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REVIEW ARTICLE

Current Status of Sugar Research and Development in Nigeria

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In the development of the sugar industry in Nigeria, Sugarcane Research and Development (R & D) are very important. The National Cereals Research Institute, Badeggi is currently progressing with some significant success. However, the sugar estates, the government and the private sector needed to help to adequately fund R & D on sugarcane and sugar for their effective contribution to the national economy. A free flowing brown sugar technology has been developed from indigenous research and engineering efforts at National Cereals Research Institute to promote increased sugar production in the country. This is a cost saving measure on continued sugar imports. This paper briefly reviews the current R&D efforts on sugarcane and sugar production in Nigeria against the backdrop of the National Agricultural Policy. It highlights the reasons for the lack lustre performance of the domestic sugar sector and demonstrates the potential impact of a locally developed sugarcane processing technology in the national economy. Suggestions are also made to policy makers and other stakeholders in the sugar industry to encourage local sugar production and R & D on sugarcane and sugar for its contribution to the nation's economy.

KEY WORDS : Research and Development, local sugar production, production trend, sugarcane processing technology, sugar imports, national economy, Nigeria.

INTRODUCTION

Historically, agriculture has relied on public investment in both basic and applied research because the private sector could not capture the benefits from technologies developed such as improved seed and cultural practices. The performance of the agricultural sector reflects the effectiveness of agricultural research in generating technologies and facilitating appropriate management decision making for boosting agricultural production. In agricultural research, an alliance is emerging between public sector basic science and private sector technology development. Many researchers represented by these areas do not belong to traditional agricultural research establishments. However, these new participants in agricultural research and development should be viewed as a complement of, rather than substitute for existing publicly supported agricultural research.

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As for sugarcane research in Nigeria, which is still in its initial experimental phase of knowledge and development, much of the activities are in the hands of basic scientists, who are making original contributions in science and at the same time developing model applications. Various scientists have contributed immensely toward the development of sugarcane research in Nigeria. On the surface, these past efforts have not been translated into higher domestic sugar production. Rather Nigeria still relies heavily on sugar imports. Some of the problems militating against the development of a sound sugar industry in Nigeria are highlighted in this paper against the backdrop of the National Agricultural Policy. Reasons for the lack lustre performance of the domestic sugar sector and the potential impact of a locally developed cottage sugarcane processing technology on the national economy are also discussed.

AGRICULTURAL POLICY IN NIGERIA

The national development objectives in the national policy on science and technology document emphasize

the maintenance of a well-fed, healthy, well-informed and happy citizenry through adequate provision of suitable food, shelter etc. Coupled with these, the Federal Ministry of Agriculture has specific policy objectives, which include:

i) the attainment of self sufficiency in basic food commodities with particular reference to those food commodities like sugar, cocoa, oil palm etc which contribute considerable proportion of Nigeria's foreign exchange and which can be produced locally in Nigeria;

ii) increased production of agricultural raw materials to meet the growing needs of an expanding industrial sector.

Agricultural research consists of plans, strategies and programmes which are executed in order to generate and adapt new technologies for increased productivity. This provides efficient methods of processing, marketing and utilizing what is produced, as well as generating technologies that can provide rural employment, and contribute to food security for the nation (SPAAR, 1987). By its very nature agricultural research takes time with a lot of capital investment while its results are slow and time taking. Yet, not to commit the required resources and time to the sector is to condemn us to perpetuate food insecurity. Sadly, this appears to have been the lot of the Nigerian sugar industry because of probably wealthy Nigerians entrepreneurs prefer to import than to invest in local sugarcane and sugar research and production.

SUGARCANE/SUGAR PRODUCTION IN NIGERIA

Two most important crops from which sugar can be produced in commercial quantity are sugarcane and sugar beet. Of these, sugarcane produces 62% of total world's sugar while only 38% is produced from beet (Naidu, 1987; Fry, 1997). Beet is a temperate crop, while sugarcane is adapted to wider ecological zones, especially in the tropics and sub-tropics. Nigeria lies in an ecological region, which favours sugarcane production. Though cultivated in larger expanses in the north, sugarcane can be, and is, cultivated in virtually all the Nigerian agro-ecologies (Lafiagi,1984) and the total cane tonnage including both industrial and chewing cane types in Nigeria is shown in Table 1.

