



MAFAP SPAANA

Monitoring African Food and Agricultural Policies
Suivi des politiques agricoles et alimentaires en Afrique

ANALYSIS OF INCENTIVES AND DISINCENTIVES FOR SUGAR IN NIGERIA

JULY 2013



This technical note is a product of the Monitoring African Food and Agricultural Policies project (MAFAP). It is a technical document intended primarily for internal use as background for the eventual MAFAP Country Report. This technical note may be updated as new data becomes available.

MAFAP is implemented by the Food and Agriculture Organization of the United Nations (FAO) in collaboration with the Organisation for Economic Co-operation and Development (OECD) and national partners in participating countries. It is financially supported by the Bill and Melinda Gates Foundation, the United States Agency for International Development (USAID), and FAO.

The analysis presented in this document is the result of the partnerships established in the context of the MAFAP project with governments of participating countries and a variety of national institutions.

For more information: www.fao.org/mafap

Suggested citation:

Gourichon H., 2013. Analysis of incentives and disincentives for sugar in Nigeria. Technical notes series, MAFAP, FAO, Rome.

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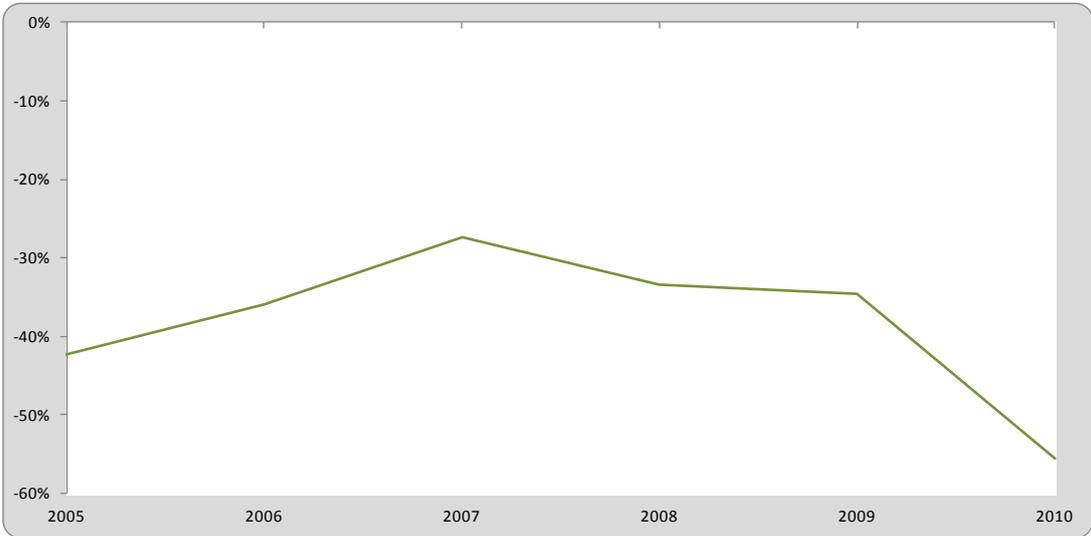
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SUMMARY OF THE NOTE

Product: Raw sugar
Period analyzed: 2005 – 2010
Trade status: Net importer in all years

- Sugar is the 2nd agricultural import in Nigeria in terms of quantity. The average share of imports of raw sugar in the domestic supply is about 96% (2005-2009);
- Despite the increasing production level, yields remain low compared to other African countries;
- Mills have been privatized and rehabilitated since 2002 and the rehabilitation is still ongoing.
- The National Sugar Policy was drawn up in 2003 and the Sugar Master Plan in 2010 to foster the sugar production and process.



The observed Nominal Rate of Protection (NRP, green line) indicates that sugar producers received variable disincentives from 2005 to 2010.

- The policies in force had a significant impact on production level. However, the National Sugar Policy focused more on improving productivity at process level rather than at production level;
- The high concentration of mills (limited number and geographic concentration) results in an oligopolistic situation limiting the market opportunities for producers and preventing them from receiving higher prices;
- Access costs are high due to inefficient process activities, high transport costs and lack of connection between producers and mills.

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1. PURPOSE OF THE NOTE

This technical note aims to describe the market incentives and disincentives for sugar in Nigeria.

For this purpose, yearly averages of farm-gate and wholesale prices are compared with reference prices calculated on the basis of the price of the commodity in the international market. The price gaps between the reference prices and the prices along the value chain indicate to which extent incentives (positive gaps) or disincentives (negative gaps) are present at farm-gate and wholesale level. In relative terms, the price gaps are expressed as Nominal Rates of Protection. These key indicators are used by MAFAP to highlight the effects of policy and market development gaps on prices.

The note starts with a brief review of the production, consumption, trade and policies affecting the commodity and then provides a detailed description of how the key components of the price analysis have been obtained. The MAFAP indicators are then calculated with these data and interpreted in the light of existing policies and market characteristics. The analysis that has been carried out is commodity and country specific and covers the period 2005 - 2010. The indicators have been calculated using available data from different sources for this period and are described in Chapter 3.

The outcomes of this analysis can be used by those stakeholders involved in policy-making for the food and agricultural sector. They can also serve as input for evidence-based policy dialogue at country or regional level.

This technical note is not to be interpreted as an analysis of the value chain or detailed description of production, consumption or trade patterns. All information related to these areas is presented merely to provide background on the commodity under review, help understand major trends and facilitate the interpretation of the indicators.

All information is preliminary and still subject to review and validation.

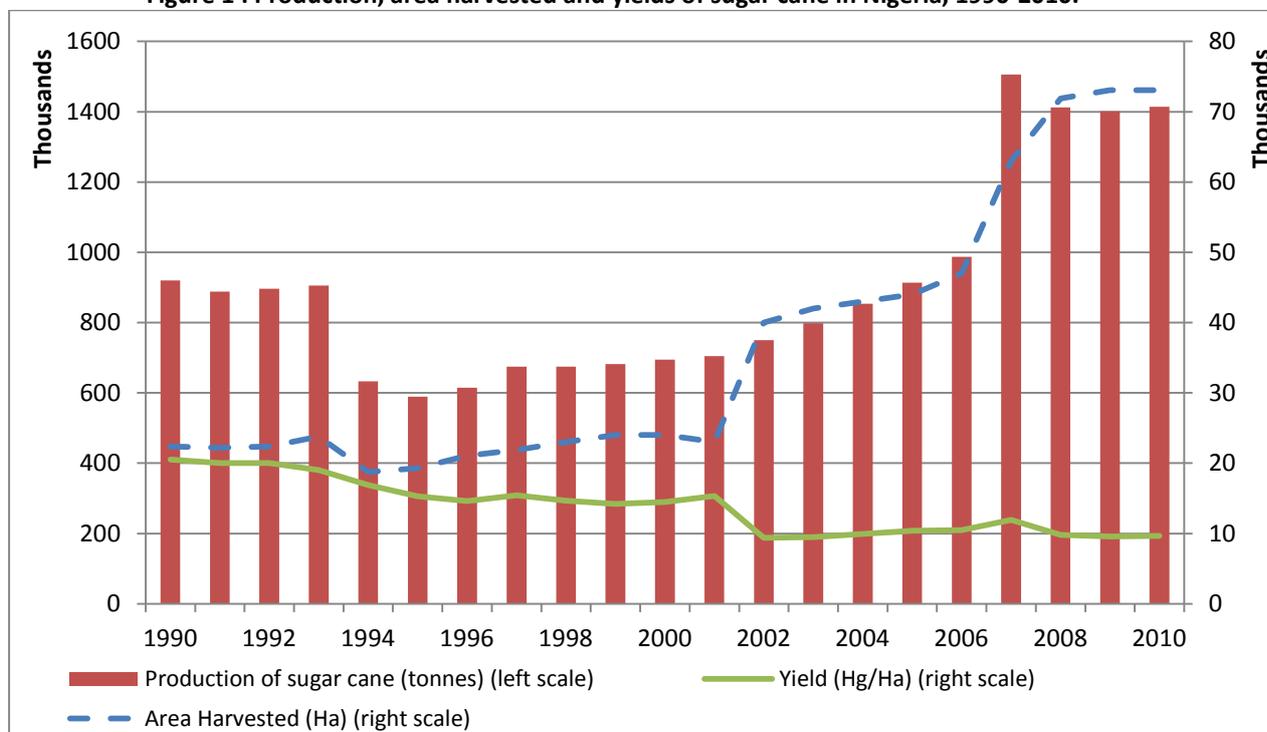
2. COMMODITY CONTEXT

The Nigerian sugar industry remains underdeveloped and the Government of Nigeria (GON) through the National Sugar Development Council (NSDC) intends to foster sugar production. Since domestic demand is unmet, sugar is largely imported. Raw sugar was the 2nd agricultural import in Nigeria in terms of quantity (after wheat) and the 3rd in terms of value (after wheat and palm oil) for the period 2005-2010 (FAOSTAT, 2012).

