Nigeria’s Strategic Grain Reserves Department:
School Feeding Linkages

Anne Delaporte
Charlotte Jordan
Samrat Singh

Abstract
This report is part of PCDs technical assistance programme on grain reserves.

The purpose of this report is two-fold. One is to provide an initial assessment of agriculture/food policy instruments, SGRD operations and relevant agriculture markets. And the second purpose is to set out the findings of the technical needs assessment.
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INTRODUCTION

This report is part of PCDs technical assistance programme on grain reserves.

The purpose of this report is two-fold. One is to provide an initial assessment of agriculture/food policy instruments, SGRD operations and relevant agriculture markets. And the second purpose is to set out the findings of the technical needs assessment.

The paper is divided into four chapters. Chapter-1 briefly analyses markets and production for maize, rice and sorghum followed by a historical policy overview of market interventions in Nigeria in chapter-2. In chapter-3 we analyze the different components of SGRD operations. The final chapter describes the findings of the technical needs assessment.

The findings of this report will hopefully provide a useful basis for developing the detailed technical assistance work plan and research agenda with SGRD and other partners.

METHODOLOGY

This paper applies policy analysis approaches with some basic quantitative analysis.

The qualitative data is based on detailed consultations with SGRD staff from all units and a field visit to a large silo complex in Mina. The quantitative data is secondary and obtained principally from FAO database.

This report also builds on PCDs country briefing notes and an earlier report on school feeding and grain reserves.

A detailed literature review was conducted for the policy history chapter and key documents were reviewed for other chapters as appropriate.

SCOPE AND LIMITATIONS

The scope of this paper is limited to providing an overview of the current situation to inform the development of a detailed work plan and research portfolio.

The overall analysis around pricing and costs is highly constrained by availability of data. It has not been possible to obtain data on market prices, crop budgets etc. The aim here is to provide a basic insight into some of the key issues and set the agenda for further analysis as part of the work plan.

Detailed research will be undertaken in the course of work plan implementation.
CHAPTER 1: AGRICULTURE MARKET OVERVIEW

90% of Nigerian total agricultural production comes from smallholder farmers (Fasoyiro and Taiwo, 2012). Cassava, yams and maize are the main crops produced (Table 1) and Nigeria is the largest yam producer in the world. This chapter will focus on 3 crops that are important for the SGRD, namely maize, sorghum (also locally known as guinea corn) and rice.

Table 1: Main Crops Production in Nigeria (source: FAOSTAT, 2014)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>cassava</td>
<td>54,000,000</td>
<td>283.8</td>
<td>14.0</td>
</tr>
<tr>
<td>yams</td>
<td>38,000,000</td>
<td>753.6</td>
<td>13.1</td>
</tr>
<tr>
<td>maize</td>
<td>9,410,000</td>
<td>695.5</td>
<td>1.8</td>
</tr>
<tr>
<td>sorghum/guinea corn</td>
<td>6,900,000</td>
<td>670.2</td>
<td>1.2</td>
</tr>
<tr>
<td>millet</td>
<td>5,000,000</td>
<td>623.5</td>
<td>1.3</td>
</tr>
<tr>
<td>rice, paddy</td>
<td>4,833,000</td>
<td>633.8</td>
<td>1.8</td>
</tr>
</tbody>
</table>

The country is susceptible to extreme weather events such as floods that occurred in Northern Nigeria in 2012 and led to an increase in crop prices. Civil insecurity is also prevalent, especially in the northeast of the country, which is also responsible for some instability in the markets.

AGRO-ECOLOGICAL ZONES

There are 8 agro-ecological zones in Nigeria classified according to climate, humidity, rainfall and soils (table 2). Half of the country is classified as dry sub-humid or sub-humid. In terms of vegetation, the savannah is the major cereal production zone in Nigeria. It accounts for about 665,600km², which also represent about 70% of the geographical area of Nigeria (Idem and Showemimo, 2004). For analytical purpose the country can be classified into 3 broad agro-ecological zones: humid forest zone (southern states), moist savannah (central states) and dry savannah (northern states) (ref, 2004). Table 3 indicates the cost of land management and mean revenue of crop production in fadama areas. Costs are lowest in the humid forest zone and highest in the dry savannah zone.

Table 2: Agro-Ecological Zones in Nigeria (source: FAO water report 29, 2005)

<table>
<thead>
<tr>
<th>Zone description</th>
<th>Percentage of country area (%)</th>
<th>Annual rainfall (mm)</th>
<th>Monthly temperature maximum (°C)</th>
<th>Normal (°C)</th>
<th>Minimum (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semi-arid</td>
<td>4</td>
<td>400-600</td>
<td>13</td>
<td>32-33</td>
<td>40</td>
</tr>
</tbody>
</table>
Table 3: Cost of Land Management Practices and Value of Crop Production in Fadama Areas (ie. irrigable land) (source: Nkonya et al, 2010)

<table>
<thead>
<tr>
<th></th>
<th>Dry Savannah</th>
<th>Moist Savannah</th>
<th>Humid Forest</th>
<th>All Zones</th>
</tr>
</thead>
<tbody>
<tr>
<td>fertilizer</td>
<td>12%</td>
<td>2%</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>seeds</td>
<td>5%</td>
<td>6%</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>pesticides</td>
<td>3%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>machinery</td>
<td>5%</td>
<td>2%</td>
<td>1%</td>
<td>3%</td>
</tr>
<tr>
<td>fungicides</td>
<td>-</td>
<td>5%</td>
<td>-</td>
<td>1%</td>
</tr>
<tr>
<td>mean revenue (Naira/ha)</td>
<td>76,272</td>
<td>962,316</td>
<td>4,634,289</td>
<td>1,202,546</td>
</tr>
</tbody>
</table>