The first commercial cultivation of the crop started in the late 1950s (Oguntoyinbo, 1978) with the establishment of the Bacita estate whose first sugar product came out in 1964/1965. This was to be followed by the establishment of the Numan estate in 1980. Since then, however, no new sugar plant has been established in

Table 1 : Sugarcane production trend in Nigeria 1970 - 1999

	Cane type (Mt'000)		
Year	Soft	Industrial	Total (mt '000)
1970	450	300	750
1971	460	320	780
1972	470	330	800
1973	480	450	830
1974	420	450	870
1975	440	400	840
1976	460	420	880
1977	420	360	780
1978	460	380	840
1979	600	400	1000
1980	580	390	970
1981	590	440	1070
1982	620	450	1070
1983	620	180	800
1984	520	450	970
1985	720	440	1160
1986	500	400	900
1987	640	450	1090
1988	400	440	840
1989	400	460	860
1990	400	600	1000
1991	500	580	1080
1992	720	780	1500
1993	570	400	970
1994	590	300	890
1995	710	220	830
1996	600	300	800
1997	760	180	940
1998	900	60	96
1999	1228	820	2047

Sources : CBN. 1997, NISUCO.1965-1999; SSC 1983-1999

Table 2 : Nigeria's Sugar Consumption trend, Percentage domestic quantity produced and imported during 1970 - 1999

Year	Consumption ('000 tonnes)		Total	% Domestic	% Imported
	Domestic	Imported			
1970	33333	88,888	122,222	27.27	72.73
1971	38887	133,333	172,221	22.58	77.42
1972	42222	166,667	208,889	20.21	79.79
1973	38900	255,556	299,456	13.21	86.79
1974	44444	311,111	355,555	12.50	87.50
1975	44440	400,000	444,440	10.00	90.0
1976	38889	477,778	516,667	7.53	92.47
1977	35556	533,333	568,889	6.25	93.75
1978	27778	533,333	561,111	4.95	95.05
1979	33333	555,556	588,889	5.67	94.33
1980	35556	777,778	813,334	4.37	95.63
1981	40000	600,000	640,000	6.25	93.75
1982	55556	811,111	866,667	6.41	93.59
1983	31111	866,667	897,778	3.47	96.53
1984	26667	877,778	904,445	2.95	97.05
1985	33350	844,444	877,794	3.80	96.2
1986	55600	755,556	811,156	6.85	93.15
1987	66667	811,111	877,778	7.59	92.41
1988	50000	744,444	794,444	6.29	93.71
1989	67680	733,333	801,013	8.46	91.14
1990	35560	844,444	880,004	4.04	95.96
1991	44444	855,556	900,000	4.94	95.06
1992	42222	911,111	953,333	4.43	95.57
1993	35540	811,111	846,651	4.20	95.80
1994	81111	722,222	803,333	10.10	89.90
1995	33400	666,667	700,067	4.77	95.23
1996	22222	611,111	633,333	3.51	96.49
1997	11111	477,778	488,889	2.27	97.73
1998	555.6	977,778	478,334	0.12	99.88
1999	2950.8	1023,889	1027,210	0.28	99.72

Sources : CBN. 1997, NISUCO.1965-1999; SSC 1983-1999

Nigeria. Sugar production by these 2 estates has thus oscillated between 27,000 – 33,000 tonnes per annum from 1978 to 1995 (Table 2). As from 1996 to date, domestic production has declined considerably reaching an all time low value of less than 1% in 1998 and 1999 (Table 2). Even at their highest continued production level, the two estates have only been able to produce about 5% of the annual national sugar requirement, leaving a short-fall of 95% which is supplied through importation. The reasons for this dismal situation are not far fetched. They include among others:

1. inadequate supply of sugarcane (raw materials) to the factories
2. few operating sugar factories
3. low capacity utilization in the two operating factories
4. myriad of factory and field production problems
5. lack of improved indigenous sugar production technology (especially at the cottage level).
6. Lack of patriotism on the part of wealthy Nigerians who instead of investing in domestic sugar production promote and take sugar imports as a lucrative business.

The total sugarcane production in Nigeria averages between 600,000 to about 1 million tonnes annually (Table 1). However, these figures consist of both industrial and chewing cane with the latter constituting generally between 55 – 65% of the total and only the industrial cane types, produced on the estates, are used in sugar manufacture. The chewing type is chewed raw. These factories on the estate have been unable to operate at installed capacities due to lack of industrial cane to process and other compounding factors like government's interference in the management operations of the existing factories. In other countries such as India, USA, Brazil, Kenya and South Africa, where sugar production business is not handled by the government but by private sugarcane associations, there exists a sound sugar industry (Anon, 1989).

