

Enhancing the Sorghum Value Chain



Nigerian Breweries Plc
RC: 613

Contents

SECTION 1

Introduction	4
Vision Statement	6
Mission Statement	7
Statement from the Managing Director/Chief Executive Officer	10
Preface	13
Nigerian Breweries at a Glance	14

SECTION 2: Our Strategic Response to the Backward Integration Policy	17
---	-----------

SECTION 3: The Grain Sorghum	21
Nutritional Profile	23
Nutritional Information	24

SECTION 4: Development of the New Hybrid Sorghum	25
Overview of our venture into the Development of the New Hybrid Sorghum	26
Governance Structure	28
The New Hybrid Sorghum: A Milestone	30
The Roles of Partners	34
Testimonial from Springfield Agro Limited	39

SECTION 5: The Nigerian Raw Sorghum Market	41
Engaging Smallholder Farmers	42
Protecting Interest of Farmers	43
Providing Technical Assistance to Farmers	44
Multiplier Effect of Sorghum Supply	45
Producing and Supplying Raw Sorghum	46

SECTION 6: Malted Sorghum	49
Promoting the Use of Malted Sorghum	50
Our Support to Sustainable Supply of Malted Sorghum	51
Aba Malting Plant	51
Kudenda Malting Plant	53
Third Party Malting Plants	54
The Malting Process	54
SECTION 7: Future Outlook on Sorghum	55
A New Road Map for Nigeria's Agricultural Sector	56
Guaranteed Demand	57
Development of Improved High-Yield Hybrids	57
Export Opportunities	58
Improved Food Security and the Local Economy	58
SECTION 8: Benefits, Challenges and Opportunities	59
Benefits	60
Challenges	61
Investments Opportunities	61
Case Study of Nikoy Nigeria Limited	62
Conclusion	64
Glossary	65

Introduction

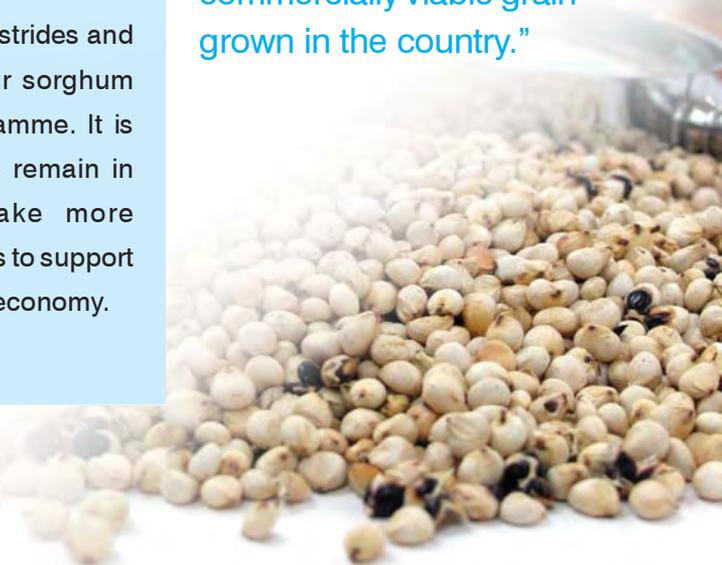




As a responsible and forward-looking Company, we take issues of sustainable development very seriously. In the last twenty-five years, we have made huge investments to significantly improve the output and quality of sorghum produced in Nigeria through support to research and introduction of new hybrids, among other efforts. These have remarkably enhanced the fortunes of local farmers and taken the sorghum value chain within the economy to new heights.

Enhancing the Sorghum Value Chain, issued by our Corporate Affairs Department, is our second publication on the journey to support commercial production of sorghum, one of Nigeria's major staple foods, and a commercially viable grain grown in the country. It chronicles some of the initiatives as well as our latest strides and achievements in our sorghum development programme. It is part of our drive to remain in business and make more positive contributions to support the society and the economy.

“Enhancing the Sorghum Value Chain, issued by our Corporate Affairs Department, is our second publication on the journey to support commercial production of sorghum, one of Nigeria's major staple foods, and a commercially viable grain grown in the country.”



Vision Statement



“
To be
a World Class
Company
”



Mission Statement

“
To be the leading beverage company in Nigeria, marketing high quality brands to deliver superior customer satisfaction in an environmentally friendly way
”





“Our investment towards the sustainable commercial production of sorghum is in line with our global sustainability agenda - *Brewing a Better Future* - which includes a commitment to locally source a minimum of 60% of raw materials used in our operations by 2020. This further validates our licence to operate and supports our standing as Africa’s partner for growth.”

Siep Hiemstra,
Regional President, Heineken, Africa and the
Middle East



“The huge investments we have made and milestones recorded in the development of sorghum in Nigeria in the last twenty-five years are a reflection of our philosophy of sustainable development with the goal to support our stakeholders, create a better society and foster good living conditions for us and the next generation.”

Nicolaas A. Vervelde,

MD/CEO, Nigerian Breweries Plc

Statement from the Managing Director/ Chief Executive Officer

Winning with Nigeria through Sorghum Development

I am highly pleased to present to you, *Enhancing the Sorghum Value Chain*, our second publication on the journey to support commercial production of sorghum, one of Nigeria's major staple foods and a commercially viable grain grown in Nigeria. Since our first publication in 2009, we have made significant strides towards the development and commercial cultivation of sorghum and its use by industry.

Our commitment to the sustainable commercial production of sorghum is in line with part of our global Company's long-term sustainability agenda of *Brewing a Better Future (BaBF)*, which is to source a minimum of 60 per cent of raw materials used in our operations locally by 2020. *BaBF* was introduced by HEINEKEN in 2010. The ambition is to continuously improve our

environmental impact, empower our people and our communities as well as improve the role of our brands in society. The four focus areas for BaBF are: to reduce water consumption, reduce CO₂ emission, improve local sourcing and deliver on industry commitments towards responsible consumption.

In this edition, we are updating readers about the recent developments, milestones as well as future plans for this cereal, which is increasingly taking a greater dimension in our national food chain discourse among grains cultivated in Nigeria.

Following Government's call for backward integration through the use of local cereals in the 1980's, Nigerian Breweries Plc committed significant resources to the commercial cultivation of sorghum. Research and development effort to explore and establish better varieties, and trials to perfect its use in brewing some of our beverages commenced and have since

advanced to great heights. We saw the potentials of the cultivation and use of sorghum in facilitating sector linkages and creating a value chain that greatly benefits our stakeholders, especially the farmers.

We have continued to collaborate with various implementing partners. These include the United States Agency for International Development/ Maximizing Agricultural Revenues and Key Enterprises in targeted Sites (USAID/MARKETS). We are also working with the Institute for Agricultural Research (IAR), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), seed producers, regional production coordinators and other partners in the sorghum value chain.

The USAID/MARKETS I project team partnered with us from 2003 to 2006 in the development of CSR-01 & CSR-02 sorghum varieties with the capacity to increase farm yield from less than 1 metric tonne per hectare to 2.5 metric tonnes per hectare.

Our effort to cultivate better varieties of high-yield sorghum seeds has produced better results. In 2012, we completed research and development work on two new high-yield hybrid

STATEMENT FROM THE MANAGING DIRECTOR/CHIEF EXECUTIVE OFFICER

sorghum- CSR-03H and CSR-04H, with the potential to yield 4 metric tonnes per hectare. They were certified, released, and registered in Nigeria by the National Centre for Genetic Resources and Biotechnology (NACGRAB) in December 2012. This milestone was achieved through the collaboration of Nigerian Breweries and relevant research institutes and was commended by NACGRAB.

In the last 10 years, we have spent N100m annually, amongst other things, and this has contributed to increasing the capacity of local farmers and suppliers, providing more jobs for youths and poverty alleviation.

With the acquisition of Sona Systems in 2011, Nigerian Breweries inherited a sorghum malting plant in Kudenda, Kaduna State. This is in addition to the Aba malting plant, the biggest sorghum malting plant in Africa, that was commissioned in 2008 for the production of malted sorghum. We also facilitated the establishment of some privately owned sorghum malting plants.

The 2013 Socio-Economic Impact Assessment of our Company shows that our expenditure on local sorghum supports a total of N8.8 billion value-added in the

supply chain. The employment associated with local sorghum procurement is almost 50,000 jobs of which over 90 per cent are at the local farmers level. Most of these farmers are indirectly impacted by our presence.

We are aware that Nigeria plans to make agriculture a major business that will improve food security and provide employment opportunities for our teeming population of unemployed youths. Our sorghum development strategy supports this aspiration and is aligned towards improving the commercial importance of the cereal. It is also designed to establish a value chain using hybrid seeds that can enable every stakeholder within the sorghum network to benefit.

I like to commend the Federal Government of Nigeria for its focus on the Agricultural Transformation Action Plan which is designed to revolutionize the sector and make agriculture a viable business in the country. We recommend that the government should give more attention to sorghum to improve food security, drive revenue generation, export and reduce dependency of industry on imported raw materials.

This brochure chronicles our involvement in the sorghum

supply chain development and provides the latest information on what we are doing with this important grain. It is our story of how far we have gone with sorghum and where we hope to take the cereal. It showcases our commitment to sustainable development through our continued support to the development of commercial production of sorghum in Nigeria.

As with other areas of our business, our sorghum development strategy will continue to offer us the opportunity as an industry leader to make a difference towards sustainable development on a national scale. This will reinforce our philosophy of ***Winning with Nigeria***.

Mr. Nicolaas A. Vervelde

Managing Director/Chief Executive Officer





“The sorghum supply chain development programme and the rapidly evolving improvements in sorghum quality and productivity have encouraged a win-win situation for our Company and critical stakeholders.”

Mr. Hendrik A. Wymenga,
Technical Director, NB Plc

Preface

I am happy to introduce to you, *Enhancing the Sorghum Value Chain*, the second edition of our publication on our commitment to the development of sustainable commercial production of sorghum in Nigeria. In the first edition, we detailed the strides we made to support the commercial production of sorghum in developing a sustainable value chain for the cereal through collaboration with research institutes and other stakeholders. We discussed the value creation in support of sorghum farmers as well as the use of the grain in the production of some of our beverages. We are delighted that the first edition was well received.

This edition features the further progress we have made in the development of new hybrids, supporting improvements in quality and productivity, enhanced performance of the sorghum value chain and contributions to the national economy, among others. The publication will inform you



about our achievements and challenges in the journey and how sorghum is positively impacting the lives of farmers and other stakeholders engaged in the programme, providing benefits to all parties involved and helping the growth of the Nigerian economy.

For those who are new to the subject, it provides basic information about the grain sorghum, the botanical nature of the grain, its uses and values. It also explains the development of the new hybrid sorghum varieties, CSR-03H and CSR-04H as well as our other efforts in expanding the sorghum value chain.

We have provided data on our investments and achievements on the sorghum value chain. We interviewed stakeholders for updates and have presented

latest developments in the value chain for your reading pleasure.

The achievements we have recorded to date and the opportunities presented by our engagement with various stakeholders are also discussed herein. All these and much more we have presented to you in this colourful and informative document.

My thanks go to my colleagues in the Corporate Affairs Department and Technical Division for their input in the preparation of this publication.

I am, therefore, delighted to invite you to explore our sorghum story.

Happy Reading!

Mr. Kufre U. Ekanem
Corporate Affairs Adviser



Nigerian Breweries at a Glance

Nigerian Breweries Plc., the pioneer and largest brewing company in Nigeria, was incorporated in 1946. The Company recorded a landmark when the first bottle of STAR lager

beer rolled off the bottling lines in its Lagos Brewery in June 1949. This brewery has undergone several optimization processes and as at today boasts of one of the most modern brew houses in the country.