**CROP CALENDAR**

The crop calendar (figure 2) shows the sowing, growing and harvesting timelines for maize, rice, sorghum, cassava and yams over a calendar year for the northern and southern regions. The harvest period for the main maize crop is between June and September. For main rice it is between August and December and for sorghum it is between September and November.
**MAIZE**

**Production**
Nigeria is the 11th largest producer of maize in value and 12th in volume in the world and the second largest producer in Africa behind South Africa. Maize production has more than doubled since 2000 and reached 9.4 million tonnes in 2012 (Figure 3). According to FAO statistics productivity seems to have been declining slightly in the last 3 years. Productivity is low with average yields of 1.8t/Ha in 2012.

**Figure 3: Production, Yield and Area Maize trends 1990-2012**
Maize is a versatile crop growing in different ecological zones (IITA, 2001). Maize is usually intercropped, with yam, cassava, sorghum, rice, cowpea, groundnut and soybeans (FAO, 2013). Most of the production is situated in the north central zone. The southern regions are in minor deficit (USAID, 2008). Kaduna is by far the main producing state, with an annual production in 2006 of 907000t (figure 3), followed by Borno and Taraba (figure 4).

**Consumption**

Nigeria grows two varieties of maize, namely white maize and yellow maize; white maize is consumed by most households. Most of maize production is consumed domestically and is widely used in the preparation of traditional foods. According to Cadoni et al (2013), 18% of total maize production was used for feed in 2010. Food supply per capita increased from 17.6kg/capita/year in 2000 to 29.4kg/capita/year in 2009.

**Trade**

Levels of imports and exports are very low but maize is known to be traded informally with neighbouring countries.

**Prices**

Retail prices for 2012/13 were higher than for 2011/12, especially between May and July (FEWS NET), with nominal wholesale prices attaining more than 75NGA/kg in Dawanu, Kano, the largest wholesale market in West Africa (figure 5). Moving average for the period 2007/08-2011/12 show that retail prices tend to be the highest between June and August on the main markets with a minimum price close to 50NGA/kg.
RICE

Production
Average rice production for the period 2011-2012 was 4.7 million tonnes. There are 36 million hectares of arable land in Nigeria (FAOSTAT, 2011) of which xx% is covered by rice. Yields are low at 1.8t/Ha in 2012 (figure 6). Millers achieve a low milling recovery rate of an estimated 58% (Johnson et al, 2013).

Figure 6: Trends in production, yield and area for rice between 1990 and 2012 (source: FAOSTAT).
Kaduna, Niger and Benue are the main producing states (figure 7). Rainfed lowland rice production is the most dominant system of rice production followed by upland production (figure 8).

**Figure 7: Rice production in 2006. States represented produced more than 100000t in 2006 (source: Nigeria bureau of statistics).**

**Figure 8: rice production by ecologies in Nigeria (source: Fashola et al, 2006)**

### Consumption
A Nigerian consumes on average 31.3kg of rice per year\(^2\). Consumption has been increasing over the years, particularly in urban areas (Cadoni & Angelucci, 2013\(^3\)). Domestic rice which is normally semi-

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2 FAO food balance sheets data for 2011.
milled brown rice is generally 20-30% less expensive than imported rice which is generally processed milled rice (ibid.)

**Trade**

FAO statistics indicate that Nigeria was the second largest net importer of rice in Africa in 2011. Between 2008 and 2011 the volume of rice imported has increased twofold (figure 10).

![Figure 9: Trend in rice import volumes between 1990 and 2011 (tonnes). Source: FAOSTAT.](image)

**Prices**

Rice is an expensive commodity and fetches high prices on the retail market, compared with other major food crops. Moving averages for the period 2007/08-2011/12 suggest that retail price is between 120 and 150NGN/kg with few seasonal variations (figure 10). Interestingly, retail prices are slightly higher in the main producing state. However, farmgate prices in southern states, (Benue and Ebonyi) are higher than for central and northern states (Kaduna, Tabara, Borno) (figure 11). It would be a logical explanation if these southern states were the least producing ones. This is however not the case according to the most recent data from 2006 and knowing that all these states are in surplus. Further investigation is needed to understand these differences.

![Figure 10: Retail prices in Bodija (Oyo state – minor deficit region) and Dandume (Kaduna state – surplus state) (source: FEWSnet).](image)
Figure 11: Farmgate price in selected states in Naira/kg (source: NBS in Cadoni & Angelucci, 2013).

SORGHUM

Production
Nigeria is the second largest producer of sorghum in volume and value with 69 million tonnes in 2012, following Mexico. Since 2006 production statistics show a decreasing trend in production associated with a decrease in area harvested which resulted in higher yields, despite declining production (figure 12). According to Gourichon (2013) a decrease in production can be explained by a tendency for producers to switch to more profitable crops. Production is concentrated in the north of the country and the southern regions are in major deficit (Fewsnet, 2008). Kaduna, Zamfara and Borno are the three main producing states with production levels in 2006 attaining 610000, 601000 and 534000 tonnes, respectively (figure 13).

Figure 12: trends in production, yields and area harvested for sorghum between 1990 and 2012 (source: FAOSTAT).