Except for the small (100 ton cane per day (tcd) capacity) plant at Lafiagi and the new big refinery currently being test-run by the Dangote group of companies in Lagos, no one in Nigeria has invested in the sugar sub-sector since 1980. Even the Dangote refinery is being fed by sugarcane cultivated in far away Brazil. The pertinent question is, are the Nigerian soils not suitable for cane cultivation? Not at all, the only reason for this type of action could be that wealthy Nigerians prefer to drain the foreign reserve of their country than to conserve it. So Nigeria in realistic terms has only 2 sugar factories, the fortunes of which have declined in recent years (Table2). Both factories operate at less than 30% of their installed capacities, due in part also to a number of field and factory problems as already stated above.

Unlike other important sugar producing countries like India, Brazil, Cuba and Kenya, Nigeria has also not developed an improved indigenous technology for sugar production that could be widely adopted at the cottage level. It is pertinent to ask what has research done to solve or ameliorate some of these problems? The proceeding section provides some answers to this question.

SUGARCANE/SUGAR RESEARCH AND DEVELOPMENT IN NIGERIA

Sugarcane research in Nigeria started in the early 1960s, at the inception of the Nigerian sugar industry. Research was started mainly on crop protection at the request of the new sugar company in Bacita. Later, in the mid 1970s, the need to establish a sugarcane breeding and varietal testing station arose as a result of visits by a Government delegation to the West Indies Breeding Station in Barbados. Consequently, the National Cereals Research Institute (NCRI) then at the Moor Plantation, Ibadan by 1981 had constituted a full research programme on sugarcane comprising of scientists in various research disciplines. The focus of the NCRI team was on varietal breeding and evaluation, agronomic practices, crop protection and utilization. In January 1980, the Council of the University of Ilorin got the mandate to conduct research into all problems relating to sugarcane production, processing and utilization of its by-products and to undertake training of under graduates and sugar factory workers. In addition to NCRI, which rightly has the national mandate for the genetic improvement of the crop in Nigeria, scientists from the University of Ilorin, and other individuals scattered all over the country conduct research in different aspects of sugarcane (Sugar Directory 2000 In-press).

The main focus of sugarcane research now centres on: Cane breeding and varietal development, development of optimum agronomic practices, pest and disease management and utilization of sugarcane and its by-products. Sugarcane breeding which is the bedrock of the programme at NCRI has three major activities, which include:

- germplasm acquisition
- varietal evaluation and
- hybridization and selection.

At present, a total of 557 sugarcane accessions have been assembled in a national germplasm at NCRI, Badeggi. A comprehensive catalogue of thirty-two traits has been compiled for about 230 accessions (Anon, 2000a). Cataloguing is a continuous process and more accessions and traits would be catalogued in future. Proven parents have been identified and used in hybridization scheme annually. Thus, over ten thousand seedlings (sugarcane hybrids) are generated from different crosses annually. Selections of vigorous seedlings with prominent characters of sugarcane biomass and sugar yield are accomplished through different progeny testing stages before identifying the best progeny clones for preliminary/ advanced yield trial along with standard commercial checks. The best progeny clones are nominated into the national Coordinated trial for multilocational evaluation across the six geopolitical zones of the country before final nomination for varietal release. To date, two varieties from NCRI and two others by Unilorin Sugar Research Institute have been formally registered and released. These varieties have out standing yield, disease and pest resistant qualities, over most of the canes grown by the sugar estates. Ten other newly developed varieties are at the commercial stages prior to formal registration and release (Anon, 2001).

Agronomic practices of cane production such as planting date, seed rate and spacing which give optimal cane yield under good cultural management have been recommended for specific ecological zones of the country. All these and other agronomic recommendations have been published in extension 'Advisory Leaflets'. Research on pest and disease management involving the testing of various rates, mode and time of application of several pesticides has been conducted. Also cultural management practices that could complement the use of chemicals are studied. Recommendations on these have been published and disseminated to cane farmers and other stakeholders in the sugar industry.

Research on cane utilization has led to the development of a brown sugar production technology. A pilot plant of this technology was established jointly by the Jigawa State and NCRI in 1999. This technology basically entails six processes. These include: cane juice extraction, juice evaporation, crystallization, centrifugation, drying and packaging.