PRODUCTION

In 2010, Nigeria was the 2nd largest producer of sugar cane in West Africa after Ivory Coast and the 19th in Africa (FAOSTAT, 2012). In terms of yields, Nigeria is one of the least productive countries in the continent. Production increase is essentially attributed to the growth in area harvested owing to yields steadily declined since the 90's (Figure 1).

Figure 1 : Production, area harvested and yields of sugar cane in Nigeria, 1990-2010.

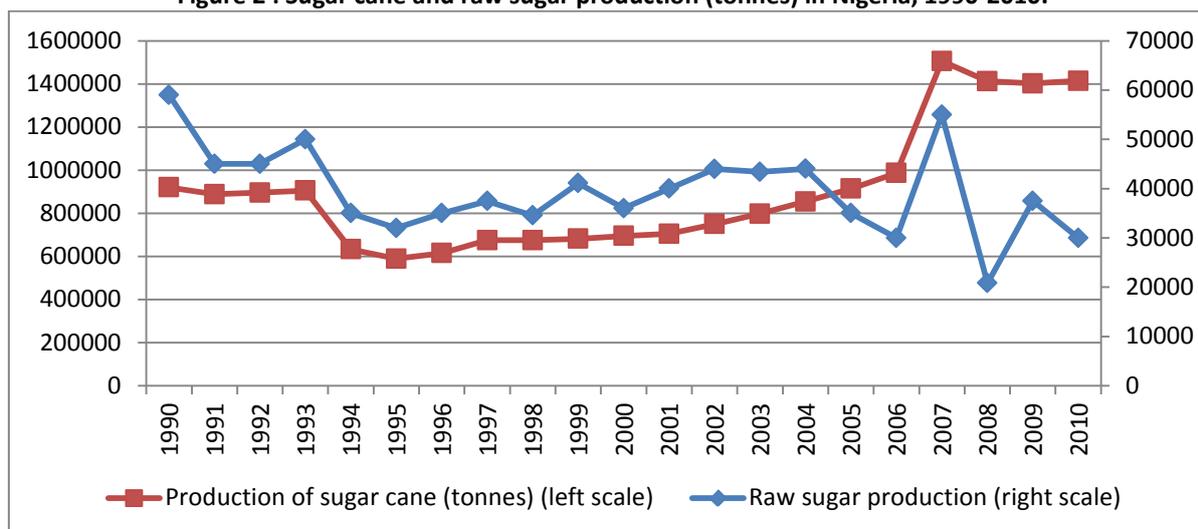


Source: FAOSTAT, 2012

The strong growth in area harvested is correlated with the mills privatization. Since 2002, four companies have been privatized (Table 1) in order to boost sugar cane production and consequently to reduce sugar imports. In addition to this area extension, mills have also been steadily rehabilitated between 2002 and 2010 resulting in production increase. However, the privatization did not lead to higher yields, although it did halt their steady decline since 2002. Low yields have resulted in negative consequences for the profitability of the companies and for the competitiveness of the commodity.

During the 1990's, raw sugar production followed the same trend as the sugar cane production. From the privatization in 2002, raw sugar production has been characterized by high variations and by a strong decline in 2008 (Figure 2). The literature available could not explain this trend.

Figure 2 : Sugar cane and raw sugar production (tonnes) in Nigeria, 1990-2010.



Source: FAOSTAT, 2012

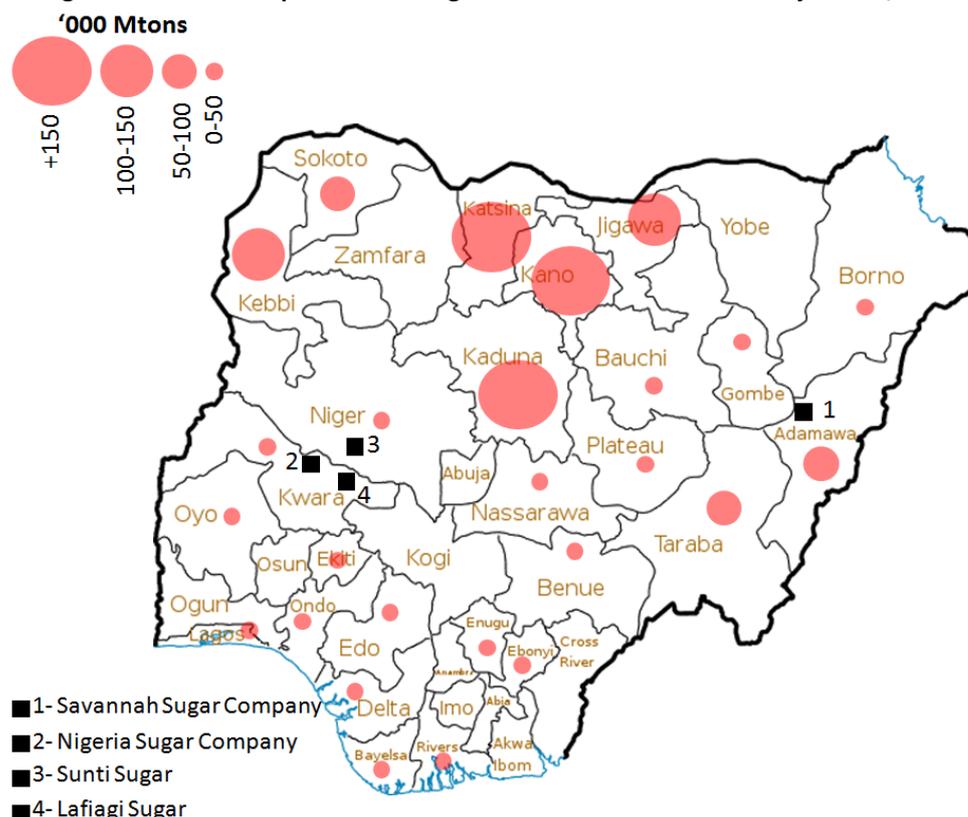
Sugar cane is not a major commodity in the country in terms of value and quantity of production compared to other crops. The production represented 0.3% of the national GDP and only 1% of the agricultural GDP in 2006 (IFPRI, 2006).

Climatic conditions are favorable for the production of sugar cane in the country even if the lack of water is a major constraint. Irrigation is therefore used extensively in sugar production to compensate the lack of water, irrigation for sugar being more common in Nigeria than irrigation for rice or maize (WB, 2009). The National Sugar Development Council as well as the mills provide supports to producers to ensure irrigation (section POLICY DECISIONS AND MEASURES).

Sugar cane production is mainly located in the North Central part of the country and close to the border with Niger (Figure 3), with Kano State accounting for 30% of the national production (NBS, 2009). The border states of Kano, namely Jigawa, Kaduna and Kastina, represent respectively 8%, 13% and 13% of the domestic production. Two other regions remain important in terms of production: the North West (Kebbi and Sokoto) as well as the Central East (Taraba and Adamawa). The 8 states mentioned above represented 86% of the total production in 2009-2010 (USDA, 2010) but most of the states in the country have reported production of sugar cane even if it refers to very small amounts.

The largest mill -Savannah Sugar Company- is situated in the Adamawa State and the three other major mills are concentrated in the Central East part of the country (Figure 3). The mills are not situated in the major production area, which is significant constraint for the producer.

Figure 3 : Production per states in Nigeria and localization of the major mills, 2009-2010.



Source : Authors based on National Bureau of Statistics, 2012 and USDA, 2010

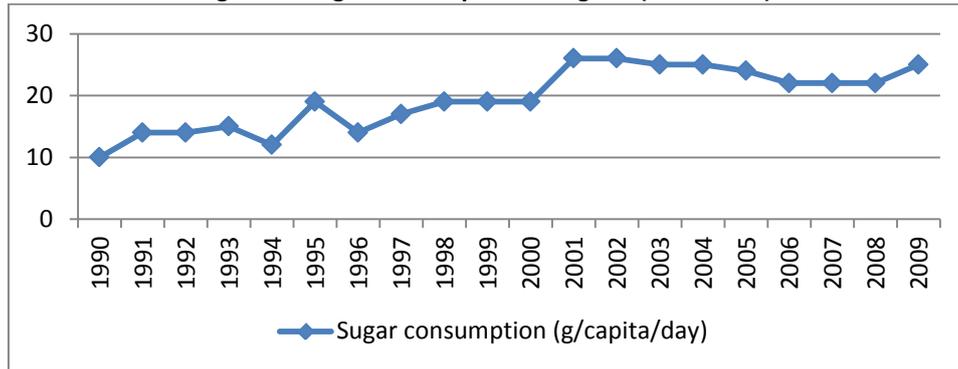
In Nigeria, two types of sugar cane are produced: the industrial cane and the chewing cane. The industrial one is the major raw material used in the mills, by contrast the chewing cane is mainly chewed in its natural form for its sweet juice but it can be also processed into various forms. In collaboration with the NSDC, new cane varieties have been imported in 2010 to increase production quantity.