Figure 13: production (1000MT) of sorghum in year 2006 by state (source: Nigeria bureau of statistics).

Consumption

70% of sorghum is used for household consumption and 15% for feed. Sorghum is particularly important for households in the north (Fews net⁶). The red and yellow sorghums are used both for animal feed and human consumption. The most extensively grown sorghum in Nigeria is Vulgare and S. Bicolour (L.) Moench, locally called guinea corn.

Trade

There are no significant exports and imports and most of the production is consumed domestically.

Prices

Retail prices for sorghum are around 50NGN/kg in different markets. Figure 14 a) and b) show retail prices in Kaduna and Zamfara states, respectively. Both states are in surplus. Figure 14 c) show retail prices on a major deficit market in Oyo state. As expected, prices tend to be higher in the south, as production is mostly concentrated in the north of the country. Prices also tend to be the highest between June and July.

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⁶ FEWS NET (sept 2013) Nigeria price bulletin.
Figure 14: Retail prices for sorghum on different markets (source: FEWSnet Nigeria price bulletin February 2014).
CHAPTER 2: A BRIEF HISTORY OF AGRICULTURE MARKET INTERVENTIONS IN NIGERIA-UNDERSTANDING THE POLICY CONTINUUM

Broadly speaking national policies were detailed in a series of National Development Plans (1962-1968, 1970-1974, 1975-1980 and 1981-1985). Following this, a national agricultural policy was formulated in 1988 to ‘correct past anomalies and was replaced in 2001 with a new agricultural policy. Present day policy is being driven by the Agricultural Transformation Agenda (ATA) which is discussed in some detail later in this chapter.

1960-1969

Initiatives and market interventions in agricultural policies have largely been prescribed by the constitutional placement of agriculture. Both the 1954 Federal Constitution and the 1963 Republican Constitution positioned agricultural as a state responsibility, therefore state governments played a key role in agricultural programming until the early 1970s. This was managed through the regional marketing boards, designed in 1954 to replace the pan-regional centralised commodity boards, which were mandated with marketing of all export crops produced within a region. This allowed regional boards to operate not as price and income stabilisation instruments, as commodity boards had, but as major fiscal bodies which generated huge revenue through high levels of taxation on farmers. Main export crops included: palm, cocoa, groundnut, cotton and rubber (Ugwu and Kano 2012) and significant emphasis in the colonial era into the 1960s was placed in export crop economies. Export produce was handled and shipped to foreign markets by the Nigerian Produce Marketing Company (NPMC) (Hay 1970). Smallholder farmers produced the bulk of production for both domestic and export markets; their engagement and self-sufficiency was encouraged through the formation of co-operatives and farm settlements (ref). Daramola (2008) potential’ describes the agricultural sector at this time as ‘very robust’.

1970-1985

Following the end of the civil war and the discovery of commercial oil reserves, investment in agriculture fell. Nigeria began to import foods it was self-sufficient in; the percentage of food imports as a share of total imports grew from 7.67% in 1970 to 10.26% in 1979 (Sanyal 2010) and the food import bill reached $4 billion in 1982. This was financed by oil revenues, however oil shocks in 1973-4 and 1979 demonstrated high levels of volatility within the economy and ability to pay high import bills.

Following this shift in governmental intervention began to grow: macroeconomic policies included government’s direct involvement in agricultural production and incentives such as low tariffs on agricultural inputs were introduced. The number of agricultural institutions and programmes also began to increase. From 1972-3 the government of the time, run by General Conwon, established the National Accelerated Food Production Programme (NAFPP).

In 1977, in anticipation of a boost in agricultural output from these programmes, existing regional commodity boards and the Nigerian Produce Marketing Company were dissolved and replaced with seven (later reduced to six) new national boards, including The National Grains Board. It handled
guinea corn, maize and corn oil, millet, wheat and wheat offals, rice and beans. It administered a guaranteed minimum price policy whereby floor prices were nationally set for each of the six grain crops as guaranteed minimum prices (see box 1) at which the board would intervene as a buyer of last resort. However, the official floor prices had little effect, as they were set substantially below farm gate and retail prices: since farmers were free to sell on the open market, the National Grains Board made very few intervention purchases; none at all until 1984 (small purchases were made through the state-level Strategic Grain Reserve Scheme).

Box 1: The Guaranteed Minimum Price Scheme

The agricultural pricing policy objectives included ensuring fair, stable and competitive prices for farmers and establishing a degree of parity between agricultural and non-agricultural commodity prices. One of the instruments deployed during the Third National Plan (1975-1980) for this purpose was the establishment of the Guaranteed Minimum Price Scheme (GMPS).

Government applied the minimum price guarantee scheme to assure farmers of floor prices and purchase of their products in case the open market failed to absorb the produce they put on the market. It provided for the first time the food crop farmers with the “benefits” that the export crop farmers had enjoyed for a fairly long period under the marketing board system. By fixing these minimum prices for the major staple crops of the country, it was hoped that the scheme would assist in eliminating seasonal price fluctuations as well as serve as a means of achieving a better income distribution to the advantage of rural areas.

However, the scheme was ineffective because the prices fixed were less than the prevailing market prices. In fact, the buying agents and merchants were unable to purchase at the guaranteed price levels even in the rural areas. Consequently, the scheme could not eliminate seasonal price fluctuations nor was it able to redistribute income in favour of the farmers. Two main reasons were responsible. First, the basis chosen for arriving at the minimum price which used production costs to arrive at a minimum price was fraught with several shortcomings. Second, the inadequacy of storage facilities in many parts of the country truncated the strategic grain reserve concept incorporated as part of the minimum pricing policy.