Over the next decades, Nigerian Breweries Plc. commissioned breweries across the breadth of Nigeria, Aba Brewery in 1957, Kaduna Brewery in 1963, and Ibadan Brewery in 1982. In 1993, the Company acquired its

fifth brewery in Enugu. In October 2003, a sixth brewery, sited at Ameke, in Enugu State was commissioned and christened Ama Brewery. Ama Brewery is today, one of the biggest and most modern breweries in Africa. Operations in the old Enugu Brewery were however discontinued in 2004, while the Company acquired a malting plant in Aba in 2008.

In October 2011, Nigerian Breweries acquired majority equity interests in Sona Systems



■ The Corporate Headquarters of Nigerian Breweries Plc

CORPORATE PROFILE

Associates Business Management Limited (Sona Systems) and Life Breweries Limited from Heineken N.V. This followed Heineken's acquisition of controlling interests in five breweries in Nigeria from Sona Group in January 2011. Sona Systems' two breweries in Ota and Kaduna, and Life Breweries in Onitsha have now become part of Nigerian Breweries Plc., together with three brands: Goldberg lager, Malta Gold and Life Continental lager.

Brand Portfolio

Nigerian Breweries Plc. has a rich portfolio of high quality brands: **Star** Lager Beer, the first in its portfolio, was launched in 1949; this was followed by **Gulder** Lager Beer in 1970; **Maltina**, the nourishing Malt Drink, was introduced in 1976, followed by **Legend** Extra Stout in 1992. **Amstel Malta** was launched in 1994 while **Heineken** the International Premium Lager Beer was relaunched into the Nigerian market in 1998. **Maltina Sip-it**, packaged in Tetrapaks was launched in 2005, while **Fayrouz** was launched in 2006. In 2007, the Company introduced Star, Heineken and Amstel Malta in cans. In 2013, the Company sold a total of 30 Stock Keeping Units (SKUs) including Gulder Can,

Legend Can, Heineken Magnum, Maltina Can and PET, Fayrouz Cans, Fayrouz PET, **Climax** Energy drink as well as **Goldberg** lager, **Malta Gold** and **Life Continental** lager, which became part of the family in October 2011. Two brand extensions – **Star Lite** and **Fayrouz Exotic** were introduced in the first quarter of 2014.

Ancillary Industries

As a major brewing concern, the Company encourages and sustains many ancillary businesses locally. Several of these organisations and individuals depend largely on the Company for their means of livelihood. These include manufacturers of bottles, cans, PET resins, crown corks, labels, cartons, plastic crates and

such service providers as Hotels/ Clubs, Distributors, Transporters, Event Managers, Advertising, PR and Marketing Communication Agencies etc.

Corporate Social Responsibility

Nigerian Breweries is a socially responsible corporate organisation with good track record of corporate social initiatives in identified and strategic areas. Over the years, Nigerian Breweries has been very active in supporting the country's development aspirations in line with our commitment to "Winning with Nigeria." We have continued to identify and respond to major challenges confronting our nation through our corporate social investments especially in the areas



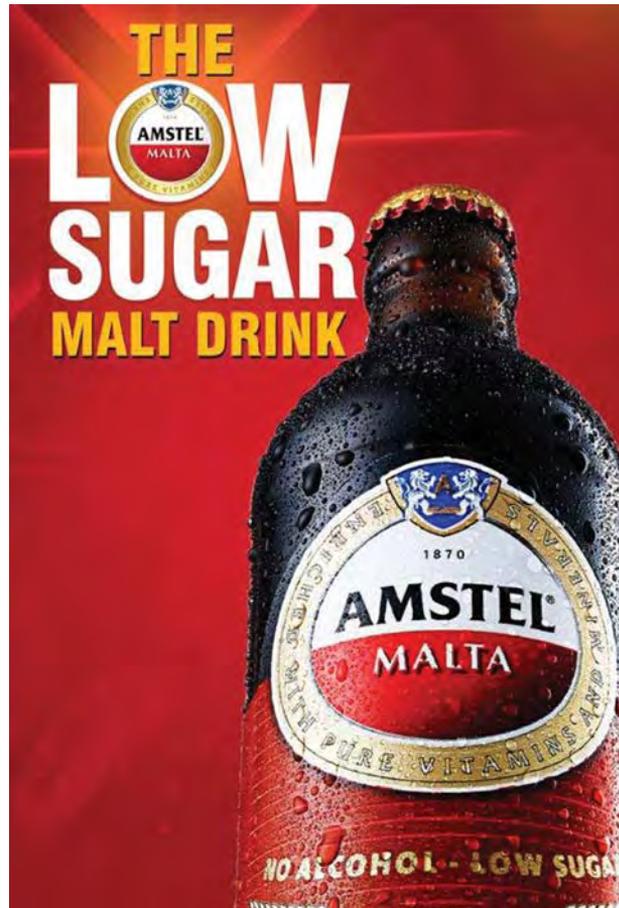
CORPORATE PROFILE

of education, the environment, water, youth empowerment, talent development and sports, amongst others. The Company in 1994 established The Nigerian Breweries-Felix Ohiwerei Education Trust Fund with a take-off grant of N100 million to take a more active part in the funding of educational and research activities in Nigeria. This is in addition to its secondary and university scholarship programmes for children of its employees. The Company is also involved in the development of leadership, musical and movie talents, through various programmes.

Socio-Economic Impact

Nigerian Breweries has a significant presence in Nigeria with 7 breweries, 2 malting plants and distribution centres strategically located across the country. Some of the impacts of the Company's operations on the Nigerian economy are as follows:

- Nigerian Breweries operations have a value added impact of N243bn on Nigeria's economy which represents 0.65% of the nation's GDP.
 - In 2011, N87 billion was paid directly and indirectly as taxes which represented 4.02% of Nigeria's non-oil tax revenue.
 - Nigerian Breweries has a high value direct work force of 3,200 employees and the Company's operations support indirectly 586,000 jobs which represents 0.64% of the total labour force, of which 54,000 are within the Sorghum Value Chain.
- In 2011, the Company's operations represented 12% of Nigerian manufacturing in terms of value added. In that same year, Nigerian Breweries generated N245bn revenue and N345bn consumption of its products.



Section 2

OUR STRATEGIC RESPONSE TO GOVERNMENT'S BACKWARD INTEGRATION POLICY



Section 2

OUR STRATEGIC RESPONSE TO GOVERNMENT'S BACKWARD INTEGRATION POLICY

Nigeria is the second largest producer of sorghum, coming next to Mexico. Most of the domestic production of the grain in Nigeria is used for household consumption and as fodder. In some parts of the world, however, sorghum is a cash crop processed into food, beverages, commercial animal feed, and ethanol. Nigerian Breweries experience over the years has shown that development of commercial sorghum offers substantial benefits to Nigerian farmers, industry and national food security.

In line with our mission statement, we take concrete steps to positively impact the society and the economy in an environmentally friendly manner. As part of our business strategy, Nigerian Breweries has since the late 1980s contributed significantly and has partnered with some key



■ The Mace: a sculptural piece in front of the Senate Building of the Federal Republic of Nigeria

stakeholders in improving the production of sorghum in Nigeria and this way enhance economic opportunities for many farmers. In the last 10 years, Nigerian Breweries has spent N100m annually on the Sorghum Value Chain Programme and engaged over 10,000 farmers.

Backward Integration Policy

Following the Structural Adjustment Programme (SAP) of the 1980s, the Federal Government of Nigeria in an effort to conserve foreign exchange earnings, and enhance domestic and commercial production, started restricting importation of certain goods. Some categories of goods were completely prohibited from the country's import list. In addition, the government introduced the policy on Backward Integration, which requested manufacturers to substitute some imported raw and packaging materials with local alternatives.

Malted barley importation was banned in 1988 and all breweries

“In response, Nigerian Breweries commenced exploratory work in reformulating some of its brands with local substitutes. One of the local grains that then received the attention and patronage of the Company was sorghum.”

were forced to brew with only locally available grains. In response, Nigerian Breweries commenced exploratory work in reformulating some of its brands with local substitutes. One of the local grains that then received the attention and patronage of the Company was sorghum.

Some level of success, which was to be improved upon with time, was recorded. Ever since, some sorghum farmers have continued to receive part of our corporate social investment outflows as well as market support as part of our grain supply chain development.

In 1999, following a reversal in policy direction by the

government, the ban on malted barley importation was lifted. The effort at backward integration was to later peter out following the policy reversal. The net effect was for the beverage industry to re-focus once again from the use of locally grown sorghum to imported malted barley. Thus, the initial attempts at local cultivation of grains waned considerably.

Nigerian Breweries, however, driven by corporate social responsibility as well as business interests, continued to work on its sorghum development programme, latching on the tremendous experience already gained in incorporating local grains in its beverage formulations. As a result, the Company decided to maintain a substantial level of local grains in most of its products recipes. This gave the Company the competitive advantage of pioneering the commercial development of sorghum using new hybrids in Nigeria.

The decision to sustain the sorghum supply development effort was taken among other

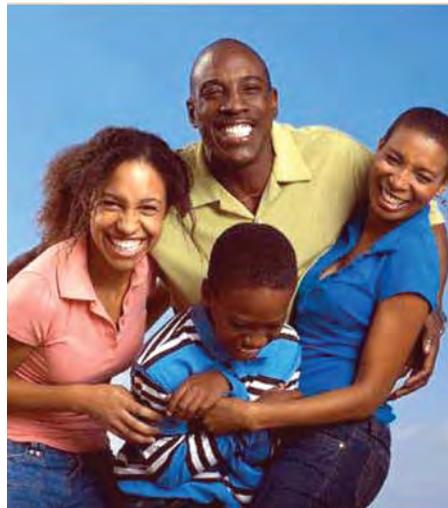
OUR STRATEGIC RESPONSE TO GOVERNMENT'S BACKWARD INTEGRATION POLICY



■ Workers loading bags of sorghum into a truck

reasons, to encourage the sustainability of our business and this way, to help in poverty alleviation among farmers by boosting the quality of seeds sown and the quantity of yield per hectare of land. In addition, it was designed to motivate demand for sorghum with the attendant multiplier effects as well as lead our industry and corporate Nigeria in showing more interest in the agricultural sector as a way to improve food supply, create employment opportunities for our youths as well as explore the opportunities of producing sorghum and other grains for export.

“The decision to sustain the sorghum supply development effort was taken among other reasons, to encourage the sustainability of our business and this way, to help in poverty alleviation among farmers by boosting the quality of seeds sown and the quantity of yield per hectare of land.”



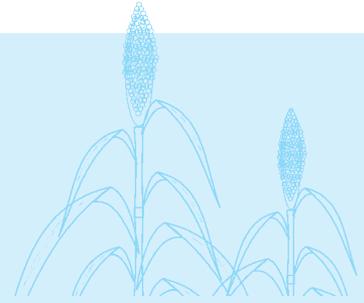
■ A happy family



■ Sorghum seeds

Section 3

THE GRAIN SORGHUM



Section 3

THE GRAIN SORGHUM

Sorghum is a local grain that is grown predominantly in the semi-arid savannah and grassland areas of Northern Nigeria and other parts of the world. It is nutritionally rich and serves as a staple food in most parts of Northern Nigeria. The grain has assumed commercial relevance lately, especially in the food and beverage industry. It has been found to be a valuable ingredient next to malted barley used in the industry. Grain sorghum is an annual grass similar in appearance to maize (corn), although it has more stems and more finely branched roots. Wild sorghum is a tall plant of 5-7 feet. Through breeding efforts, newer varieties now have 2-3 dwarf genes, resulting in a plant 2-4 feet tall and easier to harvest.