CONSUMPTION/UTILIZATION

In 2010, Nigeria's annual consumption of sugar accounted for 50% of the West African consumption (USDA, 2010) owing the large amount of inhabitant in the country. Despite this, the consumption per capita of refined sugar has been low (25 g/capita/day) compared to the average consumption in all Africa (41g/capita/day) and with the average in West Africa (31g/capita/day) (FAOSTAT, 2012).

Sugar consumption is increasing due to the evolution of the Nigerian diet (Figure 4). The traditional Nigerian diet is essentially sugar-less, however preference of both the elite and middle class, and the growing young population, are changing from traditional little or no sugar-based diet to western diet, which contains high quantities of sugar.

Figure 4 : Sugar consumption in Nigeria (1990-2009).

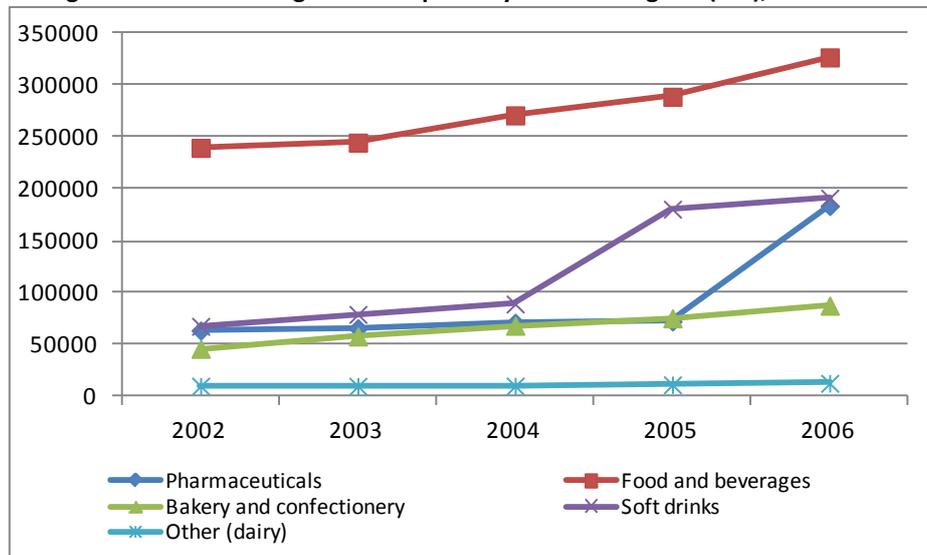


Source : FAOSTAT, 2012

Data corresponding to the share of human consumption on the total consumption are conflicting; as figures vary from 38% (NSDC, 2006) to 75% (USDA, 2006).

With regards to industrial utilization (Figure 5) namely manufacturing soft drink, pharmaceuticals, bakery and confectionary, food and beverage and dairy products, consumption is rising steadily especially for soft drinks and pharmaceutical industries. Food and beverages represent the largest consumer industries, accounting for 41% of the total industrial sugar consumption in 2006 (NSDC, 2006). Lagos concentrates the highest industrial consumption in the country (82% in total in 2004) (NSDC, 2006).

Figure 5 : Industrial sugar consumption by sector in Nigeria (MT), 2002-2006.



Source: NSDC, 2006

Overall, the trend for domestic consumption has a significant potential for growth as industrial demand is growing and human consumption remains low compared to other African countries.

MARKETING AND TRADE

Nigeria is a net importer of sugar owing to the gap between sugar supply and demand, which is filled through massive imports (Table 1). As a consequence, there is an heavy reliance on imports and raw sugar was the 2nd commodity imported in Nigeria after wheat in terms of quantity in 2010 (FAOSTAT, 2012). Between 2005 and 2009, the average share of imports of raw sugar in the domestic

supply was about 96% (FAOSTAT, 2012). In terms of value, the average amount of imports of raw and refined sugar was \$ 480 919.17 per year during the period under review.

Table 1 : Production and trade of raw sugar in Nigeria (tonnes), 2005-2009.

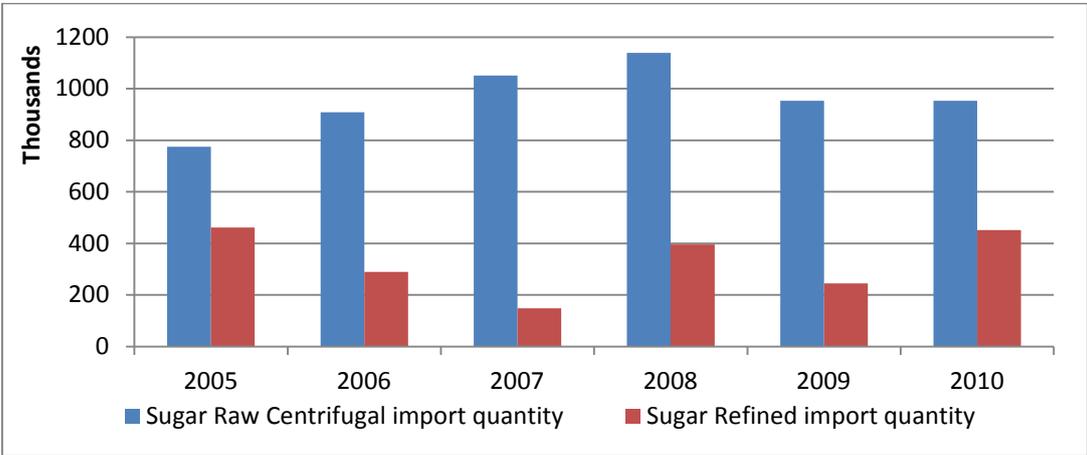
	2005	2006	2007	2008	2009
Production	55000	56400	69400	35211	51900
Import Quantity	1345616	1283438	1334274	1720740	1295204
Stock Variation	543	148	543	-271690	271788
Export Quantity	1661	1762	1044	3868	3716
Domestic supply quantity	1399498	1338224	1403173	1480394	1615176
Share of imports in the domestic supply	96.1	95.9	95.1	116.2	80.2
Share of exports in the domestic supply	0.1	0.1	0.1	0.3	0.2

Source: FAOSTAT, 2012

With regards to the type of sugar imported, raw sugar is mostly traded in order to be domestically refined. The sole importer of raw sugar, in 2010, was the Dangote Group, which owns one refinery situated in Lagos. As 70% of the direct costs to produce refined sugar correspond to raw material cost namely raw sugar, international prices directly affect the processing cost.

Refined sugar is also imported but in smaller quantity (Figure 7) as the duty fee applied by the GON on refined sugar discourages imports. Considering refined and raw sugar together, imports remained stable from 2005 to 2007 and increased in 2008 probably to meet the domestic requirement as the production decreased this year.

Figure 6 : Imports of raw and refined sugar in Nigeria ('000 tonnes), 2005-2010.

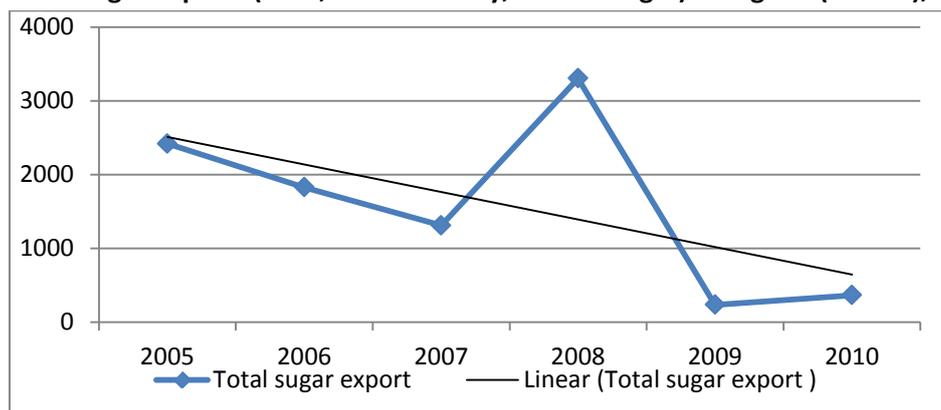


Source: FAOSTAT, 2012

The bulk of Nigeria’s sugar imports, both refined and raw, mainly comes from Brazil. Between 1997 and 2006, Nigeria was the second main export destination for Brazil (after Russia), accounting for 8% of the country’s total exports (TRALAC, 2007). In addition, between 2005 and 2010, Nigeria imported large amounts of raw sugar from United States, China, Guatemala and France.

On the other hand, sugar exports have drastically decreased since 2005 (Figure 8). The type of sugar mostly exported is the refined sugar.

Figure 7 : Total sugar exports (cane, confectionary, refined sugar) in Nigeria (tonnes), 2005-2010.



Source : FAOSTAT, 2012

Trans-border formal exports with the neighboring countries are expected to increase to reach 100 000 tonnes annually, especially because Dangote refinery concluded in 2010 a plan to start formal sugar exports to Ghana, Niger and Senegal. Indeed, sugar produced in Nigeria can be found in most West and Central African countries, and especially in the land-locked countries.

