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Industrial Sector Specific Action Plan for Vision 20-2020

FEDERAL MINISTRY OF COMMERCE AND INDUSTRY

GARKI – ABUJA

In cooperation with United Nations Industrial Development Organization (UNIDO)

This report has not been edited

Acknowledgement

The report on Industrial Sector Specific Action Plan for Vision 20-2020 was prepared by the United Nations Industrial Development Organization (UNIDO) at the request of the Federal Government of Nigeria through the Steering Committee of the National Council on Commerce and Industry at its third session held in Kano in May 2010. The contribution of the UNIDO technical team led by Mr. Masayoshi Matsushita, the UNIDO Representative in Nigeria and Director of Regional Office, Abuja and managed by Mr. Reuben Bamidele, National Programme Officer, UNIDO is well complimented.

The study and analysis of the eight selected subsectors were undertaken by five National Experts. The Food and Beverages subsector was handled by Dr. (Mrs) Josephine Bosede Ayoola and Mr. Ezekiel Gomos. Without reinventing the wheel, the 2009 report of UNIDO on the textile and garment industry in Nigeria was adapted in this report. The chapters on automotive and leather and leather products subsectors were contributed by Dr. Prince Benneth Obi. Dr. John Olatunji Adeoti contributed the chapters on chemical and pharmaceuticals, and electrical electronics. In the same vein, the chapters on non-metallic products and basic metal, iron and steel and fabricated products were contributed by Dr. Aderemi Medupin. The activities of the National Experts were coordinated by Professor Mike Kwanashie, the National Coordinator for the preparation of the report. The contribution of key players in these eight subsectors and the Manufacturers Association of Nigeria (MAN) in the conduct of the study cannot be overemphasized and well appreciated.

In view of the long years of experience of Dr. Jebamalai Vinanchiarachi, former Principal Adviser to the Director of UNIDO, he was recruited as the International Consultant to provide strategic direction for the research.

The UNIDO technical team worked in close consultation with the Steering Committee Co-chaired by Ms. Josephine Tapgun, the Honourable Minister of State for Commerce and Industry and Dr. Emem Wills, the Honourable Commissioner for Commerce and Industry, Akwa Ibom State. The meetings of the Steering Committee provided opportunity for a constant review of the activities of the UNIDO technical team and the draft report.

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Contents

Glossary and Acronyms

ARIPO	African Intellectual Property Organization
ARMTI	Agricultural and Rural Management Training Institute
BOI	Bank of Industry
BOT	Build, Operate and Transfer
BTA	Bilateral Trade Agreements
CAC	Corporate Affairs Commission
CBN	Central Bank of Nigeria
CET	Common External Tariff
CFC	Common Fund for Commodities
CPC	Consumer Protection Council
ECOWAS	Economic Community of West African States
EDP	Entrepreneurship Development Programme
EEG	Export Expansion Grant
EPZ	Export Processing Zone
FDI	Foreign Direct Investment
FEC	Federal Executive Council
FIIRO	Federal Institute of Industrial Research Oshodi
FMCI	Federal Ministry of Commerce and Industry
FPIS	Federal Produce Inspection Service
FMST	Federal Ministry of Science and Technology
FMF	Federal Ministry of Finance
GDP	Gross Domestic Product
GPWS	Ground Proximity Warning System
GSTP	Generalized System of Trade Preferences
ICAO	International Cotton Advisory Committee
ICAO	International Civil Aviation Organization
ICCO	International Cocoa Organization
ICO	international coffee organization
IDC	Industrial Development Centres
IFC	International Finance Corporation
ISO	International Sugar Organization
ITF	Industrial Training Fund
LPFO	Low Poor Fuel Oil
M&A	Merger and Acquistion
MAN	Manufacturers Association of Nigeria
MDGs	Millennium Development Goals
MRL	Maximum Residue Limits
MRR	Minimum Rediscount Rate
NAC	National Automotive Council
NACCIMA	Nigerian Association of Chambers of commerce, Industry, Mines and Agriculture
NACRDB	Nigerian Agricultural Cooperative and Rural Development Bank
NAFDAC	National agency for Food, Drugs Administration and Control

NASB	Nigerian Accounting Standards Board
NASENI	National Agency for Science and Engineering Infrastructure
NCC	Nigeria Copyrights Commission
NCCI	National Council on Commerce and Industry
NCS	Nigeria Customs Service
NEPZA	Nigerian Export Processing Zones Authority
NEEDS	National Economic Empowerment and Development Strategy
NEPC	Nigerian Export Promotion Council
NFP	National Focal Point
NIDO	Nigerians in Diaspora Organization
NIPC	Nigerian Investment Promotion Commission
NOTAP	National Office for Technology Acquisition and Promotion
NSDC	National Sugar Development Council
OGFZA	Oil and Gas Free Zones Authority
OPS	Organized Private Sector
OSIC	One-Stop Investment Centre
OCD	Over the Counter Drugs
PPP	Public-Private Partnership
PMS	Premium Motor Spirit
TRIPS	Trade Related Intellectual Property Rights
UNCTAD	United Nations Conference on Trade and Development
WIPO	World Intellectual Property Organization
RMRDC	Raw Materials Research and Development Council
OAGF	Office of the Accountant General of the Federation
SEC	Securities and Exchange Commission
SME	Small and Medium Enterprises
SMEDAN	Small and Medium Entreprises Agency of Nigeria
SMCI	State Ministry of Commerce and Industry
SON	Standard Organization of Nigeria
SPS	Sanitary and Phytosanitary Standards
TFP	Total Factor Productivity
TIFA	Trade and Investment Framework Agreement
W-DAS	Wholesale Dutch Auction System
WTO	World Trade Organization

Forward

This technical report on Industrial Sector Specific Action Plan for Vision 20:2020 was prepared in response to the need for a blue print for implementing the industrial development agenda encapsulated in the Vision document. The report derived its inspiration from the Vision 20:2020. It could, therefore, not have come at a better time than now.

The process that led to the report began at the third session of the National Council on Commerce and Industry held in Kano in May 2010. At the Council meeting, a motion was moved for the crafting of an industrial master plan for Nigeria. This led to the setting up of a Steering Committee comprising key stakeholders including the Federal and State Ministries of Commerce and Industry, the Organized Private Sector and UNIDO. In view of the existing Vision 20:2020 document, it was baseless to reinvent the wheel. Thus, the focus of the report was redirected to the current title. The Steering Committee, chaired by the Honourable Minister of State for Commerce and Industry, and the Honourable Commissioner for Commerce and Industry, Akwa Ibom State as alternate chairman, is expected to present its report to the Honourable Minister of Commerce and Industry. The Honourable Minister of Commerce and Industry would then submit the report at the next Council meeting slated for February 2011 at Uyo.

The report is the outcome of study and analysis of eight subsectors based on the UNIDO technical team's field work, its meetings with the Steering Committee and the validation workshop organized for key stakeholders in these subsectors. The report examined a number of issues in its quest to reposition the Nigerian economy within the context of the Vision 20:2020. For example, attempt was made to provide an overview of the subsectors with the aim of ascertaining capacity utilization, sources of raw materials, employment profile, and output level. On the basis of this, the major constraints to the subsectors were ranked and stakeholders' perception of solutions to the critical issues provided. An inventory of the modern industrial applications of the resource base for the subsectors was undertaken as well as Nigeria's distance to World's best practices in processing, design and marketing. An assessment of Nigeria's distance to the technology frontiers was also explored. All these led to proffering specific policy agenda for action for the subsectors including the mechanisms and frameworks for implementing the agenda for action.

The major contribution of the report is the succinct implementation matrices that were developed for advancing development of the eight subsectors in Nigeria in the short, medium and long term. The implementation matrices recommend initiatives comprising programmes and projects aimed at rejuvenating enterprises and stimulating sustainable growth towards realizing the objectives of Vision 20:2020.

Masayoshi Matsushita
UNIDO Representative in Nigeria
& Director, Regional Office, Abuja

Executive Summary

The achievement of the much desired National Vision 20:2020 of Nigeria becoming one of the twenty largest economies of the world by 2020 requires a vibrant manufacturing sector able to cope with the dynamic challenges of an increasingly globalised world. The vision for the manufacturing sector stands for *'a technologically driven and globally competitive manufacturing sector, with a high level of local content and contributing a high proportion of the National GDP'*

This report on sector specific implementation plan has been prepared to elaborate further strategies and actions articulated in the Vision 20-2020 and its first Implementation Plan. Specifically, the report examines the major constraints to the priority subsectors; assesses the country's distance to world best practice in processing, design, and marketing of each product; examines product-specific technology frontiers; develop policy agenda for action towards hastening the growth of priority product areas and develops a mechanism and framework for implementing an agenda for action towards achieving the goals of Vision 20-2020, using manufacturing as a dynamic force.

The Global Context

An endeavour to achieve rapid industrialization as an effective means of achieving socioeconomic transformation cannot be out of the global context and new industrial realities. The global industrial scene is increasingly being underpinned by a transformative shift from quantitative increase to qualitative improvement. The priority focus of the third industrial revolution experienced in the 21st century is on promoting fast-growing, job-creating green industries. New lessons were learned during the recent downturn of the global economy triggered by the mistakes of imaginary wealth creation by a few. The difference between the past and recent global economic downturns is in the approach adopted to stimulate recovery.

It is being increasingly realized that innovation is the key to unlock the development potential of countries. The key features of innovation in developing countries are different from those in developed countries. Most innovations in developing countries are incremental in nature. The central role of government as a major player in R&D execution and funding is mainly due to low level of resources devoted to R&D by enterprises. Small firm size, informality, foreign and state ownership lead to the informal organization of innovation and fewer R&D projects. Macroeconomic uncertainty, instability, physical infrastructure (which sometimes lacks basic services such as electricity or 'old' communications technologies), institutional fragility, lack of social awareness about innovation, risk-averse nature of firms, lack of entrepreneurs, existence of barriers for business start-up, lack of public policy instruments for business support and management training are major constraints.

Developing countries are generally considered to be mere assemblers or best "imitators" of technologies. Given the context, firms in developing countries are not expected to reinvent the wheel. Thinking in terms of innovation systems changes the focus of analysis from the internal working of an economic system (whether countries, regions or national sectors) to the way that the system interacts with the outside world. Sources of knowledge for a national innovation system, for example, are often located outside the national boundaries by which the system itself

is defined. Similarly international institutions influence the research and development decisions of firms in any national innovation systems of countries.

Adaptive R&D underpinned by adapting imported technology to local conditions, which is common in developing countries, raises the question whether governments can stimulate adaptive R&D at enterprise level merely by financial stimulus. In order for the financial stimulus to succeed a number of non-financial instruments are needed. Non-fiscal instruments include:

- strengthening tertiary education in science and technology at the university and polytechnic levels;
- engineering positive FDI spillovers to local SMEs;
- strengthening technical infrastructure in high tech areas; and
- creating an enabling policy environment for strengthening university-enterprise linkages.

The current focus is on getting the private sector heavily involved in the process of fostering green industrial revolution, with an accent on creating jobs for millions. In this context the role of the State is being revisited. Today, the State is expected to emerge as a dynamic entrepreneur not in terms of owning industrial assets, but in terms of rekindling new sources of dynamic growth. Prosperity is not due to resource endowments. Poverty is not due to the lack of resource endowments. Prosperity and poverty are the outcome of policy choices. With right policy choices, growth impulses could be created for the case of sustainable development.

The Nigerian Context

In Nigeria the manufacturing sector is known for subdued response to consecutive years of macroeconomic stability. It is largely due to infrastructural bottlenecks and supply-side rigidities, leading to high cost of production and doing business.

To be a latecomer in the sphere of industrialization is not a disadvantage today. Given the preconditions, countries can conveniently bypass several stages of development and edge into a high degree of industrialization. The task entails enhanced adaptive capabilities to use modern technology and to commercialize new knowledge. Notwithstanding the fact that major constraints of infrastructural bottlenecks, supply-side rigidities, lack of utility services and energy needs cannot be overcome within a short period, it is important to make optimistic claims about the industrial development potential of Nigeria because of the country's huge resource base. The challenge is to convert resource-based comparative advantages into competitiveness. The endeavour calls for state interventions within the framework of public-private partnership.

Despite its huge potentials to create wealth and generate employment, the manufacturing sector contributed only an average of around 4 per cent to Nigeria's GDP over the 2006 - 2008 periods. Capacity utilization in the sector has not been very impressive either, as it averaged only 53.0 per cent between 2004 and 2008. Nigeria needs to use manufacturing as a dynamic force in propelling the wheels of socio-economic transformation. There should be beginning in this direction.

The manufacturing sector is pivotal to the development of a nation as it involves the utilization of a large proportion of resources. As evidenced by the development experience of developed

countries, newly industrializing economies and emerging economies, prosperity is the outcome of value addition to resources. Failing which there would be resource curse. The primary policy objective of the country's manufacturing sector is to significantly drive the economy through increased productivity, expansion of the value addition in the sector, sufficiently competitive in the supply of finished goods to the domestic market and surplus for export to both regional and international markets. This will require a major shift from low technology based production system to more modern production processes. Hence, the sector is set out to achieve the following objectives in Vision 20-2020:

- to increase the efficiency and profitability of manufacturing establishments;
- to enhance global competitiveness of Nigerian manufactured goods;
- to increase manufacturing local content and linkages with other sectors of the economy;
- to capture greater share of the domestic market;
- to make Nigeria's manufactured products a major source of earning foreign exchange;
- to contribute to the rapid and sustained growth of the Nigerian Economy and diversify the nation's productive base.

The targets of this Action Plan envisaged in Vision 20-2020 are to:

- upgrade skills and productivity of at least 60 per cent manufacturing workforce by 2013;
- increase access of 60 per cent of manufacturers to short-term and long-term credit by 2013;
- attain 25 per cent reduction in cost of production between 2010 and 2013;
- increase capacity utilization from 54.67 per cent in 2008 to 65 per cent by 2013;
- attain 60 per cent compliance with Global ISO Quality Standards within the next three years;
- promote the growth of core industries to be the backbone for material inputs by 70 per cent by 2013;
- draw local content in manufacturing by 5 per cent annually, to enable us reach 60 per cent by the year 2013;
- increase indigenous innovation and R&D by 2013;
- increase employment share of manufacturing sector by 15per cent annually;
- increase access to local raw materials by 2013;
- ensure a reduction of percentage of manufactured goods in imports from 70.6 per cent in 2009 to 55 per cent by year 2013;
- patronage of locally manufactured goods to double between now and 2013;
- attain cost parity with imported manufactured products within the next 5 years;
- ensure that locally manufactured goods meet global standards within the next 5 years;
- increase the share of manufactured goods in exports from 2.5 per cent in 2005 to 15 per cent in 2013; and
- increase annual growth in manufacturing sector from 8 per cent in 2005 to a minimum of 35.9 per cent on the average annually.

Accordingly, the following strategies will be pursued in the medium term:

- Improve physical infrastructure such as, power, transport and water supply;
- Promote joint ventures and provide incentives to facilitate the inflow of Foreign Direct Investment in partnership with exiting SMEs;

- Implement a government procurement policy which support locally produced goods and services;
- Promote product standards by the regulatory agencies such as SON, NAFDAC, etc.;
- Coordination of the establishment of Free Trade Zones, Industrial Parks, Enterprise Zones, Clusters and Incubators;
- Provide a tax incentive that promote expansion and encourage R&D in the sector;
- Enforce industrial linkages through backward integration between industry and research institutions and forward integration between industries and distribution/trade agencies;
- Establish a dedicated fund for the revival of the core manufacturing industries as well as critical industries such as textile, iron and steel, chemical, leather and leather products, petrochemical, agro-processing, food processing, pharmaceuticals etc.;
- Specify and enforce a bold local content policy on manufacturing on sub-sector bases; and
- Strengthen the bank of industry through the injection of additional equity capital to support the manufacturing sector as well as funds for SMEs.

The SMEs are expected to play an important role in the development of the industrial sector under the vision period. They are expected to encourage access to productive assets to a large segment of the population thus assisting in poverty reduction. They are recognized as critical mechanism in achieving pro-poor growth in Nigeria. Vision 20-2020 envisages the sector as capable **"**to be the main engine of economic growth, a driver of sustainable industrial development and a globally competitive SME sector**"**

The industrial sector as a whole will play a major role in positioning Nigeria as a leading economy in the region and globally. In order to translate thoughts into deeds incremental innovation at the firm level is critical. All that Nigeria needs today is to enhance capacity and capability to acquire, assimilate, adopt, adapt, learn and invent products to suit the country-specific content and to capture market modes in domestic, regional and global markets.

The Action Plan will focus on selected subsectors based on the criteria contained in the Vision 20-2020 document. Those subsectors are petrochemicals chemicals and pharmaceuticals, food beverages and tobacco, textile, clothing and leather, basic metal, iron and steel and fabricated metals and non-metal mineral products

Sector Specific Action Plan

In pursuing subsector-specific interventions, the scope of industrial policy framework will have to encompass a range of policy parameters pertinent to an evolving and enabling economic and business environment that befits the country-specific context. Such a policy will primarily concern itself with specific aspects of strengthening industrial policy-making process and implementation capabilities, with a focus on priority sectors that point to address critical issues of economic diversification, transformation and make manufacturing and related services as potential sources of sustainable development.

The private sector must eventually become the primary source of growth and the government will have to take aggressive action to support and strengthen the existing private sector to accelerate foreign direct investment and to encourage more private sector involvement.

Opportunities are not guarantees. The required policy response to convert opportunities into guarantees of wealth creation is a discovery process. The discovery process should convert comparative advantages into competitiveness and enhance competitiveness without comparative advantages. This should be made possible in Nigeria.

Food and Beverage

Although the Nigerian manufacturing industry has continued to struggle, in the face of severe constraints, and in the process contributing less than 5 per cent to the GDP, the food and beverage subsector has fared slightly better. While average capacity utilization in the subsector has remained around 40 per cent, the subsector has enjoyed capacity utilization of above 50 per cent. But it is far from realizing its potential of meeting the food and beverage demand of the population, leading to massive imports of products ranging from flour to fish.

Like other subsectors in the manufacturing sector, it is bedeviled by a number of constraints including:

i. huge infrastructural deficiencies prevalent in the economy especially power;
ii. inadequacy and high cost of raw materials;
iii. obsolete production equipment and chronic lack of application of modern technology/innovation;
iv. high cost of production, packaging and distribution;
v. stiff competition from imported, dumped or smuggled products;
vi. harsh operating environment occasioned by tough regulatory framework/bureaucratic red-tapism;
vii. lack of credit facilities;
viii. declining consumer and purchasing income; and
ix. inconsistent and unstable policy regime.

The Vision target is to achieve a capacity utilization of 75 per cent in the food and beverage subsector through the implementation of a number of product specific action steps. In addition, the plan is designed to reduce the unit production cost, raise the quality of Nigerian food products and make them very competitive through the adoption of global best practices complying with international standards and quality control norms.

Furthermore, the implementation plan targets substantial improvement in the exportability of the key products of the food and beverage subsector so as to earn foreign exchange and thereby diversification of the economy from over dependence on petroleum subsector. Some of the recommended strategies include:

- Tackling the huge infrastructural deficits will not only require massive financial investments but also a review of several legal and policy frameworks like pricing so that private capital can be attracted into the energy sector; and
- The inadequacy and high cost of raw materials can be tackled through a combination of the following:
    - increased local sourcing of raw materials;
    - review of the tariff on certain basic raw materials like sugar;
    - easing access to credit to finance imports of raw materials; and

- creation of a special fund to support and finance research and development initiatives.

On the problem of fake and adulterated or substandard products flooding the market thus stifling the growth of local industries, the study recommends the strengthening of SON and NAFDAC to enforce standards, restated that borders patrols be properly reinforced and stiffer penalties be given to defaulters.

- To enhance quality and competiveness, Nigeria must adopt the Codex Alimentarius, the internationally recognized codes of best practices, standards, guidelines and other recommendations relating to foods, food production and food safety.
- Multiple taxation which has been a serious burden to the entire business community and especially manufactures can tackled through the centralization of the tax administration system in the country and fast tracking of the national tax reforms at the federal and state levels, including automation of tax administration.
- The lack of modern technology and low application of innovation which has put the Nigerian food and beverage industry to gravely lag behind needs to be urgently tackled. Nigeria needs to intensify modern technological applications in the food processing industry to enhance competiveness through application a national system of innovation (NSI) framework to and greater linkages between the research institutes and industry. This can be achieved through the setting up a Research Development Fund for the food and beverage subsector starting with an initial capital of N100billion.
- The study recommends the need for a food and beverage subsector policy whose thrust is to increase the processing of perishables (fruits, vegetables etc) from the present level of below 5 per cent to about 15 per cent by 2020 and raise value addition in food processing to 20 per cent by 2020.

Textile and Wearing Apparel

Textile is a strategic non-oil industry for Nigeria as it is an employer of 24,000 people (direct) and about 500,000 (indirect) - cotton growers, labourers. It is the second largest textile industry in sub-Sahara after South Africa and represents 63 per cent of the textile capacity in ECOWAS sub-region. The present installed textile manufacturing capacity in Nigeria represents a US$ 2bn of sunk investment; important non-oil export industry. Even a partial sufficiency in local textile production could save the country a foreign exchange of US$ 1.5bn annually in imports. The textile industry in Nigeria has, however been shrinking rapidly. The number of textile and garment factories declined from 50 to 25; Employment declined from 60,000 to 24,000; Decline in cotton lint production from 98,000 to 55,000 tons; Fall in exports from US$ 44mn to US$ 31mn; The capacity utilization in the industry is 20 per cent and even many of the surviving are on the brink of closure; Smuggled textiles occupy 85 per cent of market share;

The Textile subsector faces a number of challenges such as:

Smuggling & counterfeiting –The partial import prohibition on textiles has been totally ineffective. There has been a sharp increase in the influx of the cheap textiles flooding Nigerian markets since 2007, mainly through the land border with Niger Republic. Smuggled goods occupy 85per cent of market share. Many of these goods, which originate in China, counterfeit the trademarks of Nigerian textile manufacturers and bear false ‘Made in Nigeria’ markings.

Scarcity & high price of Black Oil –Generally the manufacturing sector suffers from deficiency of electricity. However the scarcity of black oil (LPFO) and its high price has been seriously affecting the textile industry in particular. Since 2006, due to the erratic functioning of the Kaduna refinery the industry has been receiving hardly 20per cent of its requirement of LPFO and the recent increase in the ex-refinery price from N25.40 to N59/liter has made the operations unviable.

Textile Development Fund –The Fund was announced in 2006 with a view to provide concessionary financing to the sector for retooling the equipment and funding the working capital needs. Due to the high interest rates and non availability of long term financing, the textile industry has not been able to modernize. The delay in implementation of the proposed fund hastened the closure of many textile factories.

Cotton production –The quantity and quality of cotton has been declining due to fall in local demand. Nigerian cotton is perceived as low quality due to high level of contamination and the productivity (yield per hectare) remains among the lowest in the world.

Exports –Export of textile products have declined due to delays in implementation of the EEG policy and loss of preferential market access in the EU market resulting from expiration of the Cotonou Agreement.

Wearing Apparel has not performed well in Nigeria despite the various opportunities available in the global market for wearing apparels.

The key issue emerging from the above findings is that the Nigerian textile & clothing industry is facing a serious threat –internal and external-which requires an urgent and adequate response to save the employment of 24'000 direct workers and over half a million cotton growers.
i) Urgent relief measures are recommended to stem further deterioration in the health of the industry:

- Exempting local textiles from VAT for a period of 3 years;
- Exemption from import duty and VAT on spare parts, dyes and chemicals; and
- Disbursement of textile development fund on a pilot basis to existing textile mills by September 2009.

ii) Enforcement against smuggled and counterfeit textiles and taking up the issue with the Chinese authorities;
iii) Adequate supply of black oil to textile mills at the pre-June 2009 price of N 25.40 per litre;
iv) Extension of natural gas pipeline in Ikorodu, Lagos state where large textile cluster is located;
v) Addressing the fiscal policy distortions in customs tariff
vi) Implementation of the Textile Development Fund through commercial banks at subsidized interest rate along the lines of similar schemes operated by other countries and Nigerian Agriculture sector loans by CBN.

The following key measures would be required to lead to the realization of Textile Vision 2015:

- Implementing and sustaining the Textile Development Fund till Year 2020;
- Removal of infrastructural constraints in terms of supply of power, energy with efficient transportation;

- Human resource development to provide skilled manpower to the industry;
- Adoption of bio technology to improve the production and quality of cotton;
- Institutional capacity building by creation of an apex Textile Restructuring Unit within the Ministry of Commerce & Industry and strengthening the organized private sector institutions; and
- Effective enforcement of import policy to check illegal imports.

Other recommendations for the improvement of the subsector include:

- Providing institutional capacity building to the Federal Ministry of Commerce & Industry to set up a dedicated Textile Restructuring Unit;
- Technical assistance to the Bank of Industry in implementation of the Textile Development Fund;
- Trade capacity building to the textile industry through identifying new opportunities through market research;
- Cotton sector improvement through bio technology
- Skill development in textile and garment industry by strengthening the identified existing institutions; and
- FDI promotion by providing assistance in preparing industry profile and identification of prospective investors.

Leather and Leather Products

The Leather and Leather Products subsector has gone through various challenges. During the colonial era, the livestock was structured to produce high quality, hygienic meat products. The by-products which are predominantly hides and skins were gathered, processed, and exported overseas. The traditional sources of hides and skins in Nigeria are cattle, sheep, and goats. The domestic production of hides and skins from cattle, sheep and goats has not really change over the years, even the world production has not changed significantly.

The demand for Hides and skin is derived demand. The raw hides and skins are processed into finished leather, which is then converted into footwear, garments, furniture, vehicle upholstery, etc. These products have both domestic and industrial uses. The international leather market is currently undergoing several changes. There has been devolution of processing from developed countries to developing countries, due to stringent environmental protection regulations in the developed countries and higher labour cost. This new development in the processing of hides and skins is driving up the demand for raw hides and skins for processing in the developing countries. There are three major shoes manufacturing centres in Nigeria whose demand for leathers is quite high. These centres are located in Aba, Lagos and Kano. The Aba cluster specialized in the manufacturing of military and paramilitary shoes, as well as the oil industry shoes. While the manufacturing firms in Lagos specialized in school children shoes, like the Cortina types school shoes, the firms in Kano manufactures sandals and other shoes. On regional trade, the Aba covers markets in Cameroon and Congo. The products from Kano, Maiduguri, and Sokoto cover markets in Cameroon, Chad, Niger, Burkina Faso, Mali and Senegal. On International Market, leather products are not really sold internationally. Nigeria majorly exports hides and skins to the EU

Various institutions are involved in products development and marketing. The Nigerian hides and skins institute in Zaria was established as a research centre to develop new products and expand the market for hides and skins and by extension the leather industry. Also the institute is to build capacity for the industry. Surprisingly, no breakthrough has been recorded since its inception. Financial constraints have been given as reasons for non performance, as well as government inconsistent policy on the mandate of the institute.

Myriad of problems have plagued the subsector over the period, apart from the general problem of inadequate infrastructure that made general economic business uncompetitive. The stakeholders have ranked major constraints of the leather and leather products subsector as: lack of accessibility to single digit loans from the financial system; delay in the payment of the EEG; accessibility to the import of fine raw leather that can be processed; leather from the skins of reptiles are fine but not abundant in the country; rejection of made in Nigeria products by Nigerians; and inaccessibility of black oil – LPFO

Suggested solutions and policies to enhance the performance of the subsector include: making available LPFO and other inputs at reasonable price - all basic raw material and chemicals used by the industry be imported at duty free or a reasonable lower rate; payment of the EEG be made within four (4) months from the day submission of receipts of transaction was stamped; single digit loan with a repayment period of not less than 10 years; and access to the textile fund.

Reducing the distance to world's best practices in processing, design and marketing will enhance competitiveness of the subsector and increase its contribution to the economy. The Nigerian leather and leather products as a whole seem to be very close to world best practices in terms of processing, design and marketing. The leather produced by the tanneries is competing internationally. Most of the tanneries major markets are from abroad: 95 per cent of the products are for export, while 5 per cent only is for local market. Quality has been the driving force in the export market.

In terms of developing indigenous technology, Nigeria is miles away from the developed world. The reason for this is the long neglect of the industry, and the domination of the subsector by foreign firms whose interest is short run profit maximization. The subsector has been described as a cartel and instead of them to develop indigenous technology they prefer to import all their equipment.

Other sector specific policies include collective response to enhance efficiency gains. This will ensure:

- Improvement in general infrastructure, especially electricity and water supply;
- Institutions to reinforce standards and quality, especially among indigenous firms;
- Data base to be build up to support the industry;
- Stability of government policies;
- Reduction of environmental pollution as a factor for competitiveness;
- Trade promotion strategies by NIPC and NEPC;
- Improve transparency in the industry- there is now low local content and technology transfer due to the cartelization of the industry; and
- Increase in labour productivity.

As part of the solution to challenges of the subsector, institutional framework for capacity building should be strengthened. The college of chemical and leather technology was established with a mandate to provide courses for institutional training and research in the field of leather product technology and conduct research and development on leather technology and goods production. Since its inception the college has not really do much due largely to government inconsistency in the mandate and functionality of the college. Government should therefore address the infrastructure and funding need of the college.

There is also the need to strengthen local and regional value chains. The supply chain in the leather and leather products subsector involves the animal husbandry and the processing of the hides and skins, and the manufacturing and marketing of leather products. Specific policy actions to strengthening local and regional value chains include:

- Provision of easy access to micro-finance for micro-entrepreneurs engaged in the hides and skins trade;
- Promote more market-oriented approach to livestock rearing among livestock producers;
- Provide training to a wide range of people in both urban and rural areas in slaughtering and flaying skills, in preservation techniques, and in applying grading and standards. The training programme should establish linkages among the people operating in different sections of the chain through the train-the-trainers programme;
- Establishment of Leather and leather production cluster in the six geopolitical zones. The Aba cluster is an example. We need one especially in Kano;
- Adopt an environmentally friendly technology available in the market;
- Enforcement of effluent standards that are appropriate for local conditions and in keeping with global market requirements;
- Enterprises should be encouraged to enter into sub-contracting agreements with foreign companies as independent enterprises or in groups in order to accelerate the transfer of technology and business know-how;
- Participate in joint ventures to attract cheaper capital, obtain updated technology and modern management techniques, and gain better access to global markets; and
- The research.

Certain specific fiscal and non-fiscal instruments that would enhance the subsector include:

- Government to grant a tax holiday to indigenous firms that have made new capital investment towards increasing plant output;
- Special incentives to foreign owned firms that has demonstrated high level of local content in its processing system;
- To persuade banks to increase sectoral allocation of credit to the real sector; and
- The sector to benefit from the textile fund.

Strengthening sectoral innovation systems would enhance the contribution of the subsector through the following:

- Learning and capabilities development by domestic firms through R&D;
- Government policy interventions for domestic capacity and capability building
- Skilled labour force is required;
- Entrepreneurship and development of SMEs; and

- Enhanced adaptive capacity and capability to use modern technology and device, and to commercialize new knowledge, paving the way for strengthening sectoral innovation system.

Specific measures for spreading the impact of FDI on domestic capacity and capability building would enhance the performance of the subsector. Such measures include:

- Extending/enforcement of the Local Content Act as well as ensuring value addition;
- Overseas training;
- Special incentive for the transfer of technology;
- Joint venture with foreign partners; and
- Transparency in the subsector.

Chemical and Pharmaceuticals

The chemical and pharmaceuticals subsector is the second largest manufacturing subsector in Nigeria (next to the food, beverages and tobacco subsector). It is reckoned to have a potentially large market in Nigeria and the West African sub-region. Over the years, there has been significant increase in the number of Nigerian companies participating in the subsector, though it is still dominated by subsidiaries of multinational companies and other foreign chemicals and pharmaceuticals companies. Starting from a few multinational firms in the 1950s, the subsector now has over 100 formal sector firms with aggregate investments in excess of N300 billion ($2 billion), and employing over 600,000 persons in manufacturing plants and marketing outlets.

Nigerian pharmaceutical industry consists of 128 registered local pharmaceutical manufacturing companies in 2009, 292 registered importers, 724 registered distributors as well as a large number of unregulated manufacturing, importing and distribution businesses. The size of the unregulated market is difficult to accurately quantify because the operators rarely make returns to industry associations or regulatory bodies. The subsector however currently produces only 35per cent of the country's drug supplies. The subsector has been unable to significantly exploit the locally available raw materials or intermediate products. The subsector lacks significant R&D in the public and private sectors.

The major constraints on the subsector as identified by this study include: Inadequate infrastructure; Overdependence on imported raw materials; Poor funding and lack of access to credit; Fake and counterfeit products; Multiple taxation/levies; Inconsistent government policy.

Major infrastructure constraints identified include grossly inadequate electric power supply from public electricity utility company, inefficient/obsolete technology, bad roads and absence of functional railway system, and inadequate port facilities.
High dependence on imported inputs has persisted largely due to lack of production of essential raw materials from local petrochemical complexes.

High cost of fund manifests in high lending rates to manufacturers by commercial banks. The rates are currently 22-30per cent for local SMEs, and multinational companies could get 12-14per cent, depending on the banks' perception of risks associated with each lender.

Fake and counterfeit products especially from Asian countries continue to flood the market as a result of porous borders and inefficient regulatory and compliance monitoring system.

Multiple taxation/levies have remained a major constraint on manufacturing due to weak law enforcement and weak institutions for tax administration. Besides, taxes and levies are often conceived mainly as instrument of revenue generation and extortion of businesses.

Inconsistent government policy results from too many policies that are often uncoordinated and thereby create obstacles to the growth of existing firms and new start-ups. Sometimes genuine incentives are provided for industry; however changes occur before industry stabilizes on assimilating extant policy or incentive regime.

An action agenda that would result in the revival of ailing firms, improve performance, and encourage innovative and job creating green field investment would require the following elements which are expatiated in the concluding chapter of the report:

- Common Facilities for Collective Response to Enhance Efficiency Gains
- A Mega Distribution System for Pharmaceuticals
- Special Purpose Vehicles for Product Development
- Strengthening of Local and Regional Value Chains
- Strengthening Sectoral Innovation System in the Chemical and Pharmaceutical Industry
- Reducing overdependence on imported raw materials
- Tackling the challenge of inadequate infrastructure
- Strengthening the technology and engineering base
- Eliminating fake and counterfeit products
- Fostering R&D and industrial linkages
- Developing local human resources
- Improving funding and access to credit
- Reducing bureaucratic bottlenecks
- Stoppage of multiple taxation/levies
- Ensure sustainability and consistency in government policy

Electrical and Electronics

The subsector benefited immensely from the import substitution industrialization of the 1960s and 1970s. Products of the subsector in the years of boom include wires and cables, radios and televisions sets, lamps and bulbs, fans, fridges and freezers, and air conditioners. These products were of high quality and gained exports to neighbouring countries. In fact the Nigerian wire and cable was notably recognized as among the best quality in the international market.

The subsector has been in decline since the early 1980s, and there is no evidence that the decline has been halted. As at 2004, a presidential committee assessed the industry and reported that many of the firms in the subsector have either closed down, change their line of business, or were operating at less than 20per cent installed capacity.

Recent developments in Nigeria suggest that the sector has been terribly weakened by the predominance of imported electrical equipment and components, and consumer electronics from the East Asian countries such as China, Taiwan, and South Korea. The few existing local firms

producing electrical goods such as Nigerian Wire and Cable PLC are known to be operating under considerable stress. A few multinational companies are also operating in the Nigerian electrical industry, and they are also not spared of the stress arising from the unconducive manufacturing environment. The electronics industry has virtually collapsed, except for the emergence of some information technology firms engaged in the assembly of computers in recent years. Two notable examples are the Omatek Computers PLC and the Zinox Technologies Ltd.

The subsector has been unable to significantly exploit the locally available raw materials or intermediate products. The subsector lacks significant R&D in the public and private sectors.

The major constraints on the subsector as identified by this study include: Inconsistency of government fiscal policies and inappropriate duty; Lack of basic infrastructure; Undue competition; Multiple taxation/levies; Preference by local buyers/consumers for imported products; High cost of borrowing from banks and financial houses.

There is inadequate tariff differential between CKD and FBU especially for air conditioners and refrigerators. The duty on intermediate products is 10per cent while the duty on finished products is 20per cent. The gap between the two duty regimes is considered too low and unable to deter the importation of finished goods which are often cheaper than the local products produced under Nigeria's high cost manufacturing environment.

Major infrastructure constraints identified include grossly inadequate electric power supply from public electricity utility company, inefficient/obsolete technology, bad roads and absence of functional railway system, and inadequate port facilities.
Undue competition exists in respect of imported cheaper products especially from China. It is believed that imports of fully built electrical and electronics products make assemblers in Nigeria to survive, and thus every manufacturer in Nigeria is also a potential importer because manufacturing environment is too costly.

Multiple taxation/levies have remained a major constraint on manufacturing due to weak law enforcement and weak institutions for tax administration. Besides, taxes and levies are often conceived mainly as instrument of revenue generation and extortion of businesses. Other important constraints identified by stakeholders include preference by local buyers/consumers for imported products; and high cost of borrowing from banks and other financial institutions.

An action agenda that would result in the revival of ailing firms, improve performance, engender competitiveness, and encourage innovative and job creating green field investment would require the following elements which are expatiated in the concluding chapter of the report:

- Promotion of dynamic industrial location
- Special purpose vehicles for product development
- Strengthening local and regional value chains
- Strengthening sectoral innovation systems
- Consistency of government fiscal policies and appropriate duty
- Provision of basic infrastructure
- Reduce dependence on imported inputs

- Remove undue competition and engender preference for local products
- Stop multiple taxation/levies
- Reduce high cost of borrowing from banks and other financial institutions.