It has been difficult for historians to tell exactly when and where sorghum was domesticated. Whether it was domesticated in Africa, or transported from Africa and domesticated in India and then returned to Africa, is not certain. However, it is believed that African slaves brought sorghum seeds with them to the United States of

America, which has turned out to be one of the major sorghum growing and exporting countries in the world. Sorghum is a nutritionally rich, energy-producing cereal that can be grown in areas of the world that are too hot or too dry for other crops to be grown successfully. Sorghum is one of the five most important cereal crops behind rice, wheat, corn and barley. The top sorghum producers are Mexico, Nigeria, U.S.A and India. The U.S is the top exporter (70% to 80% of world sorghum exports) and also uses sorghum as livestock feed. Today, the grain



■ A grain sorghum cultivar

sorghum is cultivated across the world in the warmer climatic areas. It is grown in about 8.5 million hectares of land in Nigeria. In 2013, the production levels of sorghum in Nigeria, Africa and the world were estimated at 6.9 million, 20 million and 60 million metric tonnes, respectively.

Sorghum quantitatively is the second most important cereal in Africa after maize. It is mainly eaten in form of flour or paste. It

Top 10 countries in the production of sorghum in 2012 (Metric tonnes)

 Mexico	6,969,502
 Nigeria	6,900,000
 United States	6,272,360
 India	6,010,000
 Argentina	4,252,310
 Ethiopia	3,604,262
 Australia	2,238,912
 Brazil	2,016,873
 China	2,003,564
 Burkina Faso	1,923,805

■ Source: Food and Agricultural Organisation of the United Nations (FAOSTAT) 2012

has a high calorific and nutritional value and, therefore, it is recommended for infants, pregnant and lactating mothers, the elderly and the convalescents.

Around the world, sorghum production and consumption are on the rise but they are not growing as fast as the world population. Therefore, the supply (and calories) per capita is actually decreasing.

In Africa, sorghum is still largely a subsistence food crop, but as this publication shows, it is increasingly being used by the food and beverage industry in Nigeria.

Global Production of Sorghum

Sorghum is one of the few resilient crops that can adapt well to future climate change conditions, particularly the increasing drought, soil salinity and high temperatures.

Nutritional Profile

Like other grains such as rice and maize, sorghum contains carbohydrates, proteins, fats, fibre, ash and minerals. Its nutritional value is good enough but not exceptional when compared with other locally available cereals that are grown as staple foods in Nigeria. Globally, over half of all sorghum produced is used for human consumption. When processed, the nutritional value of sorghum is comparable to corn, so in some cases, it requires supplementation with vitamin A.

THE GRAIN SORGHUM

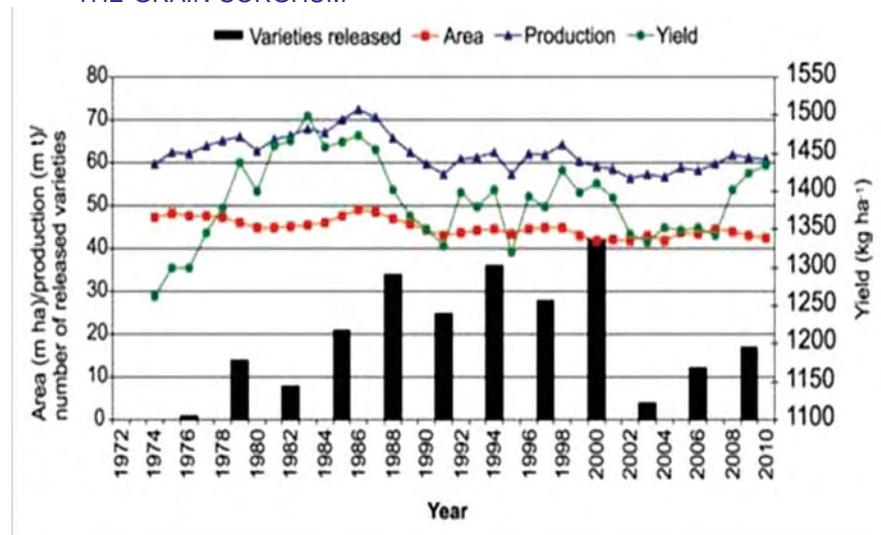


Figure 1. Three-year moving average for sorghum area, production, yield; and number of released varieties (3-year total) based on ICRISAT-bred material globally.

Sorghum is about 70% starch, so it is a good energy source. It also contains proteins. A World Health Organisation report suggests the inherent capacity of the existing sorghum varieties commonly consumed in poor countries was

not adequate to meet the growth requirements of infants and young children. The report also claimed sorghum alone may not be able to meet the healthy maintenance requirements in adults.



Sorghum bicolor

THE GRAIN SORGHUM

Sorghum's nutritional profile includes several minerals. It is a good source of B-complex vitamins. Some varieties of sorghum contain β -carotene which can be converted to vitamin A by the human body; given the photosensitive nature of carotenes and variability due to environmental factors. Some fat-soluble vitamins, namely D, E and K, have also been found in sorghum grain in detectable, but insufficient, quantities.

Uses of Sorghum

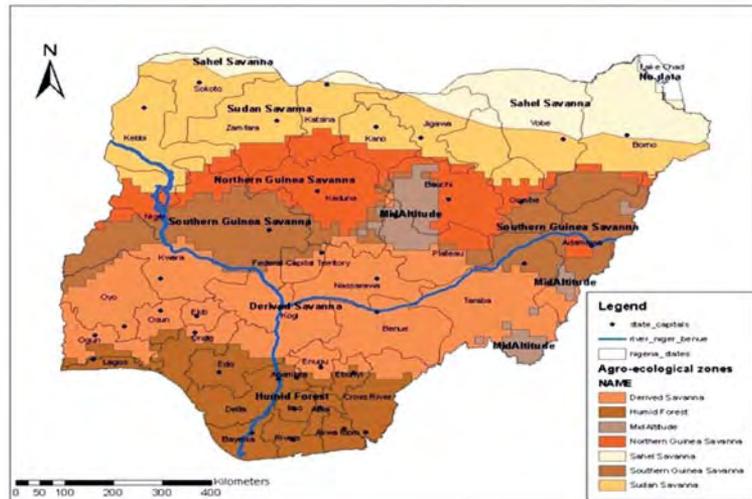
Sorghum is used in foods, such as porridge, bread, pastries, couscous, and beverages. In Nigeria, sorghum is mainly consumed as *tuwo* (local paste) and local beverages. Around the world, it is also used for the production of malt drinks, lagers, other beverages and confectioneries as well as in the livestock feeds industry. It can also be used as a gluten-free replacement for wheat, but due to the lack of gluten, sorghum bread is generally unleavened.

Today, breeding has resulted in better nutritional value of sorghum and better flavour. With the collaboration of Nigerian Breweries and research institutes, better breeds of sorghum are being developed and are expected to further enhance the commercial viability of the cereal. The table above shows some basic nutritional information of sorghum compared with corn.

Nutritional Information

Nutrient Per 100gm Serving	Sorghum	Corn
Total Calories	339	365
Calories from Fat	29.7	42.66
Total Fat (g)	3.3	4.74
Saturated Fat (g)	0.457	0.667
Protein (g)	11.3	9.42

Table 1: Nutritional Information on Sorghum and Corn
Source: ICRISAT



■ Sorghum Ecological map



■ Sorghum Cookies



■ Sorghum Bread

Section 4

DEVELOPMENT OF THE NEW HYBRID SORGHUM



Section 4

DEVELOPMENT OF THE NEW HYBRID SORGHUM

“The decision to shift emphasis to hybrid seeds development triggered a series of activities and motivated a wide range of collaborations with relevant organisations that resulted into the development, certification, registration and release in December 2012 of two new hybrid sorghum seeds, CSR-03H and CSR-04H. The new hybrids are high-yield seed varieties with the potential for 4 metric tonnes per hectare of land.”

Overview of Our Venture into the Development of the New Hybrid Sorghum

Nigerian Breweries' initial successes in 2006 with the selection of the open pollinated varieties - CSR-01 and CSR-02, with a farm yield of 2.0 to 2.5 tonnes per hectare of land was well received by farmers and other stakeholders. This was because it came at a time when the annual national average was 0.8 to 1.2 tonnes per hectare. With the goal to significantly boost productivity from 2009, the Company decided to shift emphasis from variety seed identification and selection to hybrid seed development. Our aim then was to increase productivity up to 4 – 5 tonnes per hectare.

After meeting our initial project targets with CSR-01 and CSR-02, it soon became apparent that to maintain a competitive sourcing strategy, we must encourage sustainable agriculture by

making our preferred varieties very attractive to farmers through higher farm yields. We believed that the sure way to achieve that was through Hybridization.

The decision to shift emphasis to hybrid seeds development triggered a series of activities and motivated a wide range of collaborations with relevant organisations that resulted into the development, certification, registration and release in December 2012 of two new hybrid sorghum seeds, CSR-03H and CSR-04H. The new hybrids are high-yield seed varieties with the potential for 4 metric tonnes per hectare of land.

The development of the new hybrid variety was initiated in 2006 and lasted till 2012. Ideally, such a major hybrid development process should last about 10 years. The speed of the development was due to the Company's commitment and effective collaboration among all implementing partners as well as planting both during the season and off-season through irrigation.

DEVELOPMENT OF THE NEW HYBRID SORGHUM

In this section, we highlight the key activities including the evolution of a governance structure, major components of the process, research and development activities, involvement of critical partners, achievements and opportunities presented by introduction of the new hybrid sorghum, among others.

Key Activities Involved in the Hybrid Development Programme

The development of the hybrid sorghum seeds involved extensive and painstaking efforts as well as engagement of strategic implementing partners and huge investments on various farms tests and other activities. From the

assemblage of the parental lines of seeds, to series of test crossings, field investigations, to micro malting and brewing evaluations to determine the characteristics of any hybrid seeds developed, a wide range of seed selection techniques were involved.

Besides, the seeds were tested for agro-ecological adaptation which lasted one year and established that they were acceptable to the Southern and Northern Guinea agro-ecological zones. The process also involved selection and capacity building of seed producing companies and the selection and training of out-growers. In

addition, the process included the production of foundation and certified seeds as well as the naming and registration of the hybrids, among others activities.

Specific Roles of Nigerian Breweries

Nigerian Breweries' roles on the development of the new hybrid sorghum include but not limited to the following:

- Support the coordination of sorghum hybrid activities with stakeholders;
- Train MARKETS II farmers on hybrid sorghum production;
- Coordinate reporting and dissemination of sorghum development activities;
- Support the attainment of 50% buyback success for produced CSR-01 and CSR-02 seeds and bringing onboard its existing suppliers to be linked to farmers;
- Make performance data or result of intervention available to MARKETS II management on a periodical basis;
- Provide funding where necessary.



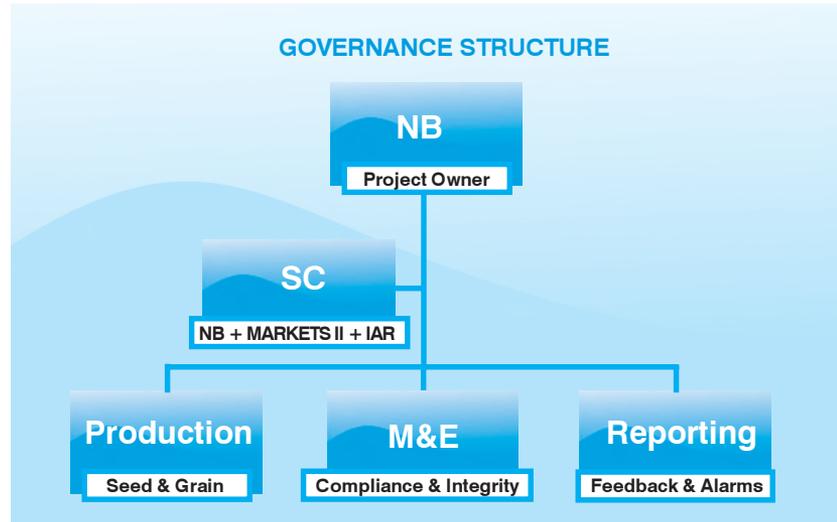
DEVELOPMENT OF THE NEW HYBRID SORGHUM

Governance Structure

With the wide range of activities stated, as well as the number of institutions involved as implementing partners in the hybrid sorghum development process, there was the need to evolve an effective and efficient governance structure to ensure the seamless achievement of targets at specified periods. The two diagrams on this page show the major components within the governance structure that encourages a seamless networking and effective control of stakeholder groups and activities within the sorghum value chain.