The sugarcane juice is first extracted using cane juice extractors. The juice is conveyed immediately through the pipe into the evaporator pans. The evaporation of the juice is complete when the brix of the syrup reaches 75-80° C. The syrup is then cooled in a crystallizer for the crystals to form within 18-24 h before they are separated from the molasses in a centrifuge. The sugar drying process is done in a rotary dryer or the sun using solar energy, while packaging is accomplished with an impulse sealer. This technology has recently won awards from 3 different organizations: It won the National Academy of Science/Manufacturers Association of Nigeria (NAS/ MAN) National Science prize, National Office of Technology Acquisition and Promotion (NOTAP) and the National Merit Award of the Raw Materials Research and Development Council (RMRDC).

CONSTRAINTS TO THE DEVELOPMENT OF THE SUGAR INDUSTRY

The importance of agricultural research lies in its ability to spur or catalyse both agricultural and economic development. In the particular case of sugarcane, which is a cash crop as well as the raw material for sugar production, and a major employer of labour worldwide, research should lead to higher productivity and production and consequently a greater impact on the national economy. It is pertinent to ask why research into the crop has not resulted in the desired impact in Nigeria. The reasons lie in the peculiar nature of cane culture in Nigeria.

Industrial Vs Chewing Cane

As already highlighted, two types of sugarcane are grown in Nigeria. Only the sugar estates cropping a total of about 10,000 ha grow the industrial cane, which is used in the manufacture of sugar. The bulk of sugarcane produced (55 – 65%) in the country is of the chewing type and this is produced by thousands of local sugarcane farmers in hundreds of cane growing communities. It has been difficult to get these farmers to shift to the production of industrial cane because the chewing cane fetches higher net returns. Studies by NCRI revealed that farmers obtain between ₦60, 000 to ₦95, 000/ha net returns for chewing cane while industrial cane fetches less than ₦40,000/ha (Anon, 2000a). Secondly, industrial cane can only be sold to sugar estates, which can dictate the price, while chewing cane has a wide and vibrant market both within Nigeria and in neighbouring countries. To induce local farmers to switch to the production of industrial cane will require a significant price incentive, which is currently not available.

There is also very little the sugar estates could do about the price of industrial cane since sugar has a fixed market price already dictated by the international market. Only recently the M.D. of the premier sugar factory (NISUCO) was reported to lament the unfair pricing mechanism of the global sugar market (The Punch, 2000). He revealed that it costs about $900 to produce a tonne of sugar in Brazil and the EU countries, whereas this sugar is sold at $320 per tonne in Nigeria. The local

sugar factories cannot compete with such cheap imports even as some wealthy Nigerians prefer such a climate to cash in on than to support and fund R&D on local sugar production. Any increase in the cost of sugarcane in order to make its cultivation attractive to local chewing cane farmers will result in higher cost of production thereby making the sugar produced unsaleable.

This unfavourable pricing mechanism is the major constraint to the development of the local sugar industry as it scares prospective enterpreneurs. But for the poor returns on investment, many investors may have invested in sugar production. Therefore, despite the achievement recorded in sugarcane R&D in Nigeria, the problem of unprofitable pricing and poor returns has continued to stall the development of the sugar sub-sector.

POTENTIAL IMPACT OF THE SUGAR INDUSTRY ON NATIONAL ECONOMY

It is easy to project the potential impact of this sector on the national economy assuming the major constraints highlighted above can be removed. In order to appreciate the potential impact of this sector, we wish to highlight a theoretical framework involving the large-scale establishment of the Mini Sugar Plant in at least 25 states of the country. Current domestic demand for sugar in Nigeria stands at between 500 – 750,000 tonnes. However, less than 50,000 tonnes is produced. In order to increase local production and drastically cut down on sugar importation, more local cane farmers have to be induced to grow industrial cane and more land would have to be brought under industrial cane cultivation. The target is to produce at least 500,000 tonnes of sugar annually.

The Theoretical Frame Work

In order to produce 500,000 tonnes of sugar annually to meet domestic needs, 7.0 million tonnes of sugarcane are needed to be produced at the cottage industry average of 7% brown sugar recovery from sugarcane (Anon, 2000). Thus, projecting an average yield of 70 tonnes per hectare, 100,000 ha are needed to attain this level of sugarcane, that means, total industrial cane hectarage in the country has to be increased by about 90,000 ha since the estates' current cane production stands at around 10,000 ha. Taking cognizance of the fact that seed rate for industrial cane is 7 ton/ha, about 630,000 tons of seed cane is needed.