Non – Metallic Mineral Product

The sub-system holds great promises for the promotion of industrial dispersal within the country because of the availability of raw materials in different parts of the country. In the past, the industries in the sub-system made attempts to introduce technology to improve the quality of the locally available raw materials. For instance, the glass-making group embarked on plans to purify the silica sand in order to produce high quality flint glass tableware. But at the initial stages of the plan in 1985, it was discovered that the cost would be prohibitive.

The sub-system is currently oriented towards satisfying the domestic market although there are still many products yet to be produced domestically and have to be imported. A major characteristic of the sub-system is that most of the industrial units, especially in the ceramics and burnt bricks sector, belong to the small and medium-scale ranges.

Major Constraints on the sector In respect of locally-sourced raw materials the problems include:

i) Inadequate quantities of local supplies, in many instances, even when raw materials are locally available, they are not available in sufficient quantities to meet the needs of industries. This is the situation with the supply of limestone power, a key input into the glass-making industry. The raw material is only available at the Jakura Marble Industries, and the quantity supplied cannot meet the needs of the industry. The problem has been compounded with the coming on stream of the International Glass Industries at Aba.

ii) Deficiencies in the properties of available local raw materials: This is a major problem confronting all the industrial groups in the sub-system:

iii) The technologies utilized in this sub-system are largely imported. This in itself constitutes a problem. The operators at the sub-system have to contend with the following constraints:

- Lack of spare parts;
- High cost of equipments; and
- Shortage of technical manpower.

The lack of development of local designs of machinery and parts is also traceable to the inadequate supply of technical manpower required to service this sub-system in particular and the manufacturing sector as a whole. An insignificant proportion of admissions into tertiary institutions are in the area of engineering. This drawback may take some time to reverse as it requires some long term plant to ameliorate.

iv) Production problems encountered by this sub-system include:

- Low capacity utilization;
- Lack of standardization; and
- Lack of appropriate technical manpower.

v) The lack of appropriate technical manpower constitutes a serious problem. Due to the limited number of tertiary institutions offering such courses as Glass, Ceramic and Building technology, few Nigerians have training in these disciplines. This militates

against the development of local innovations in the sub-system. Added to this, the production operation requires specialized personnel. The number of Industrial and Production personnel required for the production operations functions can only be made up by increasing the number of tertiary institutions offering such disciplines. Presently, about two universities offer industrial engineering programmes, while about four offer the production engineering option. Production operations require more than basic engineering qualifications. Many companies presently convert graduates of other disciplines to carry out the production functions. This has cost implication as effectiveness is usually impaired.

Unfortunately, many of the locally produced non-metallic building materials like bricks, tiles and glass are of varying low quality and do not confirm to recognized standards. In the case of bricks, there is usually no uniformity in dimensions, there is frequent occurrence of cracks and they are not as durable as expected.

Key Proposed Actions on cement include:

- Liberalization and opening up of the industry to new producers and reduce import duty on the product in order to increase local production and bring down the price. Implementation time frame: during first half of 2011.

Key Proposed Actions on Glass and ceramics include:

- Special training programme to develop high skilled hands under a structured industry-education collaboration framework; and
- Revitalize and give institutional support to PRODA with explicit mandate on glass challenges.

Basic Metal

The importance of the sub-sector is so critical to industrialization that detailed attention to its progress should be urgent. Happily, the natural raw material base is huge within the country and so, what is needed is policy sharpness and effective implementation. In this vein, the experience of other leading iron producing economies is of relevance in order for Nigeria to benchmark itself appropriately for subsequent global competitiveness. Currently, the sub-sector produces at barely 50per cent of its installed capacity due largely to missing critical ingredients of policy consistency and manpower quality; in particular, there is weak link between industry needs and academic curricular resulting in below international standard output.

Major Constraints to the sector include:

- Energy remains a major constraint to the sector. The cheapest source of energy, PHCN is the most erratic, unreliable and problematic. Thus, energy costs have moved up due to the failure of PHCN.
- General Infrastructure
- Government Policy uncertainty
- Absence of supporting institutions
- Lack of political will to develop a grand vision for infrastructural development for the nation. Various governments over the years have paid lip services to the development of infrastructure in the country-but there was no consistent vision and mission.

- Lack of maintenance culture. The few existing infrastructure are never maintained.
- Lack of participation by all stakeholders in engineering infrastructure policy making process
- The Nigerian economy lacks a skill mass of relevant skilled manpower for engineering and technology applications
- Inadequate resource commitment to the sector
- Non-recognition and consequent absence of challenge to the available skilled manpower
- Inadequate funding for R&D
- Poor linkages between R&D institutions and the industry
- Difficulties in commercializing R&D results
- Absence of a technology culture in the society
- Poor power and utility supplies

In response to the myriad of challenges facing the sector, specific action lines are proposed, namely:

i. The setting up of a Steel Corporation of Nigeria;
ii. Invite foreigners to the iron and steel sector-with a timeframe for technology transfer to local hands; and
iii. Adopt successful cases of privatization of iron and steel in other parts of Africa as typified by Egypt.

Stakeholders are united by and large on the following approaches to moving the industry and economy forward:

- Promotion of local content of industrial machinery- this calls for understanding between manufacturers and industrialists. Projects can start with the local production of spare parts and gradually graduate into the design and fabrication of individual units of process lines and complete process lines.
- Investment in emerging technology development-the only way to halt the widening technological divide-calls for substantial investment outlay
- Development programme for SMEs –to make them technology-driven. This may involve the promotion of interactive sessions and participatory programmes that will generate the emergence of relevant technologies and engineering infrastructure for the SME sub-sector.
- Upgrading of "Mechanic Villages"
- Establishment of mini-foundry in tertiary institutions-expanding and promoting the NASENI initiative
- Conscious and sustained promotion of human capacity development in engineering design and development
- Adequate and efficient infrastructure facilities and the supply of reliable utilities are mandatory requirements before the steel industry in Nigeria can attain its full potential in the production of competitive iron and steel products for both domestic and international markets.
- The provision of adequate and dependable supply of quality electric power and other sources of energy (e.g., gas and coke) is an important parameter in the operation and competitiveness of any steel plant. Furthermore, the availability of low cost reliable power is necessary for the development of the downstream industries and the economy in general.

- Although PHCN may be able to meet the electric power demand of the steel plants, the reliability of supply still needs to be improved upon. For example, frequency fluctuation on the National grid can damage sensitive electrical control systems in the plant .At the time of visiting with a PHCN official the frequency meter on his table was reading 51.08Hz. This is outside the permissible fluctuation range for a number of electrical control systems in a steel plant (i.e. frequency, 1.5per cent; voltage, 10per cent)

Automotive Sub sector

The automotive industry was started in the 1890s in Europe and USA. It has since grown to be a major economy activity of many countries, not just in transportation of people, goods and services, but also in manufacturing activity. The automotive subsector promised high linkages. Its activities involve lots of components manufacturing which can be done by large firms as well as the small and medium scale enterprises. It is the believed that a country who wish to industrialized can quickly achieve that through the development of the automotive subsector.

The Nigerian automotive industry which witnessed high volume of activities in the 1980s with various assembling plants being active has nose dive as industry capacity utilization has dropped below 30per cent. Many of the assembling plants are moribund with only Peugeot, Anamco, and Innoson with skeletal activities. The industry is import dependent in raw material sourcing.

The major constraints facing the industry include:

- Low local patronage: the governments at all levels and their agencies/parastatals, including the military have reneged on patronizing domestic assemble autos;
- Inconsistent policy: the lifting of ban on importation of autos and the subsequent lowering of import duties resulted to influx of both new and used autos, most of the used autos are not really environmentally friendly
- Weak and deteriorating infrastructure leading to high cost of operation and un competitiveness in regional and global markets.
- Lack of long term and cheap finance

Suggested solutions to the critical constraints include:

- Governments' promotion of locally assembled automotives through a 100per cent patronage of locally assembled autos. The military/paramilitary and MDAs must also be directed to patronize the locally assembled autos
- A special fund should be set outside for the revitalization of the auto industry
- Development banks whose mandates are to provide cheap and long term loans should be directed to support the industry
- A concrete effort must be made to track the challenge of inadequate power supply and other infrastructure issues
- Government should reinstate the ban on imported vehicles, especially the used cars

Specific policy agenda for action for the automotive subsector include:

- Common facilities for collective response to enhance efficiency gains

    - All Nigerians including foreign missions should patronize autos assembled in Nigeria

- Industrial cluster should be developed for the production automotive and non-automotive components.
- Government policy geared towards protecting the domestic industry must endure as well as the provision of common facilities through a special purpose vehicle (SPV).

- Institutional framework for capacity building

The automotive industry uses many raw materials in its production. The industry is one of the main users of iron & steel, computer chips, textiles, aluminum, copper, lead, plastics, vinyl, and rubber. Government should ensure that small enterprises are developed to cater for the need of the industry. Therefore for capacity building:

- Training of manpower in different processes of the industry
- Centre for Automotive Design and Development (CADD) and Universities of science and Technologies/Polytechnics should be well equipped with both physical capital and human capital to build capacity for the industry

- Strengthening local and regional value chains

There are about 100 to 120 components involved in manufacturing a vehicle; policy should therefore focus on development of automotive industrial clusters to strengthen the value chain system; the following issues must be address by policy:

- Quality: this must be maintained at any level of the value chain
- Research and development
- Regulations: to ensure standards and that they are not compromised

- Specific fiscal and non-fiscal instruments

  - Tax break or holiday to auto firms that have made new capital investments towards increasing plant output or launching a new assembly line or pioneer product.
  - Grant tax relief on vehicles manufactured in Nigeria for export
  - Enthrone a deliberate tariff regime that ensures at least 35-40per cent differential between CBUs and CKD imports
  - Setting up auto reviving fund

- Strengthening sectoral innovation systems

  - Investment in Research and Development, as well as training for capacity and capability building
  - Research grants should be made available for technological breakthrough

- Specific measures for the spreading the impact of FDI on domestic capacity and capability building

- Extending/enforcement of the local content Act, as well as ensuring value addition
- Overseas training
- Special incentive for the transfer of technology
- Joint venture with foreign partners
- Transparency in the subsector:
- Marketing strategies are not disclosed

Cross-cutting Issues

Geographical dispersal of industries

Geographical dispersal of industries is a primary objective of Government. In a federal state like Nigeria, balanced development is an important objective of the state. The stability and coherence of the state depends on the inclusiveness of government policies at the individual and regional basis. The vision 20-2020 envisages an industrialization process that recognizes the regional comparative advantage of the various parts of the country and encourages the dispersal of industries across the nation. The existing State structure provides an adequate basis for dispersal of industries. Within this context the urban/rural divide is to be taken account of. Rural industrialization has been a major challenge in Nigeria since independence. The result has been the growing rate of migration to the urban centers. About 38 per cent of the country's population lives in urban centres because of the greater opportunities for gainful employment. This has resulted in the stretching of available facilities in these centres to the extent that in some cases, these facilities have broken down. Rural industrialization is critical in Nigeria to stem the flow into urban areas that are not able to absorb the migrants. Agro allied industries have the potential of using readily available raw material in the rural areas to sustain production and improve on their competitive advantage.

The plan is to ensure that by the year 2015 at least 75 per cent of all primary products are processed within the Local Government Areas in which they are sourced.

The strategies to ensure the attainment of the target of the plan include:

- Provision of Infrastructural Facilities in all Local Government Areas - One of the problems of industrialization in Nigeria is over concentration of industries in a few industrial centres. In order to encourage geographical dispersal of industries, therefore, it is the intention of Government to encourage the provision of infrastructural facilities in all the Local Government Areas (LGAs). In order to achieve this, State and Local Governments are encouraged to establish Industrial Estates/Layouts in their respective areas. Similarly, generous incentives have been provided to encourage investment in industrially and economically disadvantaged areas of the country.
- Creation of Industrial Growth Poles through the use of Special Incentives -Another strategy through which geographical dispersal of industry is to be achieved is the creation of Industrial Growth Poles that requires the activities of free trade zones, enterprise development zones, industrial estates, industrial layouts and craft villages to influence the

development of the catchment areas through the use of the relevant incentives for developing the peculiar business enclaves.

- Establishment of Industrial Estates by LGAs - By establishing infrastructural facilities like industrial estates, incubation centres and layouts by the LGAs in their respective domains, industries would be attracted to such LGAs thereby facilitating the geographical dispersal of industries in the country.

Industrial Support Infrastructure

All the subsectors covered by this report identified weak infrastructural support as a major constraint to development. Some infrastructural support cut across the various industrial subsectors.

Banking and financial services are essential to industrial development. The recent successful banking consolidation which has strengthened and deepened the capital base of Nigeria Commercial banks shall be further enlarged to promote industrial development. Similarly, government shall continue to stabilize the value of the naira and create a system to ensure that the country has sufficient foreign reserves at all times to cater for her needs in keeping with the spirit of the Vision 20/2020.

The provision of physical Infrastructure is also critical for making industry competitive and for the locational advantage within the region. In this regards government shall continue to develop centres of excellence for export-oriented industries to accelerate the country's economic development, including encouraging private sector participation in the provision and maintenance of infrastructural facilities at affordable prices and encourage the provision of infrastructure through the Build, Operate and Transfer (BOT) principle.

Industrial clusters have proven to be successful mechanism for industrial promotion in a number of countries and would be promoted to achieve the targets of this plan.
The primary determinant of development in every economy is the level of activity in commerce and industry within its territory. Investment is very important in this process. The clusters will provide an enabling environment including security, infrastructure, and incentives, to attract sufficient investments (foreign and domestic).

The Cluster Concept is an effort to create a community of businesses located together in which members will seek enhanced environmental, social and corporate performance towards effective global trade competitiveness. Moreover, the concept will enable government to concentrate infrastructure and other amenities necessary for smooth operation of businesses in identified locations. The cluster Concept in Nigeria will operate at different levels: industrial parks; industrial clusters; enterprise zones and incubators.

Institutional and management Framework for Implementation

A successful plan will require a sound institutional framework for proper implementation. The current structure today involves the following: a) Federal Government; b) State Governments; c) Local Government Councils; d) The National Council on commerce and Industry (NCCI); and e) Private Industrial Establishments (Private Sector)

Effective formulation and implementation of the sector-specific implementation plan requires systematic liaison and collaboration among the relevant ministries and agencies and continuous dialogue and consultation with key stakeholders. For this purpose, a participatory framework that involves all stakeholders has been evolved for the implementation of the plan. In this regard, relevant institutions identified as principal components of the implementation Plan shall be established, while existing institutions shall be strengthened. The federal Ministry of Commerce and Industry, which is the lead agency in charge of overall responsibility for coordination of the Trade and Industrial Policy framework, shall anchor the implementation of this plan.

The overall framework would have at its apex the President of the Federal Republic of Nigeria to give the needed push and guidance to the overall industrialization process in the country. Since a number of ministries and agencies at all tiers of government are involved in the process it is necessary for the President to take a leading role in this plan. The President will be assisted by a Presidential committee (taskforce) on industrialization which will draw on various stakeholders at both the federal and state levels and involving the OPS and labour.

Other organs that would have direct involvement in the process would include; Economic Management Team, Minister of Commerce and Industry, Trade and Industrial Promotion Institutions, National Council on Commerce and Industry, Executive Secretariat,

Conclusion

The global industrial scene is undergoing rapid transformation as technology continues to grow and change the structure of production. The priority focus of the third industrial revolution experienced in the 21st century is on promoting fast-growing, job-creating green industries. It is imperative that developing countries intensify efforts to stimulate economic recovery by focusing on R&D and innovation. Knowledge as a source and innovation as a force are emerging as effective factors of production in fostering economically efficient, ecologically friendly and socially desirable pattern of industrial development. Nigeria's aim of becoming one of the 20 leading economies in the world by 2020 requires particular attention to the challenges of industrialization of the country. A socially inclusive growth that is pro-poor would require the private sector to take advantage of domestic resources and the public sector to ensure an enabling environment for the private sector to drive economic growth.

The Nigerian manufacturing is challenged by low capacity utilization, depleted financial base, high production costs, unemployment and general economic decline in the country. The strategies set out in this plan to redress the stagnation in the manufacturing sector are expected to restructure the industrial sector and transform it into an engine of growth for the economy. They are expected to promote rapid economic and social development of the country as well as move the country closer to achieving NV20:2020.

PART A
The Context

CHAPTER ONE
THE GLOBAL CONTEXT

The global industrial scene is increasingly being underpinned by a transformative shift from quantitative increase to qualitative improvement. The priority focus of the third industrial revolution experienced in the 21st century is on promoting fast-growing, job-creating green industries. New lessons were learned during the recent downturn of the global economy triggered by the mistakes of imaginary wealth creation by a few. The difference between the past and recent global economic downturns is in the approach adopted to stimulate recovery.

During the Great Depression of the 1930s, interventions were attuned to stimulating consumption and investment. To stimulate economic recovery, countries now focus on investing in Research and Development (R&D) and innovation. Knowledge as a source and innovation as a force are emerging as effective factors of production in fostering economically efficient, ecologically friendly and socially desirable pattern of industrial development. The challenge is to achieve social inclusion in private value creation in the process of decoupling growth from carbon.

1.1 The new industrial realities

We are seeing the confluence of resurgent interest in industrial-policy-making and climate change agenda. The current crisis is increasingly been seen as an opportunity to encourage real 'green shoots'. Special funding for research, education, energy, green-tech investments and other forms of innovation constitute a major part.

Innovation is imperative. As evidenced by the facts presented in UNIDO *Industrial Development Report 2009*, a number of middle income countries got stuck on the ladder of value addition due largely to their failure to strengthen national and sectoral innovation systems. As a result, they failed to keep pace with the rapidly changing facets of processing, design and marketing in an internationally competitive environment. The key message of the UNIDO Industrial Development Report 2009, which focuses on the bottom billion and the slow-growing

middle income countries, is that amidst determined efforts to stimulate global recovery, don't forget the poor and the potential to break in and move up.

Innovation is the key to unlock the development potential of countries. The key features of innovation in developing countries are different from those in developed countries. Most innovations in developing countries are incremental in nature. The central role of government as a major player in R&D execution and funding is mainly due to low level of resources devoted to R&D by enterprises. Small firm size and informality, foreign and state ownership lead to the informal organization of innovation and fewer R&D projects.

Macroeconomic uncertainty, instability, physical infrastructure (which sometimes lacks basic services such as electricity or 'old' communications technologies), institutional fragility, lack of social awareness about innovation, risk-averse nature of firms, limited entrepreneurial skills, existence of barriers for business start-up, lack of public policy instruments for business support and management training are major constraints.

In an ideal national industrial innovation system new knowledge is generated by universities, exploited by laboratories and commercialized by dynamic firms. Such an ideal industrial innovation system does not prevail in developing countries. There is a lot of public spending by governments on public institutions. Despite good performance in R&D and innovation, the commercialization of most of the research findings is at stake for want of funds and technical assistance. There is a weak link between those institutions and the private sector. Thus, there is a high degree of "institutionalized inactivity" in the actual commercialization of R&D and innovation in developing countries.

Innovation studies show that firms with relatively higher levels of R&D intensity attribute their innovation performance to research-based innovation factors and strategies such as strengthening their own research capabilities, entering into research collaborations with universities. Firms with relatively lower R&D intensity focus more on production-based innovation factors and learning from customers. They learn a lot from competitiveness, marketing, and distribution channels, while recognizing the importance of advancing technologically. In fact, their success

depends on the stage of innovation in which firms are operating for a particular product or process and on government policies which support the required technological capabilities.

R&D at the enterprise level is central to domestic technology development. The key issue relates to the high cost of doing R&D at the enterprise level. As such, it will be important to find out if creation of consortia of small and medium firms for collective R&D can address the issue of high cost of doing R&D at the enterprise level.

It is being increasingly realized that if R&D activities are left entirely to the private sector, it may lead to underinvestment. This is based on the fact that private sector firms may fail to recoup the full returns from their investments in research and innovation. If research and innovation related activities should not be left entirely to the private sector, what should be the extent of government support? Will an array of fiscal measures stimulate research and innovation at the enterprise level? Should governments prefer research grants to subsidies?

Developing countries are generally considered to be mere assemblers or best "imitators" of technologies. Given the context, firms in developing countries are not expected to reinvent the wheel. Thinking in terms of innovation systems changes the focus of analysis from the internal working of an economic system (whether countries, regions or national sectors) to the way that the system interacts with the outside world. Sources of knowledge for a national innovation system, for example, are often located outside the national boundaries by which the system itself is defined. Similarly, international institutions influence the research and development decisions of firms in any national innovation systems of countries.

Adaptive R&D underpinned by adapting imported technology to local conditions, which is common in developing countries, raises the question whether governments can stimulate adaptive R&D at enterprise level merely by financial stimulus. In order for the financial stimulus to succeed a number of non-financial instruments are needed. Such non-fiscal instruments include:

- strengthening tertiary education in science and technology at the university and polytechnic levels;

- engineering positive FDI spillovers to local SMEs;
- strengthening technical infrastructure in high tech areas; and
- creating an enabling policy environment for strengthening university-enterprise linkages.

The services provided by financial intermediaries are essential for technological innovation. These services include mobilizing savings, evaluating projects, managing risk, monitoring managers, facilitating transactions and auditing the impact. As financial governance did not keep pace with the pace of the so-called financial innovation in recent years, mistakes of imaginary wealth creation resulted in the global economic downturn. Stimulating industrial innovation is indeed a challenge and an opportunity. The challenge is to ensure good governance of financial intermediaries and the opportunity stems from the way we seize opportunities from the new industrial realities.

The current focus is on getting the private sector heavily involved in the process of fostering green industrial revolution, with an accent on creating jobs for millions. What the global economic crisis has done is to confront governments worldwide with stark strategic choices. Information asymmetries and coordination failures have been exacerbated by the international nature of the crisis making decision making more difficult but choices must be made and are being made as the productive structure of the world is experiencing radical transformation. Strategic industrial policy in this context is about identifying the opportunities. In seizing opportunities, it is not the question of survival of the biggest or smallest but the fastest. Only those who keep pace with the rapidly changing facets of the new industrial realities survive. Others fall apart. We should move to the fast track of industrial development today. Tomorrow may be too late. In order to move to the fast track, the State should emerge as a great facilitator, and the private sector should be an aggressive achiever.

Nigeria does not encompass an ideal national innovation system, where new knowledge generated by universities and institutions is effectively exploited by laboratories and commercialized by dynamic firms. Given the new perceptions of effective systems of

innovation, Nigeria will need to opt for determined efforts to enhance adaptive skills and capabilities to use modern technology and devices and to commercialize new knowledge. It calls for creating an enabling environment and institutional framework for fostering incremental innovation through effective transfer of technology and knowhow. Therefore, capability building should be the nerve centre of fostering sustainable industrial development.

Notwithstanding the fact that Nigeria should not be a bystander at the global technological feast, a redefinition of technology and innovation level calls for adaptive capabilities to match modern and intermediate technology to local needs in order to foster better quality of rural life. A country's endeavour to achieve rapid economic transformation is apt to be won or lost in the countryside where the vast majority of people live, and grassroots innovations will need to serve as rural growth impulses and create sustainable sources of livelihoods for the rural communities.

If technical change lies in the heart of economic growth, its impact should reach the grassroots in terms of creating sustainable sources of livelihoods and thereby make a breakthrough in the quality of rural and urban life. Food security and livelihood sector-related initiatives are based on the economic precept that poverty cannot be alleviated by charity and that creating sources of sustainable livelihood is the key to social advancement. Better quality of life in rural areas and urban centres entails enhancing productive capacities and using manufacturing as a dynamic force in achieving socio-economic transformation in Nigeria. The State needs to play a major role in propelling the wheels of such transformation.

1.2 Revisiting the role of the State

In the wake of market forces failing to be self corrective, government failure to correct market failure could be a source of underdevelopment. Today, the State is expected to emerge as a dynamic entrepreneur not in terms of owning industrial assets, but in terms of rekindling new sources of dynamic growth. Prosperity is not due to resource endowments. Poverty is not due to the lack of resource endowments. Prosperity and poverty are the outcome of policy choices. With right policy choices, growth impulses could be created for the case of sustainable development.

A regulatory state governs the economy largely through regulatory institutions that are empowered to enforce standards of behavior that avoid government failure to correct market failures and provide public goods that otherwise would be undersupplied by the market. A developmental state intervenes more aggressively through a variety of means to facilitate the process of private sector-led growth of new industries. [1]

The current recovery phase of the global economy could be attributed largely to the increasing role of the developmental state. The message is very clear: Government policy and institutional direction are critical. Today the process of industrialization is not driven by resource endowments alone which encompasses comparative advantages. Industrialization process is increasingly being triggered by knowledge, technology, skills, information, networking, etc., which convert comparative advantages into competitiveness. Dovetailing those factors is indeed the responsibility of the State as part of policy and institutional direction to foster private-sector-led industrial expansion. In an increasingly competitive environment, innovative industrial policy initiatives and instruments serve as sources of dynamic industrial growth.

[1] For an in-depth analysis of the role of the developmental state, see Padmanand and Vinanchiarachi (2008), "Intervene to Industrialize", Trivandrum.

CHAPTER TWO
THE NIGERIAN CONTEXT

The achievement of the much desired Vision 20:2020 of Nigeria becoming one of the twenty largest economies of the world by 2020 requires a vibrant manufacturing sector able to cope with the dynamic challenges of an increasingly globalised world. Accordingly, the Vision envisages ***'a technologically driven and globally competitive manufacturing sector, with a high level of local content and contributing a high proportion of the National GDP'.***

In Nigeria the manufacturing sector is known for subdued response to consecutive years of macroeconomic stability. It is largely due to infrastructural bottlenecks and supply-side rigidities, leading to high cost of production and doing business.

To be a latecomer in the sphere of industrialization is not a disadvantage today. Given the preconditions, countries can conveniently bypass several stages of development and edge into a high degree of industrialization. The task entails enhanced adaptive capabilities to use modern technology and to commercialize new knowledge. Notwithstanding the fact that major constraints of infrastructural bottlenecks, supply-side rigidities, lack of utility services and energy needs cannot be overcome within a short period, it is important to make optimistic claims about the industrial development potential of Nigeria because of the country's huge resource base. The challenge is to convert resource-based comparative advantages into competitiveness. The endeavour calls for state interventions within the framework of public-private partnership.

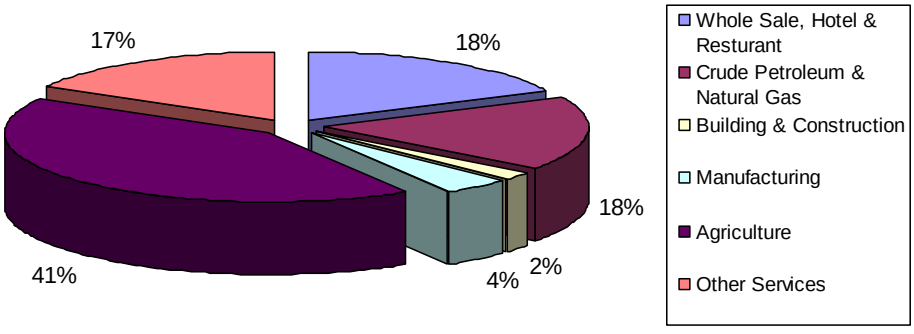
2.1 The state of manufacturing

Despite its huge potentials to create wealth and generate employment, the manufacturing sector contributed as high as 8 per cent in 1990 and a mere 4 per cent in 2008. It contributed only an average of around 4 per cent to the GDP over the 2006 - 2008 periods. Capacity utilization in the sector has not been very impressive either, as it averaged only 53.0 per cent between 2004 and 2008. Nigeria needs to use manufacturing as a dynamic force in propelling the wheels of socio-economic transformation.

The macroeconomic stability that followed the emergence of democracy in 1999 offered opportunities for planning and economic growth. The stable exchange rate and macroeconomic stability ushered a predictable economic environment. GDP grew at an average of 5.4 per cent between 2000 and 2004 and rose to 6.9 per cent in 2005. Manufacturing value added grew at an average of 8.8 per cent between 2000 and 2004 while capacity utilization rose from 34 per cent in 1999 to 50 per cent in 2007. However, social and physical infrastructural facilities limited the optimal performance of the sector. The worst outcome for the sector was the closure of manufacturing firms and some leaving the shores of the country to other neighboring countries.

Manufacturing remains the backbone of most advanced economies over the past several decades. Countries like China, India, Brazil, South Korea and substantially, the Asian tigers, have benefitted from their policy of encouraging manufacturing/being manufacturing oriented. The sector's contribution to GDP has been less than satisfactory since the 1990s. Unlike in most emerging economies and developed countries where the manufacturing sector plays significant role in terms of share of the GDP, its contribution to Nigeria's GDP has been on persistent decline over the past years from 8.2 per cent in 1990 to 4.32 per cent, 3.68 per cent, 3.91 per cent, 4.03 per cent and 4.14 per cent in 1999, 2004, 2006, 2007 and 2008 respectively. Its contribution to the GDP in comparison to other sectors of the economy is depicted below:

Fig1. Nigeria's GDP by sector 2008 (Percentage)



Source: National Bureau of Statistics (2009)

The contribution of the manufacturing sector to Nigeria's GDP is further compared with those of selected countries to further emphasize the poor performance of the sector.

Table 1: Nigeria's manufacturing as percentage of GDP and those of selected countries 2004 - 2007

Period	Brazil	China	Egypt	India	Malaysia	Nigeria	Singapore	Canada	USA
2004	23	41	18	16	30	3.68	27	18	13
2005	23	42	17	16	29	3.79	27	18	13
2006	23	41	17	16	29	3.91	27	18	13
2007	23	43	17	16	29	4.03	27	18	13

Source: National Bureau of Statistics (2009)

The capacity utilization in the manufacturing sector that was 73.3 per cent in 1984 fell to 54.67 per cent by 2008. Details of capacity utilization in the sector are depicted below.

Table 2: Manufacturing sector capacity utilization, 2000 - 2008 (Percentage)

S/No	Product	Year			
		2000	2006	2007	2008
1.	Meat & Dairy Products	43.20	54.00	63.00	64.00
2.	Vegetable & Grain Mill	16.80	48.40	58.00	46.00
3.	Bakery Products	30.10	46.03	68.00	66.00
4.	Sugar/ Confectionery	31.00	45.00	71.00	65.00
5.	Misc. Food Preparation	39.20	26.00	56.00	44.00
6.	Beer & Stout	49.40	57.50	48.00	37.00
7.	Soft Drinks	27.00	35.00	71.00	77.00
8.	Textile	21.40	56.60	41.00	39.00
9.	Knitting, Carpet & Rug	35.80	67.00	4.00	50/4
10.	Leather Products	37.90	0.00	-	91.00
11.	Leather Footwear	23.10	76.16	69.00	75.00
12.	Saw Milling	26.80	0.00	68.00	74.00
13.	Wood & Cork Products	0.00	52.50	-	57.00
14.	Paper Manufacturing Products	25.10	70.00	96.00	76.00
15.	Printing & Publishing	38.00	47.75	64.00	54.00
16.	Basic Industrial Chemicals	30.40	49.25	-	40.00
17.	Paints	47.00	51.88	32.00	60.00

18.	Drugs & Medicine	38.60	57.30	61.00	32.00
19.	Soap & Perfumes	45.60	53.80	68.00	52.00
20.	Other Chem. & Petroleum Product	46.80	90.50	82.00	-
21.	Tyres & Tubes	31.80	64.00	68.00	17.00
22.	Plastic Products	45.10	64.88	89.00	74.00
23.	Glass & Glass Products	42.30	51.00	-	57.00
24.	Cement & Cement Products	49.10	52.13	72.00	-
25.	Basic Metal Industries	0.00	0.00	22.00	63.00
26.	Structural Metal Products	0.00	55.56	73.00	83.00
27.	Fabricated Metal Products	47.10	59.26	69.00	50.00
28.	Radio, TV & Communication Equipment	36.70	53.00	-	-
29.	Motor Vehicle Assembly	41.90	16.00	-	15.00
30.	Roofing Sheets	39.80	56.13	-	-
31.	Wine, Spirits & Distillers	35.60	-	76.00	37.00
32.	**Average Capacity Utilization**	**36.10**	**53.30**	**53.38**	**54.67**

Source: National Bureau of Statistics (2008)

Low manufacturing sector capacity utilization rates have largely been blamed on frequent power outages, lack of funds to procure inputs and reduced demand for locally manufactured goods.

Currently, the state of the manufacturing industries is not encouraging. Many small enterprises have closed down, while rationalization and staff layoffs are being experienced in many medium and large-scale establishments. As depicted in Table 3, 30 per cent of firms have closed down, 60 per cent are ailing while only 10 per cent are operating at a sustainable level.

Table 3: Status of Manufacturing Industries

Industries that have closed down (30 per cent of total)	Industries in the ailing category (60 per cent of total)	Industries at a sustainable level (10 per cent of total)
• Electronic/ Electrical Appliances • Auto • All others	• Hydro-carbon based industries • Pulp, paper products, printing, publishing and packaging sector • Footwear • Textiles and garments	• Food, Beverages and Tobacco • Wood and Wood Products • Pharmaceuticals • Leather

Source: Manufacturers Association of Nigeria

Companies in the closed down group cut across all industrial products but most affected are products such as textile, chalk, dry cell and automotive batteries, shoe polish, matches, candle, etc.

With the introduction of the ECOWAS free trade treaty for free movement of goods within West Africa, relocation of Nigerian manufacturers to other countries within the sub-region has also increased. The high operating costs and challenging environment are major contributory factors to this situation.

Past experience indicates that if things continue the way they are coupled with the current global financial situation, the declining growth in manufacturing sector from 10.07 per cent in 2002 to 8.85 per cent in 2007 may persist. The manufacturing sector contributed, on the average, 2.5 per cent to total exports between 2005 and 2009.

Table 4: Manufacturing Sector Growth rate, 2002 - 2008 (Percentage)

Year	Growth Rate
2002	10.07
2003	5.66
2004	10.00
2005	9.61
2006	9.71
2007	8.85
2008	8.89

Source: National Bureau of Statistics (2009)

In general, the lackluster performance of the sector is blamed on a number of factors. These include the inability of the sector to undergo structural transformation as a result of weakness in the linkages between it and other sectors mainly agriculture. The technological base is also weak. Existing machineries are dilapidated as a result of high dependence on imported machineries and spare parts, including the inability of operators in the sector to secure loans. Contribution of the sector to foreign exchange earnings is minimal compared to the foreign exchange demand by the sector due mainly to high dependence on imported inputs. Basic industries such as iron and steel, paper mills and petrochemicals can be said to be wobbling, neglected and at the verge of closing down. The necessary skilled manpower required to run the sector is lacking. Effort at using the sector as an engine of economic growth by tapping the size of the nation's population, domestic market and natural resources has failed to yield the desired result. Instead, the country depends on imported finished products which Nigeria is expected to have comparative advantage in producing. In fact, the near dependence of the sector on imported goods is a major reason why the agricultural sector is lagging behind because of weak linkages.

2.2 The manufacturing sector to emerge as a dynamic force

The manufacturing sector is pivotal to the development of a nation as it involves the utilization of a large proportion of resources. As evidenced by the development experience of developed countries, newly industrializing economies and emerging economies, prosperity is the outcome of value addition to resources. Failing which there would be resource curse. The primary policy objective of the country's manufacturing sector is to significantly drive the economy through increased productivity, expansion of value addition in the sector, sufficiently competitive in the supply of finished goods to the domestic market and surplus for export to both regional and international markets. This will require a major shift from low technology based production system to more modern production processes. Hence, the sector is set out to achieve the following objectives in Vision 20-2020:

- increase the efficiency and profitability of manufacturing establishments;
- enhance global competitiveness of Nigerian manufactured goods;
- increase manufacturing local content and linkages with other sectors of the economy;
- capture greater share of the domestic market;
- make Nigeria's manufactured products a major source of foreign exchange earnings; and
- contribute to the rapid and sustained growth of the Nigerian economy and diversify the nation's productive base.

The targets set for the above objectives in Vision 20-2020 are to:

- upgrade skills and productivity of at least 60 per cent manufacturing workforce by 2013;
- increase access of 60 per cent of manufacturers to short-term and long-term credit by 2013;
- attain 25 per cent reduction in cost of production between 2010 and 2013;
- increase capacity utilization from 54.67 per cent in 2008 to 65 per cent by 2013;
- attain 60 per cent compliance with Global ISO Quality Standards within the next three years;

- promote the growth of core industries to be the backbone for material inputs by 70 per cent by 2013;
- draw local content in manufacturing by 5 per cent annually, to attain 60 per cent by 2013;
- increase indigenous innovation and R&D by 2013;
- increase employment share of the manufacturing sector by 15 per cent annually;
- increase access to local raw materials by 2013;
- ensure a reduction of percentage of manufactured goods in imports from 70.6 per cent in 2009 to 55 per cent by 2013;
- double patronage of locally manufactured goods between now and 2013;
- attain cost parity with imported manufactured products within the next 5 years;
- ensure that locally manufactured goods meet global standards within the next 5 years;
- increase the share of manufactured goods in exports from 2.5 per cent in 2005 to 15 per cent in 2013;and
- increase annual growth in manufacturing sector from 8 per cent in 2005 to a minimum of an annual average of 35.9 per cent.

To achieve the above targets, the following strategies are expected to be pursued in the medium term:

- improve physical infrastructure such as, power, transport and water supply;
- promote joint ventures and provide incentives to facilitate the inflow of Foreign Direct Investment in partnership with exiting SMEs;
- implement a government procurement policy that supports locally produced goods and services;
- promote product standards by the regulatory agencies such as SON, NAFDAC, etc.;
- coordinate the establishment of Free Trade Zones, Industrial Parks, Enterprise Zones, Clusters and Incubators;
- provide a tax incentive that promotes expansion and encourage R&D in the sector;
- enforce industrial linkages through backward integration between industry and research institutions and forward integration between industries and distribution/trade agencies;

- establish a dedicated fund for the revival of the core manufacturing industries as well as critical industries such as textile, iron and steel, chemical, leather and leather products, petrochemical, agro-processing, food processing, pharmaceuticals, etc.;
- specify and enforce a bold local content policy on manufacturing on sub-sector bases; and
- strengthen the Bank of Industry through the injection of additional equity capital to support the manufacturing sector as well as funds for SMEs.