The Steering Committee

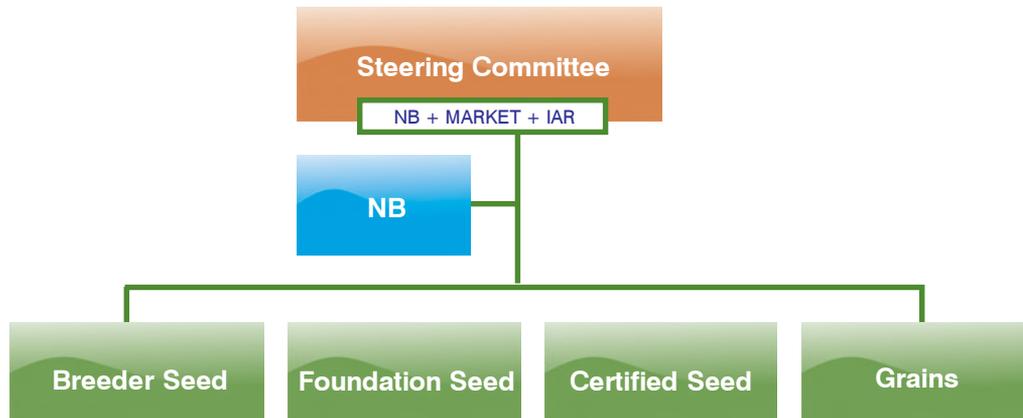
Nigerian Breweries is the project owner and implementer of the



■ Key: NB-Nigerian Breweries, SC-Steering Committee, M & E- Monitoring and Evaluation

sorghum development programme. For effective governance, we set up a Steering Committee made up of the Company, USAID/MARKETS II and the Institute of Agricultural

Research (IAR). The Committee is chaired by our Company representative. The three institutions form the nucleus of the supply chain partnership.



DEVELOPMENT OF THE NEW HYBRID SORGHUM

Major Project Components

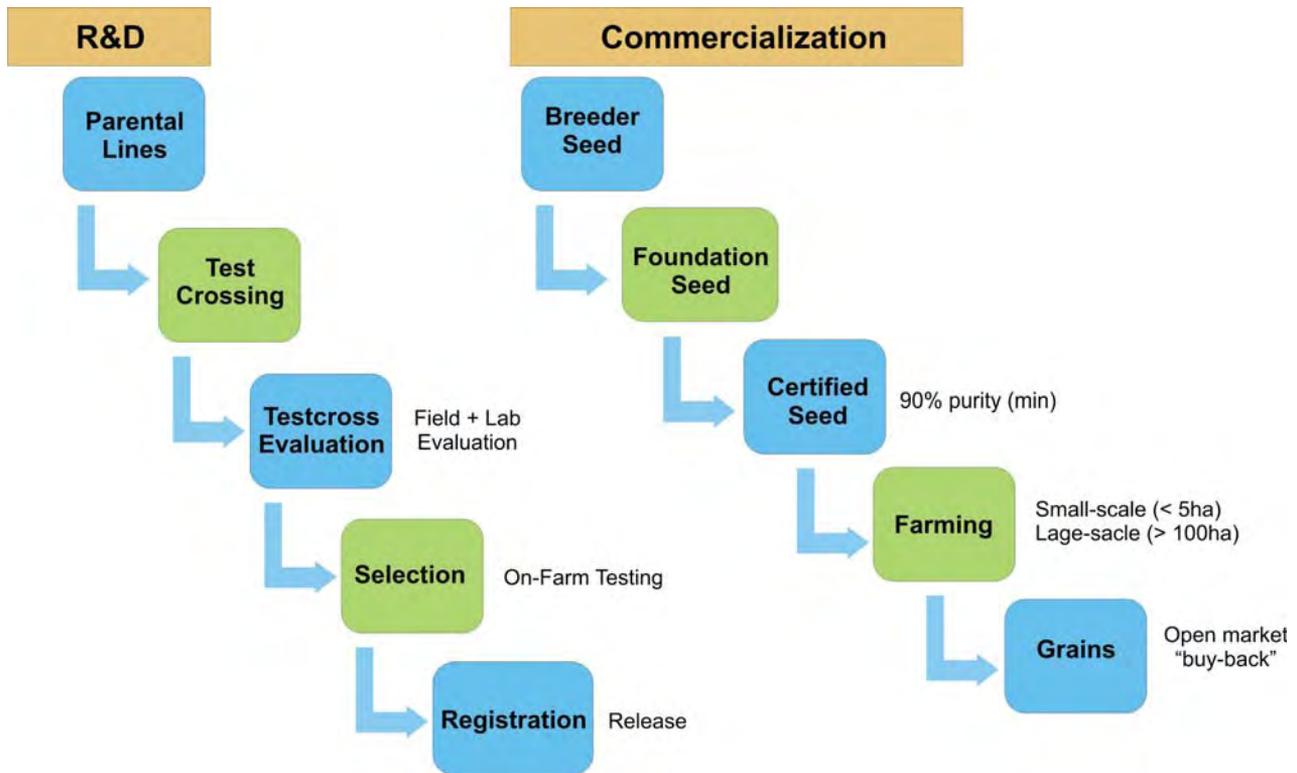
The development process for the hybrid sorghum entailed two major project components which are the research and development angle, and the commercialization aspect. Research and development aspect involved sourcing of parental lines from International Crop Research Institute for the Semi Arid Tropics (ICRISAT) and

carrying out of various tests by the Institute of Agricultural Research (IAR). Tests carried out included test crossing, test cross evaluations, which involved field and laboratory evaluations; seed selection techniques using on-farm seed testing; and seed registration and release.

The commercialization aspect entailed the growing and production of breeder seeds,

foundation seeds and certified seeds. The certified seeds were then given to small and large scale farmers for production of large quantities of grains that are available for the open market as well as buy-back. The diagram below, process overview, shows the two major components involved in the hybrid sorghum development process.

Process Overview



DEVELOPMENT OF THE NEW HYBRID SORGHUM

Certification by NACGRAB

The process of establishing an acceptable hybrid seed is a long and rigorous one. The National Centre for Genetic Resources and Biotechnology (NACGRAB), the statutory government institution for the certification and release of seeds for national use, was involved in cross-checking all the hybrids before final certification. On 7th December 2012, following the satisfaction of all necessary conditions, NACGRAB certified CSR-03H and CSR-04H hybrid varieties developed by Nigerian Breweries and released them for national use.

The New Hybrid Sorghum: A Milestone

The development of the two new high-yield seed varieties - CSR-03H and CSR-04H, with the consequent certification, release and registration, was a milestone achieved by the Company. It is bound to change Nigeria's agricultural landscape for the better. It is estimated that currently, about 8.5 million hectares of land are cultivated with sorghum (using farmer varieties and four improved OPVs - open-pollinated varieties) with yields ranging from 0.8 metric



CSR - 03H



CSR - 04H



■ Sorghum seed varieties

DEVELOPMENT OF THE NEW HYBRID SORGHUM

tonnes per hectare to 1.7 metric tonnes per hectare on the average.

The use of new hybrids will, however, significantly change the scenario by moving the nation up from the low yield plateau, increase sorghum grain yield output to about 4.0 metric tonnes per hectare as well as increase the use of high agro-inputs (fertilizer and chemicals), mechanization, supplementary irrigation, and improved commercial crop husbandry/field management. Furthermore, it will improve quality and productivity and make sorghum production more attractive and profitable for local farmers, motivate youth employment and poverty alleviation, among other benefits. It would thus lead to a more robust sorghum value chain for the country.

Investing in the New Hybrid Sorghum Development

Huge investments by Nigerian Breweries in research and development and ancillary services to establish high-yield varieties of sorghum are gradually paying off with good results and great benefits for all stakeholders. Information available indicates that a sorghum hybrid of farm yield of 5 tonnes/hectare was



■ A staff checking sorghum during germination

developed in the 1970s but the parent stock has been lost. However, with investments into research efforts by our Company as well as collaboration with the research institutes and other partners, the new hybrid sorghum varieties has been a worthwhile investment.

It is our firm belief that continued research will facilitate the establishment of commercial sorghum farming techniques, similar to those for maize and wheat, which can produce harvests up to four times the traditional methods. Nigerian Breweries with the active support of MARKETS II and other partners is committed to considerable

replacement of imported grains with sorghum to meet industrial demand estimated at 200,000 metric tonnes per annum. Increasing food security and competitiveness of Nigerian sorghum still requires the attraction of investible funds for improvements in technology, on-farm practices, and supply chain linkages.

On the two open-pollinated varieties (OPVs), we promised farmers that the yield will increase from below 1tonne per hectare to 2 tonnes per hectare. Today, it is yielding about 2.5 tonnes per hectare. We engaged an organisation to undertake an impact assessment by

DEVELOPMENT OF THE NEW HYBRID SORGHUM

determining the spread of the usage, which is to confirm the actual number of farmers growing the crop. We know that there are about 20,000 farmers under USAID/MARKETS II database. We also know that a lot more than these are growing our varieties, CSR-01 & CSR-02, due to the higher yield and demand for the grains owing to better quality. We anticipate that following the development of the new hybrid seeds, a large number of farmers will switch to the new hybrids when the commercialization process is established.

Commercial Aspects of the Hybrid Development

The commercial aspects of the hybrid sorghum development involve the deployment of three major approaches:

- Large scale (contract farming)
- Medium scale (out-growers scheme)
- Small scale (smallholder farmers)

It is desirable that in four years, a significant commercial distribution of the hybrid sorghum seeds will be achieved. We anticipate that many current farmers growing CSR-01 and CSR-02 will convert to the growing of the hybrid seeds.



■ Growers prepare to plant the new high yield sorghum seeds with the capacity to quadruple farmers' throughput.



■ Aerial view of Aba Malting Plant



■ A tender sorghum pannicle

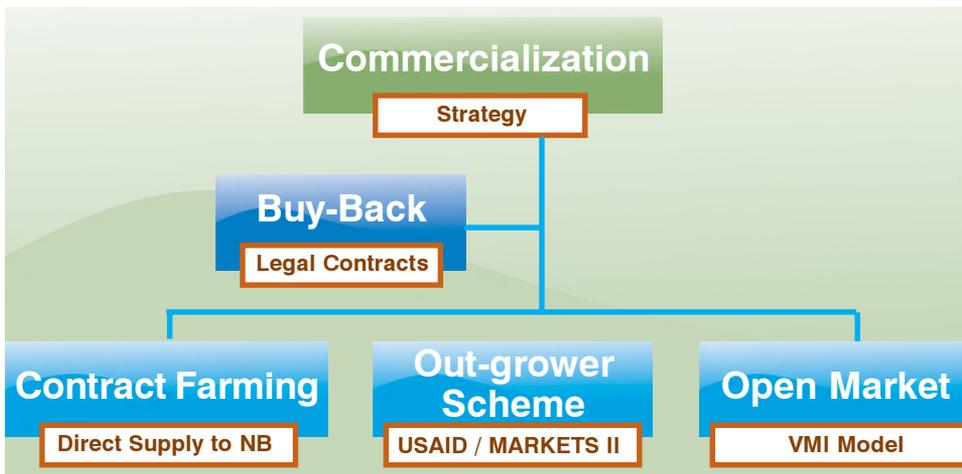
Commercial strategy for the New Hybrids

The development of CSR-03H and CSR-04H is only a stepping stone for our future research and development efforts and for the advancement of the sorghum value chain in Nigeria. Our ambition is to identify varieties that will give farm yields up to 5.0 – 7.0 tonnes per hectare in the future.