(Akande, 2003)

1985-1992

In 1986 Nigeria adopted a series of Structural Adjustment Plans (SAP) from The International Monetary Fund (IMF). This was in recognition of the lack of success of past policies to improve the economy and boost agricultural production, but ultimately to diversify Nigeria’s reliance on oil exports by encouraging production of non-oil tradable goods and broadening Nigeria’s export market (Daramola et al 2008, Anyanwu 1992). The SAP focussed mostly on increasing production of export crops and led to the liberalisation of trade and export controls, abolition of commodity boards, and decontrol of interest rates (Ugwu and Kano 2012). Despite these efforts, the SAP era saw lower agricultural economic growth, higher rates of unemployment, a reduction in export earnings, a widening gap between food demand and supply and an increase of food prices of 2.6% from 1970 to 1979 to almost 20% from 1980 to 1989 (Ugwu and Kano 2012).
Within the SAP agreement, The National Strategic Food Reserve (NSFR) was created in 1988 by the Federal Ministry of Agriculture to ensure long-term food security for the nation, provide emergency food relief, and reduce temporal variability in food prices. The major food commodities stored in silo complexes were maize, millet, sorghum, paddy rice, soybeans, and gari (cassava flour). The NSFR programme aimed for government purchase and storage of 5% of domestic grain production. From this stock, relief could be provided following emergencies and disasters. Additionally, management of purchases and sales was designed to help stabilise food prices at times of over and underproduction (surplus and deficit) (Mogues, 2008).

1992-1999

The 1990s cumulate a politically turbulent time in which agricultural economics was ‘uneventful’. Political life focussed on solving the political crises surrounding the military regimes of Generals Babangida and Abacha, Abdulsalam and Chief Sonekan.

Under the monetary policy of the 1990s, other guidelines included a loan repayment moratorium, smallholder loan guarantees, uncollateralized smallholder loan schemes, extension of repayment periods for certain export crops, and an increase in both minimum rural deposits and minimum rural credit (FMANR 1997). The fiscal policy guidelines allowed a five-year tax exemption on private-sector profits earned in any agricultural business (production, processing, or marketing). The exchange-rate policy guidelines allowed all voluntarily repatriated foreign-exchange earnings in the agricultural sector to be tariff exempted (FMANR 1997). Under the trade policy, some agriculture-specific guidelines included the abolition of export prohibition, a ban on importing several agro-industrial raw materials to stimulate local production, and abolition of commodity boards to achieve more competitive pricing and higher farm incomes (Phillip et al 2009).

2000-2011

The turn of the millennium saw a review of existing agricultural policies. The New Agricultural Policy (NAP) (2002) and the National Economic Empowerment and Development Strategy (NEEDS) (2004-2008) and NEEDS II (planned for 2007-2011 but merged in 2008 with the 7-Point Agenda to become The National Development Plan) shared a similar strategic objective: to diversify the productive base from oil and to promote market-oriented and private sector-driven economic development with strong local participation. NEEDS was supported by the State Economic Empowerment and Development Strategy (SEEDS) and Local Economic Empowerment and Development Strategy (LEEDS). NAP aimed at laying a solid foundation for sustainable growth in agricultural productivity. An overarching government policy for economic development, Vision 2020, is complemented by the National Development plan whose seven target sectors include agriculture, for which the aim is to become ‘A modern technologically enabled agricultural sector that fully exploits the vast agricultural resources of the country, ensures national food security and contributes to foreign exchange earnings’ (Adesina 2012).
Box 2: A Summary of Governmental Programmes for Agricultural Development

- **1972: National Accelerated Food Production Programme (NAFPP)**
  - Targeted self-sufficiency in production of rice, maize, sorghum, millet wheat through adoption of improved production technology and speeding up the use of research results into the development of extension services

- **1975: Agricultural Development Programme**
  - Targeted the construction of rural roads, farm service centres, extension services and credit for boosting food production

- **1976-1979: Operation Feed the Nation (OFN)**
  - Targeted the mobilisation of people to embrace agriculture, eliminate traditional distain for agriculture, enhance large-scale food production, creation of jobs and income and the utilisation of all available land resources

- **1980: Green Revolution**
  - Targeted credit supply to farmers, encouragement and intensification of cooperative education, mobilisation to actively participate in agriculture, application of research on food and fibre to enhance nutritional value and abundance of staple food production, processing and distribution

- **1993: National Fadama Programme**
  - Targeted farmer group formation and promotion of low-cost irrigation technology to increased income of beneficiaries by at least 20%

- **2000: Root and Tuber Expansion Programme**
  - Targeted the commercialisation of root and tuber crop production to improve income, living conditions, food security and nutritional health of the poorest smallholder households.