The Small and Medium Enterprises (SME) sector has been identified as one of the critical elements to achieving the Nigerian Vision 20:2020 since it is strategically positioned to generate employment, create wealth, reduce the prevalence of poverty and sustain economic growth and development. The activities of SMEs cut across several sectors of the economy including manufacturing, agriculture, solid minerals, metal fabrication, ICT, culture and tourism, transportation, and trade and commerce among others. However, there is generally a dearth of statistics on SMEs in Nigeria.

In Nigeria, SMEs constitute over 80.0 per cent of all business enterprises and covers the entire range of economic activities in the country. However, their contribution to the growth and development of the country has been minimal. This is vividly shown in Table 5 below where its contribution to the GDP is compared with those of selected countries to emphasize the poor performance of the sector in Nigeria.

Table 5: Inter-Country comparison of the contributions of SMEs, 2005 (percentage)

Countries	Employment	Export Earnings	Contribution to GDP
UK	53	27	52
USA	52	30	50
India	79	38	40
Hong Kong	78	37	51
Japan	70	40	51

Nigeria	**75**	**2**	**10**

Source: CBN SMI Surveys (2005) and SMEDEC of Malaysia

From the Table, it can be seen that the Nigerian SME sector contributed just 2 per cent and 10 per cent to export earnings and GDP in 2006 respectively. The low contribution to export is attributed to lack of skills/management capacity, poor product quality, low production capacity, poor access to international markets, and lack of working capital. Hence, the sector has tended to serve the bottom end of the domestic market.

The major issues/challenges that have affected the growth and development of SMEs include:

- poor and inadequate infrastructure (power supply and transportation facilities);
- lack of access to medium and long term credit facilities;
- difficulties in market access;
- general high cost of doing business and unfair competition from imported goods;
- multiplicity of taxes;

Part B

Subsector Specific Action Plan

An Overview of Subsector Specific Action Plans

The Action Plan will focus on selected subsectors based on the criteria contained in the Vision 20-2020 document. Those subsectors are chemicals and pharmaceuticals including petrochemicals; food and beverages; textile and garments; leather and leather products; basic metal, iron and steel and fabricated metals; non-metal mineral products; automotive; and electrical and electronics.

In pursuing subsector-specific interventions, the scope of industrial policy framework will have to encompass a range of policy parameters pertinent to an evolving and enabling economic and business environment that befits the country-specific context. Such a policy will primarily concern itself with specific aspects of strengthening industrial policy-making process and implementation capabilities, with a focus on priority sectors that point to address critical issues of economic diversification, transformation and make manufacturing and related services potential sources of sustainable development.

The private sector must eventually become the primary source of growth and the government will have to take aggressive action to support and strengthen the existing private sector to accelerate foreign direct investment and to encourage more private sector involvement. Opportunities are not guarantees. The required policy response to convert opportunities into guarantees of wealth creation is a discovery process. The discovery process should convert comparative advantages into competitiveness and enhance competitiveness without comparative advantages. This should be made possible in Nigeria.

Sixty years ago Japan was a labor-abundant country which harnessed its labor endowment through exports of labor-intensive manufactures. Land-abundant countries can prosper from exporting land-intensive products. Malaysia is a good example of a country that has harnessed its land endowment for prosperity, first through exports of the natural resource-intensive industries, and then by using the rents from those exports to transform its economy. But both development through harnessing labor-abundance and development through harnessing land-abundance have each proved difficult: they are not automatic. Malaysian palm oil industry is a success story

because of the fact that they applied science and technology to all aspects of palm oil development, from farm management to final processing of an array of disaggregated products.

Many countries with abundant labor have remained trapped in poverty: Haiti is an example. Many countries with large natural resource endowments have found them to be a curse rather than a blessing: Nigeria is an example.

The unique aspect of the Action Plan is that it presents a set of product-specific policy environment, factor conditions, support systems and institutional framework. Unless we spell out product and context specific policy choices, policy prescriptions and proscriptions will not see the light of reality. Complying with the priority focus of the Vision 20-2020, it is important to inculcate industrial development mindedness at all levels, ranging from artisan networking for value addition to primary products to integrating the local and regional value chains into global value chains.

To this end, the State should play and aggressive role in creating new sources of dynamic growth, with an accent on ecological compliance, quality control norms and social inclusion. The development experiences of dynamic industrial locations bear testimony to the State playing an effective role fostering industrial dynamism. Nigeria should endeavour to replicate those best policy practices.

Any initiative to strengthen institutions for the design and implementation of industrial policies would need to take into account international best practices:

- institutions should strengthen product and process standards and monitoring, facilitating dialogue, and thereby build up trust, information sharing and mutual learning among all actors; and
- there should be an effective monitoring and evaluation systems that links funding to performance.

The establishment of a ‘competitiveness intelligence unit’ at the Federal Ministry of Commerce and Industry is desirable. It should be composed of highly skilled young technocrats with direct

access to the highest level of policy making and strong links with the private sector. This unit should provide hard factual basis and intelligence – through technical notes, data analysis and benchmarking, competitiveness reports, sector/value chain studies, etc. – in which to anchor an objective public-private sector action plan in areas such as:

- joint identification of new products and activities for industrial diversification, bottlenecks and solutions under each priority sub-sector;
- development of 'search networks' to match those who have problems with those that can offer solutions;
- reforms in the business environment for competitiveness;
- design and implementation of industrial and sectoral policies;
- continuous monitoring of global, regional and national trends of industry and trade and their implications per priority product development;
- benchmarking national and sectoral performance to set up industry and trade targets, and to identify role models and threats; and
- Implementing business support systems for internationally tradable products which can benefit the most from preferential market access.

The formulation of high-impact policies requires a thorough strength and weakness assessment of the country's industrial and trade sectors and a consensus between the public and the private sector on priorities and actions. The starting point is a review of the best international practices and a preliminary assessment of a given country's industrial and trade strengths and weaknesses. This would entail:

- sectoral priorities and incentives for industrial competitiveness systematically assessed; and
- the principles of the new industrial policy and their applicability to Nigeria tailor-made to suit the country-specific context.

All neo-classical ideological convictions relying heavily on the atomicity of Market-based public activism is emerging as the panacea. And industrial policy response should be in line with lessons learned in gearing and steering a healthy pace of industrial expansion in each priority product area.

CHAPTER THREE
FOOD AND BEVERAGE

3.1 Overview of the Food and Beverages Subsector

The Food and Beverages Subsector (FBS) is an important component of the manufacturing industry in Nigeria, accounting for the largest size of industry employment (267,052 persons) and ranking second to the Chemical & Pharmaceutical Subsector in terms of output (N32.8 trillion), in 2006 (MAN 2007). Thus the performance of FBS is critical to the attainment of food security specifically, as a top priority item on the 7-Point Agenda of the present administration; and poverty reduction generally, ranking among the five priority areas of the manufacturing sector in the Nigeria Vision 20:2020. Furthermore FBS contributed significantly to the modest growth of the economy of 5.3% in 2006 (year-on-year), as a major aspect of the non-oil sector which grew by 6.2% and comprises the class of strategic products of Nigerian economy upon which the livelihood of the people is anchored.

The vision of FBS is derived from that of the entire manufacturing sector of the economy, as stated in NV20:2020, thus: 'a technologically driven and globally competitive industry, with a high level of local content and contributing a high proportion of the National GDP'. This statement is consistent with the overall vision for the government regarding the whole economy, i.e. 'one of the top 20 economies in the world by the year 2020, with an overarching growth target of no less than $900 billion in GDP and per capita income of no less than $4000 per annum'. This official vision statement for Nigeria obviously poses a major challenge to the FBS as a predominant source of industrial output of the country, and being closely linked to agriculture that forms the largest employer of labour in the country as well as the largest component of GDP.

Therefore the need to revamp and revitalize the FBS cannot be ignored, given the critical role of the products involved in meeting the millennium development goals, particularly the MDG1 relating to poverty and hunger. In meeting these goals and targets, the engagement of the

subsector helps in shifting from mere quantitative growth in output to qualitative improvements in living standards, which is possible through the promotion of a fast-growing and job-creating FBS in a green-enterprise economy; and from imaginary growth to concrete wealth creation to uplift quality of life in the country. Thus this action plan for FBS is aimed at stimulating incremental growth of the economy and fostering efficiency of the subsector. In this regard the task of stimulating industrial innovation in food and beverages presents as both a challenge and an opportunity – the challenge of how to explore the huge potential that exists in the country for the production of raw material and exploitation of other resources for enhancing the efficiency and output of the subsector; and the opportunity to explore the linkages within the subsector and between it and other subsectors of the manufacturing industry and the economy as a whole. Particularly, a large scope exists in the country to explore the backward linkage of FBS to agriculture, which presents an opportunity for promoting responsible production of industrial raw materials towards a green industrial revolution with an accent on creating jobs for the teeming population.

Thus the goal of this report is to properly characterize the FBS and illuminate its different aspects, with a view to designing an industrial action plan for the implementation of NV20:2020. The report is structured into seven main sections, namely: Overview of FBS which presents the background of the subsector (1); Constraints to the subsector (2); Solutions to the critical issues; (3) Best practices (4); Technological frontiers (5); Agenda for action (6) and Implementation framework (7). The focus of the study is on ten selected items from the long list of value added products of the food and beverages subsector, namely: Cocoa, Palm oil, Cassava; Maize; Rice; Fruits and vegetables; Sugar; Dairy products; Poultry and Meat products; and Marine (fisheries) products. The selection is based on the strategic importance and potential of these items for poverty reduction in terms of food security, livelihood improvement and employment; as well as the promise they hold for the country in terms of comparative and competitive advantage of their production and marketing. The rest of this introductory overture describes the policy environment governing the FBS followed by highlights of key issues about the subsector generally and the selected products specifically.

3.2 Policy environment of Food and Beverages Subsector

The policy environment of FBS is unique for its value chain that operates on two legs in different sectors of the economy – one leg in the agriculture sector (raw materials production and storage), and the other leg in industry sector (raw materials processing and manufacturing). One implication of this feature of FBS is that the entire value chain comprises multiple tasks namely production, storage, processing and marketing activities, which brings about a tripartite policy framework – agriculture policies, industrial policies and commercial policies; as specified follows: Agriculture policies - programmes and projects for promoting agricultural production that provides the raw material base for FBS; Industrial policies - programmes and projects for promoting value addition of the products; Commercial policies - programmes and projects for the trade and marketing of the products.

Another implication of the unique policy environment is the dual institutional framework governing the FBS in the Nigerian economy involving the ministries for agriculture and the ministry for industry and commerce. The Federal Ministry of Agriculture and Rural Development (FMARD) implements agricultural policies in terms of programmes and projects for promoting agricultural production that provides the raw material base for FBS, while the Federal Ministry of Commerce and Industry (FMCI) also implements industrial policies in terms of programmes and projects for promoting value addition and marketing of the products. Sometimes the borderlines between the sets of activities are not so clear which creates room for role confusion among the policy authorities involved such as it is presently the case between FMARD and FMCI. Unless such situations are clarified, both ministries will always engage, as they presently do, in unnecessary boundary maintenance practices and wasteful duplication of policy efforts in their separate activities to promote FBS.

3.3 Key issues with FBS

The food and beverages industry is generally adjudged one of the most thriving sectors of the economy; as it accounts for 64% of output of the manufacturing sector (MAN 2008). The country's staple foods derive from the subsector in large measure, which the outputs are sometimes affected by adverse weather conditions such as severe drought in 1987 and 1988 and severe flood in the current year. The aspects of performance include capacity utilization of the

subsector that averaged about 45 per cent and the local raw material ratio that averaged 62 per cent in recent years. The key issues affecting the sector border on raw material supply, which the country evidently has the resources to produce, and finance which is generally scarce for the companies operating in the sector. The usual sources of finance for the food and beverage companies include issuance of share capital and borrowing or development schemes at concessionary basis. Moreover the companies may experience shortage of imported raw materials from time to time as occasioned by fluctuation of foreign exchange, high and rising inflation, as well as occasional socioeconomic discontinuities happening in the importing countries, which often lead to increases in the cost of production.

The other issues pertaining to FBS generally include the following Capacity utilization; Sourcing of raw materials; Cost of production; Quality of products; Investment flow; Infrastructure; and High transaction costs The specific issues affecting the selected products are highlighted below.

- Cocoa – Low value addition; massive importation of products; Quality of local products
- Palm oil – Adulteration;
- Cassava – Export market for products; Local utilization of products; Technology
- Maize – Seasonality of raw materials;
- Rice – Mass importation; Low quality of local products: seasonality
- Fruits/Vegetables - High post-harvest loss; Seasonality; Perishability
- Sugar – Massive importation; Monopolistic market; Seasonality
- Dairy products – Massive importation; Feed sourcing; organization of production
- Poultry/meat products – Massive importation; Disease outbreak; Livestock feed
- Marine products – Large demand-supply gap in marine products; Large number of small to medium sized trawlers operated by small firms; Use of crude instruments such as nets, hooks, traps, etc.

3.4 Resource base and import dependence for production

The large resource base for the manufacture of food and beverage items derive from agriculture, which provides both the natural and human capital needs of the FBS. Nigeria has a land mass of 98.3million ha, and is the most populous country in Africa with about 150 million people in more than 350 ethnic nationalities. The arable land is 79 million hectares, out of which only 32 million hectares or 46% is under cultivation; which implies that plenty of arable land is available for both the arable crop and livestock agriculture for FBS to thrive in this country. Less than 10% of total land is under constituted forest reserve while deforestation estimated at 3.5% translates into more than 400,000 ha loss of forestlands which, coupled with intractable oil pollution in the south-south of the country, intense soil erosion in the south-east and the high rate of desert encroachment in the extreme north, represent major threats to the agricultural economy. Moreover, there are large bodies of surface water (268 Billion cubic metres), underground water (58 Billion cubic metres) and an extensive coastline (853 km), coupled with rainfall in the range of 300-4000 mm pa. The largest inland water bodies are Rivers Niger and Benue, which have several tributaries along its course in the length and breadth of the country.

The real strength of Nigeria with respect to agriculture lies in the wide ecological variability and good weather for the most part of the year, which accounts for the large spectrum of agricultural commodities including crops, livestock and fisheries items. Soil fertility varies considerably. The most fertile of the soils are the result of alluvial deposition in river valleys, popularly known as *fadama land*. Thus the country has a broad commodity profile that is responsible for a large capacity for producing food and beverage items for the large population. The commodity profile of Nigeria's agriculture is diverse, ranging from cereals to roots and tubers, legumes and pulses to mention a few.

Nevertheless, the agriculture sector fails to meet the total needs of the FBS for raw materials for the manufacture of food and beverage products. This leads to substantial import dependence of the industry for these items, which in some cases has reached dangerous extents that account for their high political visibility. According to RMRDC (2000), while the FBS can be said to be performing relatively well compared to other manufacturing subsectors, local industries are unable to satisfy domestic demand for food and beverage products owing largely to scarcity of raw materials, which creates the need for large importation of both the products and raw

materials together with the machineries and equipment for their production. The critical cases in point are grain particularly wheat and sugar products which their constant importation has drained Nigeria's foreign exchange reserves significantly to the embarrassment of the country at certain times in the past.

Against this background, therefore, the resource base of individual products for their production and import dependence is highlighted in terms of availability of land and other natural resources for producing the raw materials as well as the availability of machinery `and equipment required, below.

Cocoa

The bean is the basic raw material for the several products in the beverage industry, which also include non-cocoa malt-based and other products. The resource base for producing beans is the crop agriculture relating to the cocoa plant, as an activity of farmers and rural processors to harvest them in pods and dry them in the sun for sale to merchants. However the country lacks a comparative advantage in the production of cocoa-based beverages as well as the processing machinery and equipment required to do so; hence the perennial import dependence on these items including processing machinery and equipment for cocoa products and the associated items. The land resource for cocoa production is expansive occupying the good part of the southern part of Nigeria known as the cocoa belt and covering several states of the federation - Ondo, Cross River, Oyo, Osun, Ekiti, Ogun, Edo, Kogi, Akwa Ibom, Delta, Abia, Kwara, Ebonyi, Rivers, Taraba and Adamawa.

Commercial cocoa beans production depends on a high demand in Europe and America for the manufacture of value added products to be re-exported to cocoa growing countries in Africa including Nigeria and other parts of the world. In this regard virtually all of the annual production of 400,000 metric tonnes is exported and virtually all the consumption of cocoa products is imported; hence the paradoxical description of the country or continent as "a producer of what it does not consume and a consumer of what it does not produce", which refers to the perpetual situation of perennial exchange of export of raw produce of cocoa for import of

finished products from other countries or continents, for many years. Thus the convocation of the Africa Cocoa Summit in Abuja, Nigeria in 2006 was premised on the urgent need to address this issue. In particular the Summit decried the situation whereby, on the one hand West Africa provides over 65% of the world's cocoa with Ivory Coast alone providing over 40% of the world's cocoa, and with the rest of Africa producing over 90%; on the other hand the bulk of cocoa products is processed abroad, with the top four processors accounting for over 50% of the total grind.

Palm oil

The natural resource base for oil palm production is land, much of which is located in the southern part of the country where it grows in the wild and on plantations. The palm oil belt of Nigeria comprises several states wherein small-scale farmers and indigenous processors as well as medium-to-large scale mill operators are located. It is a product from the oil palm plant refined from the fruit that comes in bunches, leaving the kernel as another important product. The food value of palm oil derives from its direct consumption and use as raw material for the production of several items.

The general group of vegetable oils has palm fruits, palm kernel groundnut, cotton seed, soybean, coconut, cocoa beans and melon seed, as the major sources of raw material for their production. The lesser known sources of vegetable oil include corn seed, sun flour, castor, benniseed, rubber, tobacco, oil bean, mango seed, neem seed, pear seed orange seed, conosphore (walnut), chifanut (ofio), rape seed, linseed among others. Many if not all of these are available in Nigeria so the country has a high potential and a comparative advantage in their production.

Equally the demand for vegetable oil is high in Nigeria, particularly palm oil which generally consumed directly and used for various other products.

Cassava

The natural resource base is arable land which is largely available in the country, well adapted to the climatic conditions in all the states of the federation with the current production level being

about 45 million metric tonnes per annum. The technology for processing cassava is locally available from trained fabricators but which are not as efficient as imported ones. The processing technology used by small scale processors include the grater, the jack press, the grinder, and still frying pans. Therefore commercial processing of cassava in the country depends on imported technology to attain the desired quality for competitiveness in the international market.

Nigeria is the leading cassava producer in the world, accounting for a third more than Brazil and almost double the production capacity of Thailand and Indonesia. The Cassava is a plant with a lot of usefulness, especially it's "root" or generally called "Cassava Root". The cassava root is an edible food and a raw material in agro-based industry, including animal feeds and other industrial purposes as follows:-- *Animal Feeds*; *Alcohol production (*liquor manufacture and the disinfectant); *Gasohol (*Ethanol production and mixed with fuel which is a renewable energy source) *Food and Beverage(*used in both its original form and its other modified forms (for instance, the instant noodle, sago, seasoning sauce including beverages); *Sweeteners (*glucose and fructose which are used as the sweeteners in the beverage industry); *Textile Industry (*used for slipping the thread and to make the thread being without hair during the weaving and to fortify the thread including the cloth printing in order to make the cloth being shining and durable); *Paper Industry (* mixed with the paper in order that the paper pulp would be tough and thick); *Glue Industry (*used for producing glue including any products that their mixture is the glue); *Plywood Industry (*used in form of glue made from cassava starch in the process of plywood manufacture in order to make the plywood becomes qualified, tough and durable); *Medicine Industry (*used as the diluents of capsule medicine and pill); *Monosodium Glutamate (*used for producing the MSG for seasoning food); *Bio-Degradable Material Products (*cassava starch transformed as product by means of adding the bio-degradable substance to be in place of plastic); as raw material of animal feeds in order to increase protein/color substance in egg; and as fuel to burn it to become charcoal generating high heat but without smoke. Thus the technology for processing cassava in its various uses is not locally available, which implies that industrial utilization of cassava in the country further depends on imported technology.

Maize

The natural resource base for maize production is arable land, which is available in abundance in the country. The crop is grown in all parts of the country as a versatile crop that adapts to a range of agro-ecological zones in all states, though it is grown more in the Northern pad of the country.

Two types of maize are grown in Nigeria, the yellow and the white. Maize is eaten as it is on the cob, and as food in form of porridges, Corn flakes and popped grains. However more than 60% of Nigeria's production of maize is consumed by the industrial sector for production of flour, beer, malt drink, corn flakes, starch, syrup, dextrose and animal feeds. Particularly maize is the most important raw material for the manufacture of Infant Formulae and Cereal Baby Foods, which category of products is virtually all imported into this country. Therefore maize along with sorghum and other grains represent the closest substitutes of imported malted barley thereby representing important import substitution products in the beverage industry.

Rice

Rice is a staple food consumed in Nigeria and has witnessed considerable growing demand as more consumers move away from local carbohydrates diets such as yam and garri to making rice the pre-eminent staple food in the country. Many Nigerians now obtain about 30% of their cereal based diet from rice. In 2005, the country produced about 2.3 million tons of rice and also imported more than a million tons during the year. Rice production capacity is far below national requirements in West Africa, leading to import dependence of the countries, which owes to, poor soil fertility, poor water management and low yielding varieties. Recently the Nerica rice variety is introduced by WARDA (West African Rice Development Association) in collaboration with NCRI (National Cereals Research Institute). The major rice producing states in Nigeria include: Kano, Niger, Benue, Yobe, Kaduna, Anambra, Ebonyi, Kwara, Edo, Taraba and Kebbi states etc. In order of production level, Zamfara, Jigawa, Borno, Adamawa, Ondo, Ogun, Cross River states follow very closely especially with specialization on processing facilities. The key players in the supply sector are Veetee rice, Olam rice, Dangote group of Company etc are making impact in rice production, processing and marketing in Nigeria.

Fruits and vegetables

These provide an abundant and cheap source of vitamins, minerals, and fibre. In general it is part of food culture that vegetables should be served as accompaniments to main meals, and fruits as appetizers and desserts. It is preferable to consume fruit and vegetables when fresh, as the nutritional content is then usually at its highest. Some techniques, such as blanching, leach out many water-soluble vitamins into the surrounding liquid and much of the nutrients are lost, while other methods such as sterilization expose the food to high temperatures which destroy some of the B vitamins. From 1986-1995 production in developing countries increased by 4.11% annually. In Vietnam vegetables provide about $650 of added value per farm. South America is the number 1 exporter of fruits and vegetable for developing countries. China is experiencing greatest growth in fruit and vegetable production.

The range of fruits and vegetables available in Nigeria include tropical products such as citrus, tomato, pepper/chilies, leafy vegetables, mango, citrus, pineapple, plantain and banana. The challenge of producing enough of these nutritious and safe food items for the teeming population is immense and future demand for vegetables and fruits looks very secure; subject the issues about perishability and technology for storage and preservation. The production of fruits and leafy vegetables are largely concentrated in south and middle belt of Nigeria while the production of tomatoes, chilies and non-leafy vegetables such as cabbage, onion, etc are concentrated in the north where they are much dependent on irrigation facilities. Therefore different fruits and vegetable products are available somewhere during the year, implying the movement of such products in different directions from season to season.

Nevertheless the country is import dependent on certain types of fruits particularly temperate fruits such as apple, grapes, berries among others. A number of industries exist in the country for the manufacture of tropical fruit juice such as Fuman, Five Alive, Chivita and several small-scale others. However such industries depend on imported technologies for processing, preservation and packaging.

Sugar

Sugar is consumed as a food item and used as an industrial raw material in almost all food, beverage as well as pharmaceutical industries. Sugar is consumed direct by itself and together with glucose are the raw materials for the manufacture of confectionery (candies). In 1991, consumption of sugar in Nigeria was 7kg/year per caput compared to Africa's average of 14Kg/year and world's average of 20kg/year. The main raw materials for this product is sugarcane, while sugar itself and glucose are the raw materials for the manufacture of confectionery (candies). However, sugarcane is locally available while sugar and glucose are virtually imported. The establishment of Nigeria Sugar Council reflects the importance of sugar in the economy, which was charged with the responsibility of enhancing the domestic production of Sugar in order to reduce the country's dependency on imported Sugar. In 1985 Government identified 30 areas as suitable for development of sugar estates toward exploring its 1.3mill tonnes production potential of sugar per annum, when domestic production was less than 10% of consumption. The presence of a strong demand pull represents an important resource base for production of sugar. Nigeria's annual sugar consumption grew rapidly from 43,000 tonnes in 1955 to over 1mill tonnes in 1984 (growth of 15.5%). The factors responsible include rapid population growth; increase in per capital income; as well as rapid urbanization and the accompanying changes in taste and increased industrial usage of sugar. Moreover, following the completion of feasibility study for the production of bio-ethanol from sugarcane and cassava, a presidential approval was granted for a Bio-Fuel Policy with three sugar cane and two cassava sites identified in Taraba, Jigawa, Ondo, Anambra and Benue states. The processing of sugar involves crushing of sugarcane to extract the juice.

The main raw material for this product is sugarcane, which is locally available as an agricultural produce. Despite the widespread availability of sugarcane in the country both sugar and glucose are virtually imported. Hence the establishment of Nigeria sugar Council charged with the responsibility of enhancing the domestic production of Sugar to reduce Independency on imported Sugar. The natural resource base for sugarcane production is land. In 1985, more than thirty areas were identified suitable for sugarcane estate development, from where 1.3 million tonnes of sugar could be produced. Import dependence of sugar is historical, which was 100% before independence, and which necessitated the establishment of Nigeria Sugar Company

Bacita in 1967, and Savannah Sugar Company Numan in 1980. Nigeria's annual sugar consumption grew rapidly from 43,000 tons in 1955 to over 1 million tons in 1984 due to rapid population growth, increase in per capita income, rapid urbanization, changes in taste and increased industrial usage; leading to a high demand pressure.

In future increased use of sugar cane may result from the proposed production of bio-ethanol as a presidential approval was recently granted for a bio-fuel policy with three sugarcane and two cassava production sites identified in Taraba, Jigawa, Ondo, Anambra and Benue States of the federation. There is a tendency for this policy to make the country even more dependent on imported sugar and sugar substitutes in future. At the moment local production of sugar comes from a single company, Dangote, which has acquired the Bacita and Numan factories after privatization but still dependent on imp0ortation of brown sugar for refining in Nigeria till date.

Poultry and meat products

The poultry and meat products include dressed beef, mutton, goat, pork, and poultry; Sausages made from mixture of minced meats, usually beef and pork scraps and held in parchment encasement; Bacon from pig; Canned corned beef (mostly imported); and Eggs.

The livestock population in Nigeria forms the natural resource base for the production of poultry and meat products. In 1987 there were 12.2 million cattle, 13.2 million sheep, 26.0 million goats, 1.3 million pigs, 700,000 donkeys, 250,000 horses, 18, 0000 camels found mostly in the Sahel savanna around Lake Chad, and 175 million poultry nationally, owned mostly by villages rather than by commercial operators. Almost all rural households raise poultry as a subsistence meat. Chickens are predominantly of indigenous origin, and there is some crossbreeding with foreign stocks. Private commercial poultry operations increased rapidly during the 1970s and 1980s near urban areas, providing a growing source of eggs for the cities. The primary raw material for poultry and meat production comprise the crops such as maize, sorghum, millet, soybean, groundnut, which constitutes the larger portion of livestock, feeds raw materials; others include wheat offal, maize offal, palm kernel cake and brewers spent grains. The critical issue about poultry and meat production revolves around availability of livestock feeds.

Dairy products

The dairy products vary widely, the major ones including evaporated milk, powdered milk, to yoghurts, ice cream, pasteurized milk, and butter among others; fresh milk inclusive but not so popular. The resource base for dairy products is the large population of cattle in the country. The market is dominated by small-scale producers of local dairy pructs such as "nunu" (milk), "wara" (cheese) and "maa shanu" (butter) usually hawked by Fulani women except yoghurt sold by small scale producers.

Thus the demand for dairy products in Nigeria is met by large importation of milk powder, pasteurized milk and milk substitutes, from different parts of the world.

Marine products

The level of total domestic fish production was much lower than the national demand estimated at 1.5 million tonnes, which leads to fish importation on a perennial basis to meet its requirements for fish protein, with particular reference to marine products. Furthermore marine fisheries depend on expensive trawlers and other equipment for production in the coast line of 853 km long, which is located in the south of the country.

In this connection, there is potential for growth in the aquaculture industry which the government has supported since 1960s as a way of filling the gap in fish protein supply in Nigeria. However, existing aquaculture industry is small and based on investment by private individuals.

3.5 Firms' size, ownership, and location

In this section we highlight the main features of the firms engaged in FBS in terms of size, ownership and location.

Cocoa

The Cocoa Association of Nigeria is the organization of stakeholders in the industry, which comprised farmers, processors processors and marketers of cocoa beans and products. The major producers of cocoa products are Nestle Foods Nigeria Plc, Cadbury Nigeria Plc., Lever Brothers

Nigeria Plc, all located in Lagos as multinational companies with their bases in Europe. Others are, Cocoa Products Limited at Ede; Wonder Foods Plc, etc. In addition there are several small-to-medium scale producers in the industry concentrated in the southern part, which produce cocoa-based beverages in sachets for sale in the West African market, and relatively low cost but not meeting the required standards as the products are not confronted with importation of similar items. The main products include Milo, Bournvita, Ovaltine, among the others. In 1999 the total installed capacity for the manufacture of cocoa-based and other beverages was estimated at 24,500 MT and the production capacity was 21,000, about 80% capacity utilization.

Cocoa Industries Limited (CIL), located in Lagos is a major manufacturer in the beverages sub-sector, which was incorporated in 1965 and commenced operations in 1967 against the need to provide jobs and to add value to cocoa as the country's major foreign exchange earner at that time. It was initially owned by the government until 1990 when 40 per cent of the company's total shares were sold under the government's privatization policy. Up to the late 1970s a technical partnership agreement existed with Coutinho Carrow Company (CCC) of Germany, which installed and ran the plant while Nigerians understudied them, later to take the full control after the indigenization policy of Federal Government in the late 1970s. The initial products of the company were cocoa butter, cake and powder, and later in 1981 to add the instant cocoa beverage, Vitalo.

Palm oil

Commercial production of palm oil depends on the traditional processing units taking place within the farmstead generally operated by women. The sequence of processing steps in palm oil production is designed to extract, from a harvested oil palm bunch, a high yield of a product of acceptable quality for the international edible oil trade. These steps include bunch sterilization; bunch reception; bunch threshing; fruit digestion; nut recovery, pulp pressing; kernel separation; oil packing; oil drying and oil clarification. Production at industrial scale features a number of major companies, such as PAMOL Nigeria Limited in Cross River State, Presco Nigeria Limited and NIKO farms at Ibadan, Oyo State. PAMOL recently embarked on 6,000 ha of oil palm plantation in Cross River State by PAMOL Nigeria Limited while Presco has also embarked on the expansion of the Obaretin ha palm oil plantation to the tune of about 5,000 ha additional

plantings over a five year period, with a 10 tonnes ffb/hr mill expandable to 20 tonnes ffb/hr. The NIKO Farms also embarked on establishment of about 1,000 ha at Ibadan, Oyo State, while about 10,000 ha oil palm planting scheme is underway by numerous entrepreneurs.

The palm oil market also includes substitute products particularly groundnut oil and soyabean oil. The major producers include the Taraku Mills in Benue State and Grand Cereals and Oils Limited. The lead company in the fats and oil industry category utilizing palm oil as raw material is Lever brothers (now Unilevers), which has the largest share of the national market. The installed capacity in 2000 was about 165,000 metric tonnes when barely 64,000 metric tonne was utilized (i.e.39%), of which Lever Brothers alone accounted for about 60,000 MT or 90%. The country depends on imported machinery and equipment for operating the oil palm mills in the country. Other notable companies and stakeholders in the vegetable oil sector are AFCOTT, Real Oil Mills, Katsina Oil Mills, A & Hatman Oil Palm Co. Ltd., Plantation Owners Forum of Nigeria, Palm Oil Producers Association of Nigeria, Vegetable Oil Producers Association of Nigeria and Oil Seeds Association of Nigeria, among others.

A recent forum examined the current status of the vegetable oil sector in Nigeria and established that the demand for vegetable oils and fats in Nigeria was about 1.6 million tonnes per annum with growth rate averaging 5% annually between 1997 and 2002. Annual domestic production was estimated at 1.3 million tonnes, with palm oil and palm kernel oil contributing 72%, groundnut 23% while other crops like soyabean, cotton seed, coconut, melon seed and castor account for the balance. Cocoa butter and shear butter were recognized as vegetable oils which were also important in their own class. With a supply/demand gap of 0.3 million tonnes annually, Nigeria had become a net importer of vegetable oils and fats mainly from Malaysia, Indonesia as well as from the ECOWAS sub-region under the ECOWAS Trade Liberalization Scheme(ETLS). In 2001, an estimated 262,400 tonnes of vegetable oil valued at USD 65.6 million or ₦8.27 Billion was imported into the country, while about half as much was believed also to have been smuggled in, all with very negative impact on local production and output (Omoti 2009".

The Presidential Initiative on vegetable oil gave the following directives/production targets: (a) planting of 1 million hectares of oil palm in five years; (b) production of 5 million tonnes of groundnuts annually in five years; (c) production of 1 million tonnes of seed cotton annually in five years; and (d) production of 0.68 million tonnes of soyabean annually in five years.

Cassava

The commercial processing of cassava into value added products in Nigeria is quite recent, dating back to 1980s during the period of aggressive sourcing of local raw materials as substitutes for imported flour, biscuits and confectionery made from imported wheat, which the taste of Nigerians appeared rigidly attached to. Thus policy visibility of cassava in more recent times owes to the potential of the crop for import substitution in the market for wheat and other flour-based products. In this regard, the major producers of wheat flour in the country were Nigeria Flour Mills Limited and Honeywell Mills Limited both located in Lagos, and members of the Flour Millers Association. Other producers located in different parts of the country were Diamond Food Limited, NASCO Group, Standard Flour Mills; and Harvard Confectioneries. The total installed capacity for wheat flour production was estimated at 470,000 MT while the production level was 273,000 MT, about 58% capacity.

Cassava processing industry is hard placed to compete well with the established wheat processing industry given the massive importation of wheat flour and products at all times, which the industry leaders have formed a cartel against government policies in that regard, acting through the association. For instance, the immediate past administration came up with a policy of mandatory 10% inclusion of cassava flour, which the association was able to frustrate despite the tough stance of the government in implementing the policy. In complementing the policy IITA acted in collaboration with NRCRI to release high-yielding varieties of cassava and introduced a standard protocol for producing "High Quality Cassava Products (HQCP) for adoption by processors, under the Presidential Initiative on cassava. However the output of flour produced by these processors was rejected by the Flour Millers Association on the basis of fineness of the product and other quality issues. Although the association provided a fund in trust to assist the farmers and processors to innovate towards meeting the industry standard in flour production, the fund was not disbursed as expected until the expiration of the administration responsible for the

policy. Initially the policy stimulated the growth of cassava processing factories in the SME category in different parts of the country. Though the installed capacity of cassava processing industry increased sharply, the absence of viable and dependable market outlets at home and abroad has dampened the enthusiasm of investors as the tempo of activities has dwindled when policy is no longer in force and the industry is currently in a lull.

Maize

The main industry actors are Nesle Nigeria Plc and Evans Plc as lead companies and the only local producers of cereal baby foods, located in Lagos. Their market brands include Cerelac, Nutrend, Babeena, etc. The available infant formula which is mostly imported included Nan, Lactogen, Similac etc. The total capacity for cereals baby foods production in the country was estimated at 17,000 MT and production level at about 5,500 MT or 32% capacity utilization.

Rice

Rice production in Nigeria is largely from the small holder farm population. It was established by RIFAN (Rice Farmers Association of Nigeria) that the stock level of rice in July 2008 was 2.5 million MT parddy as verified by the ministry, which, plus the new harvest of 1.5 million mt in the next season in October 2008 was sufficient to close the demand gap during the period of soaring world food prices. The key players in the supply sector are Veetee rice, Olam rice, Dangote group of Company etc, which are making impact in rice production, processing and marketing in Nigeria. These companies engage in the massive importation of rice into the country. The Olam Company has acquired the rice mill located at Makurdi, previously owned by the Government under the defunct Nigeria Grains Board, to produce rice from local supply sources including an outgrowers scheme.

Fruits and vegetables

The number of registered producers is large which, according to a survey (RMRDC 1996), the major ones include the following: Cadbury Nigeria Plc; and Vegfru Industries, Maiduguri; others include Anochie Beverages (Nigeria) Limited Enugu; Cashew Nut Processing Industries Limited, Ibadan; Dani Foods (Nigeria) Limited, Sango Otta; Alabanla Farms Nigeria Enterprises, Ibadan; Gongola Fruits Processing Industry; Therapeutic Laboratory Nigeria Limited, Ikeja;

Odupani Integrated Fruit Processing Industry, Cross River State; Quality Foods (Nig) Limited; Marston Bi Integrated Fruit Processing Industry.

Sugar

The leading producers are Nigerian Sugar Company Limited Bacita and Savannah Sugar Company Plc Numan which have now been privatized. In addition two mini sugar factories were established at Lafiagi and Sunti. Other companies grew up at different locations but collapsed soon afterwards. Nigerian Sugar Company, Bacita had an installed capacity of 350,000MT and production capacity of 250,000MT of white granulated sugar. Jigawa Sugar Company had an installed capacity of 1825MT and 1.095 MT of Juco brown sugar. The total installed capacities were 425,000 MT for sugar (29%) and 2,400MT for sweets (60.5%), but production stood at 257,000 and 659M respectively. On individual basis, Savannah Sugar Company has installed capacity of 50,000 MT of sugarcane and 25,000MT for molasses but its production capacity was 3,182MT and 4,137MT of granulated sugar and molasses respectively. The country depends on imported technology for sugar production.