The intervention by our Company in response to inward integration policy of the government in the use of local raw materials in manufacturing is changing the face of agriculture in Nigeria, by introducing commercial, mechanized sorghum cultivation using hybrids.

In 2013, the seeds were released to farmers but due to the need to ensure the purity of grains given to farmers for commercial production, distribution was suspended until the appointment of companies to be engaged in testing the purity of the seeds. Our Company expects that by 2016, we will reach 25,000 out-growers to specifically grow the CSR-03H and CSR-04H hybrids.

Commercialization Process Design



■ Key: NB-Nigerian Breweries, USAID-United States Agency for International Development, MARKETS-Maximizing Agricultural Revenues and Key Enterprises in Targeted Sites, VMI-Vendor Managed Inventory

The Roles of Partners

Our Company's successes in the development of the new hybrid sorghum seed varieties were made possible through the engagement of various strategic implementing partners. The results of the collaborative efforts of our Company with these partners have created a model for a private sector-led initiative in the agricultural sector in Nigeria. Some of the key roles played by our partners are highlighted in this section.

“Our Company's successes in the development of the new hybrid sorghum seed varieties were made possible through the engagement of various strategic implementing partners. The results of the collaborative efforts of our Company with these partners have created a model for a private sector-led initiative in the agricultural sector in Nigeria.”



USAID/MARKETS II

USAID is playing a major role by aiding various developmental interventions in dedicated programmes for sorghum production. Various bodies handle each dedicated programme under the Agency. MARKETS is the arm that is handling USAID's agricultural developments effort on sorghum in Nigeria.

USAID/MARKETS have two project teams: MARKETS I and MARKETS II. MARKETS I project team worked with Nigerian Breweries from 2003 - 2006 to develop the CSR- 01 & CSR-02 sorghum hybrids with improved yield and better malting characteristics in place of farmer local varieties. MARKETS I project finished and closed, while MARKETS II started with us on the development of the new hybrids, CSR-03H & CSR-04H, in 2006. The project team will conclude its work in June 2017.

MARKETS II collaborates with Nigerian Breweries on the new hybrid project in three dimensions:

- As a member of the steering committee, they are involved in the evaluation and monitoring of all hybrid activities.
- Deal more with issues regarding development of out-growers scheme.
 - They developed: 20,000 farmers in their farmers' scheme. Part of the functions of MARKETS II is to retrain the farmers who were used to production using the open-ended variety, on the cropping techniques for the new hybrid
- They manage the buy-back process, which had quite a few challenges in the past.

On the development of the new hybrid sorghum, USAID/MARKETS II developed the protocols for establishing demonstration plots and on-farm tests for the two hybrids across the three major agro-ecological zones for sorghum production in Nigeria. The agency also developed protocols for monitoring & evaluation as well as

DEVELOPMENT OF THE NEW HYBRID SORGHUM

verification and validation of yields. In addition, it reviewed out-grower scheme & buy-back process as well as set up a Hybrid Release Committee in conjunction with NASD and MA&RD. MARKETS II also organised field visits at planting for observation, data collection and documentary in conjunction with IFDC and Hybrid Release Committee. The organisation was also involved in the harvest, hybrid release, seed recovery, data analysis & inferencing in conjunction with others relevant partners.

The major roles of MARKETS II are as follows:

- Provide resource persons, trainers, training materials, training venues in consultation with Nigerian Breweries
- Coordinate sorghum hybrid activities with sorghum stakeholders
- Collate, analyse and report hybrid sorghum agronomic data in partnership with IAR or engaged consultants (Nigerian Breweries will provide financial resources to USAID for activities relating to this)
- Train farmers on mechanization and commercialization in sorghum development
- Manage the CSR-01 and CSR-02 and hybrid sorghum out-



■ Aliyu Samaila, Director Agricultural Production, USAID/MARKETS II

- growers schemes to achieve 25,000 farmers by 2017
- Work to attain 50% buy-back success for produced CSR-01 and CSR-02 seeds through timely market price surveys and coordination between producers and buyer
- Provide access for Nigerian Breweries to the MARKETS II senior management, who can make decisions on how to move forward with programmes and activities for the mutual benefit to both participants
- Make performance data or result of intervention available to the Nigerian Breweries management on a periodical basis.

“ MARKETS I partnered with Nigerian Breweries on the development of open-pollinated sorghum varieties, CSR-01 and CSR-02. These varieties doubled the yield farmers used to get with traditional varieties. MARKETS II is, therefore, happy to partner with the company on hybrid sorghum development. Sorghum is an important crop for human nutrition and forms a significant part of menus in the West African sub- region. The development of these hybrids with yield potentials of up to 4 metric tonnes per hectare means more food for the teeming population and more income for small-holder farmers.”

Aliyu Samaila, Director Agricultural Production, USAID/MARKETS II

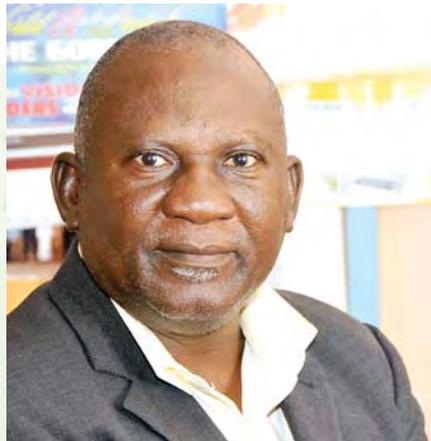
DEVELOPMENT OF THE NEW HYBRID SORGHUM



■ Different sorghum varieties



The Institute for Agricultural Research (IAR), an arm of the Ahmadu Bello University, is playing a major role in the development and commercial production of sorghum in Nigeria. The Institute is charged with the national mandate by the government to develop and improve sorghum varieties for the



■ Prof. Dan Aba, Programme Leader, Cereals Research, IAR / Head of sorghum unit



“Nigerian Breweries has taken the right direction by supporting research. It is commendable that the Company has taken good steps to encourage the commercial production of sorghum in Nigeria.”

DEVELOPMENT OF THE NEW HYBRID SORGHUM

different ecological zones. IAR was extensively engaged in the development of the new hybrid sorghum varieties and creates awareness about them by demonstration among farmers.

IAR was involved in the production of breeder seeds and produced the needed foundation seeds in conjunction with Premier Seeds Company Limited. It was also involved in Hybrid Maintenance, Evaluation and Selection of new entries for bolder grains. In addition, IAR participated in the production of certified seeds in conjunction with Premier Seeds Nigeria Limited.

ICRISAT



The International Crops Research Institute for the Semi-Arid-Tropics (ICRISAT) is a non-profit agricultural research organisation. ICRISAT adopts Integrated genetic and natural resources management as its overarching research strategy. The aim is to combine tested methods of crop commodity research with well established practices in research in natural resources management. The original goal was to use crop improvement research as the

basis to improve food availability in drought-prone areas of the tropics. The ICRISAT Genebank serves as a repository for the collection of germplasm of the five mandate crops – five mandate crops: sorghum, pearl millet chickpea, pigeonpea and groundnut; and six small millets. The institute provided the parental lines used in the development of the new hybrid sorghum.

The National Agricultural Seed Council (NASC)

The Council is involved in the development of seed varieties, which is a highly specialized and time-consuming exercise that requires professionalism, patience and great care. The Council participated in conjunction with MARKETS II in the setting up of a Hybrid Release Committee to coordinate the activities, communication and documentation that led to the successful naming and release of the hybrid seeds.

Premier Seeds Nigeria Limited

In conjunction with IAR, Premier Seeds Nigeria Limited was involved in the production of certified seeds.



■ Another variety of sorghum seeds



■ Sorghum seed varieties

“Alliance for Green Revolution in Africa (AGRA) aims to develop one or more hybrid sorghum varieties which are high yielding and can be used for both food provision and as raw material for agro-processors.”

Prof. O. B. Obilana, Consultant Sorghum Breeder

DEVELOPMENT OF THE NEW HYBRID SORGHUM

Partnership with Government

Nigerian Breweries is working out some arrangement with the Federal Ministry of Agriculture and Rural Development (FMA &RD) to facilitate information exchange to accelerate the adoption and application of the research findings supported by the Company for the overall development of sorghum in Nigeria. The government was studying a memorandum of understanding in this regard as at the time of the publication of this brochure.

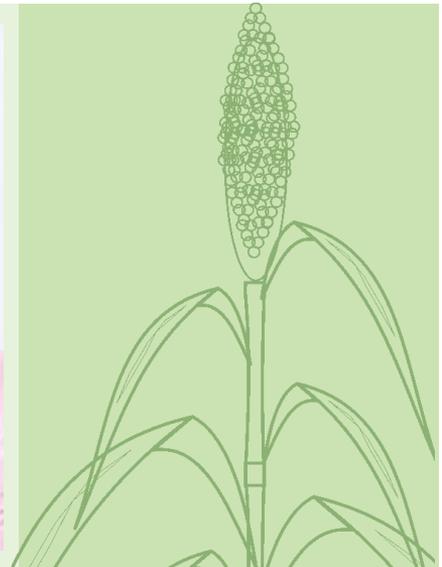


■ Prof. O. B. Obilana, Consultant Sorghum Breeder

“The use of hybrids will significantly change the scenario by moving us up from the low yield plateau, increase sorghum grain yield output to about 4.0 metric tonnes per hectare, increase use of high agro-inputs (fertilizer and chemicals), mechanization, supplementary irrigation, and improve commercial crop husbandry and field management.”

“After meeting our initial project targets, it became apparent that to maintain a competitive sourcing strategy, we had to embark on sustainable agriculture by making our preferred varieties very attractive to farmers through higher farm yields of up to 4 tonnes per hectare.”

Mr. Uzodinma Onuoha, Raw Materials Development Manager





Testimonial from Springfield Agro Limited

Our collaboration with Nigerian Breweries since over 4 years now as a supplier was strengthened with linkage to realizing the potential of hybrid sorghum. The hybrids first of its kind in Nigeria, have an enormous potential benefiting all the stakeholders across the value chain, right from sorghum farmers at the bottom to



end users, be it processing firms or grain - using end consumers.

Our collaboration has successfully shown the performance levels of hybrid sorghum CSR-03H and CSR-04H, and that it yields multifold over existing varieties in Nigeria. Nigerian Breweries has been fully with us as part of this collaboration and linking us with research institutes for carrying out the demonstrations, seed multiplication and commercial cultivation. This collaboration is the beginning for sorghum revolution in Nigeria, improving the income levels of sorghum farming communities predominantly in the arid zones of Nigeria, thereby strengthening various associated sectors.



“This collaboration is the beginning for sorghum revolution in Nigeria, improving the income levels of sorghum farming communities predominantly in the arid zones of Nigeria , thereby strengthening various associated sectors.”

- Rakesh Rawat, Managing Director,
Springfield Agro Limited

DEVELOPMENT OF THE NEW HYBRID SORGHUM

Till now, farmers cultivating sorghum in Nigeria have been facing various challenges culminating in low yields and hence low income levels. Now, with introduction of Hybrid sorghum, there is enormous potential to alleviate such challenges faced by sorghum farmers, meeting raw material needs of various associated sectors. In short, few years to come CSR-03H & CSR-04H would have paved the way for Nigeria to become a world leader in sorghum production in terms of total quantum of production as well as productivity/unit area!