- **2004: National Economic Empowerment and Development Strategy (NEEDS)**
  - Targeted private sector participation in the development of the economy; in agriculture it aimed to influence improvement in production, processing and distribution of agricultural commodities

- **1999-date: National Poverty Eradication Programme (NAPEP)**
  - Targeted the provision of subsidized credit to farmers through four schemes: Youth Empowerment; Rural Infrastructure Development; Social Welfare Services and Natural Resources Development and Conservation

- **2008: NEEDS II: National Food Security Programme**
- **2008: National Development Plan**
- **2012: Agricultural Transformation Agenda**

PRESENT

Nigeria’s Agriculture Minister, Akinwunmi Adesina launched The Agriculture Transformation Agenda (ATA) in 2012, ‘to provide opportunities for the provision of technical assistance and other support to the Federal Ministry of Agriculture and Rural Development (FMARD) for the scale up of positive inclusive markets experience in Nigeria’.
The first standout feature of the ATA is the voucher-based fertilizer distribution programme, which shows ‘better targeting than the existing subsidy program and minimal leakage of subsidized fertilizer to those who were not intended to benefit from the programme. Until now the voucher strategy had been rolled out only on a small scale, however under the ATA the government plans to scale-up the program nationally. Studies by IFPRI found that most subsidized fertilizer under the previous subsidy scheme was obtained by farmers who would otherwise have purchased fertiliser from private commercial sources, thus crowding-out the commercial fertiliser sector (Takeshima, 2012). The second is a partnership with Brazil whose Embrapa programme.
CHAPTER 3: STRATEGIC GRAIN RESERVE DEPARTMENT

MANDATE AND OBJECTIVES

The Strategic Grain Reserves Division (SGRD) is the federal-level coordinating body of the GoN’s National Agricultural Food Storage Programme (NAFSP). This is a three tier programme which includes the SGRD (federal), buffer stocks (state level) and on-farm (local level) storage in order to reduce post-harvest losses, provide relief in times of disaster and to stabilise food prices in times of volatility.

The stated objectives of the NAFSP are:

1. Ensure availability, stability and access to food at all times at affordable prices.
2. Ensure immediate food relief in times of emergencies arising from national calamities.
3. Ensure adequate supplies of food to meet current and future needs through efficient delivery system.
4. Provide immediate relief to farmers by buying up their surpluses at guaranteed minimum prices.
5. Create a conducive environment through policies to stimulate increased production while ensuring a reduction in food prices.

The SGRD specifically aims to store 5% of total food grains produced nationally to build a strategic food security stock. The SGRD’s activities include:

1. Construction and maintenance of silo complexes and facilities
2. Public procurement of grains and maintenance of stocks
3. Act as Buyer of Last Resort (BLR) through the Guaranteed Minimum Price Scheme.
4. Collaboration with other relevant federal and state agencies and NGOs on commodity marketing and price stabilisation
5. Coordination of state activities on the establishment and management of buffer stocks
6. Development of a market information system

Other policy mandates of the SGRD include Codex Alimentarius Commission (CAC), On-Farm Project of the Millennium Development Goals (MGDs) etc.

INSTITUTIONAL STRUCTURE

Oversight of the SGRD is provided by a Director who provides supervision to the department which is split into three main divisions: marketing, engineering and operations.

COMMODITY PORTFOLIO

The current stock portfolio consists of maize, gari, paddy rice, millet, soya bean and sorghum.

PROCUREMENT

SGRD uses a third party procurement modality wherein procurement is carried out by trading enterprises known as Licensed Buying Agents or LBAs. These LBAs are required to purchase
commodities from farmers at the government set Guaranteed Minimum Price (GMP). There are currently around 100 LBAs under contract with each commodity having a separate LBA.

The supply contract is only for a period of one year and each year there is a new tender for the contractors.

The LBA system has been found to be unsuitable to fulfill the mandate of SGRD. The process lacks transparency and LBAs are not implementing the GMP at the farmgate. The current system is being reviewed to move away from the third party LBA model to purchasing directly from commodity associations and cooperative groups.

**STORAGE INFRASTRUCTURE**

There are currently 13 completed and functional silo complexes in operation: see table 1 for location and capacity.

<table>
<thead>
<tr>
<th>Operational Silo Complexes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Silo Name</strong></td>
</tr>
<tr>
<td>1 Ibadan Silo Complex</td>
</tr>
<tr>
<td>2 Ogoja Silo Complex</td>
</tr>
<tr>
<td>3 Jos Silo Complex</td>
</tr>
<tr>
<td>4 Akure Silo Complex</td>
</tr>
<tr>
<td>5 Irrua Silo Complex</td>
</tr>
<tr>
<td>6 Makurdi Silo Complex</td>
</tr>
<tr>
<td>7 Ilorin Silo Complex</td>
</tr>
<tr>
<td>8 Kaduna Silo Complex</td>
</tr>
<tr>
<td>9 Gombe Silo Complex</td>
</tr>
<tr>
<td>10 Jahun Silo Complex</td>
</tr>
<tr>
<td>11 Ezillo Silo Complex</td>
</tr>
<tr>
<td>12 Minna Silo Complex</td>
</tr>
<tr>
<td>13 Lafiagi Silo Complex</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
</tr>
</tbody>
</table>

The MoA's Agricultural Transformation Agenda (ATA) and Growth Enhancement Scheme (GES) have the central aim of boosting agricultural production. Under these programmes the construction of a further 20 silo complexes were confirmed; tables 2, 3 and 4 list the geography and capacity of these silos by stage of completion: completed, near-completion and various stages of completion.