Dairy products

The dairy industry comprise firms located in different parts of the country; notably: West Africa Milk Company (Lagos), Wonder Foods Nigeria Ltd. (Ibadan), FAN Milk Nigeria Limited (Ibadan), as the major players; others include Rantito Dairies (Makurdi), Sabore Farms (Yola), Nagari Farms, etc. The supply chain also include a list of companies engaged in importation namely Nesle Foods (Lagos); Wonder Foods Plc; Camco Foods Nigeria Plc. (Lagos). The total capacity in 1999 was 98000MT when production capacity was 82000 MT amounting to about 84% capacity utilization at that time. There is always a significant proportion of total supply of finished dairy products that is imported into the country, at all times. The country depends on imported technology for the production of dairy products.

3.6 Recent trends in production, exports, and investment flows

The general trends about FBS performance in relation to the whole manufacturing sector and the economy at large was obtained from the publications of NBS (National Bureau of

Statistics) and CBN (Central Bank of Nigeria), while the specific trends about individual products was obtained from publications of MAN (Manufacturers Association of Nigeria) and a number of other sources. In 2007, agricultural production grew at 7.1%e being fourth, in the series of systematic growth of the sector since 2007, driven by growth of output of staples which reached 7.4% as against the cash crops 5.7%; specifically rice 7.7%, maize 7.1%, cassava 7.4%,, palm oil 11.4%, cocoa 5.5%. The crop subsector sustained the impressive growth performance in 2008 cassava production grew by 9.1%. Livestock production increased by 6.6 per cent in 2008, compared with 5.8 per cent in the preceding year, wherein beef production increased by 8.4 per cent, from 5.2 per cent in 2007. Fish output increased by 6.6 per cent above its level in 2007 to 668,750 tonnes in 2008, of which 584,250 or 87.3%is all marine products.

In 2007, the trend indicates that Nigeria is a net importer of food and beverages products in the international market. On the one hand, two FBS commodities occupy positions on the list of first fifteen ranked highest commodities in exports, namely: Cocoa (cocoa beans, whole or broken, raw or roasted) valued N2,031,216,380; and, fat and oil (including Cocoa butter) with N421,818,780 in the fourteenth position. On the other hand, however, five FBS products occupy the top positions on the list of first fifteen commodities ranked highest in imports, namely: wheat (Spelt, common wheat and meslin) with N87,630,323,120 in the first position; fish (Frozen fish, nes) with N13,265,703,954 in the third position; milk (Milk and cream, concentrated or containing added sugar or) with N12,673,317,796 in the fourth position; and rice (Semi-milled or wholly milled rice) with N12,260,962,280 in the fifth position.

The Table below shows the export trends of selected FBS products.

Exports of Food and Beverages, Selected items, 2004-2008 (Naira)					
	2004	2005	2006	2007	2008
Cocoa beans, whole or	120,9		642,7	48,117	59,680

broken, raw or roasted	44,935	-	87,362	,448,299	,998,653
Cocoa shells, husks, skins and other cocoa waste	-	-		138,675,831	1,102,340,372
Cocoa paste, not defatted	-	-	975,386,400	2,960,315,917	290,982,196
Cocoa paste, wholly or partly defatted	-	-	-	11,100,000	-
Cocoa butter, fat and oil	503,955	-	461,512,922	8,656,364,308	8,897,284,263
Cocoa powder, not contain.added sugar or other sweeted matter	-	-	5,820,320	82,316,682	67,829,974
Cocoa liquor	-	-	-	-	106,815,064
Cocoa powder, contain.added sugar or other sweeten.matter	165,406,555	-	1,506,291	430,052,009	32,660,771
Chocolate, etc,contain. cocoa, in blocks, slabs or bars >2kg	-	-	71,343,800	67,003,625	122,291,964
Chocolate,etc,contain.cocoa, in blocks, slabs or bars, filled	-	-	-	-	15,215,072
Chocolate,etc,contain.cocoa, not in blocks, slabs or bars, nes	-	-	-	1,546,324	-
Crude palm oil	6,627,512	-	-	2,717,235	63,263,416
Palm oil(excl.crude)&its fractns,refined/not but not chem.mod.		-	-	841,830	902,969
Manioc (cassava) starch	-	-	174,117	12,720,150	-
Maize (corn) flour	-	-	-	5,845,054	-
Milk and cream of =<1% fat, not concentrated or sweetened	40,829,395	-	273,148	347,600	3,348,259
Milk and cream in solid forms of =<1.5% fat	829,969	-	-	178,758,576	348,000,000
Milk and cream in solid forms of >1.5% fat,	7,195,749	-	-	226,875,496	494,877,427

unsweetened					
Milk and cream, concentrated or containing added sugar or	-	-	-	14,557,649	165,553,570
Milk and cream, concentrated or containing added sugar or other sweet	-	-	-	-	2,931,301
Milk and cream in solid forms of >1.5% fat, sweetened	13,344,016	-	-	-	-
Concent.milk and cream, unsweetened (excl. in solid form)	4,559,400	-	-	-	-
Buttermilk, curdled milk and cream, etc (excl. yogurt)	55,896,000	-	-	155,253,875	-
Products consisting of natural milk constituents, nes	5,003,896	-	-	12,144,188	-
Butter	-	-	-	3,196,879	-
Live ornamental fish	-	-	-	1,056,678,923	10,000
Live trout(salmo/trutt,onc'ync'mykiss,clark,ag'ab'ta, etc.	-	-	-	631,241	1,009,740
Fresh or chilled albacore or longfinned tunas	-	-	-	11,031,625	-
Fresh or chilled sardines, brisling or sparts	-	-	3,819,150	-	-
Fresh or chilled mackerel	-	-	-	8,784,102	2,781,433
Frozen pac.salmon(onc'nerka,gorbuscha,keta,tsch'cha, etc)	-	-	-	23,672,906	-
Fish, frozen, excluding fish fillets and sockeye salmo	-	-	-	231,660	-
Fish, frozen, excluding fish fillets and other (pacificsalmon(oncorhynchus	-	-	-	57,480,015	-
Frozen salmon.(excl.pacific,atlantic,danube salmon and trout)	-	-	-	146,338	-
Frozen yellowfin tunas				6,929,	

	-	-	-	548	-
Frozen tunas, nes	-	-		5,263,200	-
Frozen sardines, brisling or sprats	-	-	250,776	315,147	11,090,133
Frozen dogfish and sharks	-	-	-	-	1,098,900
Frozen fish, nes	-	-	4,212,735	175,488,123	-
Fresh or chilled fish fillets	-	-	-	5,155,632	-
Frozen fish fillets	-	-	-	10,277,088	203,119,248
Flours meals and pellets of fish,fit for human consumption	-	-	5,913,300	6,491,583	124,238,827
Dried cod, not smoked	-	-	2,020,668	-	-
Other fish salted or in brine but not dried or smoked, nes	847	-	2,488,800	-	
Frozen shrimps and prawns	7,093,107	-	6,303,902	5,709,879,028	8,010,132,529
Frozen crabs	-	-	-	96,929,266	194,464,121
Rock lobster and other sea crawfish (excl. frozen)	-	-	-	-	2,093,204
Lobsters (excl.frozen)	-	-	-	-	-
Shrimps and prawns (excl. frozen)	-	-	28,006,192	98,433,137	491,356
Rustaceans,not froz.(incl.flours/meals.)fit for human con.nes	-	-	3,194,850	302,353	-
Oysters	-	-	-	1,455,882	14,826,673
Mussels, live, fresh or chilled	-	-	-	8,416,561	-
Aquatic invertebrates(excl.crustaceans),live,fresh/chilled,nes	-	-	-	784,896	1,126,400
Milk and cream of =<1% fat, not concentrated or sweetened	40,829,395	-	273,148	347,600	3,348,259
Milk and cream in solid forms of =<1.5% fat	829,969	-	-	178,758,576	348,000,000

Milk and cream in solid forms of >1.5% fat, unsweetened	7,195,749	-	-	226,875,496	494,877,427
Milk and cream, concentrated or containing added sugar or	-	-	-	14,557,649	165,553,570
Milk and cream, concentrated or containing added sugar or other sweet	-	-	-	-	2,931,301
Milk and cream in solid forms of >1.5% fat, sweetened	13,344,016	-	-	-	-
Concent.milk and cream, unsweetened (excl. in solid form)	4,559,400	-	-	-	-
Buttermilk, curdled milk and cream, etc (excl. yogurt)	55,896,000	-	-	155,253,875	-
Products consisting of natural milk constituents, nes	5,003,896	-	-	12,144,188	-
Butter	-	-	-	3,196,879	-
Fats and oils derived from milk (excl. butter/dairy spreads)	-	-	-	12,875,567	153,486
Dates, fresh or dried	-	-	-	74,896	57,005,092
Guavas, mangoes and mangosteens, fresh or dried	2,934,846	-	1,314,447	-	-
Oranges, fresh or dried	-	-	-	-	1,082,400
Strawberries, fresh	-	-	-	6,325,000	3,267,151
Cranberries, milberries...etc, fresh	-	-	-	601,387,500	-
Cherries, provisionally preserved, not for immediate consump.	-	-	-	-	625,000
Strawberries, provisiona. preserved,not for immediate consump.	-	-	-	84,560,000	-
Fruit and nuts, provision.preserved,not for immediate consump.	-	-	-	-	1,056,841

Dried apricots	-	-	-	40,988,669	171,951,225
Other dried fruit, nes	-	-	-	-	8,453,505

The Figures below present the trends in production, export and import of selected FBS products.

1.

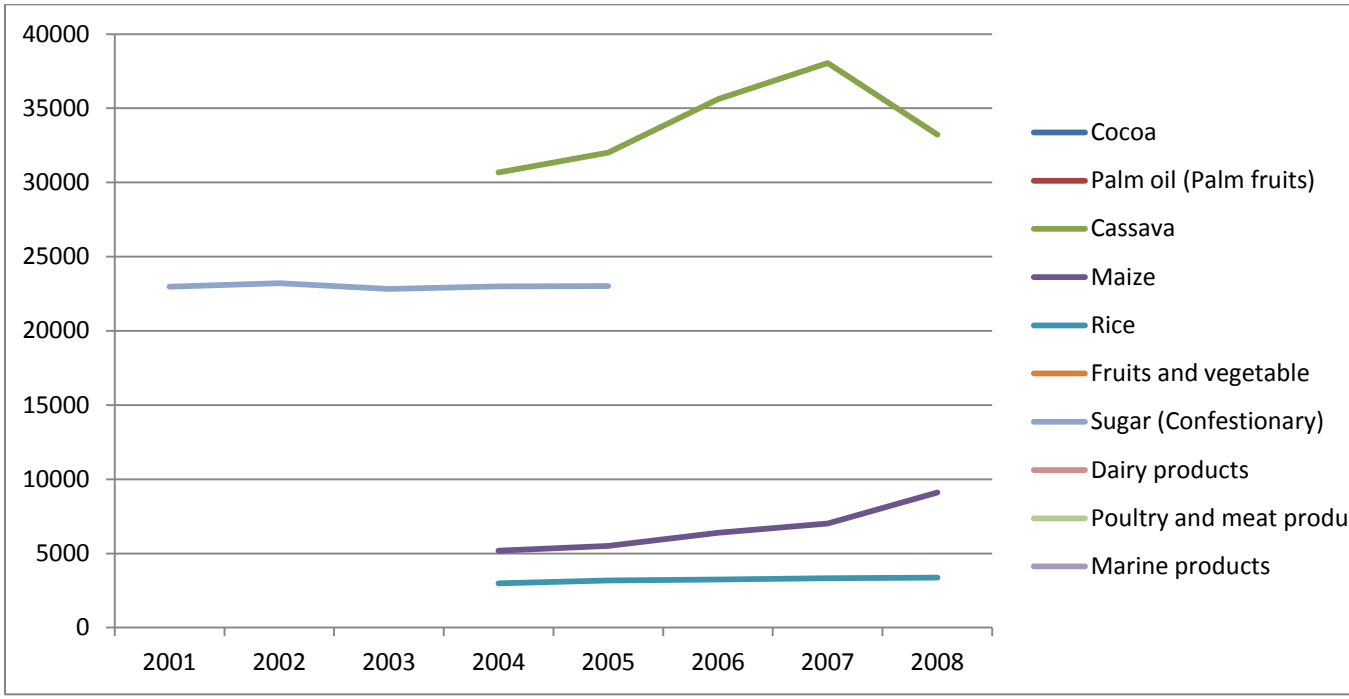


Fig 1. Production of FBS products in metric tonnes over the years (Metric tons)

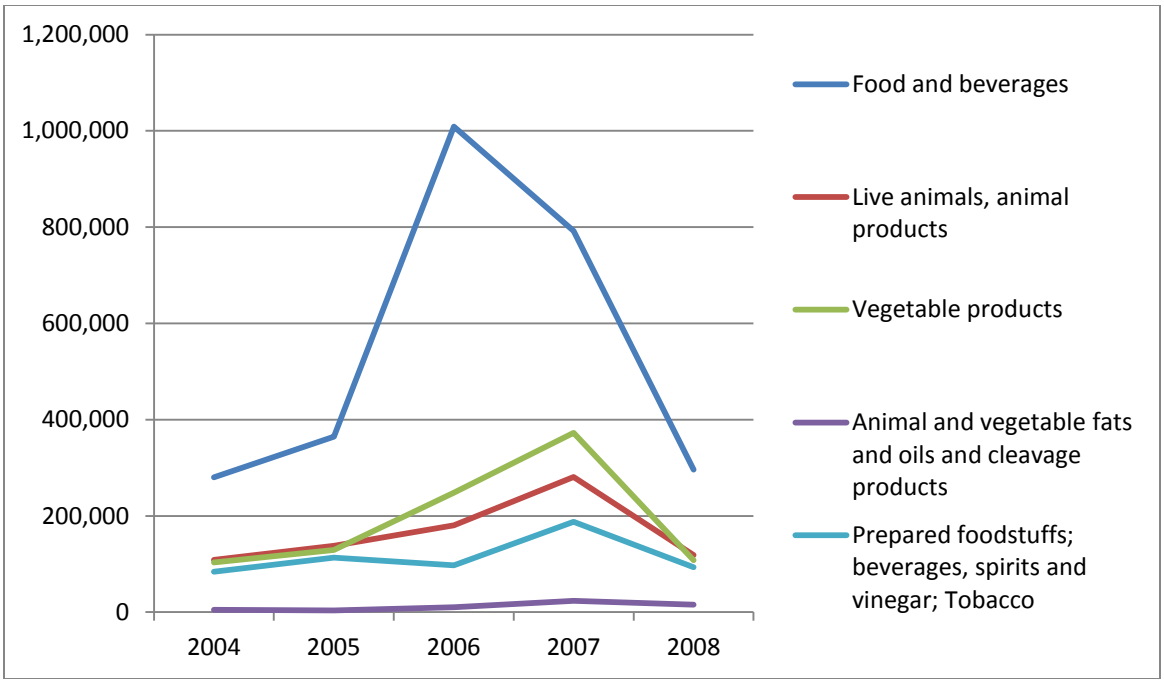


Fig 2: Trends in Imports of food and beverages into Nigeria (Naira Million)

Figure 3 Trends in Production of Dairy products in Nigeria (Litres)

3.7 Direction of trade

On the one hand, whereas in the absence of reliable records of disaggregated in-country trade flows, the direction of internal trade in FBS products can only be discerned based on a set of notional rather than on empirical mapping, as follows:

i. Movement of raw materials from the areas of natural production to areas of industrial use;
ii. Movement of products from one zone of the country where comparative advantage exists for production to areas where competitive advantage exists for consumption;
iii. Movement of products from an area where the relevant industries are located to where they are not;

Therefore FBS products will move in different directions according to a scheme of cardinal points – eastwards, westwards, southwards or northwards; as indicated in the Matrix below.

On the other hand, the direction of external trade in FBS products is empirically established in the publications of Federal Bureu of Statistics. In 2009, the direction of exports of FBS products from Nigeria leading countries is as follows:

- Cocoa (combined) – Antigua & Bamunda; Barbados; Botwana and France
- Palm oil (crude/refined) – Belize; Antigua & Bamunda; Italy
- Cassava (flour) – Antigua and Barbuda; Australia; China; Barbados; Hong Kong
- Maize (Flour) – Belize; United Kingdom;
- Sugar - Antigua and Bermuda; Saudi Arabia
- Dairy products – Antigua & Barbuda; Australia; United Kingdom; Niue; Brazil
- Marine products - Albania; Barbados; Belgium; China; Taiwan

Product /product category	Form	Area of major production/importation	Direction of internal trade			
			Eastwards	Westwards	Southwards	Northwards
Cocoa beans	Beans	South	-	-	-	-
	products	Imported	*	*	*	*
Palm oil	Refined oil	South	*	*	*	*
	Products	South	*	*	*	*
Cassava	Flour/starch	South	*	*	*	*
Maize	Grain	North	*	*	*	*
Rice						
Fruits and vegetable	Assorted	North/south	*	*	*	*
Sugar	Granulated	Imported	*	*	*	*
Dairy product	Milk powd	Imported	*	*	*	*

s	er					
Poultry/ meat product s	Egg/ meat	Diffused	-	-	-	-
Marine product s	Assor ted	South	*	*	*	*

3.8 Institutions involved in product development and marketing

The many institutions involved in FBS products development and marketing can be identified in definite categories, namely: R&D institutions, regulatory institutions, and a host of agencies established by the government. The major R&D institutions comprise the set of commodity-focused public agencies operating under one ministry or another. There is the Federal Institute for Industrial Research, Oshodi (FIIRO), which is an agency of Federal Ministry of Commerce and Industry with mandates for research into the manufacture of FBS products; there is the Raw Materials Research and Development Council (RMRDC), which is an agency of the Federal Ministry of Science and Technology involved in research for the promotion of local raw material for use in the production of FBS products; there are several commodity based research institutes under the Agricultural Research Council of Nigeria (ARCN) of the Federal Ministry of Agriculture and Rural Development (FMARD), which their statutory mandates include the full range of food and beverage raw materials and products; there is Projects Development Agency, Enugu (PRODA), which its mandate covers development of process technologies for the manufacture of FBS products; there is the IITA (international Institute of Tropical Agriculture) at Ibadan, a member of the CGIAR (Consultative Group for International Agricultural Research) which its mandate cover production and utilization of FBS items; and there are three specialized universities of agriculture, and three specialized universities of technology, established by the

Federal Government, as well as a number of conventional universities with faculties of agriculture and food technology, all playing a critical research and development role in the FBS.

The principal agencies outside the R&D range which affect the value chain development of FBS products include: a) regulatory institutions, namely NAFDAC (National Agency for Food and Drug Administration and Control), and SON (Standards Organization of Nigeria); b) the set of three agricultural commodities development and marketing companies, namely Arable Crops Development and Marketing Company; Tree Crops development and Marketing Company; and Livestock and Fisheries Development and Marketing Company; c) miscellaneous other agencies and outfits and special centres established by the Federal Ministry of Commerce and Industry to promote industrial products, as well as the Federal Ministry of Agriculture and Rural Development, among others such as National Sugar Development Council and the National Cocoa Development Committee. The national farmers body and the various commodity associations also form an important component of the institutional structure for FBS; these include Cocoa association; Palm oil association; Cassava association; Maize association; Rice association; Poultry association; to mention a few.

The table below highlights the major R&D institutions and their unique selling points in relation to FBS.

Selected Major R&D Institutions in FBS		
R&D Institutions	**Name/Location**	**Statutory mandate area and Unique selling points in FBS**
FIIRO	Federal Institute of Industrial Research Oshodi	Conducts research into product and process technologies in FBS
RMRDC	Raw Materials Research and Development Council, Abuja	Promotes research and development of raw materials for creating FBS products
IITA	International Institute of Tropical Agriculture Ibadan	Conducts research into tropical crops including FBS raw materials an products
PRODA	Projects Development Agency	Develops process technologies for manufacturing products.

NSDC	National Sugar Development Council	Promotes R&D activities in the sugar sector
ARIs (Agricultural Research Institutes):		
CRIN	Cocoa Research Institute of Nigeria, Ibadan	Conducts research into **cocoa** and related crops in terms of production and utilization
NIFOR	Nigerian Institute for Oil Palm Research, Benin City	Conducts research into oil palm and its products particularly **palm oil** in terms of production and utilization.
NRCRI	National Root Crops Research Institute, Umudike	Conducts research into **cassava** and similar root and tuber products in terms of production and utilization
NCRI	National Cereals Research Institute, Badeggi	Conducts research into **maize, rice, sugarcane** related crops in terms of production and utilization
NIHORT	National Horticultural Research Institute, Ibadan	Conducts research into **fruits and vegetables** in terms of production and utilization
NAPRI	National Animal Production Research Institute, Shika Zaria	Conducts research into livestock including **poultry and meat** in terms of production and utilization
NIOMR	Nigerian Institute for Oceanography and Marine Research, Lagos	Conducts research into **marine products** along the Atlantic coastline of Nigeria in terms of production and utilization
Commodity Development and Marketing Companies:		
ACDMC	Arable Crops Development and Marketing Company	Undertakes activities in the development and marketing of arable crops including **cassava, rice, maize** etc.
TCDMC	Tree Crops Development and Marketing Company	Undertakes activities in the development and marketing of tree crops including **cocoa, palm oil, fruits and vegetables** etc.
LFDMC	Livestock and Fisheries Development and Marketing Company	Undertakes activities in the development and marketing of **marine products** and other aspects of fisheries, etc.

3.9 Ranked Major Constraints of Food and Beverages Subsector

The constraints analysis of FBS is in three dimensions corresponding to the relevant sectors of the economy involved, namely the agriculture sector, the industry sector and the trade and commerce sector, which jointly impact of the growth of enterprises in the FBS industry in diverse ways. The agriculture dimension has two sides to it, supply side and demand side. The supply side constraints have their roots in the problems of Nigeria's agriculture as the natural resource base for raw materials supply for the production of the products. These include shortage farm inputs; lack of finance; and the poor state of infrastructure; etc. The demand-side constraints include the rigid tastes people attach to foreign products in the country which discourages agricultural production of the affected commodities; absence of an organized market for agricultural produce to create the required demand pull to trigger and reinforce the production of FBS products; the absence of a rights-based philosophy behind the market demand for FBS products to drive agricultural production on a sustained basis; and near absence of effective regulation of the market of FBS products to enhance the quality of the products and their acceptance in the international market.

The binding constraints of agriculture are weather and lack of storage facilities, which leads to seasonality of production posing a problem of discontinuities in supply of raw materials to FBS that in turn heightens the scarcity of the value added products during the off-season. Other major challenges include: the generic problems of production and marketing of crops, livestock and fisheries, in terms of poor access to credit and technical inputs namely fertilizer, seed and pesticides; the problem of maintaining the soil environment and the natural resource base; and poor rural infrastructure such as physical infrastructure (rural roads, water supply, storage facilities, and market infrastructure); social infrastructure such as water supply, education and healthcare services; and institutional infrastructure (community associations; development associations; saving and thrift societies, cooperative societies; etc.). Moreover the subsisting policy environment is not right for the transformation of the agriculture sector and to address the problem of youth unemployment in rural places; as well as inadequate marketing channels in rural areas particularly for food and other agricultural commodities. The agricultural sector is also faced with threats associated with climatic change in terms of desertification coupled with the erratic pattern of rainfall. The threat of desertification is reinforced by massive water

impoundment and irrigation schemes particularly in the northern part of the country. Uncontrolled grazing and livestock migration put tremendous pressure on the environment in some areas, while other environmental threats include poaching and settlement within protected areas, bushfires, increasing demand for fuel wood and timber, road expansion, and oil extraction activities. The latter causes some environmental concerns necessitating solutions of the FBS issues in a way that is compliant with the requirements of green industries.

The foregoing provides the critical link of agriculture sector industry sector with particular reference to food and beverages production, through the shortage of raw materials as a major constraint of FBS. Specifically the unsteady price of raw materials during the year arise from seasonality of agricultural production or weather disasters, as the high cost of transportation also arise from the unconsolidated and unorganized nature of small scale farming which necessitate the passage of produce through several stages of assemblage between the farm gate and factory gate. Also the absence of storage facilities leads to massive spoilage of farm produce with the consequence on high price that add to raw material shortage and cost. Other farm-related problems posing major challenges to FBS include scarcity of packaging materials; low impact of agricultural research; poor quality of produce in terms of impurities. Thus altogether, the net effect of agriculture sector constraints is the **high cost of raw materials** in Nigeria as it affects the FBS.

The industry sector also faces technology constraints in terms of ageing machinery and equipment as well as high cost of replacement, so FBS is unable to keep pace with technological innovations for more efficient production. Furthermore, the technology of production is foreign so local fabricators are unable to manufacture efficient machines and equipment as an alternative source. The binding constraints of industry sector pertain to poor infrastructure and finance. The main elements of infrastructure constraints include poor energy and power supply; inadequate transportation system (bad road conditions and lack of rail system that works); inadequate water supply to industries, among others. The financial constraint borders on high cost of borrowing for industrial production. Thus altogether, the net effect of industry sector constraints is the **high cost of production** in Nigeria as it affects the FBS.

Last is the set of trade and commerce sector constraints as they impact FBS. The important factors are classified into: (i) domestic factors affecting export development; (ii) factors relating to regional trade policy harmonization; and (iii) external factors prevailing in export markets. In this regard the major challenges are: Low trade capacity for effective participation in the global market; Lack of commitment to policies aimed at boosting total exports; Poor quality of goods and services that do not meet international standards; Poor trade skill and negotiation capacity; Non diversification of export base; Low level of technology, poor development of value chain and low value-addition to exports; Poor regulatory environment; Large size of the informal sector trade and lack of a suitable and well organized national market. These factors responsible for the generally low performance of the trade and commerce sector as they collectively raise the transaction costs of business activities in the manufacturing sector. Thus the net effect of trade and commerce sector constraints is the **high cost of doing business** in Nigeria as it affects the FBS.

The foregoing constraints analysis and its cost implications as they emanate from the three sectors – high cost of raw materials, high cost of production, high cost of doing business – are further dimensioned and specified in the contexts of each product or product group of the FBS; thereby identifying the priority constraints to be urgently addressed according to the special features and circumstances of each product or product group as the case may be. This is achieved through a quick opinion poll of a random sample of stakeholders in the FBS, as highlighted below.

- ***Cocoa –*** Disease problems that reduce yields frequently by half; Farmers spray conventional chemicals but the chemicals are expensive, while the environment is polluted and the end product contains undesirable levels of residues that affect acceptability of cocoa beans in the international market

- ***Palm oil*** – Harvesting difficulty due to high cost charge by climbers; Pounding and squeezing tedious; The process of extracting oil from palm fruits takes time; Continuous stirring of hot liquid and molding is tedious; Low demand;

- ***Cassava –*** Availability and distribution of planting materials is a problem; Peeling is tedious; rain may interfere with drying process; disease problems**;** High transportation cost; competition with other feedstuff in Europe; Low or no patronage by the end users particularly the flour millers; Ridiculous and unacceptable pricing of HQCF; Inconsistency in government policy; Inactive government interest; Low level of enforcement of the policy by the regulatory agencies; Closure of over one hundred HQCF processing SMEs across the country; Huge losses running into billions of naira from investment in research, manpower development, direct investment by flour millers, cassava processors, farmers and equipment fabricators; High cost of fresh roots occasioned by low patronage during the 2007/2008 planting season; Uncoordinated and contradictory activities of the various stakeholders in the sub-sector; Reduced demand during new yam season, inability to sell well during rainy season

- ***Maize*** - Cost of farming or buying; removal of seed from cob is tedious;

- ***Rice (Masa)*** - - Toasting is difficult and requires skill

- ***Fruits and vegetables –*** Difficulties in storing large quantities of fresh produce without incurring heavy losses; Small local markets for the large quantities of fresh produce in season; Ineffective distribution and transportation to meet demand in other, often urban, areas. Due to the above constraints, rural producers are often forced to give produce away or let it rot.

- ***Sugar (***Alewa (sugar candy) ***)–*** Cost of buying sugar or sugarcane; Handling hot semi liquids is tedious;

- ***Dairy products (*** Cow Butter**/**Cow Milk) - Cattle costly to purchase and maintain; Boiling, cooling and scooping takes time and is tedious; Expressing milk from cow and shaking is tedious; Produced on a small scale, lack of transportation to take to consumers

- ***Poultry and Meat products (***Suya - barbecued beef) **-** High cost of cow meat; Process tedious, process may be disrupted during rainfall;

- ***Marine fisheries products (***Smoked Fish**/**Crayfish***)*** **-** Fish may be hard to get during dry season; Process consumes firewood.

3.10 Stakeholders Perception of Solution to the Critical Issues

The stakeholder community of FBS is widespread, including several categories: the public policy authorities such as FMARD; FMCI; MAN; CSOs; Farmers Associations; Commodity Associations; Industry associations; among others. The views of these stakeholders were garnered from their publications and direct interaction with their members to obtain qualitative information about perceived solutions to the problems of FBS, as highlighted below.

National Planning Commission – The Nigeria Vision 20:2020 document was produced in 2009, which proffers the following solutions to the problems of FBS:

a. Promote regionally based special Agro-processing zones to encourage private sector participation
b. Provide soft loans to invest in processing facilities, farming and outgrower cooperatives;
c. Provide more subsidies to agro- allied inputs;
d. Provide more industrial and food processing incubation centres with free basic amenities for a period of at least five years per potential entrepreneur;
e. Reduce custom duties on machinery used in agro-allied processing.

NFSP/NAIP – The Federal Ministry of Agriculture has produced a strategy document – National Food security Programme (NFSP), which the components was recently incorporated into the National Agricultural Investment Plan (NAIP) under the CAADP process. The solutions proffered for FBS include the following:

f. Substantial food security of the nation…
g. **Promotion of Modern Agricultural Practices**
h. **Natural resources conservation**
i. **Visibility of private sector**
j. **Successor farmer generation**

k. Participative policy process
l. Policy advocacy and brokerage
m. Safety nets
n. Commodity focus and targets

Study Group - Further to NFSP, the Federal Ministry of Agriculture and Rural Development set up a Study Group on Agrricultural Commodities Development and Marketing Companies, with a view to to revitalizing the FBS. Three entities were involved, namely: Arable Crops Development and Marketing Company; Tree Cops Development and Marketing Company; and Livestock and Fisheries Development and Marketing Company. The relevant recommendations of the Study Group include the following:

o. That the commodity companies should have a fresh injection of funds
p. That the National Agricultural development Fund Bill should be passed

Manufacturers Association of Nigeria (2008) – MAN in its 2007 report recommended as follows:

q. Government should maintain 5% duty for Value Added Tax (VAT)
r. Manufacturing inputs should be VAT exempted just like finished products are VAT exempted.
s. Government should eliminate multiple taxation in the country by having a consolidated tax regime to be administered by one government tier and distributed to all others
t. More funding windows should be opened for SMEs apart from adequate funding of the bank of industry.
u. SME banks should be established as done in other developing countries of the world such as India, Thailand, Indonesia , etc
v. State governments should be encouraged to go into the establishment of industrial clusters and parks to enable industries enjoy the benefit of economies scale.

w. Government should accelerate the on going power sector reforms.
x. Government should facilitate the expansion and improvement of electric power supply by embarking on full privatization of PHCN and licensing more independent power projects.
y. Government should introduce measures to fully liberalize the transmission and distribution of power supply and remove monopoly from PHCN to encourage efficiency.
z. Government should encourage private sector participation in the ownership of local refineries so as to increase capacity.
aa. LPFO supply from Port Harcourt and Kaduna refineries should be restored as its shortage affects manufacturing output.
bb. Government should put in place an effective transport system management by providing adequate and reliable infrastructure for road, rail, air and water ways transportation in order to achieve supply chain efficiencies.
cc. There should be full implementation of cabotage and local content laws to drive the transport industry
dd. Government should accelerate the on going port reforms to improve the efficiency of goods inspection and clearance.
ee. The massive influx of banned products into the country should be checkmate by strengthening the regulatory agencies to enable them fight this battle.
ff. The continued deteriorating state of security of lives and properties should be addressed by using electronic and intelligence gadgets in forestalling crime as done in other parts of the world.
gg. Government should set good example by patronizing the usage of local products in all its ministries, parastatals and agencies.
hh. The government should encourage the Nigerian Exportation Council to conduct market studies to determine the potential markets for export in made in Nigeria products.

ii. The Ongoing Economic Partnership Agreement (EPA) should be put on hold to enable the nation determine its implication to the real sector before signing it.

Trade and Commerce Working Group – The recommendations of the Trade and Commerce Working Group of the Nigeria Vision 20:2020 directly or indirectly relevant to FBS include the following:

1. ***Promote appropriate market mechanism for domestic Trade*** **–**
    - Strengthening/capitalization of financial institutions such as BOI; NEXIM; NACRDB to provide funds at single digit interest rates, campaign, promotion and patronage of Made-In-Nigeria;
    - Registering of research findings with Trade Marks, Dissemination of Research development findings to use end users to improve production and marketing of by-products;
    - Establishment of model processing factories by Federal and State Governments, Establishment of National Food Safety Committee;
    - Evolving clear & distinctive distribution mechanism, Wholesale and Retail business and elimination of middlemen;
    - Support investment in modern abattoir; encourage building of shopping malls and modern markets, investment in better storage, distribution system etc;
    - Strengthening the Weights and measures Department, legal metrology equipment, establishment of weights and Measures Training School, strengthening of SON, NAFDAC, & CPC; Organization of existing MSME business into guilds & cooperatives to regulate, train & maintain best practices;
    - Establishment of NTCC; Establishment of Industrial Property Commission of Nigeria (IPCN);
    - Establish product specific markets through a supply base study & research; Professionalization of existing Ministry;

- Creation of International Trade & Investments Ministry; Promote activities in the Free Trade Zones and reintroduce export processing factory status;
- Create & enforce commercial courts to ensure speedy delivery of justice; Streamlining and strengthening of existing regulatory agencies;
- Market Information Intelligence Centre; Promote business in the packaging industries; Ports Reform; Concentration on products in which Nigeria has competitive/ Comparative advantage; Trade Facilitation Activities;
- Credit incentives to stimulate consumption of MIN (Made in Nigeria) goods; Right-based demand management instruments

2. Capturing global export market –

- Processing of agriculture products;
- Manufacturing products; Improving storage facilities; Improving packaging and quality control mechanism;
- Participatory process in Trade policy formulation;
- Harmonization of Trade related policies; streamlining of function export promotion and investment promotion agencies; sanctity of accountability; Transparency and Due Process etc Encourage BTA, PTA, MTAs.

3. ***Diversifying Import and Export Base –***

- Processing of agriculture products;
- Manufacturing products; Improving storage facilities;
- Improving packaging and quality control mechanism;
- Specialization in production of products that have competitive advantages and absolute advantage; marketing and branding as well as policy incentives to encourage specialization in production of export products

4. Promote Product Specialization to Ensure that Nigeria Capture 70% of Trade and Commerce in African –

- Establish product specific markets through a supply base study & research;
- Professionalization of existing Ministry
- Creation of International Trade & Investments Ministry
- Promote activities in the Free Trade Zones and reintroduce export processing factory status;
- Create & enforce commercial courts to ensure speedy delivery of justice;
- Streamlining and strengthening of existing regulatory agencies;
- Market Information Intelligence Centre
- Promote business in the packaging industries
- Ports Reform;;
- Concentration on products in which Nigeria has competitive/Comparative advantage
- Trade Facilitation Activities

Multi-disciplinary Task Force of RMRDC (2000): a multi-disciplinary task force was sponsored by the RMRDC in 2000, which conducted a techno-economic survey of the Food, Beverage and Tobacco sector. The following recommendations emerged.

- *On capacity utilization* - Special focus on the RMRDC to stimulate solution to specific problem of FBT sector in liaison with agricultural establishments in the country; Government to stabilize the policy environments to the benefits of industries in this sector specifically; Duties and tariff concession should be granted to assist the industries on importation not exceeding 15% to stimulate demand and increase capacity utilization; Taxes payable by the sector should be streamlined to avoid incidence of heavy and multiple taxation.

- *On Raw Materials availability* - Suitable policies to increase supply and stabilize market prices of raw materials of the Food, Beverage and Tobacco Sector; the main elements of this are: Promotion of appropriate preservation and storage post-harvest technologies; Increase agricultural production through irrigation system; Revitalization of the transportation system particularly the railway system; Promotion

of R & D to produce suitable packaging material for the food industries locally; Enactment and enforcement of by-laws to safeguard against environmentally non-sustainable farming practices; Funding of R & D agencies to generate innovations in product and process technologies. For instance, government needs to make available part of the 2% education tax for the improvement of R & D in the relevant institutional establishments and industries. this would benefit the R & D system in industries and institutions; There is need for improved institutional arrangement for conducting research into post-harvest technology-collaboration between industries and relevant research institutes required; Enforcement of laws pertaining to quality standards and specification of raw materials; Through the use of extension workers to generate awareness on the need for high quality raw materials emanating from the farm; Suitable import substitution policies with respect to raw materials for which the country has comparative advantage in their production(Continued promotion of sorghum, soybean and maize as substitutes for malted barley, wheat, milk and other applicable raw materials of the FBT sector; Stability of the foreign exchange market to reduce the production cost; Establishment of suitable tariff and shipment inspection programmes.

- Infrastructure - Continued improvement of road network including rural feeder roads; Revitalization and revamping the rail system to service the primary producers of food as well as distributors of finished products in the FBT sector; Sustenance of the present effort to correct the evident failure of the power and energy sector; Enhance water supply system to eliminate self expenditure on generation and treatment for own use; Improved health facilities to reduce financial burden on industries that ultimately translate into higher of FBT products; Revolutionizing the communication system consistent with recent developments in the information technology worldwide.

