296
<b>Total costs</b>				<b>4245</b>	<b>8.49</b>	<b>9.340653296</b>
<b>Revenue</b>						
Nuts (wholesale)	1250	40nuts	<b>14.4941796</b>	18117.72445	36.2354489	39.86605008
<b>Total gross product</b>				<b>18117.72445</b>	<b>36.2354489</b>	<b>39.86605008</b>
<b>Gross added value/profit</b>				<b>13872.72445</b>	<b>27.7454489</b>	<b>30.52539679</b>

NB: 1USD=0.90893GH¢=125.42NAIRA

#### Appendix 4

Sum up for Nigerian wholesaler who transports nuts from Ghana and sells to retailers in Nigeria

stakeholder	Category	per 100 nuts peeled GH¢	per 100 nuts peeled in USD
<b>landowner</b>	fixed cost	0.347222222	0.382012061
	Intermediate input and services		
	labour	2.925	3.218069598
	taxes	0	0
	<i>revenue</i>	4.8	5.280934725
	gross added value	1.527777778	1.680853067
<b>Nigerian trader</b>	fixed cost	0	0
	<i>commodity in transit</i>	5	5.500973672
	Intermediate input and services	2.4	2.640467363
	labour	0.75	0.825146051
	taxes	0.34	0.37406621
	<i>revenue</i>	32	35.2062315
	gross added value	23.51	25.86557821
<b>copra maker</b>	fixed cost		
	<i>commodity in transit</i>	3	3.300584203
	Intermediate input and services	0.1	0.110019473
	labour	0.5	0.550097367
	taxes	0	0
	<i>revenue</i>	4.7333333	5.207588373
	gross added value	1.13333333	1.246887362

## Appendix 5

Sum up for the wholesaler who sells to another wholesaler at Owode border

stakeholder	Category	per 100 nuts peeled GH¢	per 100 nuts peeled in USD
landowner	fixed cost	0.347222222	0.382012061
	Intermediate input and services		
	labour	2.925	3.218069598
	taxes	0	0
	<i>revenue</i>	4.8	5.280934725
	gross added value	1.527777778	1.680853067
<b>Nigerian wholesaler</b>	fixed cost	0	0
	<i>commodity in transit</i>	5	5.500973672
	Intermediate input and services	2.4	2.640467363
	labour	0.75	0.825146051
	taxes	0.34	0.37406621
	<i>revenue</i>	36.2354489	39.86605008
	gross added value	27.7454489	30.52539679

## Appendix 6

Sum up for the wholesaler who sells to retailers at the Northern part of Nigeria

stakeholder	Category	per 100 nuts peeled(GH¢)	per 100 nuts peeled in USD
landowner	fixed cost	0.347222222	0.382012061
	Intermediate input and services	0	0
	labour	2.925	3.218069598
	taxes	0	0
	<i>revenue</i>	4.8	5.280934725
	gross added value	<b>1.52777778</b>	<b>1.680853069</b>
			0
<b>Nigerian trader (Wholesaler)</b>	fixed cost	0	0
	<i>commodity in transit</i>	14.49417956	15.94642003
	Intermediate input and services	2.80436492	3.085347519
	labour	0.507296284	0.5581247
	taxes	0.010352985	0.0113903
	<i>revenue</i>	21.28832622	23.42130441
	gross added value	<b>3.472132478</b>	<b>3.82002187</b>