<table>
<thead>
<tr>
<th>Newly Completed Silo Complexes - Awaiting Commission</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Silo Name</strong></td>
</tr>
<tr>
<td>1 Sokoto Silo Complex</td>
</tr>
<tr>
<td>2 Kwali Silo Complex</td>
</tr>
<tr>
<td>3 Dutsonima Silo Complex</td>
</tr>
</tbody>
</table>
### Table 3: Near-Completed Silo Complexes

<table>
<thead>
<tr>
<th>Silo Name</th>
<th>State</th>
<th>Capacity (MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maidurgi Silo Complex</td>
<td>Borno</td>
<td>100,000</td>
</tr>
<tr>
<td>Gausau Silo Complex</td>
<td>Zamfara</td>
<td>100,000</td>
</tr>
<tr>
<td>Gaya Silo Complex</td>
<td>Kano</td>
<td>25,000</td>
</tr>
<tr>
<td>Bauchi Silo Complex</td>
<td>Bauchi</td>
<td>25,000</td>
</tr>
<tr>
<td>Ikenne Silo Complex</td>
<td>Ogun</td>
<td>25,000</td>
</tr>
<tr>
<td>Ado - Ekiti Silo Complex</td>
<td>Ekiti</td>
<td>100,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>375,000</strong></td>
</tr>
</tbody>
</table>

### Table 4: Silo Complexes under Various Stages of Completion

<table>
<thead>
<tr>
<th>Silo Name</th>
<th>State</th>
<th>Capacity (MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yenagoa Silo Complex</td>
<td>Bayelsa</td>
<td>100,000</td>
</tr>
<tr>
<td>Yola Silo Complex</td>
<td>Adamawa</td>
<td>25,000</td>
</tr>
<tr>
<td>Damaturu Silo Complex</td>
<td>Yobe</td>
<td>25,000</td>
</tr>
<tr>
<td>Igbaram Silo Complex</td>
<td>Anambra</td>
<td>25,000</td>
</tr>
<tr>
<td>Okigwe Silo Complex</td>
<td>Imo</td>
<td>100,000</td>
</tr>
<tr>
<td>Jalingo Silo Complex</td>
<td>Taraba</td>
<td>25,000</td>
</tr>
<tr>
<td>Lafia Silo Complex</td>
<td>Nassarawa</td>
<td>25,000</td>
</tr>
<tr>
<td>Lokoja Silo Complex</td>
<td>Kogi</td>
<td>25,000</td>
</tr>
<tr>
<td>Uyo Silo Complex</td>
<td>Ibom</td>
<td>25,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>375,000</strong></td>
</tr>
</tbody>
</table>

In addition to these silos, a series of 2,000 MT community warehouses have been completed, see table 5.

### Table 5: Completed 2,000 MT Capacity Community Warehouses

<table>
<thead>
<tr>
<th>Geopolitical Zone</th>
<th>State</th>
<th>Location</th>
<th>Earmarked for the pilot phase of AFEX WHRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>North West</td>
<td>Kaduna</td>
<td>Zaria</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saminaka</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kebbi</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Argungu</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kano</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dawanau</td>
<td></td>
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</tbody>
</table>

21
<table>
<thead>
<tr>
<th>Region</th>
<th>State</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Katsina</td>
<td>Daura</td>
<td>Dutsenma</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dutsenma</td>
</tr>
<tr>
<td>Zamfara</td>
<td>Talata Mafara</td>
<td>Bukkuyum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gummi</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tsafe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wanke</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mada</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dansadau</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kawuwar Daji</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moriki</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shinkafi</td>
</tr>
<tr>
<td>North East</td>
<td>Bauchi</td>
<td>Ningi</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BSADP premises</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adamawa</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fufore LGA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gombe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gombe</td>
</tr>
<tr>
<td>North Central</td>
<td>Benue</td>
<td>Wanune</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ogobia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kwara</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kwara</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kwara</td>
</tr>
<tr>
<td>South East</td>
<td>Ebonyi</td>
<td>Adifun Echara Ikwo</td>
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<tr>
<td></td>
<td></td>
<td>Akaeze</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enugu</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enugu</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enugu</td>
</tr>
<tr>
<td>South South</td>
<td>Cross Rivers</td>
<td>Orlu/Okuku, Yala LGA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ikkom</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Delta</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Delta</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Delta</td>
</tr>
<tr>
<td>South West</td>
<td>Ondo</td>
<td>Igbara - Oke</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ikare LGA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ekiti</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ifaki Orin Road</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Igbemo</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ose - Ekiti</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ogun</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ajegundu Farm Settlement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lagos</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Epe Farm Settlement</td>
</tr>
<tr>
<td></td>
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<td>Ikoridu Fish Farm Settlement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oyo</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Irepodun Market Oyo West</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Iresa - Apa</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Otaamapo LGA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saki, Saki West</td>
</tr>
</tbody>
</table>
PRICING

SGRD operates a floor price known as the Guaranteed Minimum Price (GMP). This is a pre-determined price and in theory the SGRD is required to purchase all grain offered at this price subject to quality considerations. The GMP is decided by a GMP committee in consultation with the SGR department. It is reported that the crop budget is taken into account to arrive at the GMP, the specific details for GMP calculation were not available for review for this report.

In practice the GMP is not working in terms of either providing a useful floor price to the framers or enabling procurement. The causes of this inefficacy would need to be determined during the pricing policy review. It appears that there are issues with both the method of arriving at the GMP (formulaic and/or market information deficit) and its implementation thorough the LBA procurement mechanism.

STOCK LEVELS

The current total stock level is 30000 mt as against a total storage capacity of approximately 1350000 mt. Presently there are no guidelines on the level of stocks to be maintained.

STOCK RELEASE

Currently stocks as such are released only for emergencies. The last such release took place in 2013 when 40000 mt was released as part of flood relief operations in the region.

Stocks are also released to public and state bodies as they exceed the optimum storage period of three years.