- Technology and Operation - FBT sector industries should invest more in R & D locally with a view to upgrading their industry in the country and improving the local raw materials sourcing for their operation; There is need for greater collaboration between industries and research institutions in the area of operational or processing technology in the country;

- Finance - Adequate access should be guaranteed to the industries to bank funds; The institutional finance for long term requirement such as NERFUND should be reinvigorated in scope and effectiveness;

- Manpower and training; Proper monitoring of curricula and academic programming of relevant training institutions; Effective exposure of students to practical components (laboratory and fieldwork) of their training including the agriculture students; Food Beverage and Tobacco Association (FBTA) should encourage its members to accept responsibility by providing adequate industrial exposure to students in food and food related institutions as part of their training programme.

In addition, an attempt was made to generate commodity-specific proposals from key industry actors in addressing the various issues. The following solutions were obtained from FIIRO and are also highlighted as follows (cassava only):

jj. FIIRO

- Constant supply of HQCF (Increase raw material supply (34 million metric tons of cassava is required to produce 21 million metric tons of HQCF needed for the 10% inclusion policy); Promotion of farm gate processing into mesh and then drying at specified centres with state of art equipment; Provision of incentives for investment in storage and ware housing; Develop mechanism for clustering and subcontracting; Capacity building in packaging and marketing;
- Flour Manufacturing Association of Nigeria (FMAN) are to be encouraged to compulsorily blend their flour in conformity of this policy and maintain a constant competitive price for HQCF; Master Bakers are to utilize this flour only for all baking purposes in Nigeria.

kk. Thai Farms Limited (Paper presentation) – The Chairman of the company presented a paper which recommended that the policy of 10% inclusion of cassava flour in composite flour should be enforced; and that the Bill pending at the national assembly to that effect should be passed.

3.11 Nigeria's Distance to World's Best Practices in Processing, Design and Marketing

Certain countries have established themselves as leaders in specific commodities or products in the world market, usually based on the volumes of output or export. In this section we survey such countries to examine their practices in the processing, design and marketing of products and determine the parameters of their leadership positions. This will help in measuring the linear distance of Nigeria to the world's best practices and to identify factors responsible for such practices. First we present the lead countries for each FBS product, and then highlight some of their practices in poultry and meat industry as an example.

Table below shows the three top world leaders in production of FBS products.

Three top world leaders in production of FBS products				
Product/ product category	Ranked order	Country	Production (Int $1000) Footnote	Production (MT) Footnote
Cocoa	1st	Côte d'Ivoire	1,024,339	1,330,000
	2nd	Ghana	566,852	736,000
	3rd	Indonesia	469,810	610,000
Palm oil	1st			
	2nd			
	3rd			
Cassava	1st	Nigeria	2,751,179	38,179,000
	2nd	Brazil	1,920,017	26,644,700
	3rd	Indonesia	1,402,244	19,459,400
Maize	1st			
Rice	2nd	China	39,193,840	185,454,000
	3rd	India	27,478,290	129,000,000
		Indonesia	11,499,260	53,984,590
Fruits	1st	India	1,052,766	6,600,000
	2nd	Viet Nam	438,652	2,750,000
	3rd	China	271,167	1,790,000
Vegetables	1st	China	26,458,650	142,010,000
	2nd	India	6,567,750	35,000,000
	3rd	Viet Nam	1,238,490	6,600,000
Sugar	1st	Brazil	8,725,914	420,121,000
	2nd	India	4,825,286	232,320,000
	3rd	China	1,819,452	88,730,000

Dairy products	1st	United States of America	21,315,090	80,150,000
	2nd	India	10,238,690	38,500,000
	3rd	Russian Federation	8,137,764	30,600,000
Poultry/meat products	1st	China	3,970,835	4,326,140
	2nd	Thailand	286,270	310,000
	3rd	Indonesia	166,470	180,270
Marine products				

Best practices in poultry processing

Although management practices will differ from country to country even for a particular FBS product, the case of poultry serves as a good example of an industry leader at its best in processing and marketing. The lessons learnt from the management of poultry are perfectly general and may be applied to other FBS products in Nigeria in several aspects, such as poultry processing and products marketing; product promotion; pricing; insurance; and cooperatives.

Certain practices have contributed significantly to the increases in global poultry meat consumption which include the development of new and efficient processing systems; adoption of advanced technologies; introduction of novel products that meet the market chain requirements and end-consumer needs (Roenigk, 1998). These practices have made poultry production and processing technologies readily accessible, and implemented on a worldwide basis, and hence, will allow continued expansion and competitiveness in this meat sector (Aho, 2001).

Processing and marketing of poultry ranges from live bird markets or a very primitive onsite slaughter and sale, to a highly sophisticated, fully automated system certified by International Standards Organization (ISO); which has led to the availability of ready-to-eat convenience products in many parts of the world. The most important factor responsible for this is cold storage capacity, which is probably the single largest obstacle to the marketing of many perishable foods, including poultry. Refrigeration is required to increase the trade, storage,

distribution, and consumption of poultry products, whether domestic or imported (Babji, 2001). Other associated factors include the adoption of modern freezing, packaging, and transportation technologies, which have provided large poultry companies the flexibility to export their high quality, mostly value-added premium cuts to all corners of the world, especially at times of domestic surpluses and low market demands. However, as the global poultry market expands, differences in labor and freight costs and tariffs may alter the competitive advantages of traditional poultry exporters.

Although whole birds, with or without giblets, and cut-up parts dominate the market forms of poultry in many parts of the world, there has been a global shift to "well-differentiated, name-branded" poultry products in the marketplace (Keeton, 1997). Whole bird and tray-pack markets, domestic or international, usually demand high quality (A Grade) product. High market share of whole birds in Middle East, South America and Eastern Europe directly relates to consumer preference for traditional meat preparation methods and chicken broth, and expanding roasting or rotisserie markets.

Best practices in poultry marketing

The international market for poultry products is becoming increasingly differentiated into pasture poultry and confined poultry, whereby the former enjoys an added value in terms of the organic nature of production. Pasture poultry production requires considerably more labor than large-scale confinement production. To market pasture poultry at a profit, the price must be higher, so there has to be differentiation between the products of each system. The pasture system involves free-range to be certified which produces a unique taste of fresh eggs or meat as the basis of differentiation; as "commodity eggs" do not compare to the taste, color, or structure of pasture raised eggs and the flavor and texture of pasture raised broilers also differs from the commercially available product. Pasture raised turkeys have a distinct flavor due to the grass they consume. Some consumers have preference for the flavor of pasture poultry products which tastes like home raised chicken as different from chicken from the grocery store, for which they are willing to pay a premium price in the market.

Thus marketing of pasture poultry is more of direct than indirect type and most producers are not natural marketers. Promotion of poultry products requires identification of the target market, i.e. Individual consumers, consumer co-ops, grocery stores, restaurants, and institutional food service markets. The target is usually reached through advertizing, including newspaper, radio, or television and word-of-mouth advertizing; Farmer's markets are a good place to sell pasture poultry products. There is a ready-made customer base in place. Producers should have newsletters available to hand out. Several cooperators sell at farmer's markets. One mentioned that this method of marketing consumes a lot of time. Those that are satisfied with farmer's markets are selling multiple products.

Other

Other best practices in poultry enterprise include the aspects of insurance; producer ooperatives; business planning; relationship marketing and regulations.

3.12 Assessment of Nigeria's distance to the technological frontiers

Just as certain countries have been established as world leaders in terms of best practices, so also they or others have been established in terms of technological capacity for export, regarding each FBS products. In this section we survey the FBS for indigenous technologies for processing raw materials in Nigeria, to be compared with imported technologies for doing the same. This helps in measuring Nigeria's distance to the technology frontiers in each case thereby revealing the technology gap of the country's FBS in relation to world leaders.

Table below highlights the indigenous technologies for processing raw materials in Nigeria side by side with imported technologies for doing the same.

Product/ product category	Indigenous technology			Imported technology		
	Local product	Process technology	Equipment	Standard products	Technology process	Equipment
Cocoa	-	-	-	Roasted beans; Cocoa powder	Roasting	Roaster - Automatic Batch Roasters (*For Cocoa Nibs Up to 11,880 lbs per batch)*
Palm oil	Palm oil	Boiling, pounding, scooping	Pit, drums, b	Refined palm oil	Oil refining	Boiler; Oil fractionation rotor; Press outer digester; Separator; Multipurpose oil expeller; Storage tanks; etc.
Cassava	Cassava flour	Peeling, soaking, drying, pounding, grinding	Knives, basins Mortar, pestle	Flour	Flour milling	Hydraulic press; Grater; Mechanical dryer;
Maize	Maize	Decobing ,	Basin,	Cereal	Four	Auto

	Flour	washing, drying, milling	sieve, stirring stick, pots	(baby food); Infant formula	milling	mixing machine
Rice	Masa (Rice grits snack)	Washing, drying, milling, sieving, fermenting and toasting	Calabash, pot, milling machine, sieve, toaster and basin	Rice mill	Rice milling;	Milling machine; Distoner
Fruits/vegetables				Fruit juice; Fresh vegetables;		
Sugar	Alewa (sugar candy)	Mixing, boiling, stirring, cooling, drawing and cutting	Frying pan, spoon, polythene sheet,	Refined sugar	Sugar refinery	Mill; Boiler; Vacuum pot; Centrifuge;
Dairy products	Cow Butter Cow Milk	Boiling, curdling, fermentation, stirring, separation washing	Pot, calabash, gourd	Pasteurized milk;	Milk production	Milk separator; Mixer; Boiler; Pasteurizer; Packaging machine; Sealing machine; Homogenizer;
Poultry/meat products	Suya (barbecued beef)	Washing, cutting, skewering, roasting	Knives, sticks, firewood	Chicken parts; Corned beef	Slaughtering; Skinning; Eviscerations;	Modern Abattoir;
Marine products	Smoked Fish Crayfish	Washing, bending, roasting, frying	Knife, sharp sticks, Firewood, wire gauze Earthen pot	Fish; shrimps; etc.	Catching;	Trawlers; Cold rooms; Cold transport vehicles

3.13 Product-specific policy agenda for action

The product-specific policy agenda for action involves a list of possible actions under the control of policy authorities, for addressing the identified constraints. This will be further elaborated with details about product specificity and time lines, leading to full length plan action plan. This sequence of steps is presented in the two tables below. The first table is a **solution matrix**, which indicates the different solution approaches against individual issues or constraints to be addressed as applicable to product specific instances; while the second table is the **recommendation matrix**, which clarifies the solution approaches further and indicates different policy actions for specific products.

The range of solution approaches considered is highlighted below, which includes the following categories: Common facilities; Special purpose vehicles; Business support services; Institutional framework; Institutional framework; Local/Regional value chain; Fiscal/non-fiscal instruments; Sectoral innovation system; Foreign Direct Investment.

a. Common facilities for collective response to enhance efficiency gains

By common facilities is meant the type that can serve the common purpose for addressing a particular set of issues or constraints for different classes of FBS products. Such categories of facilities including the following:

- C*ommon facilities for procurement of raw materials for semi-processing and further processing in order to reduce dramatically the cost of raw materials* - Promote formation of industrial clusters or cooperatives.
- *Common facilities for testing and complying with quality control norms* - Establish testing centres in clusters for processors.
- *Common facilities to promote best practices in design and marketing* – Establish training centres for local fabricators of processing equipment and machines.
- *Common facilities to promote best practices in technology* – Support research and development of product and process technologies in R&D institutions
- *Common infrastructure to promote regionally based special Agro-processing zones to encourage private sector participation* - Establish Industrial parks in each agro-ecological zone through public-private partnerships (PPP).

b. Special purpose vehicles for product development

- *Special purpose vehicle for addressing seasonality of raw materials* - Inventory credit scheme through PPP to enable farmers earn remunerative prices.

c. Business support services for production and marketing

- *Business surport services for addressing raw materials procurement problems* -Promote non-state actors (NSA) for rendering professional services in business development and brokerage services

d. Institutional framework for capacity building

- *Capacity building for product development* - Pilot projects to demonstrate alternative uses of raw materials to the investment public.
- *Capacity building for quality maintenance* – Conduct regular training
- Workshops on quality control standards and measurements for different products.
- *Capacity building for entrepreneurship* – Provide training facilities for entrepreneurship development

e. Strengthening local and regional value chains

- *Strengthening the value chain for raw materials production* - Promote agricultural production through farmer support and youth empowerment; development of farm input market locally and regionally (CAADP / ECOWAP)
- *Strengthening the value chain for generating consumer demand* – Promote right to food in the country for generating incremental demand for local foods and beverages.
- *Strengthening the value chain for marketing and trade of FBS products* – Rejuvenation of commodity development and marketing companies

f. Specific fiscal and non-fiscal instruments

- *Policy instruments for driving production of items that have shown high degree of comparative advantage* – Price support for export; tarrif for discouraging imports of FBS products.
- *Policy instruments for promoting the production of import substitution products* – Tax waivers and financial incentives for establishing factories for domestic manufacture of FBS products.

g. Strengthening sectoral innovation systems

- *Strengthening innovation systems for increased production of agricultural raw materials* - Establish innovation platforms for constant interaction and generation of new ideas for addressing constraints to production and processing of different raw materials at LGA and State levels
- *Strengthening innovation systems for marketing of agricultural raw materials* - Market linkage platform (MLP) to link farmers and industrial processors of agricultural raw materials.

h. Specific measures for spreading the impact of FDI on domestic capacity and capability building

- *Spreading the impact of FDI from many sources* - Identify different sources of FDI in the international market; Build capacity for generating proposals from different sources including agricultural sector actors in trade missions abroad.

Solution Matrix for addressing FBS issues and constraints									
Industry problems		Solution approaches							
Issues/Constraints	Product specific instances	Common facilities	Special purpose vehicles	Business support services;	Institutional framework	Local/Regional value chain	Fiscal/non-fiscal instruments	Sectoral innovation system	Foreign Direct Investment
Sourcing of raw materials -	Seasonality (cassava, maize, fruits/vege	*	*		*	*		*	

	tables, Sugar;) Perishability (Cassava; Fruits/vegetables)								
Cost of production	Technology (Cassava);			*					
Quality of products	Residue (cocoa); Adulteration (palm oil); Impurities (rice)		*		*				
Investment flow	Sugar; dairy; Marine			*					*
Infrastructure	Power; Transportation; Water								*
Consumer preference	Rice; Cassava					*			
Marketing /Trade	Market structure (Sugar); Competition (Rice; Cassava; Dairy products; Poultry/meat);			*		*	*		*

Policy Recommendation Matrix for Addressing FBS issues and Constraints		
Solution Approaches	**Clarifications**	**Product specific recommendations**
Common facilities for collective response to enhance efficiency gains	Common facilities for procurement of raw materials for semi-processing and further processing in order to reduce dramatically the cost of raw materials	Promote formation of industrial clusters or cooperatives (cassava processors; livestock feed manufacturers to jointly procure maize/cassava tubers)
	Common facilities for testing and complying with quality control norms	Establish testing centres in clusters for cassava processors
	Common facilities to promote best practices in design and marketing	Training centre for local fabricators(cassava processing equipment e.g. flash drier)
	Common facilities to promote best practices in technology	Support research and development of product and process technologies in R&D institutions
	Common infrastructure to promote regionally based special Agro-processing zones to encourage private sector participation	Establish Industrial parks in each agro-ecological zone through PPP
Special purpose vehicles for product development	Special purpose vehicles for addressing seasonality of raw materials	Inventory credit scheme through PPP to enable farmers earn remunerative prices (maize, rice)
Business support services for production and marketing	Capacity building for product development	Pilot projects to demonstrate alternative uses of raw materials to the investment public
	Capacity building for quality maintenance	Conduct regular training workshops on quality control standards and measures for different products
	Capacity building for entrepreneurship	Provide training facilities for entrepreneurship development
Institutional framework for capacity building	Capacity building for product development	Pilot projects to demonstrate alternative uses of raw materials to the investment

		public
	Capacity building for quality maintenance	Conduct regular training workshops on quality control standards and measures for different products
	Capacity building for entrepreneurship	Provide training facilities for entrepreneurship development
Strengthening local and regional value chains	Strengthening the value chain for raw material production	Promote agricultural production through farmer support and youth empowerment; development of farm input market locally and regionally (CAADP / ECOWAP)
	Strengthening the value chain for generating consumer demand	Promote right to food for generating incremental demand for local foods and beverages
	Strengthening the value chain for marketing and trade of FBS products	Rejuvenation of commodity development and marketing companies
Specific fiscal and non-fiscal instruments	Policy instruments for driving production of items that have shown high degree of comparative advantage (cassava)	Price support for cassava exports; tariff for discouraging imports of cassava products
	Policy instruments for promoting the production of import substitution products	Tax waivers and financial incentives for establishing factories for domestic manufacture of sugar and diary products
Strengthening sectoral innovation systems	Strengthening innovation systems for increased production of agricultural raw materials	Establish innovation platforms for constant interaction and generation of new ideas for addressing constraints to production and processing of different raw materials at LGA and State levels
	Strengthening innovation systems for marketing of agricultural raw materials	Market linkage platform (MLP) to link farmers and industrial processors of agricultural raw materials
Specific measures for spreading the impact of FDI on domestic capacity	Spreading the impact of FDI from many sources	Identify different sources of FDI in the international market; build capacity for

and capability building		generating proposals from different sources including agricultural sector actors in trade missions abroad

3.13 Mechanisms and Framework for implementing the agenda for action

The successful implementation of the agenda for action will depend on the establishment of a suitable funding mechanism and presence of an appropriate institutional and policy framework, as highlighted below. This is followed by an implementation matrix, indicating each recommendation on the agenda against policy actions and expected outcomes.

- Funding mechanisms – Public budget; Public/Private Partnerships; Foreign investments; Borrowing
- Institutional framework – FMCI; FMARD; State MCI; State MANR; FMST; R&D Institutions; Government Agencies; etc.
- Policy framework – NV 20:2020; National Food Security Programme; National Agricultural Investment programme.

CHAPTER FOUR
TEXTILE AND WEARING APPAREL

4.1 An overview of the sector

Textile is a strategic non-oil industry for Nigeria. It is estimated to employ 24‘000 people (direct) and about 500’000 (indirect) -cotton growers, labourers, it is the second largest textile industry in Sub-Sahara after South Africa and represents 63per cent of the textile capacity in ECOWAS sub-region. In 2008 it was estimated that the installed textile manufacturing capacity in Nigeria represents a US$ 2bn of sunk investment and remains an important non-oil export industry as even a partial sufficiency in local textile production could save the country a foreign exchange of US$ 1.5bn annually in imports. The textile industry in Nigeria has however been shrinking rapidly as reflected in the decline of the number of textile and garment factories from 50 to 25 and employment decline from 60,000 to 24,000 between 2004 and 2008 demonstrate. During the same period the country experienced a decline in cotton lint production from 98’000 to 55’000 tons; fall in exports from US$ 44mn to US$ 31mn; reduction of capacity utilization in the industry to 20per cent and even many of the surviving are on the brink of closure and increase of smuggled textiles to the level of 85per cent of the market share.

4.2 Textile supply chain - the Nigerian experience

In Nigeria, the textile industry is well integrated and organized with the presence of medium to large textile mills. The industry was mainly the creation of the FDI since mid sixties while the major backward integration into spinning and weaving took place in 1970-1980’s as a result of government policy to encourage local value addition and import substitution. Most textile mills also have backward integration into ginning. Large cotton exporters also have own ginning mills to ensure control over quantity and quality of seed cotton processing. Nigeria lacks an organized garment sector unlike in East and Southern Africa. Apart from knitted T-shirts which are produced in the organized sector, there is no readymade garment manufacturing. Production of work wear (corporate uniforms) is done in a semi-organized manner while the mass demand for customized clothing is met by tailors and fashion designers. Distribution of textiles is done mostly through open markets and not through modern retail outlets. The major wholesale textile markets are located at Kano, Lagos, Ibadan, and Onitsha which act as the first point of sale for foreign and locally produced textiles. From there the goods get distributed through semi wholesale and retail markets such as Maiduguri, Aba and Sokoto. Nigerian wholesale markets are a focal point of distribution of textiles in West and Central Africa. However, the erstwhile pre-eminent position of Nigeria has considerably diluted since 2000 with the flooding of Chinese goods through Cotonou and Lome ports.

On a replacement basis, the present installed textile manufacturing capacity in Nigeria represents a US$ 2bn investment. The textile industry of Nigeria is unique in the Nigerian context in the sense that it uses a high percentage of locally produced raw materials, such as cotton and polyester unlike other manufacturing sectors in Nigeria which are import dependent. The Nigerian spinning, weaving and processing industry has been largely a creation of foreign direct investment (FDI) in

the 60s' and 70s' only and one composite textile plant has been added during the last 5 years. Presently all the companies are in distress, and over 25 mills closed in the last 10 years.

Government has been influential in the development of the textile industry in Nigeria through policies over the years. Nigeria has pursued a long term policy for encouraging non-oil exports through legislated measures since 1986. Export Expansion Grant scheme has been the main export incentive for boosting non-oil exports. EEG rate was doubled from 20per cent to 40per cent in year 2003. The UNIDO Study in 2003 had advocated a long term sustainability of the EEG policy to boost new investment and export of textile products. The recommended period was 10 years during which the policy should remain valid. The Federal Government endorsed the recommendation and gave a specific assurance to sustain the EEG policy, specifically for the textile industry until the term of the past administration i.e., 2007. The government also addressed the distortion in the high EEG rate which was being erroneously given on cotton, being a basic raw material for the textile industry.

The policy assurance from the government led to a renewed investment in the sector resulting in capacity expansion and retooling to take advantage of export opportunities. Following significant new investments were initiated in 2002-04 in response to assurance about policy continuity for export incentive:

i) New weaving and processing mill to diversify by producing apparel fabrics for AGOA (US$ 8 mn);
ii) Expansion and modernization of spinning capacity by the mills for export of cotton yarn (US$30mn);
iii) Expansion of processing capacity for production and export of wax prints (US$10mn)
iv) Expansion of capacity to produce polyester staple fibre (US$6mn);
v) Garment making capacity to take advantage of AGOA (US$1mn);

In mid 2004, the government suspended the EEG policies amidst allegations of trade malpractices in the non-oil export sector. Though the complaints were general in nature relating to the non-oil export sector, with the blanket suspension even textile exporting companies faced a setback from the *ad hoc* suspension of the policy. The policy remained in suspension for a prolonged period and it was only in April 2006 that the new policy was announced retrospectively. During the suspension period the exporters' operations were adversely affected by the delay in payment of claims. It took over two years to clear the backlog of EEG claims and by then exporters had lost a lot of orders and this dented Nigeria's image as a reliable trading partner in the international market.

As per AGOA eligibility conditions, the eligible sub-Saharan countries are required to obtain 'visa'for taking advantage of textile and apparel provisions. As at the time of the UNIDO sector study in 2003, Nigeria still had not passed the internal legislation necessary to fulfill the requirements for textile visa. This was subsequently pursued and Nigeria was granted the textile visa in 2004 which made Nigerian textile and garment companies to export their products duty free to the US. The following is a summary of the developments relating to AGOA and which had an impact on the Nigerian textile and garment industry:

i. Nigeria became the first sub-Saharan country to be granted 'Category 9'certification under AGOA which enabled Nigerian African Prints/Wax Prints eligible to enter USA duty free. Nigeria already exported its trial shipment of Wax Prints and African Prints under AGOA. Two textile mills participated in the export. The product was well received by the US buyers. African Prints were perceived as a niche product with a limited and scattered clientele spread across the US. Due to the piece meal requirement, no bulk order for that product could be procured from the US market;

ii. AGOA was amended in 2007 to include textile products such as manmade fibres, yarns, fabrics and made ups for duty free treatment;

iii. A garment factory based at Lagos exported a sole shipment of readymade garments to the US under AGOA in 2008; and

iv. General response to AGOA has been lukewarm due to the following perceived factors:

- Post MFA preferential market access in terms of quota free status for sub Saharan countries was eroded as quotas were lifted on all countries and which resulted in loss of advantage;
- Due to the general situation in the Nigerian textile industry which came under attack in the domestic market;
- Due to infrastructural disadvantages and high input cost of doing business, exports from Nigeria lack competitiveness in export market;
- Inconsistent government policy in the implementation of EEG discouraged the creation of export oriented garment factories;

4.3 Wearing apparel

4.3.1 Structure of the garment industry in Nigeria

Nigeria still lacks an organized garment industry even on a scale that is found in East/Southern Africa catering mainly to export market. The garment industry in Nigeria in its present form could be divided into four segments:

- **Organized segment –**This is a small segment which consists of integrated operations involving knitting, processing and production of knitted garments, chiefly T-shirts. This segment is part of the organized and formal textile and garment industry. There are four companies which are engaged in this segment. The end product T-shirts is mainly aimed at meeting the local demand for promotional T-shirts used by companies and institutions to promote consumer goods.
- **Semi organized segment –**This segment consists of semi organized SME's which have a capacity of over 50 sewing machines and complementary equipment for production of work wear. The segment relies on demand for uniforms from the organized private sector comprising private companies, security outfits and schools and public procurement by civil and defence forces.
- **Unorganized segment –**There is a large inform segment consisting of fashion designing and tailoring outfits which cater to the demand from large cities, mainly Lagos. The segment also is engaged in informal or suitcase exports' to other African countries and even to the

African Diaspora in the West. There are also several T-shirt makers in this segment which procure knitted fabrics from the local textile mills and have their own sewing facilities.

- **Accessory job work providers –**This segment consists of SME‘s engaged in providing services to the semi organized segment which sub-contracts certain services relating to embellishments such as monogramming and screen printing on work wear. Such small business enterprises invest in computerized multi-head embroidery and screen printing machines and carry out on work on piece rate basis. Integrated garment factories in the organized sector are shown below. They have own garment making and also supply fabrics to the decentralized SME’s .Most of them also have machines for value added accessories such as monogramming and screen printing on promotional T shirts and work wear. The installed capacity is shown below however due to various constraints highlighted in other sections of the report; the actual capacity utilization is below 50per cent. In case of Adhama garments Kano which used to supply National Youth Service uniforms and participate in other public sector procurement programmes has been utilizing only 12per cent capacity which makes the operations uncompetitive.

Adhama Garments, based at Kano was established in 1978 and is an integrated facility to utilize and add value to locally produced Cotton Yarn. In peak period they had 355 workers and a capacity of 5000 pieces/day which is currently reduced to 24 workers with 12per cent capacity utilization only.

Cotsyn produces T shirts which are used for promotional purposes by the corporate sector dedicates a large capacity of the sewing unit (making up)for production of mosquito nets. The factory was upgraded in 2009 to produce Long Lasting Insecticide Treated Nets (LLIN) with a capacity of one million pieces per annum in response to the Roll Back Malaria (RBM) initiative of the National Malaria Control Programme (NMCP) of the Federal Ministry of Health. The major challenges faced by the company are inadequate patronage from public health authorities as well as international institutions and NGO’s such as the Global Fund, World Bank, USAID, DFID and UNICEF.

Coats (West Africa), another integrated garment factory at Lagos was forced to downsize by suspending knitting and processing operations due to infrastructural constraints and competition from smuggled goods.

Femro3 was set up in 1985 with CMT operations but was expanded into an integrated facility in 2007-08 with state of the art knitting and dyeing machines. The factory produces knitted fabrics and T shirts for the domestic market however faces similar challenges as others coupled with high finance cost making them uncompetitive.

Many SME’s have mainly CMT (cut make trim) operations, however a few also have processing facility such as fabric dyeing. In terms of capacity, the following factories have over 100 sewing machines each with an employment potential for 150-200 workers. Some of them have embarked on expansion to meet local demand.

F&D Garments exported the first shipment of knitted garments under AGOA however was unsuccessful in sustaining due to various constraints, which include non availability of desired fabrics in the domestic market. Rosie's garments based at Aba is also engaged in production of mosquito nets.

4.4 Size of textile and garment industry of Nigeria

The textile industry in Nigeria has been shrinking rapidly. Since 2002, the number of textile factories has declined from 50 to 25. The capacity utilization in the industry is 25per cent. Even the existing mills are operating at a skeleton level and some of them are on the brink of closure. Among the closed textile mills, some have been completely wound up and the unused machinery disposed off; some of the textile mills, particularly state owned which have been lying dormant since late 90's or early 2000, had ceased their operations and it's doubtful if any of them could be a candidate for revival. Many existing textile mills have also restructured and down sized their operations compared to their past levels of activity. The erratic supply of power and fuel also causes a reduction in the capacity utilization.

Unlike in the past, the textile mills no longer experience surge in seasonal demand during festival periods (Sallah, Christmas, and Easter) due to the massive stock levels of imported goods permanently available in the market. As per trade estimates, even if borders were to be completely sealed off, the existing stocks could meet the demand for over two years.

Table 1 **Number of textile mills in Nigeria**

1985	2002	2006	2008
175	50	32	25

4.4.1 Employment in the textile and garment industries

It is well known that textiles is a labour intensive industry. The textile industry in Nigeria was once the largest employer of labour after the Federal Government. However, with the closure of 25 more textile mills since 2002 about 36'000 direct workers lost employment and the current employment in the organized sector consisting of textile and garment factories is about 24'000.

The employment figure of 24'000 covers both the organized textile and garment industry of which companies are members of the textile and manufacturers association. The others are in the unorganized sector which are rather tailoring shops and not within the scope of this study. They are not like the CMT operators in Kenya or Lesotho. The garment factories in the organized sector covered in our research are among the 25 mills –West Coast, Sunflag, Femro3 and Adhama.

In the past when the industry was operating at 80per cent capacity utilization, there used to be a considerable amount of overtime wages for the workers which effective reduced due to diminishing demand for local textiles and down time recorded on account of frequent power and fuel outages.

Table 2	Employment Statistics of the Nigerian Textile Industry (1996-2008)							
1996	1997	1998	1999	2000	2001	2002	2003	2008
137000	128000	115000	97000	83000	72000	60000	57000	24000

Source : NTMA

4.5 Export of textile products from Nigeria

Nigerian textiles used to be a key manufactured product which was exported through formal channels and by way of cross border trade in West and Central Africa. However export of textile products suffered a setback between 2003 and 2008 as shown in the table below. Textile exports touched their lowest ebb in 2006 however recovered some lost ground in 2007-08.

Furthermore, the share of textiles in the country's export basket also shrank from 7per cent to 2per cent between 2003 and 2008. The textile products exported from Nigeria are cotton yarn, grey fabric, polyester staple fibre and wax prints. These products which meet international standards are exported to West and Central Africa, Europe and South Africa.

The major factors responsible for decline in exports are not fundamentally different from the general decline in the textile industry, however some specific factors which caused the decline are:

•Loss of preferential market access in EU and US;

•Inconsistent implementation of EEG policy, particularly a perennial backlog of EEG claims;

•Inconsistencies in the implementation of ETLS (ECOWAS Trade Liberalization scheme)

Table 3	Export of Textile Products from Nigeria			
2004	2005	2006	2007	2008
31	24	18	38	31

4.6 The existing product mix of the Nigerian textile industry

The Nigerian textile industry produces a wide range of products for the local market. Several other products which may not be produced in large volumes is not for lack of technical capability but is attributed to market constraints such as presence of cheap smuggled goods which discourage production of economical quantities.

A remarkable trend in the product range of the Nigerian textile industry over the last 6-7 years is the loss of predominance of African Prints/Wax Prints. China has taken over a lion's share of this largest product segment in West Africa. Current levels of production of African Prints/Wax Prints in Nigeria represent less than 1/5th of the levels prevailing a decade ago.

The exhibits below show the range of locally products textiles.

Fibre and Yarns	Traditional Fabrics	Apparel Fabrics
- **Cotton Yarn** - **Polyester Staple Fibre** - **Polyester Filament Yarn** - **Acrylic Yarn** - **Polyester and Blended Yarn** - **Sewing Thread**	- Real Wax Print - Super Print (Ankara) - Embroidery/Lace material	- Suiting material - Shirting material - Dyed Chinos and Drill fabrics - Work wear fabrics - School uniform cheeks - Institutional uniforms for Navy, NAF, Police and Customs
Made Ups	**Home Textiles**	**Knitwear**
- **Terry Towels** - **Blankets** - **Bed Sheets**	- Window blinds - Sheeting material - Mattress tickings - Furnishing/Upholstery	- Knitted fabrics - T-Shirts

4.7 Degree of integration

Out of the 25 major mills, 70per cent are partly of fully integrated companies/groups i.e. they manage spinning, weaving, knitting and processing plants. There are 10 stand-alone plants in the industry which perform only 1 or 2 manufacturing operations in the textile value added chain e.g., only spinning or knitting and processing. These plants rely on third parties for purchase or sale of their inputs or output respectively, sourced from local or overseas markets. Most integrated mills which have spinning also have backward integration in ginning to ensure reliable supply of their basic raw materials.

4.8 Revival of the Textile Industry in Nigeria

The key elements of the present fiscal policy relating to customs duty, VAT and corporate income tax are:

- Prohibition on import of certain textile products, such as African prints, terry towels, lace fabrics and garments which are produced in Nigeria;
- Import duty of 5per cent on basic raw materials, plant and machinery;
- Import duty of 10per cent on intermediate products;
- Import duty of 20per cent plus 30per cent levy on finished products;
- The government is in the process of further harmonizing the Common External Tariff (CET) with other ECOWAS countries which is intended to cut tariffs, minimize exceptions and introduce safeguard duties;
- There is an anomaly in the VAT policy which exempts VAT on imported mosquito nets whereas the locally produced nets are subject to VAT;

- The 5 year tax holiday under the Pioneer Status scheme does not cover the entire value chain of textiles and does not recognize major investment by an existing textile company for up gradation of its facilities for the purpose of tax holiday Following are the various issues relating to the impact of Fiscal policy –taxes and tariffs on the textile industry.

Import Duty

As per the prevailing Common External Tariff (CET) implemented by Nigeria in October 2008, the major anomalies identified by the industry include:

- Grey cloth (unbleached) which is an intermediate product, being unfinished, attracts customs duty of 10per cent plus a levy of 30per cent. Normally levy should be applicable only to finished products;
- Import duty on finished dyed fabrics (5208) and African Printed fabrics (HS 5208 5110 00) which are finished product is erroneously stated as 5per cent duty (although prohibited for import). All finished products should be subject to 20per cent duty;
- Import duty some chemicals used by the textile industry (resin and resin acid 3806 1000 00 and pigments 3204 1700 00) is 10per cent instead of 5per cent as applicable to basic inputs;

VAT

- Import of insecticide treated nets (ITN) (HS 6304 9100 92) is exempt from VAT to improve access of anti-malarial commodities to the masses at affordable prices. However, perhaps inadvertently, VAT exemption does not apply to locally produced ITN's.

Tax Holiday

As per the well known Pioneer Status scheme, tax holiday for a period of five years is given to new investment in 69 recognized products/industries. The list of 69 qualified or eligible items recognized by Nigeria Investment Promotion Council (NIPC) includes only two following areas relevant to textiles:

i) Manufacture of yarn and manmade fibres;
ii) Manufacture of nets from local raw materials;

The above list may have been relevant in 1980's when the government wanted to attract substantial investment in backward integration, however under the prevailing circumstances investment along the entire value chain of textile and garment industry, from spinning to garmenting needs to be encouraged by broadening the definition of the Pioneer Status products in letter and in spirit

Textile Development Fund

Recognizing the need to remove the technological obsolescence and the high cost of funds for the working capital for the textile industry, the Federal Government established the Textile Development Fund

- A Presidential Committee on the revival of the textile industry was set up under the chairmanship of the Honorable Minister of Finance;

- A Textile Development Fund (TDF) with an outlay of N 70 (US$ 460mn) was established. Out of this N 50bn was earmarked for the textile industry and N 20bn for the cotton sector;
- NEXIM was appointed as the apex agency for implementation of the TDF and in 2007, approved textile companies were issued dummy cheques by the government, pending finalisation of the modalities of the scheme;
- In 2009, the implementation of the fund was entrusted to the Bank of Industry
- However 3 years since its announcement, the implementation of the fund remains uncertain;

The TDF is yet to be implemented due to several constraints and several mills closed down in this period:

- Technicalities involving issuance of a FGN guarantee
- Mode of funding with limited role of commercial banks
- Non availability of funds

ECOWAS Trade Liberalization Scheme (ETLS)

ECOWAS Trade Liberalization Scheme (ETLS) is a key tool under the ECOWAS Protocol to boost regional trade. However, acute constraints in its implementation have affected the textile industry.