In stride to improve livelihood of farming communities, Springfield Agro Limited, a subsidiary of Kewalram Chanrai Group, got into alliance with the brewing giant, Nigerian Breweries Plc, to develop hybrid sorghum with a yield two times more over local varieties with technical assistance from agricultural research institutions. Springfield Agro carried intensive field trials of the two hybrids, CSR-03H & CSR-04H, in different locations in Northern Nigeria and the yield acknowledged from these trails confirmed higher productivity and better disease resistance

trait. In order to commercialize the hybrid, Springfield Agro and a few progressive farmers did sorghum cultivation of CSR-03H & CSR-04H over 500 hectares of land to reconfirm productivity of 3 - 4 metric tonnes per hectare.. An intensive extension programme laid down by Nigerian Breweries and Springfield Agro Limited, to popularize the hybrids in farming communities, showed that they were well accepted and preferred by farmers.



Section 5

THE NIGERIAN RAW SORGHUM MARKET



Section 5

THE NIGERIAN RAW SORGHUM MARKET

Engaging Smallholder Farmers

The effective engagement of sorghum farmers is critical for Nigerian Breweries to maintain a sustainable framework for hybrid sorghum development and supply. The sorghum farmers are many in number and operate largely on a small scale basis and as micro farming enterprises.

To facilitate their engagement and proper management, we have grouped these farmers in clusters under the supervision of Regional Production Coordinators (RPCs), also known as nucleus farmers. The RPCs manage the small groups in the clusters and facilitate the buy-back of grains from the farmers and the supply of purchased grains to maltsters.

The management of these micro enterprise farmers through Regional Production Coordinators has



■ A view of sorghum farms



THE NIGERIAN RAW SORGHUM MARKET

enabled the Company to promote bonding among them so that they can share experiences. It also offers them opportunities to reap higher returns from their farm yields. Nigerian Breweries is actively engaging these small scale farmers and micro farming enterprises in our hybrid sorghum development programme because we believe they are the engine of growth and economic advancement for a developing economy like Nigeria. The empowerment of these farmers in the sorghum supply chain is stimulating economic growth and poverty alleviation in Nigeria which is one of the Millennium Development Goals of the country.

The demand by our Company for good quality sorghum with good malting and brewing characteristics, as well as the need for the grain by other industrial users, have stimulated research into the production of improved quality grains that offer higher farm yields. The use of local seeds by local farmers yields less than 1 metric tonne per hectare of land. However, the introduction of the open pollinated varieties, CSR-01 and CSR-02, by our Company has improved farm yield up to 2.0 - 2.5 metric tonnes per hectare. With the new hybrids, CSR-03H and CSR-04H, farmers

will enjoy yields up to 4 metric tonnes per hectare. This improved variety, therefore, enhances productivity and will enable local farmers to increase supply and derive much more benefits from their efforts.

Protecting Interest of Farmers

USAID/MARKETS II has 20,000 farmers in its database while the food, agro and allied industries that also use sorghum for their operations have additional 5,000 farmers. The 25,000 farmers are those documented. It is estimated that about 10 times this number of farmers grow CSR-01 and CSR-02 varieties as they are open pollinated, i.e. the farmers can replant the grains as seeds

unlike the hybrids which require new seed collection each planting year.

The introduction of the hybrid by Nigerian Breweries is in line with Nigeria's plan to realize its ambition to make agriculture a big business and build a proper value chain where all players add value and share benefits. It will also help to provide some control in the system. Thus IAR will make money by adding value through the provision of breeder seeds to Premier Seeds to produce foundation seeds. Thereafter, other seed multiplication companies will produce seeds, the farmers will grow the crop and the Company will buy from them. The players will generate income based on their contributions and



THE NIGERIAN RAW SORGHUM MARKET

depth of specializations in the value chain. Our role in this development is to spread the income base, while USAID/MARKETS II is to ensure that farmers who labour for results are not short-changed in the value chain because there are middlemen who take advantage of local farmers.

Under the buy-back scheme, we promise to pay market price plus 10% premium to the farmer, and this is guaranteed. A village grains collector, however, who is not a farmer but has the financial muscle which enables him to provide bridging finance to settle poor farmers' domestic needs, can offer them money in advance of their grains harvest. This reduces the amount available for buy-back and the revenue accruable to the farmers. An effective communication with farmers and a proper working of the buy-back system can stem the activities of middlemen.

Providing Technical Assistance to Farmers

USAID/MARKETS II in collaboration with Nigerian Breweries provides technical assistance to these farmers through the adoption of good farming skills and improved practices. This way, the scheme provides training and on-farm demonstrations, facilitates the farmers' access to credits from banks, and farm input materials



■ A sorghum farming equipment



■ A tractor used for tilling

“Through interventions via the sorghum supply programme, these local farmers’ household incomes have continued to improve and so is their standard of living.”



THE NIGERIAN RAW SORGHUM MARKET

such as fertilizer and mechanised equipment supplies. Through interventions via the sorghum supply programme, the household incomes of these local farmers have continued to improve and so is their standard of living. A recent Socio-Economic Impact Assessment of Nigerian Breweries shows that the Company creates about 49,900 jobs within the agricultural sector of the economy through its overall involvement in the sorghum programme and procurement.

For the new hybrids, USAID/ MARKETS II will play a key role in the training of out-growers, provision of access to credit institutions and coordination of the buy-back process between the RPCs and the maltsters during the commercialization of the process.

Multiplier Effect of Sorghum Supply

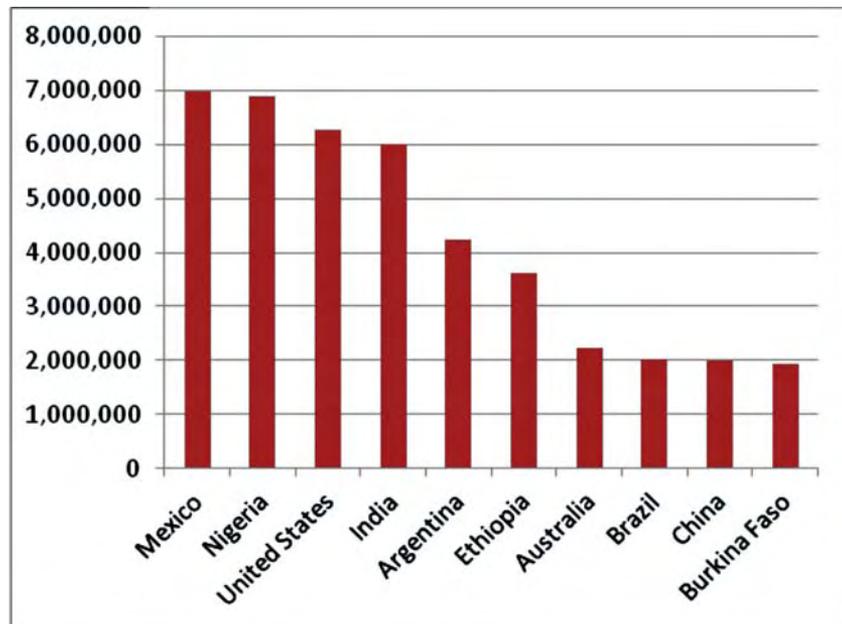
Nigerian Breweries has succeeded in generating a multiplier effect on the sorghum supply chain, which has been aided by our sustainability agenda, *Brewing a Better Future (BaBF)*. One of the focus areas of *BaBF* is local sourcing of raw materials which is driving the

enhancement of the sorghum value chain. It has also generated increased demand for raw sorghum and stimulated the interest of farmers to plant more of the grain with the support the Company is providing.

The current national demand of sorghum in Nigeria is estimated at 6.5 million metric tonnes annually. The 2014 requirement of the grain by industry alone in Nigeria is estimated at 200,000 metric tonnes. The combined demand for raw sorghum and malted sorghum is increasing.

This provides a guarantee of steady demand and more business opportunities for sorghum farmers and malted sorghum producers.

“The current national demand of sorghum in Nigeria is estimated at 6.5 million metric tonnes annually. The 2014 requirement of the grain by industry alone in Nigeria is estimated at 200,000 metric tonnes.”



■ Output of Top Sorghum Producing Countries in metric tonnes (most current figures). Food and Agricultural Organisation of the United Nations (FAOSTAT) 2012.



■ Raw sorghum truck before off-loading

Producing and Supplying Raw Sorghum

Sorghum is a crop that grows in arid conditions of little rainfall. Before the intervention of Nigerian Breweries with the commercial growing of the grain and the hybrid sorghum development programme through research, local farming practices did not use modern farming methods and inputs like fertilizer. The engagement of our major partners has helped in increasing sorghum growing and farm yields through farmers' clusters.

Under the new scheme, Nigerian Breweries has assisted farmers to

cultivate an estimated 26,000 hectares and 28,000 hectares of farmland in 2013 and 2014 planting seasons, respectively. The cultivated land area is expected to increase to 30,000 hectares in 2015.

In 2012, Nigeria produced approximately 6.9 million metric tonnes of sorghum; 80% of which is consumed for food while 20% is for cross-border trade and industrial use. Nigerian Breweries annual demand of sorghum is approximately 100,000 metric tonnes per annum. It is estimated that the consumption by the major industrial users of sorghum in Nigeria is 200,000 metric tonnes per annum.

“Under the new scheme, Nigerian Breweries has assisted farmers to cultivate an estimated 26,000 hectares and 28,000 hectares of farmland in 2013 and 2014 planting seasons, respectively. The cultivated land area is expected to increase to 30,000 hectares in 2015.”

Nigerian Breweries is the single industrial biggest consumer of the grain.

Nigerian Breweries is encouraging the large scale farmers to use mechanization. They are being trained through USAID/MARKETS II on the use of mechanised farming to increase their output. The government is influencing developments in agricultural production, through policy formulation and direct intervention in farm activities. It is subsidizing the cost of fertilizer and mechanised equipment purchase for farmers, and is paying special attention to certain crops. Nigerian Breweries liaises with government agencies to

THE NIGERIAN RAW SORGHUM MARKET

know the policies that would be implemented in the agricultural



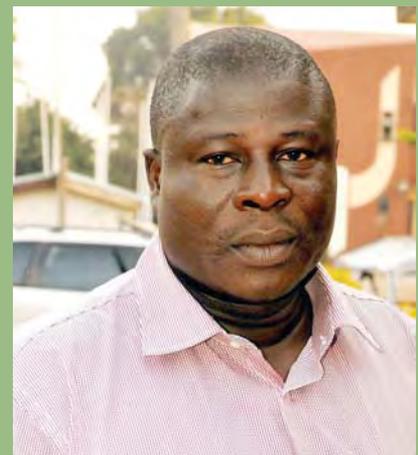
■ Map of sorghum markets

Testimonial from a Supplier

“For us at Standard Grains Nigeria Limited, our work is to source, buy, clean, store and sell sorghum to interested bulk buyers. We regard sorghum as the ideal alternative raw material for the beverage and food industry in

Nigeria and Africa. We have been in the sorghum business for a long time and we are pleased with our supplies to Nigerian Breweries Plc.”

Prince Aminu S. Usman, Managing Director,
Standard Grains Nigeria Limited, Kaduna.



THE NIGERIAN RAW SORGHUM MARKET

sector and how the Company can leverage on them.

Sourcing Grain for the Company

The buying of the desired quantities of sorghum which Nigerian Breweries needs, at the right quality, at the right price, and the right time, and the logistics of timely supply, requires careful planning and execution. The Company's Raw Materials Development Manager, Mr. Uzodinma Onuoha, coordinates this function.