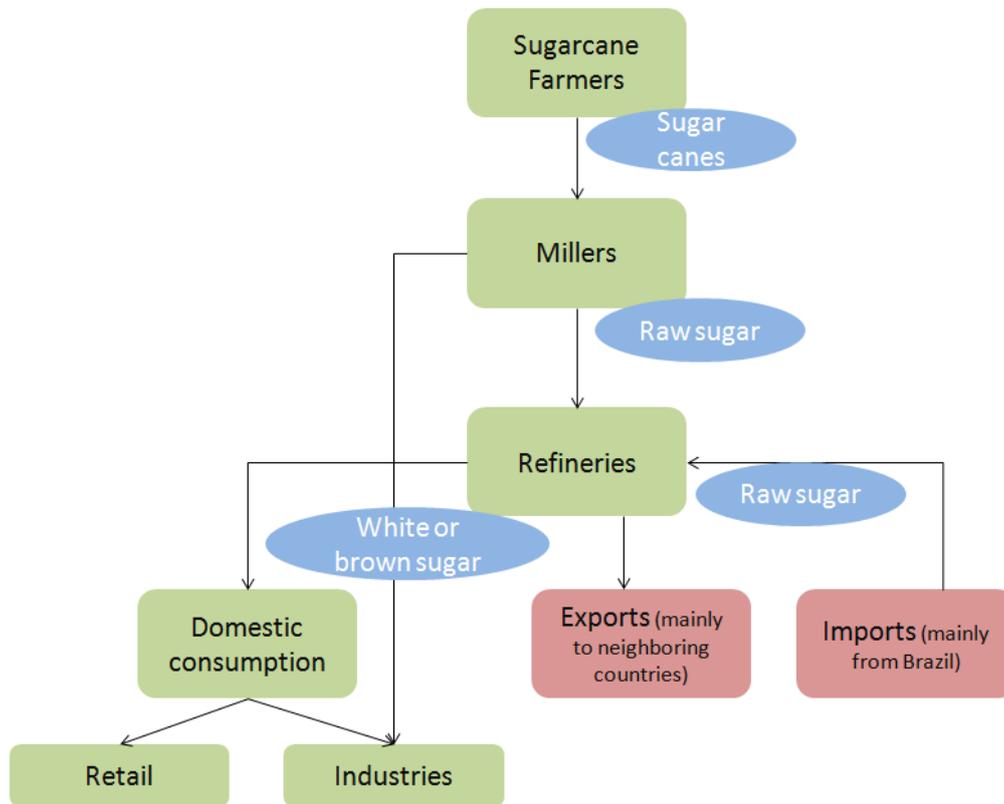
Refined sugar produced in Nigeria is competitive in some regional markets but not in international market (WB, 2009). The price of raw and refined local sugar is higher than the price of imported sugar and this is probably due to the subsidies granted to international sugar producers who dump their surplus sugar on the international market (Oloma, 2007). Therefore, international prices are so low that Nigerian sugar can hardly be competitive.

DESCRIPTION OF THE VALUE CHAIN AND PROCESSING

Sugar production relies on an estate-base industrial system.

After being harvested, sugar canes need to be processed very quickly, otherwise the crop can experience a rapid decline in quality and hence value. The canes are milled to be converted in raw sugar, which can be refined or used in the sugar industries (Figure 9).

Figure 8 : Raw and refined sugar value chain in Nigeria.



Source: Authors

Producers

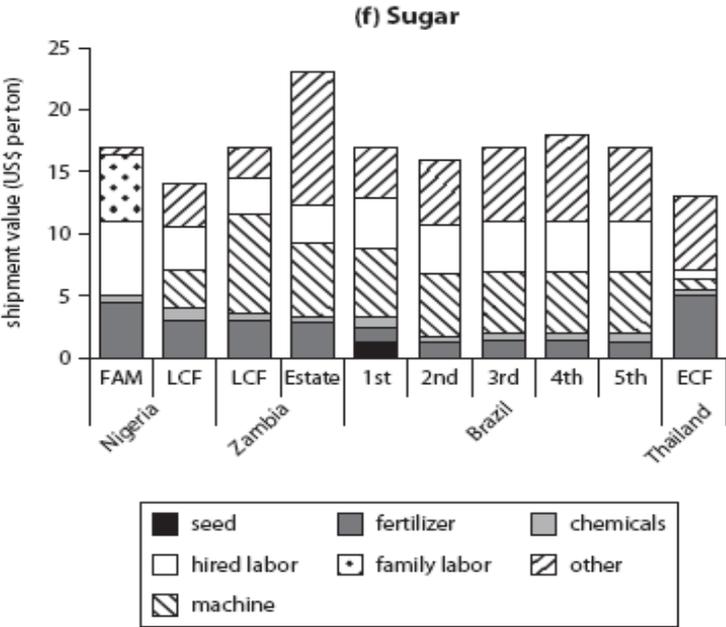
Privatization has reinvigorated the sugar industry, but at the same time has restricted the market and consequently discouraged production by small-scale farmers. Even if the sugar cane prices have increased, the output prices remain low and unattractive for the producers (Oloma, 2007). Indeed, local farmers would obtain higher returns for putting their resources into cultivation of other crops such as rice or chewing cane. Moreover, the availability of cheap imported raw sugar led to a progressive decline of the local production.

Few farmers have apparently joined the estate based out-grower scheme due to the low financial return offered. To compensate low returns and to foster production, mills and NSDC provide a direct support, acting as a production incentive to farmers. For instance, Savannah Sugar Company has started a program providing irrigation, seeds and other inputs to 500 farmers (first phase 2010/11). National policies aim to reinforce the link and the coordination between the mills and the producers (section POLICY DECISIONS AND MEASURES).

The inputs to produce sugarcane vary according to the size of the farm, namely the family farms and the large commercial farms. In Nigeria, a third of the shipment value in the family farm is the family labor, the machines are not used unlike in large commercial farms (World Bank, 2009). Fertilizers are commonly used in both type of farms (Figure 10) but neither family farms nor commercial farms use improved seeds. There is no significant difference in the composition of the shipment value of

Nigerian and Brazilian commercial farms, which means that Nigerian producers from large commercial farms could potentially compete with international market.

Figure 9 : Composition of farm gate shipment values in Nigeria, Zambia, Brazil and Thailand in 2007.



Source : WB, 2009

Note: FAM = family farms. ECF = emerging commercial farms. LCF = large commercial farms. Estate = Estate farms (Zambia only).

Flows from the producers to the mills

Small-scale farmers are also discouraged by the restricted number of mills available. In addition, most of the farmers are far away from the mills (Figure 3), which represents an important disincentive for both producers and millers. Producers of sugar cane can only sell their production to the limited number of mills, reached at a very high transport costs (Oloma, 2007). By contrast, producers of chewing cane can sell their products in various local markets.

Mills

The existing mills (Figure 3) are under-utilized compared to their capacity of production. This is due to the inadequate and irregular supply of sugar cane to the mills and the low production. The mills privatization started in 2002 to improve their efficiency and capacity.

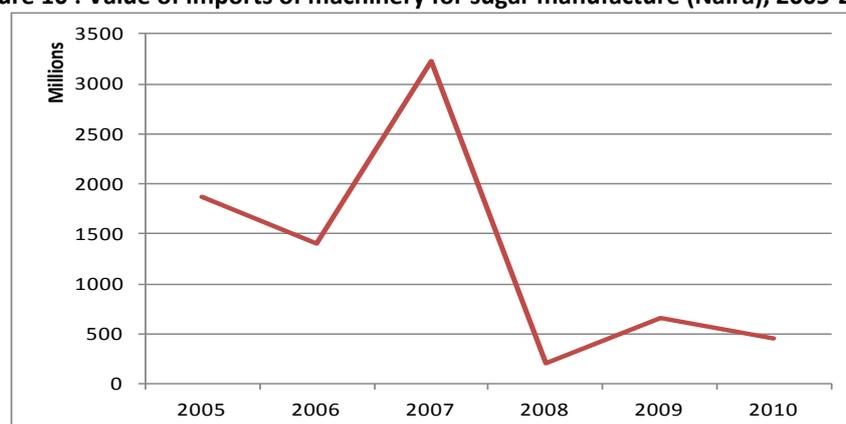
Table 2: Overview of the mills in Nigeria.

Name of the Mills	Year of privatization	Location	Owners	State of rehabilitation
Savannah Sugar Company	2002	Numan, Adamawa State	Dangote Group	Rehabilitated, and extension of cane fields. Largest producer.
Nigeria Sugar Company	2006	Bacita, Kwara State	Josepdam and Sons	Rehabilitated and milling operations started during 2010-2011 season.
Sunti Sugar	2008	Mokwa, Niger State	BUA Group	Rehabilitation ongoing (2010).
Lafiagi Sugar	2009	Lafiagi, Kwara State	Flours Mills Nigeria	Rehabilitation ongoing (2010).

Source : Authors based on USDA

When looking at the imports of machinery for sugar manufacture, we note a peak in 2007 reflecting the strong investments in the sector (Figure 11).

Figure 10 : Value of imports of machinery for sugar manufacture (Naira), 2005-2010.