It is believed that after the current expansion programme of the sugar estates, 50,000 tonnes of sugar will be produced annually. In order to produce another 500,000 tonnes sugar and to drastically reduce the 700,000 tonnes shortfall and at the same time generate rural employment, 7000 units of the mini brown sugar plant each providing 70 tonnes of sugar annually (490,000 tonnes) need to be established. It is known that at least 25 states in Nigeria can effectively put 3000 – 4000 ha of land to cane cultivation where 7 million tonnes of cane will be achieved. Thus, 280 units of the mini brown sugar plant can be set up in cane growing areas of each state (Anon, 2000a).

From the above strategy, in addition to the achievement of national self-sufficiency in sugar and increased rural industrialization, the following economic benefits will be derived:

a) Employment for local farmers:

The government of Nigeria currently has a programme on the ground to alleviate rural poverty. However, fraught with execution problems, the programme is being replaced with the Youth Employment Scheme (YES) as from the year 2001. Thus the proposed 280 units of the mini brown sugar plant to be established in each state of Nigeria will be a right way for youth employment. The cultivation of 4000 ha of land to cane per participating state to feed these plants will require at least 2000 farmers each cropping 2 ha of land. Thus cane cultivation alone will generate full time farm work for a total of 50,000 farmers in 25 states across the 6 geopolitical zones of the country (Anon, 2000b).

b) Employment for Skilled and Unskilled Manpower:

Each brown sugar processing plant will require a factory Manager (FM), two factory supervisors (FS), an accountant, 4 sales clerks, 5 skilled factory artisans, 15 labourers and a messenger/cleaner. In all, each plant site will provide employment to 25 persons. Supposing 7,000 units of the plant are established nationwide as stated in the framework above, the rural brown sugar production project will generate 175,000 jobs of different kinds in Nigeria. This will be a major contribution to the nation's economy and rural industrialization. The expected total contribution of the project to the national economy in terms of sugar production, sugarcane, gross returns on output and employment opportunities are summarized in Table 3.

MULTIPLIER EFFECTS OF THE STRATEGY

The multiplier effects of the rural brown sugar programme on the nation's economy are many and include:

i) Land clearing :

One hundred thousand hectares of land will be cleared across the country thus providing employment opportunities to rural Nigerians. In addition, total

hectarage put to cane cultivation will be increased. Expected sugar production from the cane so cultivated will save the country huge sums in foreign exchange being spent on sugar imports for now (FOS 1995 – 1997).

ii) Sustenance of Farm families:

About 50,000 cane farmers will participate in the cultivation of the 100,000 ha of land to be put to cane cultivation. This will provide sustenance for their farm families and could generate employment for unskilled labour. This will no doubt improve the living standard and income status of such families. Such a development will in effect have positive contributions on the nation's economy. This is because the contribution of rural sugar production to the national economies of several African countries is known (Amosun *et al,* 2000). The rural industrialization of Kwazulu land in South Africa and Kenya were shown to grow rapidly through the setting up of cheap and affordable sugar plants in the rural areas of these countries. Nigeria, therefore, stands to gain immensely from the rural brown sugar programme. The project should be patronized and sustained by all stakeholders in the sugar industry for the overall economic growth of Nigeria. Encouragingly efforts are on by the governments of Sokoto, Gombe, Katsina, Benue and Kano states to set up the 10 tcd sugar plant as their Jigawa state counterpart.

iii) Benefit to Local Suppliers and Haulage firms:

Under the input supply scheme, suppliers would benefit from the supplies of irrigation pumps and the sinking of boreholes and tube wells. The same will go for fertilizers and pesticides' supplies. General businesses will thus be available to different classes of people including transporters (Anon, 2000b). This development will certainly have positive impact on the nation's economy.

iv) Benefit to Local Fabricators and Building Contractors:

In establishing 7,000 units of the brown sugar plant in 25 states of Nigeria, several micro credit facilities will be available to assist artisans and contractors to participate fully in sugar business. Thus welders and local fabricators will reap micro-economic benefits from the fabrication of machine components of the plant such as cane crushers, crystallizers among others. On the other hand, civil engineering firms and workers will benefit from the construction of factory houses and the sheds housing the mills and boilers. Generation of employment and wages of different categories of Nigerians will thus be enhanced. The per capita income of such persons will be raised and this will in turn generate the economic growth of the rural areas where the plants are sited. A positive economic effect will then be felt by the nation generally.