- Delay in resolution of trade dispute between Nigeria and Ivory Coast since 2006 resulted in stoppage of duty free access of Nigerian Wax Prints to Ivory Coast which were subjected to 20per cent duty instead of 0per cent under ETLS; the dispute was resolved in 2009;
- Suspension of ETLS approvals by Federal Ministry of Finance since August 2007 led to stoppage of import of fabrics from other ECOWAS countries which may result in retaliatory measures by those countries;
- Notably, the ECOWAS Protocol allows for free movement of goods under the ETLS. As per policy the only condition being that the product and the enterprise manufacturing and exporting should be approved and gazette by ECOWAS. However, the procedure followed by the Federal Ministry of Finance requires the Nigerian importers under ETLS to apply for a prior approval for import which further requires an annual validation. This procedure is required for goods which are otherwise prohibited (such as African prints/Wax prints) but could be imported under ETLS, subject to such approval. The implementation of the approval lacks consistency and often resulting in delays; The implication of the above is Decline in regional (ECOWAS) trade in textiles

EEG (Export Expansion Grant)

The prevailing EEG policy is being implemented under the "Redesigned EEG Guidelines" with effect from 1.1.2005. The benefit essentially helps to cushion the effect of cost disadvantages faced by Nigerian manufacturer-exporters. The salient features of the policy are:

- The companies are divided into three exporter/product categories:
- Manufacturer exporters;
- Merchant exporter;
- Non manufacturer/commodities;
- EEG rate is calculated based on six weighted average eligibility criteria viz value addition, local content, employment, priority sector, growth factor for exports and investment;

- EEG is paid in the form of negotiable duty credit certificates (NDCC) which can be used for payment of customs and excise duty;
- The highest score a textile manufacturer could attain is 30per cent i.e., 30per cent EEG on the repatriated value of export proceeds;
- Each company has to submit its annual audited accounts and baseline data for determination of its EEG rating for each year;
- Constraints faced by the exporters include:
- Chronic delays in disbursement of EEG claims; it takes two years to redeem EEG claims; •Limited use of certificates for customs and excise duty erodes their value in the secondary market with discount rising to 10per cent of the certificate value which considerably erodes the net benefit to exporter;

Impact -Two year time delay leading to accumulated backlog of EEG claims paralyzed the operations of exporters and led to decline in textile exports during 2003-08 EEG

EEG Policy Eligibility Criteria

The EEG scheme operates as per the "Weighted Eligibility Criteria" in assessing applications for EEG. The baseline data supplied by individual applicant company is used in the assessment. Thus the method is "company specific". The baseline period is the preceding two financial years, prior to the export year. Another principle of the EEG policy is the "double dipping" principle as per which a company could benefit from a single export incentive only. Thus, the company would have to choose from various export schemes such as EEG, MIBS and EPZ.

Categorization of exporters - As per EEG guidelines, exporters are clearly divided into three categories. Manufactured exports are regarded as priority sector and entitled to an additional weightage of 10 per cent as stated in the eligibility criteria. An trader-exporter of cotton would be regarded as a merchant exporter and therefore entitled to a maximum EEG rate of 10per cent. However if the ginner and exporter are the same party, the same would be categorized as "non-manufacturing" entitled to 15per cent EEG (max). The weighted eligibility criteria has three EEG rate bands: 30per cent, 15per cent and 10per cent. Based on the score obtained by each company, the maximum applicable EEG rate is determined. For instance, a textile manufacturer who scores 70per cent points, would be eligible for 30per cent EEG on any textile manufactured product exported by him.

Power

The textile industry is highly energy intensive and consumes a lot of power, especially in spinning operations. Decline in power supply since2008 and high cost of diesel have adversely affected the industry.

- In the past the industry used to depend on grid power to the extent of 70per cent and remaining 30per cent from captive generation. However, since 2008, reliance on captive generation has increased to 70per cent;
- The cost of captive power generated by diesel is 4 times higher than that from grid power making the operations unviable for the industry;

- Apart from the direct cost of diesel, the provision of captive power through generators considerably adds to the capital investment, cost of maintenance and un quantified management time;

Impact - Inadequate power supply and high cost of diesel threaten the viability of textile operations which are highly power intensive

Black Oil

Supply of black oil (LPFO) at an affordable cost is vital to the operation of the Nigerian textile industry. However, its acute scarcity and high price have seriously affected the industry.

- The product is mainly supplied by Kaduna refinery which was shut down for 3 years and resumed operations only in April 2008;
- The supply of LPFO from the refinery has been erratic, leading to shortage of supply and high price in the open market;
- Total demand from the textile industry is estimated at 16mn liters per month (500 trucks) however, the supply has been less than a third;
- The official price of LPFO which was N 25.40 / liter until May 2008, was increased to N 57/liter. The prevailing market price in the North as at June 2009 was N 70/liter;
- As shown in the section on competitiveness benchmarking, Nigerian textile industry has a significant cost disadvantage in terms of power cost;

Impact - Closure of several textile mills and decline in capacity utilization of existing mills, especially in the North

Natural Gas

Availability of gas to the industry in Lagos helped to improve capacity utilization however, following constraints need to be addressed

- Gas is not available in a section of Ikorodu Industrial Estate in Lagos state which has large textile industry
- Supply of gas is erratic –over 50 days of downtime was suffered in 2007
- The price of natural gas is pegged to the price of black oil or LPFO which leads to an imperfect pricing due to arbitrary increase in the price of LPFO
- The prevailing price of gas as at June 2009 was N 25.50 / scmas applicable to existing gas users in Lagos There are no signs of gas supply to Kano and Kaduna in near future

Impact - Delay in access of natural gas supply to certain textile clusters, imperfect pricing and erratic supply, threaten the viability of textile mills running on gas

Port congestion

Efficient port operations are vital to the smooth functioning of the industry for exports and import of chemicals, spare parts and some basic raw materials.

- It takes an average of 2-3 weeks to clear imported cargo under normal conditions at Lagos ports however since 2008, the lead time increased to 6 weeks due to severe port congestion at Lagos;
- Congestion at main ports leads to transfer of containers to inland container depots (ICD's) resulting in higher costs and delays;
- As textile industry relies on supply of imported dyes and chemicals and spare parts and certain raw materials, the high carrying cost of inventory adds to the cost of doing business;
- Although customs had introduced fast track procedures for established companies however industry stakeholders did not find it effective unless overall port bottlenecks were removed.

Impact -Increase in cost of clearing a 40 Ft. container from N 200'000 to N 300'000 and Increase in inland freight from N 60,000 to N 120'000 per 40 ft container (within Lagos)

Impact - Nigerian textile industry has a cost disadvantage due to high interest cost and lack of long term funds.

4.9 Local production of textiles

Production all product groups of finished textiles registered a steep decline. The industry's core product group viz African Prints and Wax Prints suffered maximum loss of market share of almost 75 per cent to the Chinese imports. It's also to be noted that while the figures shown here represent the finished products, along with that decline, even the intermediate products and manmade fibres such as cotton yarn, polyester spun yarn and polyester filament yarn and polyester staple fibres and grey cloth for local and export market, declined significantly. Several spinning mills, one large polyester staple fibre producer and two large Polyester Filament Yarn producers and a number of weaving mills closed down in the period under study.

Table 5. Local production of textile (mn metres p.a.)

Product Category	1998	1999	2000	2001	2002	2008
1. African Print						
Super Print	250	220	200	190	160	20
Wax Prints	190	200	210	200	190	90
Sub total	**440**	**420**	**410**	**390**	**350**	**110**
2. Suiting and Shirting fabric	160	150	130	115	100	70
3. Others						
(lacers, hosiery, home furnishing, towels	100	80	75	70	50	40
Total	**700**	**650**	**615**	**575**	**500**	**220**

4.10 Import of textiles

Imports showed a dramatic increase in all product categories between 2002 and 2008. While imports of certain products such as guinea brocade /damask material and laces always had a major penetration into the local market, it is the import of African Prints / Wax Prints which increased

significantly in the 6 year period 2002 to 2008. In the year 2003, the market for Super prints was captured by cheap imports from India. However since 2005, there has been a massive increase of cheap Chinese made wax prints into Nigeria. The table below shows that import of wax prints which was estimated at only 25mn metres a year in 2002, increased manifold to 175mn metres.

Since 2007, the ban on textile products was limited to printed fabrics only; on-printed fabrics were allowed for import with payment of proper duties. However, it is observed that most of the textiles are smuggled into Nigeria by evading all duties and taxes The import of textiles increased from 800mn metres in 2002 to 1,300mn metres in 2008 representing 85per cent market share.

Table 6 Import of Textile (mn meters p.a.)						
Product	**1998**	**1999**	**2000**	**2001**	**2002**	**2008**
African print						
Super Prints	10	35	75	100	125	125
Wax Prints	6	7	10	15	25	175
Sub-Total	**16**	**42**	**85**	**115**	**150**	**300**
Damask	150	150	180	250	200	300
Lace	110	120	130	120	150	250
Suiting and Shirting fabrics						
Others	75	100	110	120	150	250
	65	120	130	150	150	200
Total	**416**	**532**	**635**	**755**	**800**	**1300**

4.11 Export of textiles

Export of textiles from Nigeria shows a significant declining trend. The following exhibit shows a 10 year trend of exports. Three major phenomena have been at play:

- until mid to late 90‘s Nigeria was the dominant supplier in the West/Central African region through flourishing cross border trade. Traders from far flung markets such as Burkina Faso, Mali, Abidjan, Cameroon, Togo and Benin used to patronize Kano, Lagos and Onitsha markets. However this pre-eminent position was ceded to China which captured the territory occupied by the Nigerian textile industry;
- With regard to the official exports of intermediate products such as yarn, grey cloth and polyester staple fibre too, there was a significant decline in exports between 2002 and 2008 due to constraints alluded to in other sections of this report (termination of MFA, inconsistent implementation of EEG policy and general decline in the production capacity of the industry)
- Due to reduction in the local cotton consumption, export of cotton lint increased significantly between 2002 to 2008;

In the table below, the year 2008 figures represent officially recorded exports of textile products from Nigeria; cross border trade was negligible. Cotton exports are for the crop season 2007-08.

Table 7 Export of cotton and textile (mn metres p.a.)						
Product	**1998**	**1999**	**2000**	**2001**	**2002**	**2008**
African print Super Prints Wax Prints	 150 100	 140 120	 120 120	 110 90	 100 50	 0 16
Sub-Total (mn meters)	**250**	**260**	**240**	**200**	**150**	**16**
Suiting and Shirting fabrics	60	60	50	50	30	1.1
Total (mn meters)	**310**	**320**	**290**	**250**	**180**	**1.1**
Cotton yarn Tons	5000	6000	2500	7000	4000	600
Polyester fibres tons	0	1000	4000	8000	8000	7000
Cotton lint tons	7000	5000	27500	17000	10000	31000

4.12 Mill fibre consumption

A global yardstick for measurement of the textile industry capacity utilization is the fibre consumption by the mills. The following table shows the trends over a period of 10 years (1998-2008).The trends reveal that the overall mill fibre consumption declined from a peak of 43‘000tons in 1998 to 61‘000 tons in 2008.

Table 8 Mill fibre consumption (mn metres p.a.)						
Product	1998	1999	2000	2001	2002	2008
Cotton	100000	93000	88000	82000	76000	40000
Polyester fibre and filament yarn	35000	31000	22000	21000	5000	6000
Others	8000	7000	6000	6000	5000	6000
Cotton production	72000	64000	93000	98000	57000	70000
Polyester fibre/filament yarn production	35000	32000	30000	29000	25000	25000

Other key trends that emerged during 2002 to 2008 are:

- Cotton consumption declined the most which is due to the fact that cotton based products such as Wax Prints / Super Prints came under maximum attack from imports. Secondly, the decline in export of cotton yarn and grey cloth and closure of spinning mills led to the fall in cotton consumption in the industry;
- Mill consumption of polyester fibre and filament yarn too declined since 2002 however the fall was not as high as in cotton;
- Cotton production declined from its peak level of 93’000 tons to an estimated 70’000 tons;
- There was a 20per cent increase in mill consumption of „other fibres“ mainly consisting of acrylic and viscose fibres used in production of blankets and fancy threads;
- The share of cotton in total fiber consumption reduced from 77per cent in 2002 to 65per cent in 2008;

The total production of textile fabrics declined in West /Central Africa. Unlike Nigeria, the other ECOWAS countries have only a few textile mills mainly producing wax prints/fancy prints which were affected by influx of cheap textiles, particularly from China, Nigeria still has the dominant textile manufacturing capacity in West Africa. Ghana and Ivory Coast have textile mills engaged in production of traditional print

4.13 Raw material Supply

4.13.1 Cotton production in the context of sub Saharan Africa

Nigeria is only the sixth largest producer of cotton in sub Saharan Africa. Although Nigeria has among the largest area under cotton cultivation, it has among the lowest yield per hectare of cotton in the region. Cotton is produced mostly by smallholders with land holding capacity of the farmers ranging from 0.5-2.0 hectares. All cotton is rain fed. There are about 500'000 smallholders are involved in cotton production in the northern part of Nigeria. The area under cultivation in Nigeria is currently estimated at 399'000 hectares. The average yield is 230kg/ha. This shows a significant decline from the earlier recorded yield of 500-600 kg/ha (year 2000).The world average yield in 2008/09 season was estimated at 784 kg. Australia had the highest yield at 1929 kg and Egypt 888 kg. The major determinants of the yield of seed cotton include the quality of the seed and the control of pests and crop diseases. As will be observed in this section of the report, the deterioration and non availability of quality seeds in Nigeria is a cause for concern. The above table shows that in case of 11 major cotton producing countries in sub Saharan Africa only 15per cent on the cotton produced was consumed locally as the rest was exported. Nigeria recorded the highest transformation rate above 60per cent based on the fact that its textile industry which has backward integration in spinning adds value to locally grown cotton. It may also be noted that, the transformation rate in case of Nigeria was much higher-over 90per cent -until 1990's before the decline of its textile industry started.

Table 9 Cotton production in Nigeria

	1999/00	2001/02	2007/08
Area planted (hectares)	490000	662000	662000
Area harvested (hectares)	490000	350000	395000
Beginning stock (mt)	13000	17000	26000
Production (mt)	64000	98000	98000
Imports (mt)	14500	10000	15000
Total Supply	**91500**	**125000**	**139000**
Exports (mt)	5000	17000	33000
Use domestic consumption (mt)	75000	75000	76000
Ending stock (mt)	11500	33000	30000
Total distribution	**91500**	**125000**	**139000**

As per statistics published by international organizations ICAC and USDA, the cotton production in Nigeria for the 2008/2009 crop was estimated to be92'000-98'000 metric tons.

4.13.2 Local estimates

There is a considerable variance between the international estimates as shown above and those compiled by the local industry which appears to be more realistic. The table below shows that the local production of cotton lint declined from 70'000 tons (180'000 tons of seed cotton equivalent) in 2006-07 to 55'000 tons (150'000 tons seed equivalent) in the 2008-09 season. During the same period, the local demand by the textile industry also declined to 40'000 tons, which is half of the demand estimated at the time of the first UNIDO study carried out in 2002/03, reflecting the decline in the sector.

Table 10 Demand and Supply of Cotton (tons)			
	2006/07	2007/08	2008/09
Export	33000	31000	11000
Consumption	55000	47000	40000
Production	70000	62000	55000

4.13.3 Exports

Exports of cotton increased significantly as the closure of several textile mills led to fall in local consumption. However in 2008/09, there was a sharp decline in cotton production which also led to lower exports. As shown in the above table, Nigeria exported over 30'000 tons per annum during the past four seasons except in 2008/09. Major destination of Nigerian cotton is Bangladesh, Pakistan and Vietnam.

4.13.4 Imports

Nigeria's cotton imports are insignificant as the mills use local cotton. As per industry estimates, imports from neighbouring West/Central Africa do not exceed 10per cent of demand to meet a limited requirement for production of medium yarn counts (Ne 28-36's) or for applications where contamination free, dyeing guarantee is required.

4.13.5 System of cotton farming

Cotton farming is done by small farmers in Nigeria, with farm sizes ranging from 0.5-2.0 hectares. The Nigerian cotton is handpicked with the resultant low trash content. The cottons produced are mostly rain fed.

4.13.6 Staple length

The majority of cottons produced in Nigeria is 1 1/16 and below "compared with staple length of 1 1/8" of cottons produced in other West-African countries.

4.13.7 Ginning

As per a comprehensive survey carried out by the Audit Control & Expertise Group (ACE) Geneva there were 51 ginneries in Nigeria in 1999 with a capacity to produce 544'000 bales per season. However due to reduction in cotton production and obsolete equipment, the number of active ginneries in Nigeria during 2008/09 season was reduced to only about 15. A few cotton processing companies which had more than one gin, were forced to utilize only partial capacity. A list of 13

active ginneries in Nigeria was identified by this study. There are only a few gins which produce cotton which meets international standards in terms of tolerable contamination, accuracy of weight and fibre properties.

4.13.8 Characteristics

Nigerian grows two short/medium staple varieties of cotton viz SAMCOT8 and SAMCOT9.Typical cotton produced in Nigeria has the following fiber properties. This cotton is suitable for spinning coarse to medium yarn counts up to a finest count of Ne 30.

4.13.9 Quality

Following are the key issues concerning quality of Nigerian cotton **Contamination** The presence of foreign fibres in the form of polypropylene is the most serious quality problem facing Nigerian cotton. The main source of contamination is over use of polypropylene sacks in the collection of cotton from the farms. The high degree of PP contamination renders the cotton unsuitable for use in dyed outer wear fabrics such as shirting and suiting material as the PP spots spoil the appearance of the fabric which has to be rejected for A grade application. However, this is not considered objectionable for use in printed fabrics. Due to the highly sensitive electronic controls in modern spinning machines, the machine productivity is affected by the presence of strands of PP which cause frequent machine stoppages.

To contain the incidence of contamination, textile mills and exporters have been making efforts toward farmer awareness and extra hands employed at ginning stage to separate strands of PP from lumps of cotton. Some spinning mills have installed automatic sensors to detect and eliminate contamination. However such measures can only yield limited success. The following tables based on a bi-annual international survey conducted by the ITMF (International Textile Manufacturers Federation) reveals that Nigerian cotton has higher incidence of contamination, particularly plastics, compared to an international average .ITMF has been conducting the global 'Cotton Contamination Survey'. The key findings from the 10^{th} survey conducted in 2007 reveal that 22 per cent of the world cotton was contaminated due to presence of serious or moderate contaminants. However in case of Nigeria (shown in parenthesis), the level of contaminated cotton was perceived to be 28per cent with serious contamination being 11per cent vis-à-vis the global average of 7per cent.

- Incidence of serious contamination 7per cent (11per cent)
- Incidence of moderate contamination 15per cent (17per cent)
- Incidence of insignificant contamination 78per cent (72per cent)

The detailed findings on the source and extent of contamination shows that of the five major sources of contamination, the most serious type of foreign fibre was strands from fabrics of woven plastic which affected half of the Nigerian cotton between moderate to serious extent. On a positive note, Nigerian cotton was found to be free from oily substances. Overall, only 72per cent of Nigerian cotton was found to be contamination-free while the remaining 28per cent was found to be contaminated. A closer look at the extent of the contamination shows that 7per cent of all cotton evaluated were seriously contaminated by some sort of foreign matter whereas 15per cent were only moderately contaminated.

4.13.10 Seed quality

Non availability of quality seeds at reasonable costs is one of the major constraints to increase cotton production in Nigeria. The Institute of Agricultural Research (IAR), Zaria is charged with the responsibility to produce breeder seed and cotton related research, It also assists National Seed Service (NSS) in the production of foundation seeds for cotton. However NSS has not been effective in this function. As a result of above constraints, the farmers rely on procurement of cotton seeds from ginneries. As these seeds lack standardization, this leads also to poor resistance of the crops to plant diseases and resultant low yields. Nigerian cotton lacks homogeneity due to absence of standardization. Due to unorganized collection and supply system from the farm gate to the ginneries, the ginneries are unable to segregate cotton originating from different fields and areas. As a consequence, the grading of the cotton becomes virtually impossible.

4.14. The Global Environment for the Textile and Garment Industry

4.14.1 General trends

In this chapter we review the present international situation and future trends as a backdrop to understand the market's driving forces that shape the evolution of the global textile-and garment industry. The textile industry is evolving world-wide in three directions as consolidation, integration and globalization.

4.14.2 Consolidation

A strong consolidation process is under way at all stages of the textile chain, from fibre production to retail. With the exception of the US situation (where consolidation has already taken place) the textile sector is still very fragmented in almost all countries. Economies of scale, traditionally related to investments in production technology, have become a determining factor in many corporate activities like sourcing, marketing, management processes, and finance.

4.14.3 Integration

Integration between different stages of the textile chain may provide great advantages in terms of speed of response to market demands and suppression of non-value-added (or duplicated) activities along the chain. These may impact on such items as product development, sampling, sales organization, marketing and promotion, administration, quality control, productivity, sales volumes, leftovers of finished products and raw materials. A successful integration strategy that is usually labeled as efficient consumer response, may involve cost advantages up to 25per cent of total cost. Integration may take place both in the form of strategic alliances between companies at different stages of the textile chain, and through mergers and acquisitions. The number of textile companies across the world which are investing in clothing and retail is in fact rapidly increasing. Parallel to that, efficient consumer response is becoming a common strategy among companies of high wage countries as a way to counteract low cost competition.

4.14.4 Globalization

The two components of this macro-trend are the globalization of markets and the regionalization of sourcing. While textile consumption in industrialized countries (USA, Europe, and Japan) is generally stable or declining, new markets are emerging in Asia, South America, Eastern Europe

and the Middle East, characterized by the growing demand for quality goods. The globalization of major brands as well as retail outlets is clearly visible from Shanghai to Berlin, from Dubai to Buenos Aires. This phenomenon has been further fuelled by the regionalization of sourcing, where the low local wages of developing countries are often coupled to the availability of raw materials, the abundance of labour and the existence of a long established tradition in textiles. For example Indonesia has labour costs of US$0.44/hour (2008) against 0.87 in Nigeria. Some countries have power costs and interest rates substantially lower, combined with higher labour productivity than others. These differences in factor costs, which vary greatly among producing countries, have enormous consequences on corporate decisions today and in future.

4.14.5 Global trade in textiles and garments

Global trade in textiles and clothing which was only US$ 96bn in 1980 jumped to about US$ 358bn in 1997 and recorded, after the Asian recession, a significant increase to US$ 356bn in 2000 but declined to US$ 342bn in 2001. It continued to increase from US$ 395bn in 2003 to US$ 479bn in 2005 to US$ 583bn in 2007.The other remarkable phenomenon to notice is the impressive growth of clothing trade compared to textile trade. In 1990, global international trade was equally distributed between both categories whilst in 2007, clothing represented 59 per cent of the total trade showing the growing importance of finished product exchange.

4.14.6 Global trade in textiles

The change in the direction of exports becomes evident if we look at the United States as an example. In the year 1990 the United States had an export in textiles of US$ 5.0bn, China of US$ 7.2 bn. 17 years later, China had an export of US$ 56.0bn whereas US exports increased only to US$ 12.4bn in the year 2007. The USA increased its imports from US$ 6.7bn in the year 1990 to US$ 24.1bn in the year 2007. The imports of China increased from US$ 5.3bn in 1990 to US$ 16.6bn in the year 2007.The following tables show some interesting relationships in the world trade of textiles. Many of the leading textiles exporting countries are also important importers of textiles. Some EU countries import as an example considerable volumes of textiles which are dyed / bleached / printed and finished in the country. China on the other hand imports considerable volumes of fully processed fabric, which the local processing sector cannot, or not yet supply to the Chinese garment industry. As said earlier China imports fabrics to the tune of US$ 16.6bn in the year 2007. This is quite an exceptional development for a developing economy. However this strategic move by the Chinese planning authorities to delink the development of the textile industry from the development of the garment industry, is one of the major success factors for the dramatic development of the Chinese garment industry. In other words the Chinese garment industry did not have to wait until all the fabrics needed by a world class garment industry are made available by the local Chinese supplies. Exports in textiles by the industrialized countries are still considerable. Exports from the European Union reached US$ 80.6bn in the year 2007 which represents almost 34per cent of the world trade in that year, whereas North America represents with exports of US$ 16.9bn only 7.1per cent of the world trade in the same year.

4.14.7 Global trade in garments

In the world exports of garments the following picture emerges: The United States exported garments for a value of US$2.6bn in 1990, US$8.6bn in 2000 and only US$4.3bn in 2007. Its share in worldwide exported garments increased from 2.4per cent in 1990 to 4.4per cent in 2000 but

dropped down to 1.2per cent in 2007.Whereas the European Union could increase their garment exports from US$56.2bn in 2000 to US$103.4bn in 2007. Related to the worldwide traded garments this represents an increase from 28.4per cent to 29.9per cent. China increased its garment exports from US$9.7bn in 1990 to US$36.1bn in 2000 to US$115.2bn in 2007. Related to the worldwide traded garments this represents an increase in share from 8.9per cent in 1990 to 18.2per cent in 2000 to 33.4per cent in2007. This impressive increase has not yet reached the top level. The European Union increased its garment imports from US$83.2bn in 2000 to 162.8bn US$ in 2007. The United States increased their garment imports from US$27.0bn in 1990 to US$67.1bn in 2000 to US$84.9bn in 2007.

4.14.8 The driving forces in global trade in textiles and garments

The evolution of the textile and clothing industries has been a combination of parameters that have shaped the global business environment and the competitive environment. These parameters include:

- The emergence of international trade agreements;
- The economic and sectoral strategies of national governments and international institutions such as the World Bank:
- Demand and technology;
- The development of international communications;
- The revolution of the retail industry mainly in developed countries;
- The strategies chosen by machine manufacturers and chemical companies;

A brief overview of each of these important factors is a pre-requisite in order to better understand the dynamics of global change in the textile and apparel industry.

4.14.9 Government policies –The example of India

FGN policies have an immediate impact on the development of the textile and garment industries. All the successful exporting countries in textiles and clothing have formulated clear textile policies for their countries which is confirmed by the textile vision in India which we present below as an example: Faced with new challenges and opportunities in a changing global trade environment, the FGN of India (GOI) unveiled its National Textile Policy 2000(National Textile Policy 2000) on November 2, 2000. The NTP 2000 aims to improve the competitiveness of the Indian textile industry in order to attain US$ 50bn per year in textile and apparel exports by 2010. The NTP 2000 opens the country's apparel sector to large firms and allows up to 100 per cent FDI in the sector develop state-of-the-art apparel manufacturing facilities and reach economies of scale to withstand competition from low-cost countries and increase apparel exports to US$ 25bn by 2010. The GOI is reviewing a proposal to deregulate the knitting mills from the small scale industry sector.

As a part of its economic reforms, the GOI has liberalized its investment policies for the textile industry. The Reserve Bank of India now grants automatic approval within a period of 2 weeks to all proposals involving foreign equity up to 51 per cent in the manufacture of textile products in the composite mills and in the manufacture of waterproof textile fabrics. The Reserve Bank of India also gives automatic approval to these mills for technology collaboration agreements as long as (1) lump sum payments for technology transfer do not exceed US$ 2mn, (2) royalty payments that can be repatriated are limited to 5 per cent for domestic sales and 8 per cent for exports, and (3) royalty

payments do not exceed beyond 7 years from the date of commercial production or 10 years from the date of the agreement whichever is earlier.FDI in India's textiles industry has been low largely because the GOI first allowed FDI rather late in the mid-1990s, when most funds were being invested in other Asian countries such as China, Indonesia, Thailand, Laos, Vietnam and Cambodia. Between 1994 and June 1998, India approved 402 textile projects totaling US$ 650mn in FDI. Of these projects, 63 involved technical assistance and 339 involved financial assistance. Actual FDI inflow totaled an estimated US$ 143mn, or only 22 per cent of the amount approved. This can be attributed to the infrastructure deficiencies of India and its rather late effort in attractive FDI. In formulating the NTP 2000, the GOI acknowledge that over-regulation and targeted tax benefits to the small scale Industry and decentralized sector units were harmful to the growth of the country's textile industry. The NTP 2000 therefore liberalizes FGN controls and regulations so that different sectors within the textile and apparel industry can function in a more competitive environment.

4.14.10 Demand, technology and international communications

Internationally, industrialized countries have attracted a vast majority of the global demand. Among these countries, several other countries have recorded the similar trends:

- Markets have become increasingly segmented and difficult to understand;
- Fashion trends have become highly sophisticated and difficult to predict;
- Quality, service and value for money have become business mottos;
- Markets in developing countries have remained difficult to reach;
- Lifestyles tend to converge towards an industrialized, urban, consumer and casual lifestyle model;

The sources of these movements have been trade liberalization and improved international communications. Multi-national media (especially films, television and internet), low travel and communications costs are accelerating the diffusion of new ideas and tastes between nations. The result is the emergence of international market segments. The ability to identify and exploit new trends internationally have been behind the global success of global brands such as Ralph Lauren, Calvin Klein or the GAP, and of global products, such as jeans, suits, and several sportswear items. On the supply side, new information technologies (IT) and management systems such as ISO 9000 have enabled improved long-distance supply capabilities. Just as important, through standardization, they have provided a more open and transparent marketplace by creating new benchmarks that suppliers and customers can adopt to guarantee performance.

Leading textile and apparel retailers have quickly understood the significance of IT and international standards. They are already establishing virtual exchange base to set Internet communication standards for textile and apparel products in a move to cut third party providers. In other words Internet development enables to reconsider the role of each stakeholder of the textile chain as suggested in the following figure.

4.15 Impact of international strategies pursued by retailers

4.15.1 The retail revolution

The growing internationalization of retailing evident in recent years will accelerate as global economic integration proceeds and as domestic market saturation stimulates more retailers to seek growth opportunities outside their own borders. Combination of retailers of different nationalities

will become common, though national champions will precede international integration. The diversity of consumer lifestyles will continue to support different formats and channels to market. However and despite the progression of virtual shopping, bricks and mortar retailing will maintain a leading position due to its role as a leisure activity and improved services. Retail competition will continue to intensify as consumer choice expands. Intense competitive pressures, shifting and ever more complex consumer requirements and market and channel diversity will press retailers to put more emphasis on managing brands and channels as they develop multiple channels (stores, catalogues, merchant websites) for private label merchandise.

4.15.2 Non-store retailing

Over the next 10-15 years, there will be a significant shift to non-store retailing of all types, from the traditional phone-order (but this time on a wireless personal communicator, with interactive video screens, anytime, anywhere)to interactive, in-home shopping –or anywhere, shopping. In the mid 90s, non-store retailing accounted for 15per cent of total general merchandise, apparel and furniture sales. In 2010, non-store sales should account for approx. a third of total sales –30per cent. What will cause this shift from in-store to non-store retailing? The consumer, aided by technology. The consumer is the driver. The consumer wants speed, efficiency, access, choices, customization and instant service. Technology is the enabler, sometimes the innovator, for this new world of retailing. It will also give consumers access to amounts of information and options. Technology will also give consumers control to activate demand when and where they choose. For retailers, how this mass of information will be edited for the consumer will become another new differentiator among competitors. An important development in non-store retailing is 'home' shopping. Home shopping will be interactive, on demand, with 'infinite' channels and choices. Wireless personal communicators will allow consumers to shop anywhere, anytime –customers will even be shopping in 'virtual' stores where they will be able to try on various colours and sizes, etc. In this world, all retailers will:

- Have value embedded in their lexicon;
- Be connected to the consumer electronically for customized service and marketing feedback;
- Be connected to their suppliers electronically for product planning, sales forecasting and automatic replenishment;
- Collaborate with designers, developers and distributors, forming virtual entities and eliminating non-value adding, redundant functions; There will be no definitive lines between channels as they exist today. Although some retailers will succeed and some will fail, make no mistake –electronic shopping signals a strong change for retailing in the future.

4.16 Impact of international strategies pursued by textile equipment suppliers

Equipment suppliers have played an important role in intensifying international competition in the textile and apparel sectors. In pursuit of global positions, these international companies have ensured that new products and technologies have been diffused rapidly.

4.17 Impact of international strategies pursued by dyes and chemicals suppliers

Environmental regulation is spurring considerable product reformulation and increased interest in recovery and reuse operations. Chemical suppliers are moving away from the use of objectionable solvents, heavy metals, salt and other chemicals that release formaldehyde, volatile organic compounds or other regulated materials. While constraining volume gains in chemical demand, this trend offers opportunities for companies which develop products which reduce the environmental impact of textile production. These chemicals include high fixation dyes, auxiliaries which increase the efficiency and performance of dye and finish operations, low-formaldehyde finishes, water-based polymers, non-chlorine bleaches, and enzymes. While minimal at present, increased dye bath reuse could lower consumption of dye auxiliaries and possibly even dyes, although this is unlikely through the end of the century. The outlook for textile end use markets plays a key role in both volume and mix of textile chemical consumption. Through the year 2000, best prospects are expected in medical products, especially value-added nonwovens, high-performance industrial textiles, such as coated fabrics, and carpets and rugs. Import penetration into these markets has been minimal as US textile producers maintain production advantages based on the use of automation and other advanced machinery. Many of these products are also less labour intensive. In contrast, apparel markets will experience below-average gains due to the high import presence in the market and the depressed outlook for dye consumption. However, the apparel market, due to its fashion focus and fast-changing requirements, will continue to demand new, high performance, high-value chemical treatments. There are numerous companies involved in the supply of chemicals to the textile industry, ranging from large, multinational conglomerates such as BASF to small, niche formulators such as Piedmont Chemical. However, despite this diversity, sales are dominated by the large dye, chemical and polymer producers, with three companies --BASF, Ciba and DyStar--alone controlling nearly one-quarter of the total market. While large chemical companies such as Imperial Chemical Industries and BF Goodrich are important volume suppliers, specialty companies such as Apollo Chemical and IVAX are key players due to their strong focus on textile applications, their close customer contact and important role in new formulation development.

4.18 Trends in final consumption

4.18.1 Evolution of the World population growth

Recent studies demonstrate that population growth will not stop during the first half of the 21st century. It is however unclear whether global equilibrium will settle down at 10 or 11bn people; indeed, it is not established whether the stabilization of human population can be fully achieved by the year 2100. As standards of living and education improve, the birth rates will fall and the rate of world population growth will subside. However, a huge worldwide bulge of fertile youth (mostly in poorer countries) is a key parameter to be taken into consideration in order to anticipate future trends. Even with the prospect of smaller families, the effects of the medical revolution -which will provide and is providing longer life spans –mean that there is a long way to go before world population stops growing. It is clear that the increasing pressure of population on natural resources will be a one of the major problems of the 21st century.

4.18.2 World GDP growth by regions

The skewed consumption position reflects the global economic imbalance between rich and poor nations. However, despite the recent Asian crisis, overall economic and population growth rates

have remained higher in the developing countries. The next figure shows some projections regarding the development of poor populations in the World and suggests that the only region which is not going to improve its current situation is Africa. All the others should see their poor population ration decrease over the next 10 years.

4.18.3 Evolution of the fibre demand

The World population is continuing to grow mainly in the developing and emerging economies. At the end of the second millennium, more than 40per cent of the World population lived in China, India and Brazil and now that figure is approaching 50per cent. Since an increase in purchasing power is also evident in these countries, global fibre consumption is growing at a faster rate than the world population. The current per capita consumption of fibres in North America, Western Europe, Japan, Taiwan, South Korea and Turkey is more than 10kg. One billion people live in these rich countries as shown in a previous figure. Annual per capita consumption of fibres in the rest of the World is less than 10kg. However the rest of the World accounts for more than 80per cent of the global population. A comparison of fibre consumption between industrialized countries and developing countries reveals striking growth potential for fibres, yarns and textiles. Rising population figures and economic growth are therefore still regarded as the driving force of the textile and garment industries. Population growth (approx. 1.32per cent per annum) will contribute to some 40per cent of the increase in fibre consumption, while economic growth and the rise in disposable income will account for 60per cent for the overall increase. Annual per capital consumption of fibres has risen from 8.2 kg in 2000 to 9.6 kg in the year 2007. This is equivalent to an annual growth rate of 2.3per cent.

4.18.3.1 Natural fibre versus MMF- Global fibre demand has been rising as a function of population growth and per capita usage. In 1982 the world managed its textile and garment requirements with 30mn tons of fibre; 50per cent of it being cotton. 25 years later world fibre consumption stood at 82.5mn tons and with a cotton share of 31.6per cent. Development of polyester is one of the explanations for this rapid shift. The driving factor for the strong growth in PES are by the side of macro-economic growth (population and economical development):

- Easy and cheap to produce;
- Availability of raw material (PTA and MEG);
- Easy processing;
- Flexibility in end-use;
- And of course strong innovations fuelled by R&D efforts engaged by strong oil and chemical companies (Shell, Dupont, etc...);

4.18.3.2 The evolution of MMF- The worldwide market for MMF is dominated by polyester fibre group which reported a production volume of approx. 30.6mn tons in 2007. This total volume corresponds to a 60per cent market share. The polyamide fibre group ranked second with its output of approx. 4mn tons, a total volume which corresponds to a 8per cent market share. The next positions are occupied by:

- Polypropylene fibres with 6.3mn tons;
- followed by cellulosic fibres with 3.7mn tons;

- Acrylic fibers with 2.4mn tons…;
- and other synthetics fibres such as elastane, aramide, glass and carbon fibres with totally about 4mn tons; Filament yarns make up approx. 51per cent of the total market of MMF compared with staple fibres, which represent 49per cent.

4.19 The global spinning and weaving industry

The textile and clothing industry is one of the most globalized industries in the World, imposing its rules of the game on all players willing to participate in its growth.

- The textile industry (including the garment industry) is one of the industries in the world economy which is common to almost all countries;
- As one of the key industries in the changing international division of labour it is one of the major battle grounds within and between the industrialized countries and developing countries;
- The importance of the textile industry can be measured by its size. It ranks number 3 after the tourism and information industry;

4.19.1 Flow of investments

A strong indication for the changes in the international division of labour in the primary textile industry is the flow of investments and the resulting installed capacities. A brief analysis shows the dramatic decline in the installed capacities in the industrialized countries along the textile chain. South America showed a moderate increase, Africa stagnated, only South East Asia increased its share in the world capacities over the period 1985-1999.

4.20 The future outlook

4.20.1 Mill fibre consumption and final demand

Projections concerning fibre mill consumption and final consumptions are shown in the following figure. This analysis suggests the following:

- China will increase its fibre mill consumption by 80per cent between 2005 and 2015;
- North America and Europe should still record a significant increase in their final demand whilst their mill demand slightly decreases;
- India should record impressive growth rate both in mill and final consumption;

4.20.2 Demand and location of textile industry

The internationalization of marketing and production operations has been a major parameter in the evolution of the textile and garment industry. As foreign competition has intensified in their domestic markets, companies have sought to establish a presence in international markets either through exporting, foreign manufacturing operations or licensing. The most rapid movement has been in the garment sector where cost differences are greatest and which is relatively mobile. Movement in textiles has been slower. However, textile manufacturing is clearly being drawn to be close to garment operations to satisfy cost and speed requirements but also because of local FGN incentives. As a example, consequences to this phenomenon have been -and will be -massive investments in spinning equipment as shown in the following figures.