STOCK ROTATION

Stocks are rotated internally after a few months of storage depending on the commodity. However in the absence of a clear stocking policy there is no established release and replenishment pattern to maintain a certain average stock level

FOOD SAFETY AND QUALITY CONTROL

In ensuring food safety and quality of grain stocks, laboratory facilities must be able to provide equipment for the parameters given in table 1. Laboratories are also equipped to perform analysis of pH level and bulk density. Testing is done before grains are accepted by the silo: any stock which falls within the threshold level for each parameter is accepted into the store, that which does not achieve any one of the parameter thresholds is rejected.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Maximum Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture Content</td>
<td>12.00%</td>
</tr>
<tr>
<td>Hectolitre Weight</td>
<td>68.75kg/hl</td>
</tr>
<tr>
<td>Insect Damage</td>
<td>1.00%</td>
</tr>
<tr>
<td>Broken Grains</td>
<td>1.00%</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Mould</td>
<td>1.00%</td>
</tr>
<tr>
<td>Foreign matter</td>
<td>1.00%</td>
</tr>
<tr>
<td>Temperature</td>
<td>should be ambient temperature</td>
</tr>
<tr>
<td>Grain age</td>
<td>No older than latest harvest</td>
</tr>
</tbody>
</table>

After being accepted, grains undergo a cleaning process to remove impurities and treated with storage chemicals - aluminium phosphide or permethrin dust (pyrethroid) to reduce the likelihood and rate of storage infection. Grains are then transported to the silo bins for storage.

Once within the silo, there are additional checks made throughout each stock’s storage life:

- Aeration: use of fans to provide cool air into the grain mass to prevent the development of storage diseases
- Rotation: after 12 months in storage, stock is transferred from one silo to another. This has the dual advantage of allowing for physical inspection and re-cleaning as necessary.
- Sampling: at defined intervals samples are taken and undergo testing of the original quality parameters, including discolouration and odour.

On release of stock into the public arena, samples are again tested for chemical residue to determine safety for consumption. Normally this function is carried out by an external laboratory.

**INVENTORY MANAGEMENT SOFTWARE**

In 2012 the Ministry of Agriculture commissioned a Stock Records Keeping and Distribution System (Inventory Software. The Inventory Software facility is web-based, allowing for easy access and use across multiple sites, and is hosted on a secure server and platform. In summary it was designed to provide the following services:

- Generate a master-list of suppliers from a range of procurement procedures
- Track stock levels and balance of stocks as grains are purchased and distributed
- Track changes in stock type and location
- Maintain a database of beneficiaries and suppliers
- Maintain data integrity, transparency and accountability
- Assign appropriate access levels to different users

The status of the system in terms of efficacy and usage is not entirely clear. At the time of writing the license for this facility had expired and it appears that the system has not been operationally tested and implemented.
CHAPTER 5: TECHNICAL NEEDS ASSESSMENT

Technical needs assessment was carried out with SGRD in Abuja in March 2014. The consultations were carried out over three days and identified key issues which need to be addressed across realms of policy, management, institutional structure, funding and capacity. The scope of PCD SGR support includes technical assistance in evidence generation, policy development, operational guidelines development, pilot interventions and impact assessment. The content of the support within grant parameters would entirely depend on the needs as articulated by SGRD. It is useful to note that for ‘needs’ beyond the scope of this initiative, support can be provided in developing leads where possible.

The two most important issues that need to be expeditiously reviewed are procurement and pricing. The stock levels are very low even though there is abundant storage capacity in the form of large warehouses and silos and funding. This can be partly attributed to issues around pricing and procurement which are constraining the ability of the department to efficiently function. It is important to note that any substantial change in pricing policy i.e. moving away from a GMP system would necessitate a review of SGRD objectives and goals. It is crucial to ensure overall policy harmonization within the department with the larger agricultural policy agenda whilst looking at individual components such as pricing and procurement.

Other main issues include:-

1. Demarcation of different stocks i.e. emergency stocks, buffer stocks etc. Stocks for ECOWAS regional reserve is an additional dimension.
2. Assessing required stock levels.
3. Inventory management system.

**SGRD-School feeding linkage**

A pilot project to explore linking SGRD stocks to the Osun school feeding programme has been proposed and there is in-principle approval from both the state government and the SGRD. Grain reserves and school feeding are already linked in countries such as Ghana and India. This proposed pilot would seek to identify the operational and policy processes involved and test the overall feasibility of such an arrangement in the Nigerian context.
<table>
<thead>
<tr>
<th>S.No</th>
<th>NEEDS</th>
<th>SCOPE</th>
<th>PRIORITY</th>
<th>ACTIVITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Institutional coordination</td>
<td>Y</td>
<td>Med</td>
<td>Develop guidelines to clarify SGRD’s lead role in food procurement and release</td>
</tr>
<tr>
<td>2</td>
<td>Stock management policy</td>
<td>Y</td>
<td>High</td>
<td>Research on stock management aspects, policy development, operational guidelines.</td>
</tr>
<tr>
<td>3</td>
<td>Inventory management technology</td>
<td>Y</td>
<td>High</td>
<td>Review status of the existing system and support testing.</td>
</tr>
<tr>
<td>4</td>
<td>Procurement</td>
<td>Y</td>
<td>High</td>
<td>Develop procurement guidelines and modalities.</td>
</tr>
<tr>
<td>5</td>
<td>Pricing</td>
<td>Y</td>
<td>High</td>
<td>Market analysis, pricing guidelines review</td>
</tr>
<tr>
<td>6</td>
<td>SGRD- Osun school feeding pilot</td>
<td>Y</td>
<td>High</td>
<td>Conduct a pilot study linking SGRD to school feeding in Osun state</td>
</tr>
<tr>
<td>7</td>
<td>PPP on Storage/warehousing facilities</td>
<td>Y</td>
<td>Med</td>
<td>PPP workshop/meeting</td>
</tr>
<tr>
<td>8</td>
<td>Food safety risk assessment</td>
<td>Y</td>
<td>Med</td>
<td>Food safety survey at community and warehouse level</td>
</tr>
<tr>
<td>9</td>
<td>Silo management training</td>
<td>N</td>
<td>Med</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Standards and grading</td>
<td>N</td>
<td>Med</td>
<td>-</td>
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<tr>
<td>11</td>
<td>Market information systems</td>
<td>N</td>
<td>High</td>
<td>-</td>
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</table>
References