Source : National Custom Service, 2012

Refineries

As mentioned above, refined sugar production partially relies on raw sugar imports. In 2010, Nigeria had an installed production capacity of about 2.1 million tonnes between BUA Sugar Refinery and Dangote Sugar Refinery (Afrinvest, 2010). Dangote sugar company, situated in Lagos, is the major refining industry with a 1.44 million tonnes installed capacity (USDA, 2010). The company shares are listed on the Nigerian Stock Exchange (NSE). Until 2008, the company had the monopoly in the sugar sector. However, BUA Group, also situated in Lagos is regenerating its infrastructures and the company has also planned to export refined sugar in Africa (Corporate Nigeria, 2011).

POLICY DECISIONS AND MEASURES

National policies aim at moving Nigeria from imports dependence to self sufficiency. Reaching at least 70% of self-sufficiency by 2010 was the main objective when the privatization started (USDA, 2005). The creation of the National Sugar Development Council, as well as the privatization of the mills, were part of this strategy. However, Nigeria still relies strongly on imports since 80% of the sugar consumption came from imports in 2009.

The National Sugar Development Council (NSDC)

The NSDC is the government's sugar sector development agency. It was set up in 1993 to raise domestic production. Its first goal was to privatize the mills. Since the privatization has been completed, the agency monitors programs to support the development of the sector. The National Sugar Policy was drawn up in 2003 and the Sugar Master Plan in 2010.

The National Sugar Policy -2003 (NSP) aimed to:

- Extend and rehabilitate the existing mills (Table 1).
- Establish 5 medium scale mills and many mini plants.

The NSDC involves private sector participation to set-up small sugar plants for communities or individuals. The agency provides infrastructure facilities, including access road boreholes, power lines, land, and health care facilities (USDA, 2010). Moreover, the GON decided to apply a low duty of 2.5% on the machinery import and to remove imports duties on agricultural chemicals for sugar production.

- Organize the sugarcane out growers in connection with the sugar mills.

The NSDC provides assistance to the farmers in connection with mills, supporting irrigation, infrastructures, fertilizers, and subsidizing pesticides, improved seeds and other inputs. Moreover, it aims to establish a support mechanism to ensure that farmers receive a fair deal from the mills. In collaboration with the Central Bank and local bank, NSDC introduced a new scheme to deliver inputs and credits to out grower cooperatives at a low interest rate. The Council especially encourages and assists farmers living in and around the existing mills.

- Establish a Sugarcane Research Development and Training Centre.

The agency also collaborates with other government agencies such as the GON's River Basin Development Authorities and the State Agricultural Development Projects.

The main source of revenue for the Council is the levy on the CIF value of imported sugar.

Trade policies

The Government applies high duties on refined sugar imports (Table 2) in order to protect the local refineries and to encourage new investments in local refining capacity.

Table 3 : Import duties applied to refined sugar in Nigeria, 2005-2010.

Year	Duty	Port surcharge	Development levy	VAT	Custom Inspection Surcharge	ECOWAS trade Liberalization Scheme	Effective duty
2005	40%	7% of the duty	10%	5%	1% of the FOB	0.5% of the CIF	60%
2006	40%	7% of the duty	10%	5%	1% of the FOB	0.5% of the CIF	60%
2007	40%	7% of the duty	10%	5%	1% of the FOB	0.5% of the CIF	60%
2008	50%	7% of the duty	10%	5%	1% of the FOB	0.5% of the CIF	65%
2009	n.a	n.a	n.a	n.a	n.a	n.a	n.a
2010	20%	10% of the duty	5%	n.a	n.a	n.a	35%

Source: Authors based on USDA

By contrast, raw sugar imports attract a lower duty of 5% and are exempt from payment of sugar development levy (USDA, 2005).

The GON also applies non-tariff barriers to protect the local production. Since 2005, the government has banned the import of refined sugar that is not fortified with vitamin A in order to eradicate vitamin A deficiency in Nigeria. However, this measure had a significant impact on business health for some companies (fortification costs about 10\$ per tonnes) so the Association of Food and Beverage Employers have requested in 2005 a waiver to import unfortified sugar for their exclusive use and the local refineries are now allowed to supply non- fortified sugar to industrial users.

Furthermore, the GON required that all sugar consumed in Nigeria have a minimum of 45 ICMSA, which corresponds to a international unit related to the purity of the sugar and to its color.

3. DATA REQUIREMENTS, DESCRIPTION AND CALCULATION OF INDICATORS

In order to calculate the indicators required for the analysis and to estimate incentives and/or disincentives for sugar production, several types of data are needed. They were collected and are presented and explained hereafter.

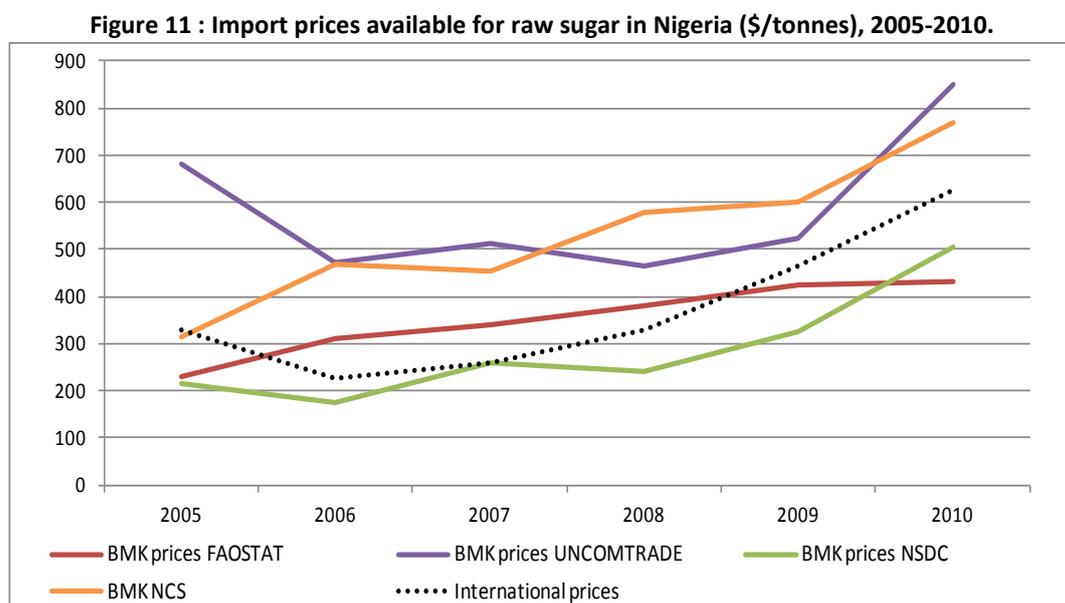
TRADE STATUS OF THE PRODUCTS

Nigeria is a net importer of sugar. In terms of quantity, raw sugar imports are larger than refined sugar imports (Figure 7). Consequently, the analysis will be focused on raw sugar.

BENCHMARK PRICES

Observed

Since Nigeria is a net importer of raw sugar, the CIF price was taken as benchmark price. Import prices for raw sugar from different sources were available (Figure 12) and prices from the National Custom Service (NSC) were selected for the analysis. Indeed, prices provided by the National Sugar Development Council (NSDC) are too low compared to international prices. It is also preferable to use national rather than international sources and data from FAOSTAT and UNCOMTRADE are disconnected from international prices.



Source: FAOSTAT, 2012; NCS,2012; NSDC,2012; UNCOMTRADE,2012; GEMS- WB, 2012

The 2005 and 2007 prices were not provided by the NSC and therefore were calculated using the Consumer price index from the World Bank (Table 4).

Table 4 : Benchmark prices for sugar in Nigeria (\$/tonnes), 2005-2010.

	2005	2006	2007	2008	2009	2010
Sugar benchmark prices	459.1205	468.48	479.0687	578.4072	601.3072	770.279

Source : NCS,2012 and WB,2012

Adjusted

No adjustment to the benchmark price has been made.

DOMESTIC PRICES

Wholesale prices

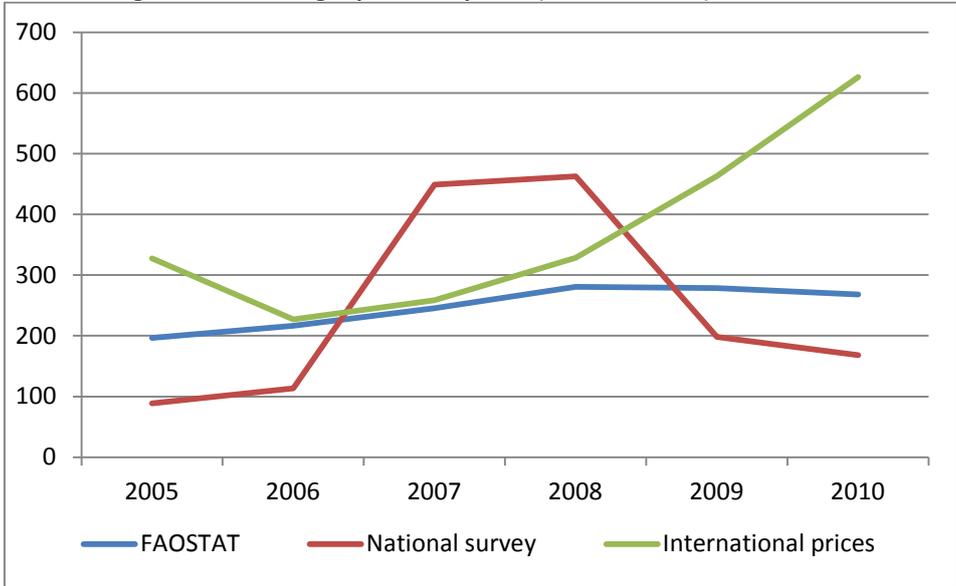
In the case of the raw sugar analysis, we do not consider wholesale prices since import raw sugar competes with local production at the factory gate, the point of competition being the factory processing raw into refined sugar. However, prices at factory gate were not available thus the analysis will only focus on incentives/disincentives at producer level.