4.20.3 The development of technical textiles

4.20.3.1 Definition of technical textiles **-** The technical textiles industry is a diverse and dynamic one, embracing a wide range of materials, processes, products and applications. It also shares a number of technologies and has overlapping interests with other materials industries such as glass, plastics, films, membranes, metals, composites and paper. The following definition is given by the Textile Institute: *"Textile materials and products manufactured primarily for their technical performance and functional properties rather than their aesthetic or decorative characteristics."*

4.20.3.2 Definition of technical textiles **-** The technical textile sector represents a significant proportion of world textile manufacturing and trade. Recent studies within this field indicate that an estimated 40per cent of fibre consumption within developed countries is consumed in the manufacture of technical textiles. Developments within the technical textile sector have been characteristic of high added value products, high technology and performance and a niche market orientation. Additionally, technical textiles are utilized in a broad cross-section of industries and applications. Technical textiles are expected to continue to grow at a higher rate than any other segment of the textile market.

4.20.3.3 AGOA **-** The African Growth and Opportunity Act (AGOA) was enacted in 2000 to provide non-reciprocal trade preference to eligible sub-Saharan African countries in the form of quota free and duty free market access to the US under the Generalized System of Preferences (GSP) It provides additional security for investors in Sub-Saharan African countries by extending benefits under the GSP programme for beneficiary countries till 2015. African exports of apparel to the United States have more than doubled under the AGOA duty-free preferences, creating an estimated 200'000 new jobs in Africa. But this success story got a setback upon expiration of the Multi Fibre Arrangement (MFA) in 2005, which exposed Africa's infant industry to competition from strong and well-established Asian producers, especially China, Bangladesh and Cambodia. Since 2005, U.S. apparel imports from Africa have declined by 25per cent with the loss of an estimated 50'000 African jobs. It is widely recognized that the competitiveness of Africa's apparel industry would be enhanced by the parallel development of a competitive textile industry to supply the inputs of apparel production. Without a viable upstream to supply competitively priced yarns and fabrics, the sustainability of AGOA is in peril. The following table depicts the trends in import of apparels imported by USA under AGOA.

4.20.3.4 Emerging Trends and Impact of World Economic Crisis on the Textile Industry **-** The textile industry has been undergoing unprecedented changes caused by a combination of factors which are specific to the industry and the fallout of the global economic crisis. Governments in developed and developing countries have responded to these changes in significant ways.

- The US which is the largest market for textiles and garments (US$ 93bn in 2008) registered 3per cent drop in total imports in 2008 and 8per cent drop in January 2009;
- China's exports of textile and garments growing at double digit rate until 2007, increased by 4.7per cent only in 2008 and in fact recorded 15per cent negative growth in Jan-Feb 2009;
- India had targeted exports of US$ 50bn by 2012, but achieved only US$ 21bn till 2008; 4.Pakistan's exports suffered as exports were at US$ 10bn against target of US$ 22bn;

5.New low cost countries have emerged with double digit export growths and adding capacities vacated by bigger countries and leveraging their low labour costs –Bangladesh, Vietnam and Cambodia;

- Textile machinery industry facing unprecedented crisis due to stagnation in new investment in the industry;
- The Sub Saharan countries are still in the process of negotiating the terms of the Economic Partnership Agreement (EPA) with EU. Many countries which did not sign the interim EPA in 2008(e.g., Nigeria), lost the duty free preferential market access of their textiles (among several other products) to EU;
- Decline in commodity exports from SSA countries in the midst of the world recession has rekindled the importance of agricultural and manufacturing sector;
- Weaknesses of currencies in many SSA countries could boosted their export competitiveness subject to other conditions not being unfavourable (infrastructure and high cost of doing business);

4.21 Major constraints

The Nigerian textile industry is faced with numerous internal and external constraints. In recent years negative developments some deriving from internal policies, bordering on gaps in government policy implementation, while others were external in nature have continued to undermine the industry. A combination of several negative factors, some of which exposed the vulnerable textile sector, while others were more general in nature, nonetheless rendered the operations of many a textile mill unviable. Even the existing textile industry has been operating at below 50per cent capacity only.

At present Nigeria's textile companies are struggling with:

- Stiff competition from massive illegal Asian imports of cheap textiles and garments in spite of a partial import prohibition imposed since 2002;
- Changing consumer tastes and habits
- An outdated production base resulting in low machine and labour productivity and high conversion costs;
- Poor infrastructure which forces mills to generate their own electricity, find their own water supply and erratic supply of fuel oil (LPFO) due to the poor state of the refineries;
- Inconsistent government policy environment for manufacturing industries especially textiles reflected in lack of implementation of well stated policies;
- High cost and lack of long term funds;

In specific terms, the major constraints include:

i) Massive influx of cheap textiles, particularly from China since 2007, flooded the Nigerian markets. Initially, the local industry responded by curtailing the production to avoid stock piling. However as the influx increased further, several mills found it unviable to continue the operations. Apart from smuggling, counterfeiting of local manufacturers trademarks and falsification of the country of origin markings by unscrupulous overseas producers, caused a setback to popular local textile brands. 25 large textile mills in Kaduna, Lagos and Kano

closed down during 2003-08 Smuggled goods occupy over 85per cent of the estimated US$ 1.4bn textile and garment market in Nigeria and representing a lost revenue of about US$ 325mn on account of evasion of customs duty and VAT. Many of these goods, which originate in China, counterfeit the trademarks of Nigerian textile manufacturers and bear false 'Made in Nigeria' markings.

ii) Infrastructural deficiencies became acute since 2006. The prolonged closure of the Kaduna refinery for nearly two years during 2006-08 resulted in a perennial scarcity and high price of black oil (LPFO) heavily used in the processing of textiles was the major factor responsible for the closure of the large textile mills, particularly in Kaduna and Kano which were solely reliant on that fuel oil for their operations. Acute power shortage in the country also hit the textile industry in 2008 and the high price of diesel due to the unprecedented crude oil price in the world market made the operations of many a textile mill unviable;

iii) EEG implementation suffered a setback as the policy was suspended for a prolonged period of 2 years with a view to streamlining the scheme. Backlog was outstanding claims had a serious negative effect on the operations of the non-oil exporters in general. Eventually when the scheme was restored in 2006, the effective benefit was halved and was not perceived to be sufficient to make the price of Nigerian textiles internationally competitive. This caused an irreversible set back to textile exports;

iv) Strengthening of the exchange rate between the Naira and US Dollar by about 13per cent between 2004-08 had a twin negative effect on the textile industry. On the one hand it led to cheaper imports which occupied greater market share of the domestic market and on the other hand, export of Nigerian textiles became uncompetitive due to an unfavourable exchange rate;

v) Phasing out of the MFA had a negative impact on export of textiles and apparels from sub Saharan Africa as it eroded the quota free advantage enjoyed by the African countries until 2004. Specifically it resulted in loss of preferential market access for Nigerian textile products such as cotton yarn, fabrics and polyester staple fibre in the EU market;

vi) Scarcity & high price of Black Oil –Generally the manufacturing sector suffers from deficiency of electricity. However the scarcity of black oil (LPFO) and its high price has been seriously affecting the textile industry in particular. Since 2006, due to the erratic functioning of the Kaduna refinery the industry has been receiving hardly 20per cent of its requirement of LPFO and the recent increase in the ex-refinery price from N 25.40 to N 59/liter has made the operations unviable.

vii) Textile Development Fund –The Fund was announced in 2006 with a view to provide concessionary financing to the sector for retooling the equipment and funding the working capital needs. Due to the high interest rates and non availability of long term financing, the textile industry has not been able to modernize. The delay in implementation of the proposed fund hastened the closure of many textile factories.

viii) Cotton production –The quantity and quality of cotton has been declining due to fall in local demand. Nigerian cotton is perceived as low quality due to high level of contamination and the productivity (yield per hectare) remains among the lowest in the world.

Increase in inventory holding cost raw material base Cotton

Following are the key issues relating to quantity and quality of cotton

ix) Cotton production in Nigeria has been declining from a peak level of 200,000 tons (seed cotton) to 150'000 tons in 2008/09 and if this trend continues, Nigerian textile industry may face a crisis due to cotton shortage from 2010 onwards;

x) The quality of cotton is a matter of concern. The lack of standardization and supply of quality seeds is a serious issue. Nigerian cotton remains highly contaminated with the incidence of polypropylene foreign fibres;

xi) A long term constraint with the Nigerian cotton is lack of medium staple (11/8), the type required to spin medium to fine counts up to Ne 40's;

xii) In the past inconsistent implementation of export incentive (EEG) led to an indiscriminate export of cotton lint as a basic raw material to detriment of the local textile industry. This discourages value addition to indigenous raw materials;

xiii) In terms of manmade fibres, Nigeria produces polyester staple fibres which was also affected by the reduction in spinning capacity during 2003-08. Manmade fibre and filament yarn plants require high economies of scale and uninterrupted power supply, factors which are deficient in Nigerian conditions;

Impact - Declining trend in cotton production threatens the viability of Nigerian textile industry post 2010

Financing issues

xiv) High interest cost and lack of long term funds

xv) Textiles is a capital intensive industry, both fixed as well as working capital and accordingly, the cost of funds has a significant impact on its viability.

xvi) Raw material represents over 50per cent of the total cost of production. Due to seasonal availability cotton, the textile mills have to procure cotton for the whole year which ties down a large chunk of working capital;

xvii) Other inputs such as dyes and chemicals and spare parts are imported and also require at least three months of inventory at any given time;

xviii) For capital expenditure for expansion / modernization the industry faces non availability of long term loans from commercial banks. The Bank of Industry has barely funded a textile expansion project since 2005;

xix) Only a few textile mills take advantage of working capital funding available at a concessional interest from NEXIM Bank;

xx) The prevailing interest rate on working capital funds as at June2009 was 22per cent p.a.;

xxi) The strength of Naira during 2003-08 led to rise in imports however the decline in the value of Naira since 2008 improved the competitiveness of Nigerian textiles vis à vis imports;

xxii) Non implementation of Textile Development Fund caused a set back to the plans of the textile mills to re-tool and led to an accumulation of a huge backlog of replacement of old equipment;

International textile situation and impact of the global economic crisis

There has been a fundamental restructuring of the global textile industry, particularly since the expiration of the Multi Fibre Arrangement (MFA) in 2005 and adoption of WTO based trading system. This has led to the shift of the production capacity from the developed countries towards developing and less developed countries. Countries which have integrated value chain from raw materials to finished products and competitive wages have been the major beneficiaries of this shift. China, India, Pakistan, Bangladesh and Vietnam have emerged as the major textile producing and exporting countries.

Countries in Sub Sahara which had benefited from preferential market access under AGOA and Cotonou agreement faced loss of preference and resultant decline in exports. There is no doubt that government support is essential to the development of the textile sector. The above countries adopted policies and gave attractive incentives to develop their textile industries. Six aspects of the conducive policy regime are:

- A clearly stated vision and policy for the textile sector. Some of the countries even have a dedicated textile ministry;
- Investment incentives in the form of concessional funding for modernization and expansion of capacity. The Indian government provided long term concessional funds of over US$12bn during 1998-2008 to its textile industry;
- Enabling environment in terms of efficient infrastructure with adequate availability of power and fuel and transport coupled with special economic zones;
- Fiscal policy incentives such as tax holidays up to 10 years and export tax rebates;
- Concessional export funds to compete in the international market;
- Other benefits in these countries consist of adoption of bio technology for improving cotton quality and productivity, human resource development through textile institutions and preferential market access, among others;

The current financial crisis has had a significant impact on the global textile industry as reflected in the following trends

- The massive capacity expansion in China, India and other countries since 2005 led to excess production capacities due to fall in demand in the developed countries markets in the US and EU;
- Lack of demand from the developed countries led to diversion and dumping of textile goods in Africa causing a serious injury to its fragile local textile industry;
- New investment in the textile industry has stagnated since 2007-08 as reflected in the distress suffered by textile machinery manufacturers;

Major constraints faced by the garment factories are similar to those faced by the organized textile industry:

- Illegal imports of garments and second hand clothing dominate the market. Garments such as jeans, dress shirts, knitted underwear and other types of Western wear are almost entirely imported.
- The dressing habits of people are still predominantly traditional which require the ethnic style garments for men and women to be stitched locally by custom tailoring outfits rather than organized garment factories;
- Nigeria lacks the export competitiveness due to infrastructural constraints and high cost of doing business. This discouraged the entry of FDI into the garment industry, unlike countries such as Lesotho, Kenya and Swaziland which were able to attract FDI into export oriented garment factories involved in garment assembly operations at a large scale;
- As stated in the other section, delay in processing of export incentives is a deterrent to new entrants to exports. It takes nearly two years to redeem export incentive claims;

The Cotonou Agreement that provided a duty free and quota free market access to Nigerian (and sub Saharan) textiles into the EU for several decades expired in December 2007. The expiration of Cotonou Agreement and inability to enter into the Economic Partnership Agreement (EPA) with EU, resulted in a tariff disadvantage up to 6.2per cent for Nigerian textiles being exported to EU. The following products were affected:

- Polyester staple fibre;
- Cotton yarn;
- Woven fabrics;
- As at June 2009, the two West African regional organizations ECOWAS and UEMOA (West African Economic and Monetary Union) and EU were negotiating the terms of EPA to pave the way for a successful conclusion of a regional trade agreement by October 2009;

Impact - Exports of textile products have been declining due to loss of tariff preference in EU market EPA (Economic Partnership Agreement) A significant distinction between the Cotonou Agreement and EPA is the rules of origin. Textiles and clothing have seen the most fundamental changes:

OLD rules: highly restrictive, required two distinct steps of local processing

- For clothing: required making of fabric plus making of garment
- No sourcing of fabric from abroad
- For fabric: required making of yarn plus weaving of fabric

NEW rules**:** allow flexibility, generally “single-stage” local processing

- For clothing: must make up garment locally but from any fabric
- Allows producers to source fabric from anywhere in the world
- Similar to RoO under AGOA
- For fabric: must weave locally but can use yarn from anywhere The implication for Nigeria would be that a garment exporter could source fabric from any country and still the

garments stitched or assembled in Nigeria would qualify as made in Nigeria. This would bring the EPA at par with AGOA as regards rules of origin.

4.22 Industrial stakeholders' perception of solutions to the problems

4.22.1 Addressing the issue of smuggling and counterfeit products

The suggestions received from various stakeholders -local as well as international agencies have been captured below:

Training: Ports are the point of entry of many counterfeit goods –from fake medicines to textiles. Nigerian customs controls and port authorities need appropriate training so they can recognize, seize and destroy counterfeit textiles.

Raids and media: Counterfeit textiles are sold openly in marketplaces and without any fear of reprisals. Vendors do not seem to be aware that it is illegal to sell the counterfeits. Raids may only be a temporary setback for counterfeiters but they attract media attention, quickly spreading the word that the illegal sale of counterfeit goods will no longer be tolerated. It may be recalled that raids conducted by Nigeria Customs Service at warehouses in Kano in 2003/04 had a positive impact.

Cooperation –neighbouring countries: Smuggled counterfeit textiles are being sold across Africa. The border patrols required to curb smuggling would, therefore, demand more than coordinated efforts between Nigeria and its neighbours, Benin, and Niger, as undertaken in the past. But it would certainly be a start.

Cooperation –exporting countries: NAFDAC gained the cooperation of the Chinese and Indian governments in their fight against counterfeit drugs; both countries had a number of companies that had been indicted for manufacturing fake drugs. International cooperation with exporting countries could well play a pivotal role in enforcement. China has also become Africa's primary partner for development. Would there be a possibility for cooperation between Nigeria and China on customs and port controls, modeled, for example, on the China and European initiative which aims to tighten enforcement and crackdown on counterfeiting by sharing information among ports.

Based on the interaction with stakeholders, the following areas have been identified where UNIDO and other donors could offer assistance to the Nigerian cotton-textile-garment sector:

1. Institutional Capacity Building – Public & Private Sector

This intervention involves the strengthening of the capacity of the government institutions, mainly the Federal Ministry of Commerce & Industry and the Bank of Industry to effectively steer the revival of the textile sector. At present there is a lack of a unified, empowered agency to spearhead the sectoral development. There is also a need to strengthen the organized private sector agency to interface between the industry and the government.

The factors include :

i) Creation of a dedicated Textile Sector Restructuring Unit (TSRU) within the ministry to act as a nodal agency for overseeing the issues relating to the textile sector, coordinating with other government agencies and programme monitoring

ii) Training and development of the ministry officials at various officials on the fundamentals and dynamics of the textile sector and appreciation of various policy inputs required to address the sectoral issues. The ministry officials should be provided exposure to international best practices through interaction with the policy makers and institutions in other textile producing developing countries

iii) In the private sector the institutional capacity building intervention should be made to equip the Nigerian Textile Manufacturers Association with IT tools, trade journals and subscription to the International Textile Manufacturers Federation for continuous exchange of information at a global level.

2. Assistance to the Bank of Industry

The BOI has been entrusted with the responsibility of implementing the Textile Development Fund. The Bank would need technical assistance in this area which may be provided through the following means;

i) Technical assistance in formulating the policy for the implementation of the fund. This would also include the criteria for selection of beneficiaries of the fund, monitoring mechanism and assessment of benefits derived;

ii) ii) Training and orientation of the Bank officials to the fundamentals and dynamics of the textile industry. This should include exposure to international best practices adopted by major textile producing countries;

3. Trade capacity building

It was felt that the Nigerian textile industry which was created in the post independence period needs to be restructured. There is a need for the private sector firms to diversify and improve their understanding of the changing consumer tastes and preferences. The trade capacity of the private sector could be improved by interventions suggested below:

I) A survey of the dressing habits of people in Nigeria and the region;

II) Techno commercial feasibility for establishment of new projects for production of insecticide treated long lasting mosquito nets (LLIN),

III) Readymade garments such as Jeans and home textile products such as sheeting and terry towels;

IV) A market study on potential for technical textiles;

4. Cotton improvement

It is clearly evident that unless urgent steps are taken the Nigerian cotton production would suffer in near future. The key interventions required should be in the following areas. Exploring the introduction of bio technology in improving the yield and quality of Nigerian cotton.

Learning from experience of other countries such as India. Reduction in contamination levels in Nigerian cotton through benchmarking with international best practices and creation of better awareness and education at the level of cotton growers and ginners.

5. Human resource development

Due to the downtrend in the textile sector not only has the industry lost skilled manpower but also resulted in lack of interest in the field by the present generation of youth. The lack of adequate funding of the textile training institutes has also been a negative factor responsible for the low skill level in the industry. There is a need to strengthen this important aspect through various interventions in partnership with the private sector suggested below:

i) Refunding the technical institutes such as the Yaba School of technology and the Kaduna polytechnic to strengthen their textile and garment departments through supply of equipment, laboratories and educational materials;
ii) Undertaking training and re-training in selected textile mills for spinning and weaving operators;
iii) Strengthening the capacity at the NEPC garment training school at Lagos and CFC Aba through supply of equipment and training materials;
iv) Engagement of international garment experts for the training of garment factory operators, supervisors and entrepreneurs for improving productivity and commercial practice;

6. FDI Promotion

If through government intervention a level field is created for the existing local textile industry, the local industrialist will certainly respond with investments to increase their market share. Assistance in the form of measures suggested below could be offered to promote FDI in the sector. This should however be embarked on only at a later stage when there is evidence of recovery in the health of the sector and basic policy interventions have been implemented:

i. Preparing a textile industry profile to provide a summary of the opportunities for international investors;
ii. Identification of key players in various textile producing countries who may be interested in relocating / expanding to Nigeria;
iii. Visits to select countries for FDI promotion;
iv. .Arranging reciprocal visits from potential investors to Nigeria;

4.23 An inventory of the modern industrial applications of the Nigeria's resource base

4.23.1 Benchmarking of the age structure of the machinery installed in the Nigerian textile industry

The following tables show the age structure of the Nigerian spinning and weaving equipment in comparison with some of the major textile producing countries of the world and shows the lack of modern equipment in Nigeria, resulting in low quality and low machine productivity.

4.23.1.1 Ring spinning -Short staple - Compared with the reference countries Nigeria shows in 2007 (as in 2003) the lowest level of modern ring spinning equipment. Only 3.5per cent of the ring spindle installed are 10 years and less than 10 years old. In South Africa it is 100per cent.

4.23.1.2 Open end spinning - In open end spinning the machines installed in Nigeria show a quite favourable age structure in comparison with the reference countries, 48per cent of the rotors installed are 10 years and less than 10 years old. China has the most modern machines and this on a massive scale

4.23.1.3 Shuttleless looms - Only 2.7per cent of the shuttleless looms installed in Nigeria are less than 10 years or 10 years old. In South Africa 37.8per cent, in Turkey 45.8per cent and in India 100per cent. However, China has the biggest shuttleless loom population and 76.1per cent are 10 years and less than 10 years old. In the out dated, low speed shuttle loom sector Nigeria has still about 2'300 looms installed. The ratio of modern shuttleless looms to shuttle looms is apart from India the lowest compared with the reference countries as the table shows.

4.23.1.4 Installed fabric capacities, capacity utilization and replacement value of textile industry - According to industry estimates the total sector has an installed capacity of 1.4bn linear metres. The production in the year 2002 was about 500mn linear metres resulting in a capacity utilization of about 35per cent. Based on the present production, the sector represents a replacement value of about US$ 2.0 bn.

4.24 Textile capacities installed in Africa

4.24.1 Spinning

The African continent has a share of only 3.0per cent, in 2007 of the world installed spinning capacity in ring spindles and a 2.2per cent share in the installed rotor spinning capacity.

The share in the world shipment of new textile machinery is a direct indication of the level of technology of a sub-sector in a particular continent.

On the shipment side, the figures of Africa are also not very impressive. From all the shipments made in the years 1999-2008, Africa had only a 1.2per cent share in ring spinning shipments and 1.0per cent in rotor spinning shipments.

4.24.3 Weaving

The African continent had a 1.3per cent share of the world installed weaving capacity in shuttle less looms and 4.1per cent in shuttle looms in 2007.In the cumulative shipments between 1999-2008 the share for Africa was 1.2per cent in shuttle-less looms and 1.6per cent in shuttle looms. The following table describes both installed capacities and cumulative shipments for all continents.

4.24.4 Capacities installed in Nigeria

4.24.4.1 Short-staple spinning sub-sector - The Nigerian short-staple spinning capacity installed ranks n°2 in Africa after Egypt. In the Sub-Saharan countries, it ranks n°1 before South Africa. However the sector is over aged with only:

- 3.5per cent of the ring spindles installed being less than 10 years old, whilst South Africa records a 100per cent ratio;
- 48.9per cent of its rotor spinning capacity being less than 10 years old, whilst China records a 85.6per cent ratio;

The following table and the table on the next page summarizes installed capacities in 2007 and shipments made between 1999-2008 in short staple spinning in Nigeria and compared them with two countries in Africa and three countries in Asia to show the scale differences.

4.24.4.2 Weaving sub-sector

- **Shuttle looms**

In the obsolete shuttle weaving technology, Nigeria has the highest population in Africa after Egypt.

- **Shuttle-less looms**

In the shuttle-less looms population, Nigeria holds the first place in Africa however with a negative age structure. Only 2.7per cent of the looms installed are indeed 10 years old and less against South Africa which records a 37.8per cent ratio.

4.24.4.3 Mill working hours/year - For a developing country, the mill hours worked / year are quite low compared with the reference countries. This results in a low level of utilization of the capital intensive spinning, weaving and processing equipment in Nigeria and adds to the fixed cost. The low capacity utilization is attributed to three main factors:

- Power and fuel outages –Erratic supply of electricity and fuel oil (LPFO) and natural gas have a significant negative effect on the manufacturing operations. It was estimated that the industry in Lagos state experienced over 50 days of down time due to lack of supply of natural gas;
- Seasonal nature of demand whereby buying activity is at a low ebb during the rainy period and peaks after the harvest and festival seasons, forces the textile mills to reduce production in the off season (May-September);
- The working method in the Nigerian textile industry is on 5 days basis unlike a 7 day shift working in the Asian countries with each worker putting in up to 60 hours a week and taking time off by rotation and not necessarily on a fixed day such as a Sunday. The Nigerian textile mills experience high absenteeism on the weekends and instead of running the operation at an uneconomical scale choose to stop or curtail production on the weekends;

4.25 Gauging Nigeria's distance to world's best practices in processing, design and marketing

In comparing the Nigerian situation with practices in different parts of the world one understands the distance to world's best practices in the textile and wearing apparel industry.

4.25.1 Supply chain strategies

In order to optimize their margins, garment contractors in developed countries are refining their supply chain management: not only do they select sourcing zones and their co-sourcing manufacturing partners more carefully, but they also try to master the difficult technique of combining three distinct delivery schedules, i.e. (i) long-term, (ii) mid-term and (iii) short-term. Long term collections are mostly conceived one year in advance, mid-term collections are mini-collections worked out some six months in advance, while the short-term collections are designed

in response to the first results of the season. The general trend among prime contractors is towards delayed engagements, fractioned orders and smaller quantities. It is of course in their advantage to place orders as late as possible so that they can get the best possible information on new market developments. However, this behaviour puts an heavy burden on garment manufacturers and fabric suppliers. Anyway the long term remains the basis of a vast majority of delivery schedules especially in European countries. In the future it will also provide a structure to the collections and to the marketing efforts of the brands. The short term will develop further hitting the ceiling. Requirements for ultra-fast response along the lines can only be met by a limited number of suppliers. The mini-collections, however, which are already strongly developed in northern Europe, will become generalized across Europe. These mini-collections are designed in mid-term, continuously supplied on few products in the stores, giving the impression that there is always something new on offer.

4.25.2 Criteria influencing European contractors

Demands of the textile industry are nowadays extremely important and diversified. Partnership frameworks are more and more complex and the identification of 'who has the decision power' throughout the textile chain remains highly difficult**.**

4.25.3 Distributors and brands secure their sourcing

What is their compass? This is still the price. Price pressure, particularly important for the low-end, tends to decrease with the medium-and high-end. This pressure orients sourcing localization with a research of competitive price in far countries (essentially Asia) and a research of creativity and reactivity in neighbouring regions (In Europe, Maghreb, Eastern Europe and Turkey). Is there a common thinking regarding sourcing in Europe? No, each country has its own. Regional cultures dictate specific approaches regarding partnerships and sourcing frameworks. Taking into consideration this price compass and these different cultures, a clear difference appears between Northern Europe and Southern Europe.

4.25.4 The Northern Europe zone

Prime contractors in Northern Europe (Germany, UK, Belgium, Netherlands, Denmark, and Sweden) tend to focus more on what they consider to be their core business: designing and marketing garments. They believe that they have a better chance to improve their margins and to escape crippling price competition when they act more as designers / prime contractors and less as production drivers:

- They look for competitive prices, essentially in Asia, or in neighbouring countries for Germany;
- They have developed strong partnerships;
- They mainly work with co-sources (they delegate fabric purchase to their subcontractors) or;
- in a pure trading framework (purchase of finished products);
- Short-term for them means complete new collections within a given season to refresh their stores' product offer or to "stick" to versatile fashion trends. As said earlier, these mini-collections are generally designed and prepared 6 months earlier;

4.25.5 The Southern Europe zone

In Southern Europe (France, Italy, Spain, Portugal), a great emphasis is given to product realization and production management. Prime contractors are purchaser / production pilot:

- In order to manage the production process, proximity is a pre-requisite. The majority of their sourcing solutions still come from neighbouring regions like Maghreb, Turkey and Eastern Europe;
- Co-sourcing and outsourcing are both used depending on the financial strength of their garmenters;
- Information sharing is not particularly promoted vis-à-vis real efficient partnerships except in Italy with the historical use of manufacturing clusters;
- Short-term concerns essentially the manufacturing process: On-going adjustments within a given season on quantities coming from Italy or replenishment / actualization designed on a very short-term in France and Spain;
- Prime contractors are currently very cautious «pilots» which decide about the whole production process. Their options remain indeed quite limited in a context of expensive stocks;
- Sourcing zones are globally stabilized: Potential new competitive countries concerning low labour costs are unlikely to rapidly emerge;
- The balance between far and near sourcing is also dictated by the price difference influenced by the US$ exchange rate; Potential gains in margin level do not concern low labour costs which are already optimized but a real fine-tuning of the supply chain process including the costs of non-quality.

4.25.6 A strong phenomenon for secured purchasing

- Rationalization of the number of suppliers, reinforcement of partnerships with the most efficient and reliable players;
- Development of the co-contracting in order to avoid the “fabric” risk;
- Purchase sequencing and development of mini-collections; The specialization “designer-purchaser” tend to progressively dominate in Europe. Distributors and brands tend indeed to:
- Integrate the design with internal resources;
- Outsource the production and the management of the production process In a context of limited visibility regarding textile and clothing sourcing evolutions, fabric suppliers are going through a profound revamping of their positioning throughout the textile chain. Despite initiating the movement, anticipating their customers’ requests, many fabric suppliers are only guided by more and more demanding purchasers without much pro-activity. Prime contractors are indeed willing to work through strong partnerships with strong “upstream market weavers or knitters” capable of offering creativity, competitive price, flexibility and security.

4.25.7 European fabric suppliers tend to offer specific solutions

- a creative touch in Italy;
- a security / quality approach in Germany;

- strong partnership in the UK;
- ‘quality’ benefits in Portugal and ‘service’ benefits in Spain;
- Sourcing zones are globally stabilized: Potential new competitive countries concerning low labour costs are unlikely to rapidly emerge;
- The balance between far and near sourcing is also dictated by the price difference influenced by the US$ exchange rate;

Potential gains in margin level do not concern low labour costs which are already optimized but a real fine-tuning of the supply chain process including the costs of non-quality.

4.25.8 Textile Stimulus Plans announced by major textile producing countries recently

China

The government announced a 3 Year plan to revitalize the textile and garment industry with focus on following aspects:

- Enlarge domestic market;
- Consolidation in the industry;
- Phase out obsolete capacity;
- Up gradation in value chain;
- Relocation of industry from Southeast to the rural West;
- Increase in export tax rebates from 13per cent to 16per cent (4th increase since August 2008);

India

- Moratorium on repayment of term loans by 1 year;
- US$ 64 million package under Market Linked Focus Product Scheme (MLFPS) on apparel and leather exports by giving duty certificates @ 2per cent on FOB value over and above existing drawback schemes;
- Thrust on attracting FDI;
- 50per cent reduction in excise duty;
- Fast tracking incentive claims to improve liquidity;

Pakistan

- Seeking duty free access to the US market 3per cent interest subsidy on spinning investments for 2 years
- Fast tracking incentive claims to improve liquidity Moratorium on loans up to the end of 2009 (1 Year)

4.25.9 Benchmarking of Government Policies and incentives adopted by the reference countries for the promotion of the textile industry and exports

4.25.9.1 Investment Incentives - Investment incentives are aimed at long term capacity building of the industry. Three examples of such incentives given by the reference countries are:

- Technology Up-gradation Fund Scheme (TUFS) introduced by the Ministry of Textiles of India. The measure introduced in 1999 was extended till 2012 and is aimed at attracting massive new investment to expand capacity and modernize the industry. The main instrument of the TUFS is a 5per cent interest rate reimbursement and up to 20per cent capital subsidy for specified textile machinery for technical textiles and processing. The funds are to be repaid by8-10 years with an initial moratorium of 1-2 years. As per statistics published by the Textile Commissioner of India, a sum of about US$ 12bn had been disbursed under TUF till 2008;
- Long Term Finance Facility (LTFF) provided by the State Bank of Pakistan to export oriented units (EOU's). The loans given at concessional rates of interest are repayable up to 10 years;
- In Bangladesh, 5per cent export rebate is given to exporters of fabric and garments provided they use locally produced yarn. This is aimed at encouraging investment in spinning;

4.25.9.2 Fiscal Incentives for export and local sales **-** Chinese government provides export tax rebates against exports. The rates vary from 11per cent to 17per cent of FOB value;

- In India, duty drawback is given on various export products. On textile products the drawback rates vary from 4per cent of FOB value on cotton yarn to 9.8per cent on garments;
- These measures are aimed at neutralizing the incidence of taxes paid on inputs used in export production
- Income tax exemption is given in the form of tax holidays up to 10 years;
- Sri Lanka introduced an export incentive called Export Development Reward Scheme (EDRS) in year 2008. Under the scheme exporters who are able to maintain at least 90per cent of the export turnover as preceding year, are eligible for a rebate of 3 to 5per cent of exports;
- India has adopted a differential VAT rates whereby textiles are subject to a lower VAT of 4per cent from a range of 4 to 20per cent applicable to different products
- Pakistan gives an R&D incentive at 3-6per cent on FOB value of export of added value textiles and garments;

4.25.9.3 Concessional Export Finance- Many countries provide working capital funds to exporters at a concessional rate of interest to improve the competitiveness of their products in the international market;

- The Reserve Bank of India provides concessional funds to textile exporters under the "Rupee Export Credit Interest Rates" by giving an interest subvention of 2.5per cent on the BPLR (Bank Prime Lending Rate). Therefore, based on a BPLR of 12per cent, a yarn exporter could borrow his working capital funds at an effective rate of 9.5per cent p.a. Under the scheme, the funds are provided for pre-shipment (270 days) and post shipment (180 days);
- The State Bank of Pakistan, under the Export Refinance Scheme, provides funds to exporters of high value added textiles (processed fabrics and garments) at a concessional rate of 7.5per cent p.a.;

- Bangladeshi banks offer up to 90 per cent refinancing on a back to back basis against export Letters of Credit

4.25.9.4 Infrastructure **-** China has focused on providing an efficient infrastructure to make its textile industry competitive. This includes: Special economic zones (SEZ); Adequate supply of power and water; Efficient roads and rail; Efficient ports with quick turnaround of vessels and container movement;•India also embarked on schemes to set up textile clusters such as SITP set up under PPP arrangement to provided dedicated infrastructure with common facilities. Examples of two such schemes are given below:

- **Mega Cluster Scheme**-The scheme is aimed to assist micro, small and medium entrepreneurs to set up world-class units with modern infrastructure, latest technology and adequate training and HRD inputs along with appropriate market linkages. The scheme is funded to the ratio of 40:60 (public : private stakeholders). However in case of handloom and handicraft cluster development, the government assistance could be up to 80per cent of the project outlay.
- **Scheme for Integrated Textile Parks (SITP)**–The primary objective of SITP is to provide the industry with world-class infrastructure facilities foe setting up the textile units. 30 parks have been set up since 2005 (each park consists of 50 factories). The government provides funds in the form of equity and grant to the extent of 49per cent of the infrastructure cost.

4.25.9.5 Other benefits **-** Technology Mission on Cotton (TMC). This special scheme was launched in India in 2000 to find solution to many problems in cotton production and processing and to place the cotton sector on a sound footing. The project is divided into 4 components called Mini Missions:

i) Mini Mission I Cotton research and technology generation
ii) Mini Mission II Transfer of technology and development
iii) Mini Mission III Development of market infrastructure
iv) Mini Mission IV Modernization of ginning and pressing factories

Remarkable progress was achieved in improving cotton yields in India by introduction of bio technology. Presently over 70per cent of the area under cotton cultivation in India is under genetically modified cotton. Out of 250 market yards approved till 2008, 161 were developed and in which the government contributed 55per cent of the project outlay.

- **Export Promotion Schemes**

Apart from the Duty Entitlement Passbook (DEPB) scheme described above, India has several export promotion schemes enshrined in the Foreign Trade Policy of the country. Some relevant schemes are briefly alluded to below:

Deemed Export Scheme

Deemed exports refer to transactions in which goods supplied do not leave the country, and the payment for such supplies is received in foreign currency. Deemed exports are eligible for all incentives otherwise available to regular exports. Examples of transactions recognized as deemed exports include

- Supply of goods by a company in DTA (Domestic Tariff Area) to a company in EPZ
- Supply of goods to projects funded by the UN agencies and international donor

- **Focus Product Scheme (FPS)**–Under the scheme labour intensive and hi-tech sectors such as handlooms, textiles and garments (including technical textiles), leather & footwear are entitled to duty free imports up to 5per cent of FOB value of exports during the preceding year. An outlay of US$ 65 was earmarked for the scheme during 2008-09.
- **Focus Market Scheme (FMS)**–Under the scheme certain countries/regions such as sub Saharan Africa and Latin America are targeted for development and exports to such markets are entitled to duty free imports for a value up to 2.5per cent of FOB value. The incentive is paid in the form of negotiable certificates.
- **Recognition of Exporters –**Exporters with consistent performance are recognized and are eligible for certain privileges. Status holders of Export/Trading House are allowed repatriation of export proceeds by 360 days instead of 180 days available to ordinary exporters. They are also allowed to retain 100per cent of foreign exchange proceeds in the domiciliary account.
- **Recognition of Export Cluster Towns**–Certain towns where important export clusters exist, recognition is given under the TEE (Town of Export Excellence) scheme. The government assists the towns by providing funds for organizing trade fairs and exhibitions and undertaking market research.
- **Market Development Assistance (MDA) –**The scheme is intended to provide financial assistance for a variety of export promotion activities implemented by the export promotion councils on a regular basis every year. These include participation in trade fairs, organizing buyer/seller meets and giving travel grants to small and medium exporters with an annual turnover up to US$ 3 mn.
- There are several other factors which provide an impetus to the development of the textile industry. These include:
  - Large domestic market;
  - Investment in R&D and human resources;
  - Preferential market access;

4.26 Nigeria's distance to technological frontiers

4.26.1 Installed capacities–ring spinning short-staple

In 1985 about 12.4mn ring spindles or 8.3per cent of the worldwide installed capacities stood in Western Europe. By the year 2007 the capacity was down to 3.7mnringspindlesor 1.7per cent of the World ring spindles population. North America lost during the same period more than 12mn ring spindles. Mexico showed slight increase, so did South America. Africa reveals an almost static situation. Only Asia showed a continuous build up of its capacities form 78mnringspindlesin the year 1985 to 178mn ring spindle sin the year 2007.Today more than 82per cent of the worlds short-staple ring spinning capacities are located in Asia and about 45per cent of the long staple ring spinning capacities.