## ANNEX 1: food balance sheets average 2008-2009 (source: FAO)

<table>
<thead>
<tr>
<th>Item</th>
<th>Food (1000 tonnes)</th>
<th>Food supply quantity (kg/capita/yr)</th>
<th>Food supply (kcal/capita/day)</th>
<th>Protein supply quantity (g/capita/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grand Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vegetal Products (total)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Animal Products (total)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cereals - Excluding Beer (total)</strong></td>
<td>21816.5</td>
<td>143</td>
<td>1199</td>
<td>31.7</td>
</tr>
<tr>
<td>Wheat</td>
<td>3259</td>
<td>21.35</td>
<td>157</td>
<td>4.4</td>
</tr>
<tr>
<td>Rice (Milled Equivalent)</td>
<td>3104.5</td>
<td>20.35</td>
<td>207.5</td>
<td>4.1</td>
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<td>Barley</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Maize</td>
<td>4374</td>
<td>28.65</td>
<td>249.5</td>
<td>6.55</td>
</tr>
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<td>Rye</td>
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<td>0</td>
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<td>0</td>
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<tr>
<td>Oats</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Millet</td>
<td>5337</td>
<td>35</td>
<td>282</td>
<td>7.25</td>
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<tr>
<td>Sorghum</td>
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<td>37.3</td>
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<td>3</td>
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<tr>
<td>Starchy Roots + (Total)</td>
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<td>227</td>
<td>555</td>
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<td>Cassava</td>
<td>16426.5</td>
<td>107.7</td>
<td>237.5</td>
<td>1.15</td>
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<td>Potatoes</td>
<td>668</td>
<td>4.4</td>
<td>8.5</td>
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<tr>
<td>Sweet Potatoes</td>
<td>2122</td>
<td>13.9</td>
<td>37</td>
<td>0.45</td>
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<td>Yams</td>
<td>13438</td>
<td>88.05</td>
<td>241.5</td>
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<td>Roots, Other</td>
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<td>12.9</td>
<td>30.5</td>
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<tr>
<td>Sugarcrops + (Total)</td>
<td>146.5</td>
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<td>1</td>
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<tr>
<td>Pulses + (Total)</td>
<td>1529.5</td>
<td>10.05</td>
<td>92.5</td>
<td>6.15</td>
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<tr>
<td>Beans</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>Peas</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Pulses, Other</td>
<td>1529</td>
<td>10.05</td>
<td>92.5</td>
<td>6.15</td>
</tr>
<tr>
<td>Treenuts + (Total)</td>
<td>724.5</td>
<td>4.75</td>
<td>34.5</td>
<td>1.05</td>
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<tr>
<td>Oilcrops + (Total)</td>
<td>1148</td>
<td>7.5</td>
<td>86.5</td>
<td>4.9</td>
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<tr>
<td>Soyabees</td>
<td>424.5</td>
<td>2.8</td>
<td>31</td>
<td>2.55</td>
</tr>
<tr>
<td>Groundnuts (Shelled Eq)</td>
<td>334</td>
<td>2.2</td>
<td>32.5</td>
<td>1.4</td>
</tr>
<tr>
<td>Product</td>
<td>Value 1</td>
<td>Value 2</td>
<td>Value 3</td>
<td>Value 4</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
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<tr>
<td>Sunflowerseed</td>
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<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Rape and Mustardseed</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cottonseed</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Coconuts - incl Copra</td>
<td>113</td>
<td>0.7</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Sesame seed</td>
<td>2</td>
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<td>Palmkernels</td>
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</tr>
<tr>
<td>Olives</td>
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<td>0</td>
<td>0</td>
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<td>Oilcrops, Other</td>
<td>273.5</td>
<td>1.8</td>
<td>20</td>
<td>0.9</td>
</tr>
<tr>
<td>Vegetable Oils + (Total)</td>
<td>2318.5</td>
<td>15.2</td>
<td>363.5</td>
<td>0</td>
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<tr>
<td>Vegetables + (Total)</td>
<td>8961.5</td>
<td>58.8</td>
<td>41.5</td>
<td>2.15</td>
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<td>Tomatoes</td>
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<td>10</td>
<td>5.5</td>
<td>0.3</td>
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<tr>
<td>Onions</td>
<td>654</td>
<td>4.25</td>
<td>4</td>
<td>0.1</td>
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<td>Vegetables, Other</td>
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<td>44.55</td>
<td>32.5</td>
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ANNEX 3: crop production in Nigerian states in 2006 (1000MT) (source: NBS)

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