Nonetheless, we identified the point of competition in order to assess the access costs from the border to the point of competition and from the producer to the point of competition. Taking into account the data availability for access costs, the level of production per state and the location of the main factories, we selected the Savannah Sugar Company in Numan, Adamawa State as the point of competition. This means that the refinery costs are not taken into account in the analysis.

Farm gate prices

Two types of prices were available for the analysis : national average prices from a survey conducted by the Federal Ministry of Agriculture, the National Bureau of Statistics and the Central Bank of Nigerian and average producer prices from FAOSTAT (Figure 13). In both cases, these prices do not take into account regional disparities and gaps between prices obtained by producers connected to mills and producers working on their own.

Figure 12 : Raw sugar producer prices (dollar/ tonnes), 2005-2010.



Source : FAOSTAT 2012; NBS-Min.Ag. and CBN, 2012; GEMS-WB, 2013

Data recorded by FAOSTAT and from the national survey were reported as sugar cane. However, after comparing with international prices and prices reported by USDA and using the 0.1 factor to convert cane to raw, we assumed that FAOSTAT and national prices correspond to raw sugar and not cane (Table 5).

Table 5 : Sugar producers prices as reported in different reports and surveys (dollar/ tonnes), 2005-2010.

	2005	2006	2007	2008	2009	2010
International prices raw	327	227	259	329	463	627
USDA raw	N.A.	N.A.	N.A.	N.A.	N.A.	285
FAOSTAT prices "cane"	197	216	245	281	279	268
National survey "cane"	88	113	449	463	198	168

Source : FAOSTAT,2012; NBS-Min.Ag. and CBN, GEMS-WB, 2010; USD,2010

Even if national sources are preferable in this type analysis, FAOSTAT prices were selected owing to their consistency with international and USDA prices. Moreover, there is no evidence in the context analysis explaining a such price increase in 2007 and 2008.

The adjusted domain was not analyzed due to a lack of availability of the data.

EXCHANGE RATES

Observed

We applied the exchange rate between US dollar and Naira (NGN) since the benchmark prices are in USD (Table 6).

Table 6 : Exchange rate (NGN/USD), 2005-2010.

	2005	2006	2007	2008	2009	2010
Exchange rate NGN per USD	131	129	126	119	149	150

Source: World Bank, 2012

Adjusted

As there is no explicit exchange rate policy nor foreign currency control there is no justification to consider an adjusted exchange rate.

ACCESS COSTS

The access costs were collected for two different segments in the value chain :

- from the border (port of Lagos) to the point of competition (Savannah Sugar Company in Numan, Adamawa State);
- from the point of competition (Savannah Sugar Company in Numan, Adamawa State) to the farm gate (Numan, Adamawa State). The Savannah Sugar Company is the largest mill converting raw sugar into refined sugar and the cane is mostly collected from producers close to the mills.

The access costs corresponding to the sugar value chain in Nigeria were indicated in a World Bank report analyzing commodity specific competitiveness in Africa (Table 7). They refer to family farm prices. Access costs were available only for 2007 and the remaining years were calculated using the Consumer price index from the WB.

Processing costs reflect costs to process cane into refined sugar and thus they were adjusted to obtain processing costs for raw sugar (Table 7). Despite the fact that access costs from border to

point of competition correspond to the segment from port to point of consumption, access costs were not adjusted. We assume that the costs are similar since the point of consumption and the point of competition are both located in Numan and reflect transports and logistics.

Table 7 : Access costs from farm-gate to point of competition and from border to point of competition for raw sugar in Nigeria (NGN/tonnes), 2005-2010.

SMALL SCALE FARM		2005	2006	2007	2008	2009	2010
From farm gate to point of competition	Assembly and processing to refined sugar (T)	28787	31159	32836	36638	40865	46472
From farm gate to point of competition	Assembly and processing to raw sugar (T)*	22166	23992	25284	28211	31466	35783
From border to point of competition	Logistic port to consumption	6618	7163	7548	8422	9394	10683

Source : Awakening Africa's Sleeping Giant, World Bank, 2007

* Coefficient factor = 0.77. 23% is the gap between costs for refined sugar and for raw sugar (international prices, average gap for the 2000-2010 period)

EXTERNALITIES

We are not aware of any positive or negative externalities associated with sugar production in Nigeria and have therefore not considered this concept in the analysis.

BUDGET AND OTHER TRANSFERS

We have not been able to identify an allocation key for sugar and therefore no BOT have been considered.

QUALITY AND QUANTITY ADJUSTMENTS

All prices used in the analysis referred to raw sugar. Therefore, no conversion factor was used in the analysis.

DATA OVERVIEW

Following the discussions above here is a summary of the main sources and methodological decisions taken for the analysis of price incentives and disincentives for sugar in Nigeria.

Table 8 : Data and source used for the analysis

Concept		Description	
		Observed	Adjusted
Benchmark price		→The CIF price is calculated using the volume and the value of imports from National Custom Service	N.A.
Domestic price at wholesale		→The wholesale prices were not available.	N.A.
Domestic price at farm gate		→Farm gate prices were reported by FAOSTAT.	N.A.
Exchange rate		→The exchange rate used comes from the International Monetary Fund.	N.A.
Access cost from border to the wholesale		→ Access costs used in the analysis were reported in an analysis conducted by the World Bank.	N.A.
Access costs from farm gate to the wholesale		→ Access costs used in the analysis were reported in an analysis conducted by the World Bank.	N.A.
QT adjustment	Bor-Wh		N.A.
	Wh-FG	N.A.	N.A.
QL adjustment	Bor-Wh	N.A.	N.A.
	Wh-FG	N.A.	N.A.

Source : Authors

Table 9 : Data used for the analysis, 2005-2010.

		Year	2005	2006	2007	2008	2009	2010
		trade status	<i>m</i>	<i>m</i>	<i>m</i>	<i>m</i>	<i>m</i>	<i>m</i>
DATA	<i>Unit</i>	<i>Symbol</i>						
Benchmark Price								
Observed	USD/t	$P_{b(intS)}$	459.12	468.48	479.07	578.41	601.31	770.28
Adjusted	NGN/t	P_{ba}						
Exchange Rate								
Observed	fCFA/NGN	ER_o	131.27	128.65	125.81	125.81	125.81	150.30
Adjusted	fCFA/NGN	ER_a						
Access costs border - wholesale								
Observed	NGN/t	AC_{owh}	6,617.69	7,162.96	7,548.49	8,422.45	9,394.20	10,683.11
Adjusted	NGN/t	AC_{awh}						
Domestic price at wholesale	NGN/t	P_{dwh}						
Access costs wholesale - farm gate								
Observed	NGN/t	AC_{ofg}	22,165.96	23,992.33	25,283.66	28,210.99	31,465.89	35,783.07
Adjusted	NGN/t	AC_{afg}						
Farm gate price	NGN/t	P_{dfg}	25,795.41	27,840.22	30,860.73	35,301.76	35,075.30	40,309.93
Externalities associated with production	NGN/t	E						
Budget and other product related transfers	NGN/t	BOT						
Quantity conversion factor (border - point of competition)	Fraction	QT_{wh}						
Quality conversion factor (border - point of competition)	Fraction	QL_{wh}						
Quantity conversion factor (point of competition - farm gate)	Fraction	QT_{fg}						
Quality conversion factor (point of competition - farm gate)	Fraction	QL_{fg}						

Source : Authors

CALCULATION OF INDICATORS

The indicators and methodology applied in this analysis are described in Box 1. A detailed description of the calculations and data requirements is available on the MAFAP website.

Box 1: MAFAP POLICY INDICATORS

MAFAP uses four measures of market price incentives or disincentives. *First*, it uses two observed nominal rates of protection (NRPs), one at the wholesale and one at the farm gate level. These compare the commodity's observed domestic prices to reference prices free from domestic policy interventions.

Reference prices are calculated from a benchmark price, such as an import or export price, which is expressed in the country's local currency and brought to the wholesale and farm gate levels with adjustments for quality, quantity, market access costs, shrinkage and loss.