Table 3 : Summary of expected output from brown sugar project in 25 states of Nigeria

		Annual output	
	Output Unit	**Per State**	**in 25 States**
A.	Sugarcane (tonnes)	105,000	2,625,000
B.	Sugar (tonnes)	7,350	183,750
C.	Gross Returns on Output (N)		
	- Sugarcane at N1700/ton	178,500,000	₦4.56 billion
	- Sugar at N42,000/ton	308,700,000	₦7.7 billion
D.	Employment generation :		
	- Factory Manager	280	7,000
	- Factory Supervisor	560	14,000
	- Sales/Account clerk	280	7,000
	- Messenger/Cleaner	280	7,000
	- Unskilled labour	4200	105,000
	- Farmers	2000	50,000

Source : Anon. 2000b

v) **Benefit to Sugar Merchants and End-Users:**

The establishment of the 7000 units of the sugar plant across the country will boost local sugar production by 490,000 tonnes. This output will no doubt provide business to local sugar merchants as well as local industries particularly the pharmaceutical, confectionery, soft drink bottling and beverage industries, which depend on sugar for their operation. Availability of locally produced sugar will enhance the productivity of these local industries. It will also stop the drain on foreign reserve yearly expended on sugar imports (FOS 1995-1997) by government or wealthy Nigerians and these industries. The saved forex will thus be re-channeled to other key areas of the economy. By this, the gross domestic product of the country will increase thereby enhancing the nation's foreign reserves. The national economy will then grow as it will be well stimulated and made functional for the overall growth of the gross domestic product (GDP).

PROSPECTS OF INCREASED SUGAR PRODUCTION TO THE NATIONAL ECONOMY

The present state of the sugar industry in Nigeria does not have positive contribution on the national economy as over 95% of the country's sugar needs is imported. Thus colossal sums are spent on sugar imports. For example in 1995, 1996 and 1997, Nigeria spent about $64.04m, $154.93m and $122.22m on sugar imports alone. At the current exchange rate of about ₦100 to a US dollar these translate into ₦6.4 billion, ₦15.4 billion and ₦12.2 billion respectively, and they represent 2%, 3.3% and 2.4% of the total cost of all imported commodities into Nigeria (FOS 1995 – 1997). This national wealth could have otherwise been used for other micro credit ventures that would stimulate the annual growth or be spent on other vital sectors of the economy.

The mini brown sugar technology if adopted as highlighted, thus has the potential to significantly reduce or completely stop the import dependency of the sugar industry as obtains at present. Nigeria can conveniently change from being a sugar importer to a sugar exporter and save the current forex spent on sugar imports for the rapid development of the rural areas. The country has suitable climate and vast arable land for sugar cultivation that would support the production of enough cane to meet domestic sugar demands (Lafiagi, 1984; Busari and Misari, 1996). The establishment of even 1000 units of the brown sugar plants across the country would lead to the production of at least 100,000 tons of sugar annually. When sustained, and added to the production from invigorated estates' sugar produced, the total output would gradually help the phasing out of sugar imports by Nigeria thus improving her economy.

CONCLUSION

From the foregoing, it is clear that fully developed sugar sub-sector directs its impact on the national economy which would be significant. In order to achieve this therefore, we wish to suggest the following for consideration by policy makers at various levels:

1. The only way to induce local cane farmers to produce industrial cane is to offer substantial price support to it to make it compete favourably with chewing cane. Since agricultural subsidies is still provided to farmers even in the developed countries of U.S, Europe, Japan etc, the Nigerian Government should revisit this issue with a view to providing the appropriate support to local cane producers.

2. There is the urgent need to invest more in sugar factories of both the large and small scale. Once the issue of appropriate cane pricing is resolved and investors are assured of higher margins through subsidies as provided by Brazil and E.U. governments a lot of private investors will invest in the sector.

3. Government should note that the unrestrained importation of cheap sugar into the country would continue to depress the development of the sector. It might be necessary to increase the current 5% levy (or surcharge) on imported sugar in order to generate the required funds for the development of the local sugar industry and discourage indiscriminate importation.

4. The National Sugar Development Council (NSDC) the umbrella organization for the development of the local sugar industry should be empowered to adequately fund R & D activities on sugarcane and sugar production in the country. The NSDC should also be directed to stop its present technology importation approach in order not to further strangle the already suffocating Nigerian sugar industry.

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