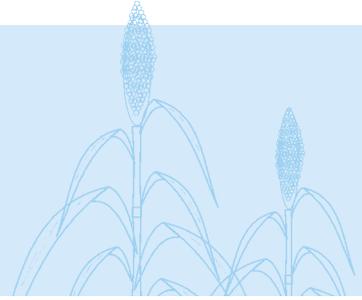
■ A sorghum market

“The buying of the desired quantities of sorghum which Nigerian Breweries needs, at the right quality, at the right price, and the right time, and the logistics of timely supply, requires careful planning and execution.”



Section 6

MALTED SORGHUM



Section 6

MALTED SORGHUM

Promoting the Use of Malted Sorghum

The inclusion of sorghum in some product recipes by the beverage industry, which was motivated by Nigerian Breweries, as well as its increased consumption by some other food manufacturers, necessitated the establishment of sorghum malting plants in Nigeria. The major users of malted sorghum are companies in the food and beverage industry.

To ensure sustainable supplies of malted sorghum, our Company demonstrated its genuine commitment to the sorghum supply chain development when it identified and encouraged prospective investors to establish sorghum malting plants. Today, through the active involvement of Nigerian Breweries, there are third party sorghum malting plants with total installed capacity of about 74,000 metric tonnes of malted sorghum per annum that supply us malted sorghum.

Nigeria currently boasts of locally available installed capacity of over 111,000 metric tonnes per annum. With the commercialization of the new hybrid sorghum with potential for higher productivity and production of grains with better malting characteristics, future supplies of good quality sorghum to support the malted sorghum market is guaranteed.

Besides providing the Company with malted sorghum, Aba Malting Plant was also established to pioneer research and development of sorghum malting.



A Researcher at work



A sample of malted sorghum

MALTED SORGHUM

Our Support to Sustainable Supply of Malted Sorghum

We pioneered the local malting of sorghum by going into partnership with a local investor, which resulted in the establishment of Africa's largest sorghum malting plant, the Aba Malting Plant. Today, we own and operate two malting plants in Aba and Kaduna with a combined capacity of 37,000 metric tonnes per annum.

To date, through the Aba and Kaduna malting plants, Nigerian Breweries is leading the pack and has recorded a milestone as the largest producer of malted sorghum in Africa and has changed the face of sorghum malting and usage in Nigeria and the African continent.



■ Sorghum seeds undergoing a sieving process



■ Laboratory analyst at work

Aba Malting Plant

Nigerian Breweries encouraged the Universal Malting Plant to establish an ultra-modern sorghum malting plant in Aba. The investment was promoted by our Company and we also went into partnership with Universal Malting Plant and guaranteed a ready market for their products at a competitive price. The 30,000 metric tonnes per annum capacity plant started production in May 2008.



■ A section of Aba Malting Plant

MALTED SORGHUM



■ A view of Aba Malting Plant

Nigerian Breweries acquired the plant in February 2009. It has good malting process control and produces high quality malted sorghum. It is based on best-in-class technology, and is provided with an auto process control – flexible “Recipe” programming system.

In 2013, in order to further improve the quality of malting, the Company installed new spray rings in the germination kilning vessels (GKV). The Company also installed a polisher to clean the sorghum thoroughly before

storage. There is plan to increase capacity to 60,000 metric tonnes in future.



■ Germination-Kilning Vessel in operation at Aba Malting Plant

MALTED SORGHUM

Kudenda Malting Plant

Following the acquisition and merging of Sona Systems to our Company in 2011, we inherited a second sorghum malting plant in Kudenda, Kaduna state, with a capacity of 7,000 metric tonnes per annum. This has strengthened our capacity to produce the right quality malted sorghum for some of our beverages.



■ A section of Kudenda Malting Plant, Kaduna



■ Steep House in Aba Malting Plant

“Following the acquisition and merging of Sona Systems to our Company in 2011, we inherited a second sorghum malting plant in Kudenda, Kaduna state, with a capacity of 7,000 metric tonnes per annum.”

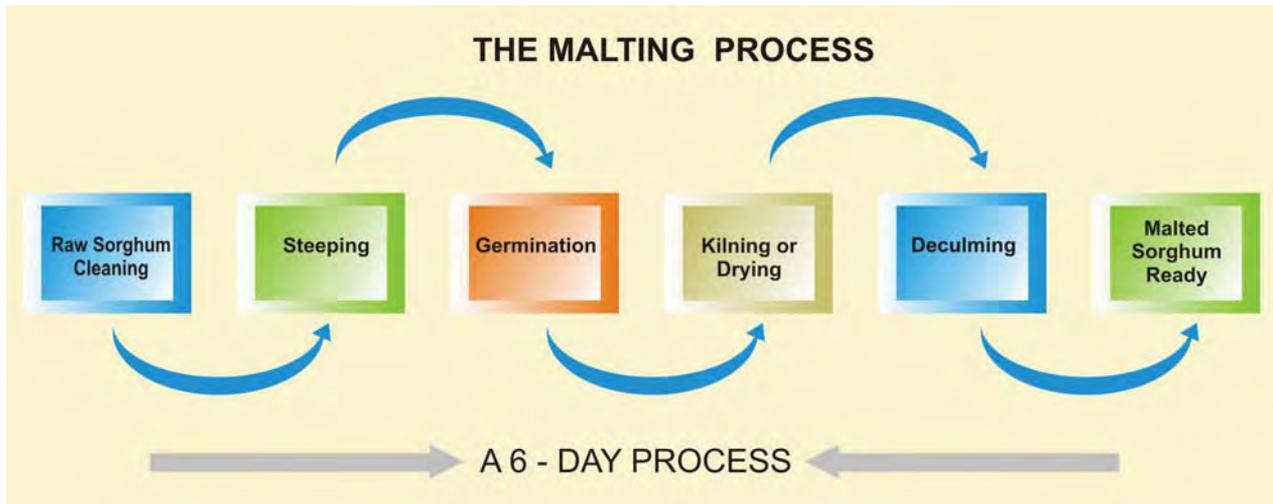
MALTED SORGHUM

Third Party Malting Plants

There are various third party malting plants operating in Nigeria. Four of them with a combined installed capacity of 74,000 metric tonnes supply malted sorghum to Nigerian Breweries. Derivatives

Industries Limited tops the list with 30,000 metric tonnes per annum; Food Agro and Allied Products Limited has installed capacity for 20,000 metric tonnes; Lifecare Industries Limited produces 15,000 metric tonnes; and Taibod Ventures Limited, 9,000 metric

tonnes per annum. Nigerian Breweries remains their main buyer. Our Company provided technical and technological support as well as guaranteed a ready market for our malted sorghum suppliers and we offer competitive prices.



■ Raw sorghum storage silos



■ Sorghum specie

Section 7

FUTURE OUTLOOK ON SORGHUM



Section 7

FUTURE OUTLOOK ON SORGHUM

A New Road Map for Nigeria's Agricultural Sector

It is estimated that Nigeria's agricultural sector provides employment to about 70 per cent of the nation's active labour force and plays a prominent role in the socio-economic development of the country through the provision of staple foods for most of the nation's population. Besides, the sector contributes about 40 per cent to the country's Gross Domestic Product (GDP). Experts believe that despite the huge potential of the sector, it has remained largely untapped, thus undermining the nation's efforts at providing gainful employment opportunities for its teeming youths and achieving self-sufficiency in food production. In response, the Federal Government of Nigeria through the Agricultural Transformation Action Plan (ATAP) is working towards a remarkable revolution of the nation's agricultural sector.

The Minister of Agriculture and Rural Development, Dr. Akinwumi Adesina, has noted that a transformation of the nation's agricultural sector had become imperative, and assured that with President Goodluck Jonathan's transformation agenda, the agricultural sector would be turned around to ensure the realisation of the potential value of N40 trillion. He promised that the ATAP would ensure a diversification of the agricultural sector to attain a significant increase of about 20 million tonnes in the production of key staple foods.



■ Dr. Akinwumi Adesina, the Minister of Agriculture and Rural Development



FUTURE OUTLOOK ON SORGHUM

On 5th September 2013, Dr. Ngozi Okonjo-Iweala, Finance Minister and Coordinating Minister for the Economy, unfolded the new roadmap for the agricultural sector. She noted that the implementation of the Agricultural Transformation Action Plan (ATAP) would inject an estimated N300 billion additional income into the hands of Nigerian farmers and another N350 billion into the economy through rice sufficiency. She expressed optimism that ATAP would create about three-and-half million jobs in the agricultural sector in the next four years through a massive focus on the production of five major crops in which Nigeria has a comparative advantage. These include rice, cassava, sorghum, cocoa and cotton.

“Agricultural Transformation Action Plan is aimed at revolutionizing agriculture so that it could be seen as a business with emphasis on partnership, investment and accountability and not just as a passive development issue.”

- Dr. Ngozi Okonjo-Iweala, Finance Minister and Coordinating Minister for the Economy

The effort of Nigerian Breweries towards the commercial production of hybrid sorghum is, therefore, very much in line with the efforts of the Federal Government. With continued efforts and investments into the cereal, we anticipate that its production will achieve a strong foothold in Nigeria and contribute significantly in meeting the governments transformation agenda for the agricultural sector. All these will support the achievements of the fine points of some of the goals of our *Brewing a Better Future*.

Guaranteed Demand

In the long-term, our company plans to retain sorghum as part



of our products recipe for some of our brands. To achieve this, we will continue to support the development of high quality varieties with excellent malting and brewing characteristics. Given the expected rise in population and consequent increase in the consumption of our brands, our demand for both raw and malted sorghum will be sustained. This will, therefore, translate into the expansion of business opportunities throughout the sorghum value chain and will impact farmers, suppliers, regional production coordinators, seed companies, fertilizer supplying companies, transporters, financial institutions, maltsters and others.

Development of Improved High-Yield Hybrids

Latching upon the successes already recorded with the CSR-03H and CSR-04H new hybrids, our Company will continue to invest in research and development efforts in collaboration with research institutions and other stakeholders in our quest to establish higher-yield hybrid sorghum seeds.

Commercialization of the New Hybrid

Our future outlook is the commercialization of the new hybrid sorghum and to ensure that it is abundantly available for farmers. We will consolidate on increasing output through the commercialization of the new hybrid by encouraging many farmers to grow the hybrid seeds. This will further reinforce our foothold in continuing to enhance the sorghum value chain. Through collaborations with other stakeholders, we will support farmers to get more value from their efforts as well as encourage the government to give greater attention to sorghum as one of the major crops grown in Nigeria.

Export Opportunities

There are observations that part of the sorghum currently grown in Nigeria is sold through cross-border trade within some West African countries. We anticipate that going forward, with the Agricultural Transformation Action Plan of the government as well as a streamlined and advanced sorghum value chain, local output of the grain will far exceed national demand. This would create opportunities for export into

nations in demand of sorghum within the West African sub-region and beyond.

Improved Food Security and the Local Economy

With our Company's continuing attention on sorghum and the anticipated encouragement from the Federal Government, which has identified sorghum as the third most important crop that requires focus, we expect the

grain to attract more interest from farmers and other stakeholders in the future. This will be expected to stimulate local output of sorghum and help to ensure food security. Besides, it will improve the economies of local farmer communities, engage more unemployed youths, help in poverty alleviation and sustain the sorghum malting sub-sector of the food and beverage industry.

“With our Company's continuing attention on sorghum and the anticipated encouragement from the Federal Government, which has identified sorghum as the third most important crop that requires focus, we expect the grain to attract more interest from farmers and other stakeholders in the future.”



Section 8

BENEFITS, CHALLENGES AND OPPORTUNITIES



Section 8

BENEFITS, CHALLENGES AND OPPORTUNITIES

Benefits

Nigerian Breweries' sorghum development programme is providing jobs for thousands of farmers and other stakeholders. It is facilitating the building of critical linkages with research institutes and sorghum related producers as well as malting plants. It is turning out improved hybrids that yield much better harvest per acre of land, meeting local demand for the crop as well as conserving foreign exchange for Nigeria.