The **Nominal Rate of Protection - observed (NRPo)** is the price gap between the domestic market price and the reference price divided by the reference price at both the farm gate and wholesale levels:

$$NRPo_{fg} = (P_{fg} - RPo_{fg})/RPo_{fg}; \quad NRPo_{wh} = (P_{wh} - RPo_{wh})/RPo_{wh};$$

The $NRPo_{fg}$ captures all trade and domestic policies, as well as other structural factors affecting incentives and disincentives for the farmer, while the $NRPo_{wh}$ helps identify where incentives and disincentives may be distributed along the commodity's marketing chain.

Second, MAFAP uses the **Nominal Rate of Protection - adjusted (NRPa)** at the wholesale and farm gate level, in which the reference prices are adjusted to eliminate excessive access costs and other distortions found in the commodity's marketing chain. The equations to estimate the adjusted rates of protection, however, follow the same general pattern:

$$NRPa_{fg} = (P_{fg} - RPa_{fg})/RPa_{fg}; \quad NRPa_{wh} = (P_{wh} - RPa_{wh})/RPa_{wh};$$

MAFAP also analyzes **Market Development Gaps (MDGs)** caused by market power, exchange rate misalignments, externalities and excessive access costs, which, when taken out of the observed reference prices, generate the adjusted reference prices and NRPa indicators. A comparison of the different rates of protection identifies where market development gaps can be found and reduced in the marketing chain.

Table 10 : MAFAP Price Gaps for sugar in Nigeria, (NGN/t), 2005-2010.

	2005	2006	2007	2008	2009	2010
Trade status for the year	m	m	m	m	m	m
Observed price gap at farm gate	(18,927.05)	(15,601.14)	(11,674.83)	(17,678.02)	(18,502.34)	(50,361.53)

Source: Author's own calculations using data as described above.

Table 11 : MAFAP Nominal Rates of Protection (NRPs) for sugar in Nigeria, 2005-2007 (%).

	2005	2006	2007	2008	2009	2010
Trade status for the year	m	m	m			
Observed NRP at farm gate	-42%	-35.91%	-27.45%	-33.37%	-34.53%	-55.54%

Source: Author's own calculations using data as described above.

4. INTERPRETATION OF THE INDICATORS

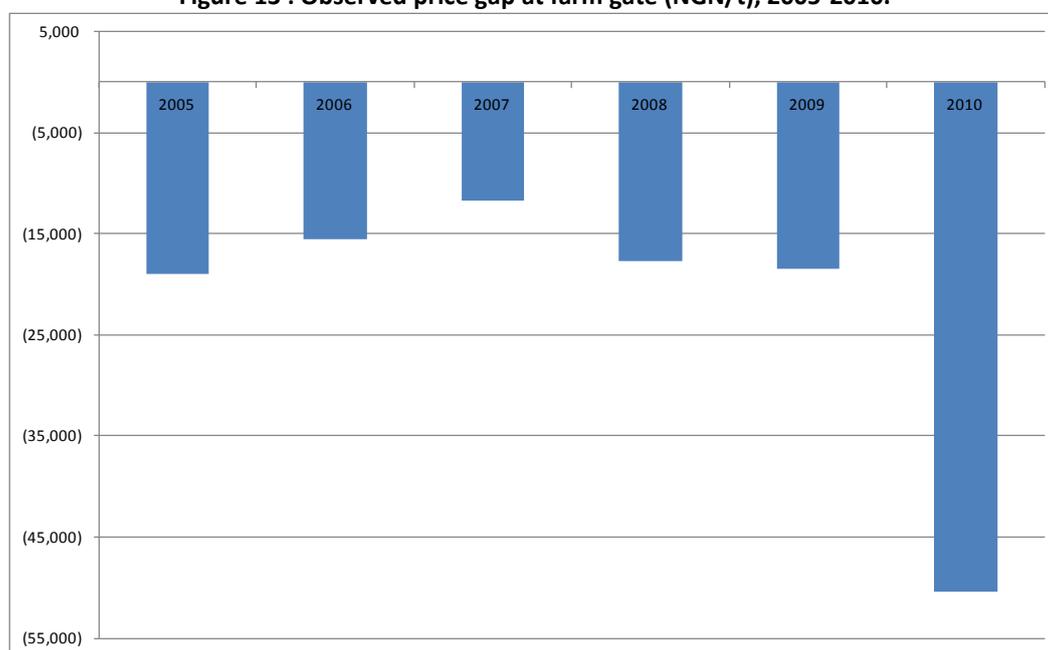
Figure 14 and Figure 15 show the results for the set of MAFAP indicators generated, which include price gaps and Nominal Rates of Protection (NRPs). Price gaps are market price differentials between the commodity's domestic and reference parity price in each respective year. More conceptually, they provide an absolute measure of the extent to which producers are protected or not under the existing market conditions and structure, while NRPs express this measure of protection as ratios that are comparable across countries and commodities.

Since the wholesale prices were not available, the analysis only provides incentives and disincentives information at producer level. Moreover, no data were available to calculate adjusted prices, therefore, the results focus on observed domain.

The National Sugar Policy in place was effective in the sense that production strongly increased. However, the policy measures in force and the current liberalized system did not lead to price incentives for sugar producers. Indeed, producers received disincentives from 2005 to 2010. The price gap declined from 2005 to 2007 and increased from 2008 onwards reaching -56% in 2010. International prices as well as border prices increased from 2007 to 2010 while producers prices barely increased resulting in increasing disincentives for producers.

The 5 percent import duty cannot explain such disincentives as inefficiencies in the sugar value chain penalized producers the most.

Figure 13 : Observed price gap at farm gate (NGN/t), 2005-2010.

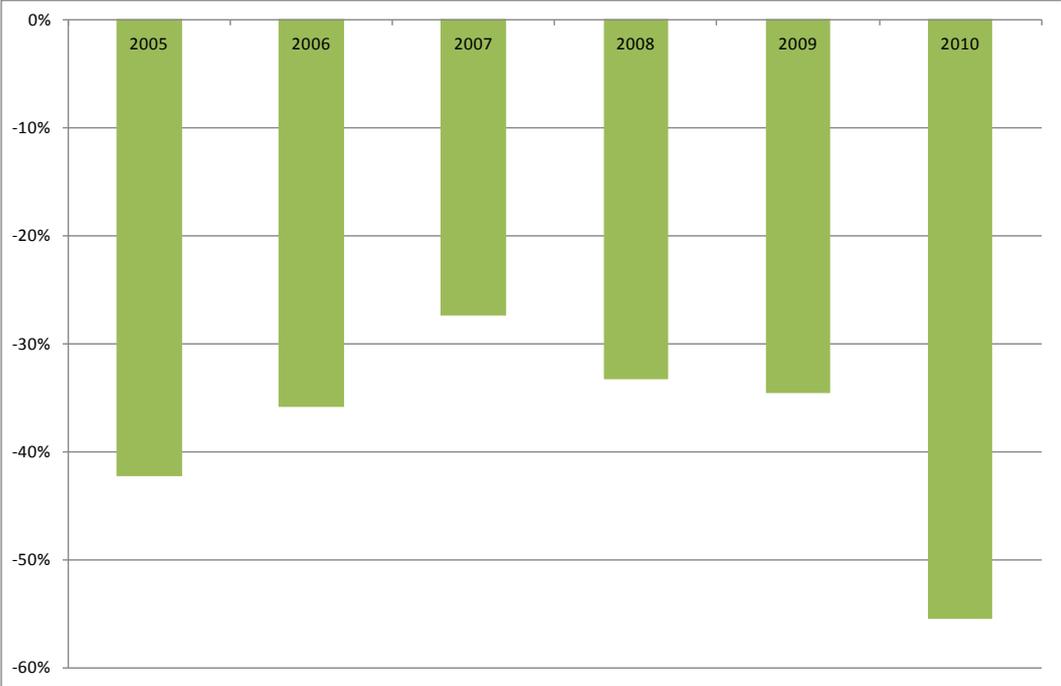


Source: Author's own calculations using data as described above.

The lack of competition between importers of raw sugar (companies processing import raw sugar into refined sugar) and between the mills results in an oligopoly system. Consequently, companies can easily fix the sugar producer prices. Moreover, producers entirely depend on mills, the processing industries being the only market for producer.

The high access costs due to ineffective processing system and the long distance between producers and mills could have penalized the producers. The high costs of processing could be explained by the under capacity of utilization of the mills and by their need of rehabilitation. Moreover, the few mills available within the country and their uneven geographical distribution could have penalized producers. This is especially true for the sugar value chain as the value of the cane decreases over time due to a reduction in the sucrose content. Due to the market power of the mills, it is more likely that producers bear the costs of these processing and marketing inefficiencies.

Figure 14 : Observed NRPs at farm gate (percent), 2005-2010.



Source: Author’s own calculations using data as described above.

The low yields and the low quality of sugar production (indicated by its lack of competitiveness in international markets) is also a driving factor of price penalization received by producers. This is especially true in this context where sugar import directly compete with local production and where high quality is requested by the processing companies.

5. PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

MAIN MESSAGE

The National Sugar Policy being more focused on mills liberalization and rehabilitation had a limited impact on producers during the period under review. The area harvested increased but yields remained low and producers received increasing price disincentives. Indeed, producers did not benefit from the increase of international sugar prices.

Despite the liberalization, the price penalization can be explained by the oligopoly system of the mills. A restricted number of mills drive the import market as well as the processing segment. This results in a strong market power at the expense of the producers, producers having very few opportunities to market their production.

In addition to the unbalanced market power, producers bear the costs of high access costs. These inefficiencies can be explained by the utilization of the mills below full capacity and their need for rehabilitation. On other hand, the uneven geographic distribution of the mills compared to the area of production and the limited number of mills also result in high transport costs.

However, strong national effort has been already made to increase the efficiency of the sugar value chain (better connection between producers and mills and rehabilitation of the mills). Therefore, incentives and disincentives should be further monitored and with recent data to assess the impact of these policy measures. So far, the main positive policy impact measured has been the production increase and the beginning of the mills rehabilitation process.

PRELIMINARY RECOMMENDATIONS

Sugar producers in Nigeria received lower prices compared to international reference prices. The MAFAP analysis suggests that the following measures could increase the producers prices:

- Ensuring that mills fix producer prices reflecting both international price trend and the value of production;
- Fostering competition between mills;
- Improving the marketing activities by reducing the transports costs and ensuring better connection between producers and mills;
- Making sure that the new plants under construction are located in the main area of production;
- Continue with the rehabilitation effort to make the process activities more efficient and improving the productivity;
- Improving the productivity by increasing yields with more policies supporting directly producers.

Increasing the productivity at production and processing level would help to satisfy the local demand and thus reduce sugar imports. This would also make the sugar value chain more competitive in regional and international markets.

LIMITATIONS

The main limitation is the lack of information on the value chain especially on the marketing aspects and on the import markets. This prevents an accurate understanding of the pathways .

Moreover, data used for access costs are not disaggregated which limits significantly the accuracy of the results.

The national average producer prices is used and they do not reflect the price variation due to the location and the type of producers.

The price at factory gate needs to be collected to better assess which actors in the value chain captures incentives or disincentives.

FURTHER INVESTIGATION AND RESEARCH

Further information is necessary to deepen the analysis such as :

- in-depth value chain analysis to better understand the price fixation process. Moreover, it is necessary to differentiate the analysis for small scale and industrial producers. Since 2003, the NSDC has fostered the implementation of small industries, but information about these mills is not available.
- The policies from the Sugar Master Plan should be assessed.
- Additional farm gate prices and factory gate prices should be collected.
- The access costs, especially the transport and process costs for the period under review should be looked for.

BIBLIOGRAPHY

Afrinvest (November 2010) *Dangote Sugar Refinery, Research Update*

Competitive Commercial Agriculture in Africa Study CCAA, A.Oloma (2006). *Nigeria case study*

Corporate Nigeria (2010/2011). *The Business, Trade and Investment Guide*

IFPRI (2010). *A 2006 Social Accounting matrix for Nigeria: Methodology and results*

National Sugar Development Council (2002-2006). *Report of the national survey on industrial sugar consumption in Nigeria*

National Sugar Development Council (2003). *National Sugar Policy*

TRALAC, Ron Sandrey and Nick Vink (2007). *Future prospects for African sugar: sweet or sour?*

UN. Commodity Trade Statistics (2012). *Database*
<http://comtrade.un.org/db/>

UN. Food and Agriculture Organization (FAO) (2012). *Trade data base, Production data base*
<http://faostat.fao.org/>

USDA Foreign Agricultural Service (2005). *GAIN report, Nigeria, sugar annual*

USDA Foreign Agricultural Service (2006). *GAIN report, Nigeria, sugar annual*

USDA Foreign Agricultural Service (2007). *GAIN report, Nigeria, sugar annual*

USDA Foreign Agricultural Service (2008). *GAIN report, Nigeria, sugar annual*

USDA Foreign Agricultural Service (2011). *GAIN report, Nigeria, sugar annual*

USDA Foreign Agricultural Service (2010). *Sugar imports to resume Strong Growth*

World Bank (2007). *Awakening Africa 'Sleeping Giant, Prospects for Commercial Agriculture in the Guinea Savannah Zone and Beyond*

World bank, World Development Indicators and Global Development finance (2012) *World Data Bank* <http://databank.worldbank.org/ddp/home.do?Step=1&id=4>

ANNEX I: Methodology Used

A guide to the methodology used by MAFAP can be downloaded from the MAFAP website or by clicking [here](#).

ANNEX II: Data and calculations used in the analysis

Name of product		SUGAR		Local currency		NAIRA			
International currency		DOLLAR							
DATA				2005	2006	2007	2008	2009	2010
	Unit	Symbol	Year trade status	m	m	m	m	m	m
Benchmark Price									
1	Observed	USD/TON	P ₁₁₁₋₁₁₁	459.12	468.48	479.07	578.41	601.31	770.28
1b	Adjusted	USD/TON	P ₁₁						
Exchange Rate									
2	Observed	LOC/USD	ER _t	151.27	128.65	125.91	125.91	125.91	150.30
2b	Adjusted	LOC/USD	ER _t						
Access costs border - point of competition									
3	Observed	LOC/TON	ACo _{1,t}	6,617.69	7,162.96	7,548.49	8,422.45	9,394.20	10,683.11
3b	Adjusted	LOC/TON	ACa _{1,t}						
4 Domestic price at point of competition									
Access costs point of competition - farm gate									
5	Observed	LOC/TON	ACo _{4,t}	22,165.96	23,992.33	25,283.66	28,210.99	31,465.89	35,783.07
5b	Adjusted	LOC/TON	ACa _{4,t}						
6 Farm gate price									
6		LOC/TON	P _{4,t}	25,795.41	27,840.22	30,860.73	35,301.76	35,075.30	40,309.93
7		LOC/TON	E						
8		LOC/TON	BOT						
		Fraction	QT _{1,t}						
		Fraction	QL _{1,t}						
		Fraction	QT _{4,t}						
		Fraction	QL _{4,t}						
CALCULATED PRICES				2005	2006	2007	2008	2009	2010
Benchmark price in local currency									
9	Observed	LOC/TON	P ₁₁₁₋₁₁₁	60,270.73	60,270.73	60,270.73	72,768.32	75,649.32	115,771.42
10	Adjusted	LOC/TON	P ₁₁₁₋₁₁₁	60,270.73	60,270.73	60,270.73	72,768.32	75,649.32	115,771.42
Reference Price at point of competition									
11	Observed	LOC/TON	RPo _{1,t}	66,888.42	67,433.69	67,819.22	81,190.77	85,043.53	126,454.53
12	Adjusted	LOC/TON	RPa _{1,t}	66,888.42	67,433.69	67,819.22	81,190.77	85,043.53	126,454.53
Reference Price at Farm Gate									
13	Observed	LOC/TON	RPo _{4,t}	44,722.46	43,441.36	42,535.56	52,979.77	53,577.64	90,671.46
14	Adjusted	LOC/TON	RPa _{4,t}	44,722.46	43,441.36	42,535.56	52,979.77	53,577.64	90,671.46
INDICATORS				2005	2006	2007	2008	2009	2010
Price gap at point of competition									
15	Observed	LOC/TON	PGo _{1,t}	(66,888.42)	(67,433.69)	(67,819.22)	(81,190.77)	(85,043.53)	(126,454.53)
16	Adjusted	LOC/TON	PGa _{1,t}	(66,888.42)	(67,433.69)	(67,819.22)	(81,190.77)	(85,043.53)	(126,454.53)
Price gap at farm gate									
17	Observed	LOC/TON	PGo _{4,t}	(18,927.05)	(15,601.14)	(11,674.83)	(17,678.02)	(18,502.34)	(50,361.53)
18	Adjusted	LOC/TON	PGa _{4,t}	(18,927.05)	(15,601.14)	(11,674.83)	(17,678.02)	(18,502.34)	(50,361.53)
Nominal rate of protection at point of competition									
19	Observed	%	NRPo _{1,t}	-100%	-100.00%	-100.00%	-100.00%	-100.00%	-100.00%
20	Adjusted	%	NRPa _{1,t}	-100%	-100.00%	-100.00%	-100.00%	-100.00%	-100.00%
Nominal rate of protection at farm gate									
21	Observed	%	NRPo _{4,t}	-42%	-35.91%	-27.45%	-33.37%	-34.53%	-55.54%
22	Adjusted	%	NRPa _{4,t}	-42%	-35.91%	-27.45%	-33.37%	-34.53%	-55.54%
Nominal rate of assistance									
23	Observed	%	NRAo	-42%	-0.359130961	-0.274472294	-0.333674852	-0.345336899	-0.555428675
24	Adjusted	%	NRAa	-42%	-35.91%	-27.45%	-33.37%	-34.53%	-55.54%



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