This programme is helping to build expertise on research into sorghum development and use. It is fostering the setting up of feeder industries such as seed multiplication companies, and malting plants; reducing dependence on imported raw materials; and increasing the contribution of the brewing industry to the development of the Nigerian economy.



■ A sorghum farm

Other benefits are listed below:

- Promoting the business sustainability of Nigerian Breweries
- Contributing to national food security and expanding the social investment of Nigerian Breweries through farmer empowerment
- Providing a guaranteed market for farmers and increased income from higher productivity
- Making Nigeria to become a world leader in sorghum production
- Making it possible for our Company to incorporate the grain into the product recipe of some of our brands
- Helping our Company to attract more farmers into sorghum farming and increasing the overall production of the grain in Nigeria.
- Reducing levels of poverty and youth unemployment

BENEFITS, CHALLENGES AND OPPORTUNITIES

- Creating unforeseen business opportunities and attracting financial resources from socially responsive investors

The intervention of Nigerian Breweries in sorghum production is attracting more farmers into sorghum farming and increasing the production of the grain in Nigeria. This is increasing Nigeria's capacity to become a world leader in sorghum production. An economic impact assessment commissioned by our Company showed that the national increase in employment as a result of direct and indirect influence of Nigerian Breweries in the value chain is estimated at 49,900 workers of which 46,800 are farmers.

In 2013, Nigerian Breweries spent over N8.8 billion purchasing sorghum either in its raw or malted forms. A considerable component of this spend went to farmers. This amount has also resulted in reducing our dependence on barley and savings on foreign exchange.

From the above background, many stakeholders in the activities of Nigerian Breweries are directly or indirectly positively affected. These include farmers, transporters, suppliers, the

manufacturing sector, distributive channels, the economy, government (improved taxes), our shareholders, employees and others.

Challenges

With the encouragement and results we have gotten so far with sorghum, we are determined to deepen our Company's involvement in its development and use it to create more benefits for the Nigerian economy. There are, however, challenges; though the Company recorded milestones with sorghum production, it has not been an easy journey. Sustaining the quality of sorghum seeds we provide to the farmers is difficult because of the absence of a seed industry in Nigeria. Also, there is a lack of reliable seed partners in the value chain, while the insecurity in northern Nigeria where the grain is largely grown, is adversely affecting planting and harvesting. In addition, the poor literacy level of the majority of farmers makes communication difficult, resulting in delayed learning curves on the use of new farm techniques and application of the right seeds.

Investments Opportunities

Nigerian Breweries spends N100 million annually on the average on the hybrid sorghum

development programme. These investments have helped to push up Nigeria's production of sorghum to an estimated 7 million metric tonnes in 2013. The Company is pursuing the sorghum development programme by investing in high yield seed varieties in collaboration with research institutes, boosting breeder seed production and operating an out-growers scheme with farmers.

Sorghum is increasingly being used as a substitute for the more expensive imported raw materials in the manufacturing of some beverages in Nigeria. The sorghum malting plant in Aba, Abia state, which has significantly reduced importation of malted barley, points to investor confidence in the continued competitiveness of Nigerian sorghum in the local beverage industry. Nigeria currently produces enough sorghum to satisfy local demand and exports 50,000 metric tonnes per annum. However, production is far from being optimized. Enormous investment opportunities still abound to enhance output for end market and industry substitution and to stimulate the agricultural sector of the Nigerian economy.

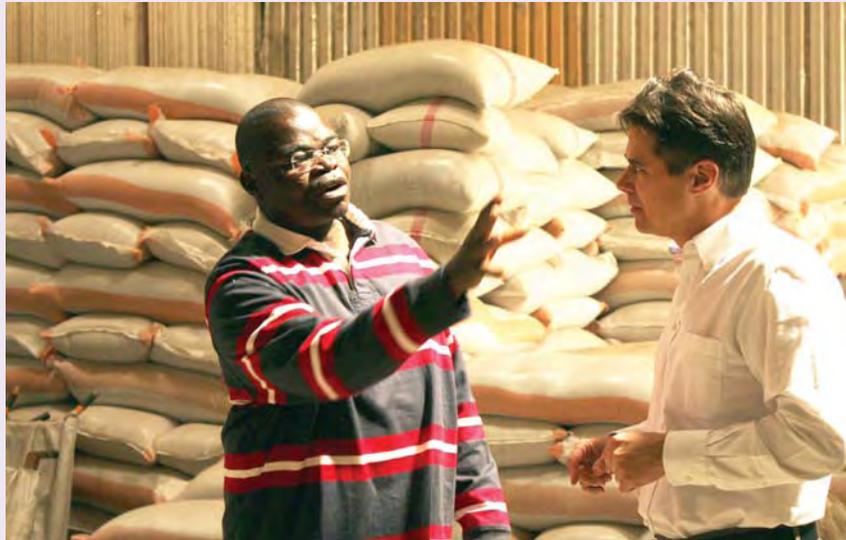
A Case Study of Nikoy Nigeria Limited

We started our relationship with Nigerian Breweries Plc over 20 years ago as their supplier of raw sorghum and maize. However, with the decision of Nigerian Breweries Plc to only accept pre-cleaned grains, we established a factory in Kaduna that has all the facilities and infrastructure to store, process, grade sorghum and eventually deliver the grains to the various brewery locations of Nigerian Breweries throughout Nigeria.

We source our sorghum from farmers and markets spread across many states in the northern part of Nigeria. As harvesting and threshing are being done manually by the peasant farmers, the process of cleaning the sorghum in our factory involves removal of the following from the raw sorghum: shaft, stone (destoning), dust, gloom; we also do demagnetizing, polishing, etc and then eventual grading into 50 kg or 100 kg bags before transporting to various locations of Nigerian Breweries Plc.

Our Impression of the Progress of Sorghum Development in Nigeria

Sorghum is still a very important agricultural produce to the Nigerian economy and Nigeria is among the



■ Mr. Oyedele, Managing Director, Nikoy Nigeria Limited, Kaduna discussing with a guest

three largest producers of the grain in the world. The four categories of buyers are those for domestic consumption, neighbouring countries, Federal and State Governments for their strategic grains reserve and the industrial or institutional buyers.

Among the industrial and institutional buyers, Nigerian Breweries is the largest buyer. Because of the commitment of Nigerian Breweries in various forms to sorghum cultivation and usage in Nigeria, there is an increasing awareness on the part of peasant farmers and all the

stakeholders in various parts of the country on the need to increase their level of cultivation of sorghum. All these and coupled with the sustained efforts of Nigerian Breweries to introduce varieties that will generate increased yield per hectare, is making sorghum production and harvest to increase on yearly basis. I commend the effort of Nigerian Breweries Plc.

Oyedele O.O
Managing Director, Nikoy Nigeria Limited, Kaduna.

Replicating Lessons Learned

There are good prospects for modernizing Nigeria's agricultural processes if corporate organisations partner with critical stakeholders and international donor agencies. Nigerian Breweries' engagement of farmers, non-governmental organisations, research institutions and others in the sorghum supply programme has demonstrated that it can be done. It is also a good manifestation of the major contributions the private sector can make towards sustainable development in the context of the current global economic challenges.

With the abundant supply of arable land in Nigeria, and the availability of many cereals that can be cultivated on a commercial scale with positive results, we believe the gains of our sorghum experience can be replicated in other areas of the nation's food chain. This will make Nigeria to become self sufficient in food production and generate enormous revenue from exports of sorghum, other cereals and diverse agricultural produce.

The inflowing investment can be deployed in the development of other critical sectors of the Nigerian economy. This will create jobs for restive youths and reduce the level



■ Sorghum in use as animal feeds

of insecurity in the country. This way, the effort of Nigerian Breweries to make significant contributions towards sustainability of the society, the economy and the environment would make more impact on the fortunes of our stakeholders.

“This will make Nigeria to become self sufficient in food production and generate enormous revenue from exports of sorghum, other cereals and diverse agricultural produce.”



■ Local farmers gathering sorghum grains

Conclusion

Our sorghum development programme is integrated into the Company's community development programme under the larger company ambition of "Winning with Nigeria". We are doing so by sustaining the commercial production of this grain through huge investments over the years and cultivation through a network of farmers in Northern Nigeria. The high yield sorghum seedlings we are developing through research institutes will continue to increase the production of sorghum farmers.

This brochure provides the latest information on what we are doing with this important grain. It marks us out as an industry leader that is socially responsible. We are committed to the Agricultural Transformation Agenda of the government and to sustainable development through commercial sorghum production. In addition, we are determined to sustain this effort so that, among other things, we will achieve our *Brewing a Better Future* ambition of sourcing a minimum of 60% of our raw materials locally by 2020.

While we promote responsible consumption of our brands, we are integrating backwards to promote deepening of our development of

local raw materials through our sustainability drive.

Our commitment to this sorghum project is with passion and is real because, we believe in it. We will continue to invest in manpower and material resources in the years ahead to demonstrate our commitment to it. The results so far have been encouraging as the cultivation and use of sorghum is positively touching the lives of many Nigerians and corporate organisations in many ways. The results are what we have shown in this brochure.

We believe that if other corporate institutions follow the trail blazed by Nigerian Breweries with sorghum, and get involved with commercial production of other crops on a large scale, the total effort can provide ready raw materials for industry and put cheaper food on the dining tables of Nigerians. As a socially responsible company, we are using the hybrid sorghum development as a CSR strategy to engage a broader set of stakeholders and create more value for them. We believe that we can do good while doing good business.

As corporate Nigeria gets more involved in agriculture, the green revolution Nigeria so badly

“ We believe that if other corporate institutions follow the trail blazed by Nigerian Breweries with sorghum, and get involved with commercial production of other crops on a large scale, the total effort can provide ready raw materials for industry and put cheaper food on the dining tables of Nigerians.”

needs to produce abundant food for her people would have set in. Nigerian Breweries anticipates that before long, many crops grown in the nation's agricultural sector will receive increasing attention of the private sector. This will stimulate a catalytic effect on the agricultural sector and develop the national economy. The immediate gains would be national food security, job creation, and poverty alleviation.

For more information, contact Mrs. Emete Tonukari, CSR/Sustainability Manager, Nigerian Breweries Plc at emete.tonukari@heineken.com



GLOSSARY

ADPs	-	Agric Development Projects
AGRA	-	Alliance for Green Revolution in Africa
BaBF	-	Brewing a Better Future
CSR 01 & CSR 02	-	(Two Open Pollinated varieties of sorghum developed by NB)
CSR 03H /CSR 04H	-	(Two Hybrid sorghum seeds developed by NB)
FMA & RD	-	Federal Ministry of Agriculture and Rural Development
IAR	-	Institute for Agricultural Research
ICRISAT	-	International Crops Research Institute for the Semi-Arid Tropics
IFDC	-	International Fertilizer Development Corporation
LAB	-	Laboratory
MARKETS	-	Maximizing Agricultural Revenues and Key Enterprises in Targeted Sites
NACGRAB	-	National Centre for Genetic Resources and Biotechnology
NASC	-	National Agricultural Seed Council
NASD	-	National Agricultural Safety Database
NB	-	Nigerian Breweries
NSE	-	Nigerian Stock Exchange
OPVs	-	Open-pollinated varieties
R & D	-	Research and Development
RPCs	-	Regional Production Coordinators
SAP	-	Structural Adjustment Programme
SERA	-	Social Enterprise Reports and CSR Awards
USAID	-	United States Agency for International Development
VMI	-	Vendor Managed Inventory
WASA	-	West African Seed Alliance