4.26.2 Installed capacities–rotor spinning

Rotor spinning which for many years has been the domain of the industrialized countries is now losing out to the developing countries. On the basis of a rotor to rotor comparison Western Europe‘s share is static. Considering the higher output of the last generation machines there may be however an increase in output. Turkey showed a spectacular increase of its rotor capacity from 25‘000 rotors in 1985 to 712‘000 rotors in the year 2007. Eastern Europe lost about 2.25mn rotors during the reference period (1985-2007). The USA with Mexico showed an increase of their capacities from 37‘000 rotors to over 1mn rotors in 1999, followed by a decrease of their capacities to 485‘000 rotors in 2007. Africa showed a small increase. Asia, still a continent where ring spinning is the preferred technology, increased its rotor capacities more than 7 fold and has now with 3.9mn rotors about 46per cent of the world rotor population.

4.26.3 Installed capacities–shuttleless looms

The shuttleless loom population of a country is a good indicator of the international competitiveness of a country in terms of fabric availability for the garment sector. Asia increased its population of shuttleless looms by 180per cent between 1999 and 2007, however most of the new installed looms were sent to China. Turkey increased its population of shuttleless looms by 87per cent during the same period. South America increased its loomage by 18per cent. Europe retained its capacity not in numbers but in production capacity. The USA showed a sharp decline of its loom population from 62’200 to 36’60, at the same time Mexico could keep its loom population at 14’500.0

4.26.4 Bio Technology

ICAC which is the apex body dealing with the cotton industry, has been raising global awareness about the use of biotechnology in cotton production. In what follows a gist of the relevant issues is provide for a better appreciation of this topic which is germane to the study undertaken by UNIDO. The scientists believe that cotton production practices will change drastically in the next two decades. Climate change through global warming may increase photosynthesis, leading to increased vegetative growth in cotton but not necessarily greater production of lint. Insects may spread to more areas, diseases may become more common and crop management will become more complicated. The cost of production may continue to rise, and the development of new technologies may be crucial. Scientists believe that biotechnology applications in cotton are providing solutions to most challenges, and new biotech varieties providing specific solutions to new problems will be widely utilized. Biotechnology is transforming the world cotton industry. The cotton varieties developed with application of biotechnology (biotech, transgenic, bio engineered, genetically modified cotton) accounted for more than half of world production in 2007/08 season. Burkina Faso has successfully harvested 10.00 hectares of biotech cotton in 2008/09. India with the largest area devoted to cotton in the world, is headed toward an unprecedented sixth consecutive season of increased production after the introduction of biotech varieties in 2002.The table reveals that the world cotton area devoted to biotech cotton, both Bt that provides resistance to certain insects, and herbicide-tolerant cotton, that allows farmers to spray herbicides over cotton fields, limed from 2per cent of total area in 1996 to 29per cent in 2005. Biotech area was estimated at 31per cent of world cotton area in 2006. Based on expected rates of adoption in India, Pakistan and Brazil, biotech

varieties are expected to account for 40per cent of the world cotton area and 50per cent of the world production by 2009/10.

Scientific evidence suggests that agricultural biotechnology is one of the many tools available for improving crop productivity and environmental sustainability of agriculture. When appropriately used, biotechnology can offer many benefits including effective control of certain pests, reduced yield losses from insect damage, and reduction in application of insecticides, resulting in additional income to farmers. As per ICAC, the world cotton yield rose from 400 kg per hectare in 1980/81 to 775 during 2007/08, and a further increase to 790 kg is forecast for2008/09. Biotechnology is the most visible of the new technologies pushing yields higher and leading to reduced use of insecticides. However in sub Saharan Africa, the cotton yield has stagnated or declined in the recent years due to low fertilizer use and neglect of other inputs.

4.26.5 Technologies for Cotton Development

Nigeria is yet to consider adoption of bio technology which has been a key factor of success for the improvement in yield and quality of cotton in major cotton producing countries such as India, China and Pakistan. Biotechnology is transforming the world cotton industry. According to ICAC, cotton varieties developed with the application of biotechnology (biotech, transgenic, bioengineered, genetically modified cotton) accounted for more than half of world production in 2007/08 and continues to grow. At the 67th Plenary Meeting of the ICAC in Ouagadogou the participants discussed the topic of "Competitiveness of African Cotton Production" and called for "faster transfer of Bt technology in Africa, increased funding for research and development and wider use of drought tolerant, disease resistant varieties to improve productivity".

Burkina Faso has successfully harvested 10'000 hectares under biotech cotton in 2008/09 season. India, in particular has achieved remarkable success in adoption of biotechnology in increasing and improving cotton production India which has the largest area devoted to cotton in the world doubled its yield in 7 years. Presently 70 per cent of the area is covered by genetically modified cotton. The following table shows the consistent improvement in cotton yields in India. The average yield before the introduction of biotech cotton was 260-300 kg/ha. However since the introduction of genetically modified seeds, the productivity went up to almost 600 kg/ha in the last season (2008/09). This resulted in several benefits to the cotton-textile economy of India:

- Increase in cotton production from 2'380'000 tons in 2000-01 to 5'463'000 tons in 2008/09; •Reduction in use of pesticides;
- Increase in farmers' earnings and poverty reduction;

4.27 Product-specific policy agenda for action

4.27.1 Focus areas –short term

Following recommendations are made to resuscitate the textile industry in the immediate short term (2009-10)

4.27.1.1Urgent relief measures

To prevent further decline

Due to several internal and external constraints as outlined earlier, the Nigerian textile industry is on the verge of a total collapse. This would lead to further loss of employment and affect hundreds of thousands of cotton growers and their families whose livelihood depends on this industry. Therefore, there is a need to consider an immediate relief package to at least save the viable surviving textile mills from collapsing to be implemented , a.s.a.p.

- .Exempt locally produced textiles from VAT for three years
- Partly disburse Textile Development Fund on priority to the textile mills whose applications have already been assessed
- Allow import spare parts, dyes and chemicals at 0per cent duty

Impact - The existing industry may be sustained in the short run until enabling environment improves for long term sustainability

4.27.1.2 VAT Exemption

At present locally produced textiles are subject to payment of 5per cent VAT. The contention for a short term exemption (3 years) may be justified on account of following merits;

i) As per the existing VAT Act, there are over 12 categories of goods and services which are exempt from payment of VAT. These include:

•Medicines;
•Basic foods;
•Educational materials;
•Commercial vehicles;
•Agricultural products (fertilizer, equipment, pesticides);

ii) Textiles produced in Nigeria are meant for mass consumption and therefore the impact of relief would make them more affordable and have a direct impact on the purchasing power of the common man;

iii) The government recently exempted several products/industries from the payment of excise duty. These include soaps and detergents, fruit juices, telephone cards and cosmetics;

iv) Recognizing that textiles is a basic necessity, many countries which have a differential VAT systems, apply the lowest VAT on textiles. India which has VAT rates ranging from 1 to 20per cent, applies only 4per cent VAT on textiles; in addition, certain textile products such as cotton and silk fabrics are exempt from VAT;

v) In any case as 85per cent of the market is occupied by smuggled goods which do not pay any taxes whatsoever, exempting locally goods from VAT won't be an aberration;

vi) The total impact of VAT exemption, in terms of foregone revenue would be miniscule;

vii) Relief from VAT would make the locally produced textiles more competitive and more affordable to the masses. It would help to retain existing employment in the textile industry;

4.27.1.3 Import Duty exemption on inputs

Textile industry imports dyes and chemicals and spare parts which are subject to a customs duty of 5-10per cent. Reducing the duty to 0per cent for a temporary period of three years would afford some relief to the industry and may be justified on the following grounds:

- There is no local production of dyes and chemicals and spare parts and therefore a duty reduction will not have a corresponding negative effect on the ancillary industry;
- The extent of foregone revenue would be minimal to the government however still significant to the industry;
- The cost reduction would improve the competitiveness of locally produced textiles and make them affordable to the masses;

4.27.1.3 Implementation of Textile Development Fund

There has been a delay in the implementation of the fund presently being handled by the Bank of Industry. As the raising of the fund itself and formulation of policy would take time, it is suggested to fast track the disbursement of at least a pilot amount of say N 15bn to the existing textile mills which are still viable. A disbursement of the pilot facility by September 2010 would yield important benefits:

- Encourage the procurement of cotton for 2009/10 season during Oct/November period which would translate into a direct income for the farmers and also restore their confidence to grow cotton in the next season;
- Some of the existing textile and garment companies which had borrowed at high interest rates could re-structure their funding;
- Textile and garment companies which have already identified some new projects for up gradation could embark on the same without further delay;

4.27.1.4 Counterfeit textiles from China

Increased enforcement and dialogue with China

- SON (Standards Organization of Nigeria) and customs authorities should be mandated to strictly monitor influx of counterfeit textiles from across the borders;
- Warehouses and outlets selling fake textiles should be inspected;
- Counterfeit materials should be seized and destroyed periodically;
- Simultaneously the Government should draw the attention of the Chinese authorities to the serious injury caused by their exporters to the Nigerian cotton and textile sector and seek action against violation of IPR's and falsification of quality certification and country of origin markings;

Impact - Even a 20per cent reduction in smuggling and counterfeiting would boost the capacity utilization and create higher demand for Nigerian cotton growers Counterfeit textiles from China Increased enforcement and dialogue with China Although it is well accepted that the problem of smuggling and counterfeiting is a complex one and defies an easy solution. On the one hand it requires the willingness of the government to address the problem and take it up with other countries at the highest level, on the other hand it requires the commitment of law enforcement agencies to implement the policies. The industry also believes that in the long run provision of an efficient infrastructure and an enabling environment would improve the competitiveness of the Nigerian industries, however in the short run, it would be essential to reduce the smuggling and counterfeiting.

4.27.1.5 Energy

Adequate supply of LPFO and natural gas

- The Government, through the Federal Ministry of Commerce & Industry should ensure that the textile industry continues to receive adequate supply of LPFO directly from the refineries at the official price regulated ex-refinery price, as per existing policy;
- In view of the condition of the refineries and long periods of down time caused during turnaround maintenance (TAM), there is a need for the PPMC (Pipelines & Products Marketing Co. Ltd) to ensure supply from buffer stocks or imports;
- Nigerian Gas Company (NGC) which is the apex regulatory agency for supply of gas should give priority to laying of pipelines to supply gas to un-served areas of Ikorodu industrial estate in Lagos State, which is a large textile cluster;
- In the long run indeed, the rehabilitation of the Kaduna refinery would be required for a viable textile industry, especially in northern Nigeria;
- It is expected that improvement in power supply, which is a crucial factor for the whole Nigerian economy in the medium term would make the textile manufacturing competitive;

Impact - Adequate supply of LPFO at competitive prices would ensure the survival of the existing textile mills, especially in the North

4.27.2 Fiscal policy with regard to imports

Common External Tariff (CET)

Following Fiscal policy issues need to be addressed in the short-run.

i) Duty on chemicals used in the processing of textile fabrics should be retained at 5per cent as per CET policy. Accordingly it is recommended that the duty on Resins and Resin acids and Pigments should be 5per cent;

ii) Grey Cloth (unbleached woven fabric), which is an intermediate product for further processing by the textile industry should not attract the levy of 30per cent;

iii) Finished fabrics –dyed and print –where duty was erroneously stated at 5per cent should be rectified at 20per cent as applicable to finished goods under CET principal;

iv) The selective import prohibition policy has been ineffective and it is therefore recommended that import of textiles and garments should be allowed with payment of applicable duties;

v) The existing anomaly whereby only imported mosquito nets LLIN (Long Lasting Insecticide Treated Nets) are exempted from VAT should be rectified by also treating the locally produced mosquito nets at par, i.e, VAT exempted;

vi) Recognizing that the government is keen to encourage renewed investment across the entire textile value chain, it is recommended that investment in the whole textile and garment industry be considered eligible for giving the Pioneer Status benefit by NIPC (Nigerian Investment Promotion Commission);

vii) Significant investment by existing textile and garment companies (say above N 150mn) should also be considered eligible for the benefit, though on a pro rata basis of sales turnover/taxable income;

4.27.3 Textile Development Fund Implementation mode

- There is a need to expedite the implementation of the TDF to at least prevent the closure of surviving textile mills
- However the following modus operandi for an effective implementation is suggested:
- All commercial banks and two development banks –Bank of Industry and NEXIM –should be able to disburse loans under the scheme with the interest rate differential between the commercial lending rate and the target single digit rate proposed under TRF, underwritten by the lead agency viz the Bank of Industry
- Notably, governments in other textile producing countries such as India and Pakistan are successfully implementing schemes along similar lines

Impact - Effective implementation of the fund will improve the competitiveness of the industry Implementation mode The central idea of the Textile Development Fund is to provide funds to the textile industry at a concessional rate of interest with a view to meeting the sector's short and long term funding requirements. One of the major constraints faced during implementation has been the difficulties faced in raising the principal fund. The following mode of implementation of the fund is recommended on the basis of international best practices and experience of Nigeria in implementing similar schemes for other sectors. Agricultural Sector funding by CBN - CBN announced the Commercial Agriculture Credit Scheme (CACS) in April 2009 with an objective of providing concessionary funding for commercial agriculture.

The salient features of the scheme are:

- Jointly implemented by CBN and Federal Ministry of Agriculture;
- A Project Management Committee (PMC) established to supervise the scheme;
- Financing of the scheme by a N 200bn bond raised by the Debt Management Office (DMO);
- Loan to be disbursed through participating commercial banks;
- Lending rate -9per cent p.a. (maximum) inclusive of all charges;
- Tenor of loan –maximum 7 years;
- Interest subsidy to be borne entirely by the CBN;

The above scheme is similar to the Agriculture Credit Guarantee Scheme Fund –Interest Drawback Programme (ACGSF-IDP) implemented by the CBN. The key features of both the schemes are implementation through commercial banks and interest rate subsidy mechanism.

Textile Development Fund Implementation mode

Based on above evidence, it is suggested that the Textile Development Fund should be implemented by the Bank of Industry along similar lines as indicated below:

- The scope of the fund should be to provide concessionary funding for working capital and capital expenditure to eligible companies along the textile value chain (cotton ginning, textile and garment manufacturers). It is to be noted that cotton growers /commercial farmers are already covered under the two CBN schemes.
- An apex committee should be set up for approval and monitoring of projects. This should include the BOI, CBN Federal Ministry of Commerce & Industry, commercial banks and the Nigerian Textile Manufacturers Association (NTMA). Technical assistance from an

international development institution, such as UNIDO may be provided in view of the complex nature of the textile value chain.

- The funds should be disbursed through the commercial banks as the private industry deals with them on a regular basis through existing limits. As the assets of the companies are already hypothecated to the commercial banks in the form of collateral security, the companies may find it too cumbersome and costly to release the same if the proposed facility would be restricted to BOI or a particular bank. In any case the commercial banks would be accountable for the due diligence for project appraisal and recovery of loan. Besides commercial banks, the development banks, BOI should also be free to extend the loan to companies who may prefer to deal directly with BOI.
- The role of the government should be to undertake the interest rate subsidy disbursed to the commercial banks through CBN. The interest rate subsidy should bridge the difference between the target rate of interest (say 9per cent p.a.) and the prevailing commercial rate at which the commercial banks are willing to lend to the government.
- As the facility shall be utilized for working capital as well as capital expenditure for modernization and/or expansion, the tenor of the loan should be from 1 year up to 8 years, with a two year moratorium on long term loan.
- Priority should be given to the existing companies which are still operating.

Textile Upgradation Fund Scheme (TUFS) India - TUFS was introduced in 1999 for a period of 5 years and later extended till March 2012.The major objective of the scheme is to provide concessional long term funds to encourage the textile mills to modernize and expand production capacity. The key element of the scheme is the interest reimbursement of 5per cent points and up to 20per cent capital subsidy towards which the government has disbursed a sum of about US$ 12bn during 1999-2008.

The salient features of the TUFS are as follows:

i) The government would provide 5 percentage points on the interest rate actually charged by the financial institutions on the sanctioned projects

ii) The small-scale textile industry has been provided an option to avail of either 15per cent Credit Linked Capital Subsidy (CLCS) in lieu of 5per cent interest reimbursement

iii) For power loom units the CLCS is 20per cent

iv) An additional incentive of 10per cent CLCS over and above the 5per cent interest rate reimbursement has been provided for the specified processing machinery and technical textiles. This is meant to encourage investment in value adding processes and non conventional textiles

Scheme for Long term financing for export oriented projects (LTF-EOP) Pakistan

The LTF-EOP scheme implemented by the State Bank of Pakistan is aimed at providing concessionary funding for import of plant & machinery by export oriented companies.

Salient features of the scheme include:

- Tenor of facility is for a maximum period of 7 ½ years

- Interest subsidy of 3per cent is provided by the State Bank
- The State Bank provides refinancing to the commercial banks extending the facility to manufacturer exporters

4.28 Vision 2015 for the Nigerian Textile Industry

At the macro level, most textile producing countries, some of whom have a dedicated Ministry for Textiles (e.g., India, Bangladesh and Pakistan), have formulated a textile policy which provides the vision for developing the sector in a holistic manner. In India, the National Textile Policy 2000 provides the long term vision for the sector. The vision covers various aspects such as quantitative targets (production, exports), cotton productivity through Technology Mission on Cotton (TMC), cluster development through creation of Special Integrated Textile Parks (SITP) and human resource development through creation of several branches of National Institute of Fashion Technology (NIFT). The Bangladesh Garment Manufacturers and Exporters Association (BGMEA) recently formulated a vision to achieve US$ 25bn of exports by 2013.

The Vision 2015 scenario for Nigeria forecasts the demand and supply and projects the capacity required to meet a part of the demand and the investment required to upgrade the local supply chain. The Vision 2015 scenario also envisages the building blocks for realizing the vision in terms of the required policy regime and enabling environment. It sets forth the agenda for the private sector stakeholders comprising the textile and garment industry and cotton growers. The envisioning exercise would be a useful tool for the policy makers to objectively assess the sector potential.

4.28.1 Vision 2015 Estimate of industry potential Estimate of industry potential

Based on the estimated per capita fiber consumption of 2 kg or 12 metres in Nigeria and in 2008, the total size of the textile (including garments and made ups) was estimated at 1’800mn metres. This is met by local production to the extent of 220mn metres (12per cent) while the remaining 1’580mn (88per cent) metres are supplied through imports. Assuming 3per cent p.a. increase in demand for textiles which is slightly above the population growth of 2.5per cent, the demand is expected to grow to about 2’200mn metres by year 2015. An optimistic scenario has been projected whereby the share of locally produced textiles could increase from the current 12per cent to about 40per cent which seems like a Herculean task.

Drivers of demand/consumption

The demand for textiles would be determined by the following key factors

- **Population growth** Nigerian population estimated at 150mn (2008) is growing at 2.5per cent and expected to touch 175mn by 2015. During the same period (2008-15) the ECOWAS population is expected to increase from 270mn to about 320mn. The textile demand is expected to grow at a slightly higher rate (3per cent) in view of growth in income.
- **Demographics** The age structure of sub Saharan population shows that In Nigeria and West Africa, over 40per cent of the population is in the age group 0-14 in contrast to India (30per

cent) and China (20per cent). High percentage of youth is favourable to textile consumption in future with complimentary changes in dressing habits among the consumers.

- **Regional integration** The regional economic integration under ECOWAS has been improving and is expected to deepen in coming years. This would provide improved access for the Nigerian textile industry to access regional markets.
- **Western influence** Increased Western influence is having an impact on the dressing habits of people. With a large share of young populations, the trend for readymade garments and Western wear is likely to grow.
- **Distribution channels** With rapid urbanization and rise in income levels, the share of organized retailing is also increasing. Compared to East and Southern Africa, textile and clothing materials are still predominantly sold through unorganized open markets in West Africa. However this trend is expected to change and as the penetration of organized retail increases, demand for readymade apparels is also likely to grow.
- **Housing** Growing demand for urban housing, hotels and institutions also provide boost for the future textile demand for products such as sheeting, towels and floor coverings.
- **Competitiveness** As infrastructure improves in the medium to long run, the economy is likely to improve its competitiveness. This would result in a competitive local industry capable of meeting consumer demand at affordable prices and boosting demand.

Investment requirement

- Textiles is a highly capital intensive industry with a long gestation period. The following section analyzes the amount of new investment required to achieve the local production envisaged in 2015.
- It is assumed that the existing operating capacity to the extent it's modern (less than 10 years) would also be due for replacement by 2015. Therefore, the following table assumes that the entire capacity to produce the output of 900mn metres to meet 40per cent of the local demand would have to be retooled with modern plant and machinery.
- By way of comparison, stakeholders of the Indian textile industry embarked on a similar exercise and estimated that a capital outlay of US$ 50bn would be needed to achieve a double digit growth from a level of US$ 36bn in 2002 to US$ 85bn in 2010.

4.28.2 Investment requirement

4.28.2.1 Investment required -explanation of assumptions

The following section explains the methodology of determining the investment required. The calculations are derived from the output of finished fabric required by 2015 Overall, it must be emphasized that this exercise is based on broad assumptions at a macro level to provide a context for the capital required for the creation of a modern textile and clothing industry. Yarn and grey woven fabric requirements are based on above finished fabric requirement. The requirement for raw materials -both cotton and manmade fibres–is based on requirement for yarn, including wastage. It is assumed that Nigerian textile industry will remain predominantly cotton based to maximize the linkages in the agro allied sector. In view of the highly capital intensive nature of the textile manufacturing, it is assumed that the utilization of machinery will improve as reflected by the number of working days –350 days for spinning and weaving and 300 days for processing and

garmenting. The reason for lower utilization for the weaving and garmenting is due to the seasonal demand and ordering pattern as per international trends. The machine productivity parameters as expressed in the output per unit are based on state of the art modern textile machinery and best practice. Prices of the machinery are based on state of the art technology level

4.28.2.2 Growth Agenda

Following are the broad areas that require support from Government in collaboration with key stakeholders to enable the sector to become internationally competitive to achieve the Textile Vision 2015.

Facilitating capital investment through following measure:

1) **Short term measures -** Implementation of the short term plan which include the 5 key focus areas:
   - Urgent relief measures such as VAT exemption on local textiles and duty on spares;
   - Dealing with smuggling and counterfeiting;
   - Energy –adequate availability of Black Oil, Gas and Power;
   - Fiscal policy issues; •Implementation of Textile Revival Fund on a pilot basis by September 2009;
2) **FDI Promotion -** Facilitating capital investment through the measure suggested below:
   - Implementation and sustenance of Textile Revival Fund till 2020.The industry needs a major 'Martial Plan' to meet the massive investment requirement. Consistent implementation of the policy would restore stakeholder confidence and boost investment;
   - Attracting fresh FDI into the sector. This could be achieved by consistent implementation of policies outlined above;
3) **Removal of Infrastructural constraints -** Address the infrastructural constraints which are faced by the manufacturing sector in general and some of which affect the textile industry specifically. These include:
   - Adequate supply of power;
   - Adequate availability of black oil, especially in the North and access to natural gas;
   - Reduction in port clearance time;
4) **Human resource development -** Investment in human resource development should be undertaken by re-equipping the existing textile & garment poly-techniques, garment training centres being run by ministries and parastatals
5) **Raw material availability -** Improving the performance of the cotton sector would be vital to the achievement of Vision 2015. This report has highlighted the need to adopt modern technology to improve the cotton yield and quantity. This should be considered at the highest level through the Federal Ministry of Agriculture and Rural Development and the R&D institutions viz the National Biotechnology Development Agency and Institute for Agriculture Research (IAR)
6) **Capacity Building** There is also a need to assist the industry in capacity building through identification of opportunities for diversification into new products and market segments.
7) **Dedicated Textile Restructuring Unit (TRU)** There is a need for creating a dedicated wing within the Federal Ministry of Commerce & Industry which would act as an apex agency. This unit would be empowered to monitor the implementation of extant policies which have an

impact on the textile sector. It will have a standing inter-ministerial committee to coordinate the implementation.

4.28.3 Perceived threats to the Textile Vision 2015 - The following factors could negatively impact the industry growth and stifle the achievement of Textile Vision 2015.

4.28.4 Policy –Inconsistency or delay in policy implementation could be the biggest risk factor in achieving Vision 2015. As observed in the past, inconsistency in implementation of EEG policy led to a fall in non-oil export performance and caused a set back to the renewed investments based on government assurance made by the textile industry.

4.28.5 Imports–The Vision for the textile industry envisages increase in the market share of the industry from the present 12per cent to 40per cent by 2015. This requires effective enforcement of import regulations by concerned agencies. Without safeguards and implementation of measures to make the domestic industry competitive, imports would increase and pose a threat to the realization of Vision targets.

4.28.6 Infrastructure–Lack of foreseen improvement in infrastructure, especially power and fuel, in medium term would pose a grave risk to the realization of the envisaged scenario by 2015.

4.28.7 Raw material-Ensuring adequate availability of local cotton is critical to maintain the competitiveness of the textile industry. As textile industry is raw material driven whereby cotton accounts for over 50per cent of the cost of finished fabric, non availability of sufficient cotton and high price could jeopardize the competitiveness or the viability of the industry.

4.28.8 Benefits of Vision 2015 Textile - Vision 2015 would lead to creation of about 1.1mn jobs during 2010-2015. Textiles being an agro-allied industry, the improved activity would directly lead to higher demand for cotton. The current production of cotton at150’000 of seed cotton would need to be increased three fold to about 500’000 tons to cater to the domestic demand and exports. A combination of higher acreage deployed to cotton cultivation and improved yields, the employment in small holder farms would double from about 500’000 to a 1mn. The textile industry would also generate higher employment with over four fold increase in production from a level of 220mn metres to 900mn metres. The creation of an organized garment industry alone would generate over 27’000 new jobs (1.7 persons per machine). Assuming a modest 10-15per cent of the industry output to be exported, the exports would increase three fold from the present US$ 31mn to over US$ 100mn by Year 2015. The most significant factor in the projected scenario remains the increase in the domestic market share of the Nigerian textile industry. The meagre 12per cent market share is projected to rise to 40per cent.

Notably, in a new globalized world no single country could fulfill the entire local demand. Moreover, there have been fundamental changes in the industry structure whereby Asian countries, particularly China, India, Pakistan and Bangladesh have emerged as the most important textile players;

Benefits			
Description	Growth	2008	2015
Cotton	Production of seed cotton (MT) Employment	150,000 500'000	500,000 1,000,000
Textile and Garment	Employment	24,000	100,000
Export	US$	31	100
Market Shares	per cent share	12	40

* Based on industry parameters the manpower requirement is calculated as follows : Spinning –350 persons per 25,000 spindles; Weaving 2 persons per shuttle-less loom and 4 persons per shuttle loom; Processing 500 persons per process house with a capacity of 100'000 metres/day; Garmenting 1.7 persons/machine

4.29 Institutional mechanism and framework for implementing the agenda for action

A number of key institutions are responsible for the implementation of the textile action plan. The focal ministry of commerce and industry has a central role in monitoring and evaluation. The textile mills have the primary responsibility of responding to the incentives and policies put in place by government to revive the textile sector in Nigeria. Bank of industry has an important role to play in the implementation of the Textile Development Fund. A number of institutions responsible for training and capacity building would be required to play a major role in ensuring that the requisite manpower for the sector is in place

4.29.1 Garment training skills

This section provides an assessment of the four important textile garment training facilities set up in Nigeria. Apart from the Yaba School of Technology which has been in existence for over two decades, the other three were special initiatives which were introduced during 2005-08:

1. UNIDO Common Facility Centre (CFC), Aba

The CFC was established in 2008 to provide technical assistance to several clusters of SME's engaged in leather and clothing articles located around Aba. The facility is supported by UNIDO in partnership with the Federal Ministry of Commerce and Industry, Abia State government. The major private sector stakeholder is the Association of Tailors and Fashion Designers Abia State (ATFAD) representing their sector. The Nigerian Export Promotion Council (NEPC) zone office is also a stakeholder in the CFC with a long term objective to improve manpower skills for garment training for export orientation by providing exposure to garment making technology to the SME's.

UNIDO provides technical assistance in the form of hardware (equipment for garment making) and training of operators, supervisors and entrepreneurs in garment making. A local UNIDO consultant supervises the facility. Training experts are expected to visit the facility for skill development of operators.

The following equipment were newly installed at the CFC in 2009:

- Embroidery machine (2x8 colours);
- Button hole machine;
- Zigzag machine;
- Binding machine;
- Over lock machine;
- Lockstitch machine;
- Straight knife machine;

The effectiveness of the facility would largely depend on the interest shown by the tailors, fashion designers and garment factory operators in Aba region. The state government support would be vital to financially sustain the facility.
In the long run, the CFC is expected to be self sustaining based on revenue generated from job work and training provided to the small and medium tailoring and fashion designing enterprises who cannot individually afford to have the costly equipment.

2. NEPC Garment training centre at Ikoyi, Lagos

The garment training centre was established by NEPC in 2005-06, with an objective of improving the garment making skills and to meet a long term aspiration of promoting non oil exports under AGOA. The centre has 150 sewing machines and pattern making and cutting tables. Training is provided in batches of 60 to 70 unskilled and semi-skilled operators for a duration of 12 weeks. The trainees are awarded a diploma certificate on successful completion of training. Cost of training is borne by NEPC. The training is outsourced to a garment training consultant The training school has six instructors. The consultants also assist the trainees in placement and starting small business. During 2005-09, the centre has churned out about 500 trainees. The skills acquired by the trainees put to test when a set of them was engaged in production of a consignment of knitted apparels exported by a private garment factory to the US under AGOA. The course content includes the following main aspects of garment making:

- Basic sewing;
- Pattern making;
- Cutting;
- Designing;
- Quality standards;

It was learnt that six trainees were nominated by CFC Aba for the training school for the batch of June 2008. In future the school may need to be upgraded with modern equipment having a basic degree of automation. With adequate support from the government, the school may be able to sustain its potential for providing skilled manpower to the garment SME‘s in Lagos and other states.

3. Federal Ministry of Commerce & Industry garment training centre at Ikorodu, Lagos This facility was established in 2006 however it has not made any significant impact and is currently lying in an abandoned form.

3. **Yaba School of Technology, Lagos and other institutions** There are four major institutes which have been providing textile and fashion design education in Nigeria:
   - Yaba College of Technology;
   - ABU Zaria;
   - Kaduna Polytechnic;
   - Auchi Polytechnic;

However with the decline of the textile industry and lack of an organized garment industry, there has been a lack of student interest in the area. This is reflected in the dwindling student population opting for the courses offered by the institutes The Yaba College which set up its Department of Polymer and Textile Technology in 1988 offers:

- •National Diploma (2 years)(30 students enrolled in 2008-09 session)
- •Higher National Diploma (3 years)(9 students enrolled in 2008-09 session) The number of students has reduced from 20-25 to less than 10 per session. The college lacks training equipment as the existing equipment is either outdated or out of order. The college has submitted a request to UNIDO for supply of technical assistance and a list of equipment for the up gradation of its Department of Polymer and Textile Technology.

4.30 Conclusion

In conclusion it may be added that a strong political will on the part of the government of Nigeria would be essential to the implementation of the action plan leading to the realization of the envisaged Textile Vision 2015 with the support of bi-lateral and multi-lateral assistance. In the past, inconsistency in policy implementation was identified as a major factor which led to erosion of the industry confidence in achieving future targets. The down side of a lack of political commitment to the process outlined above would have significant negative consequences for the Nigerian textile industry in particular and the manufacturing sector in general:

- Loss of the bulk of the remaining 24’000 direct jobs;
- Loss of a local market for the cotton growers exposing them to the vagaries of the world market and resultant decline in cotton production;
- Nigerian banks which have huge exposure to the textile industry would risk major financial losses;
- As textile industry is basic to all developing countries, its liquidation would affect the industrialization of Nigeria and turn it into an exporter of raw materials and importer of finished products;
- Wrong signal to foreign investors;
- Nigeria’s total dependence on import of textile and clothing will result in an annual outflow of foreign exchange worth US$2bn;

CHAPTER FIVE
LEATHER AND LEATHER PRODUCTS

5.1 Objective of the Leather and Leather Products Sub-Sector

Going by the nature of the leather and leather products subsector, with high level of both supply and demand chains, the subsector has great potential for growth and the needed impetus to diversify the Nigerian economy that is largely dependent on oil revenue. In line with the NV20:2020, this study has the singular objective to develop an implementation plan for the leather and leather products subsector. Specifically, the study will;

- Examine the major constraints to the subsector
- Assess the country distance to world best practices in processing, design and marketing
- Assess the country distance to the technology frontier
- Develop policy agenda for action towards industrialization of the subsector, and
- Develop a mechanism and framework for implementing the agenda for action

5.2 Overview of the Leather and Leather Products Sub-Sector

The leather and leather products industry is a part of the consumer goods industry. Four main activities, with one linking to the other have been indentified in this subsector. The activities include livestock production, slaughter slabs/abattoirs, tanneries, and footwear and other leather goods. The development of the leather and leather products industry has a long history. At the global level, it is argued that the tanning of hides and skins is probably the oldest craft in the world. The development of the subsector dates back when the primitive treatment of hides and skins was adopted. By the nineteenth century, considerable progress has been recorded in the local treatment of hides and skins. During this era, a substantial quantity of leather tanned from Sokoto was exported through Arabian traders to Morocco which was further re-exported to Europe as Moroccan leather.

In Nigeria, there are two types of hide processors in the country: the traditional bark and brain tanners, and the industrial tanners. The traditional tanners structured their production towards interior decorative uses, while the industrial tanners produce some leather for the export market. Foremost among the industrial tanners are Fata, Jose Maria, Akard, Fine

Leather, Great Northern Tannery and Harmattan. A few of the industrial processors export their products exclusively, while both traditional and industrial tanners compete on the local market.

The first mechanized tannery was established in1949 and it produced crust leathers mainly for its overseas partners. The second tannery was established in 1961, although this tannery produced wet blue for its British partners, there was a provision for finished leathers for domestic market. There are about forty-one (41) tanneries in Nigeria with a collective installed production capacity of 310,000 hides and 25.5 million pieces of skin per annum. But have been operating within 30% capacity due to various problems that have made more that 50 percent of tanneries dormant. Most of the tanneries that are functional are based in Kano are foreign own, their production have been towards high quality leather for export, with little for domestic market. It has been argued that the pricing structure in the domestic market cannot sustain the tanneries. While there is prohibition of the export of raw hides and skins, and wet blue, export of these goods, though declining, still exist.

The Nigerian livestock industry has gone through various challenges in the recent past. During the colonial period, the industry was structured to produce high quality, hygienic meat products. The by-products which are predominantly hides and skins, were gathered, processed and exported overseas. The traditional sources of hides and skins in Nigeria are Cattle, Sheep and Goats. Table 1 shows the trend in the production of these animals.

Table 1: Trend in Animal production (in Million)

Animal	2000	2001	2002	2003	2004	2005	2006	2007	2008 prel.	2009 est.
Bovine										
World	1,479.8	1,483.4	1,494.3	1,508.0	1,516.5	1,524.7	1,537.9	1,537.6	1,527.8	1,539.4
Africa	173.6	176.0	181.6	183.4	185.4	192.6	196.2	201.5	209.0	211.1
Nigeria	15.12	15.13	15.15	15.16	15.70	15.88	16.07	16.15	16.29	16.39
Sheep and Lambs										
World	1,080.0	1,057.8	1,045.1	1,054.5	1,080.6	1,108.4	1,112.6	1,103.3	1,108.6	1,105.7
Africa	162.2	166.8	171.7	176.4	184.5	190.2	195.2	199.5	201.7	202.9
Nigeria	26.0	28.69	29.40	30.09	30.80	31.55	32.31	33.08	33.87	34.19
Goats and Kids										
World	744.9	754.5	765.0	781.4	801.4	821.5	824.4	832.5	861.5	873.7
Africa	184.0	192.1	197.1	202.6	212.2	219.2	223.1	230.9	235.6	237.2
Nigeria	42.50	45.26	46.40	47.55	48.70	49.96	51.22	52.49	53.80	54.31

Source: World Statistical Compendium for Raw Hides and Skins, Leather and Leather Footwear, 1990-2009.

Cattle, Sheep and Goats tend to be restricted to grassland areas which are located in the north of Nigeria, where the firms in the industry are concentrated. Marginal cattle, Sheep and Goats rearing exist in the south, where the animals are kept more as pets or as a source of food. It is really rare to find ranches or feedlot arrangements in Nigeria. Most of these animals are raised by smallholder herdsmen, who keep them as a measure of wealth or asset.

Hides and skins are primarily produced as the by-products of the livestock industry. The international trade in skins hides and leather is more valuable than that of meat. Hides come from Bovine animals: Cattle and Oxen, while skins are from sheep and goats, and the reptile family. Nigeria is a net exporter of the skins from sheep and goats. Most of the leather of goats origin are from the Red Sokoto breed, which like most goats tends to overgraze, and also has difficulty breeding but has been acknowledged for its good quality – Moroccan style leather.

The domestic production of Hides and skins from Cattle, sheep and Goats has not really change significantly over the years, even the world production has also changed marginally (see Table 2)

Table 2: Trend in Production of Hides and Skins ('000 Tons)

Animal	2000	2001	2002	2003	2004	2005	2006	2007	2008 prel.	2009 est.
Cattle (Wet Salted Weight)										
World	5,860.0	5,794.5	5,879.8	6,065.7	5,979.1	5,982.7	6,172.0	6,025.8	6,056.7	6,042.4
Africa	260.7	266.7	279.2	280.8	283.4	292.1	312.9	314.3	318.5	319.2
Nigeria	32.2	32.2	32.2	32.3	32.3	32.3	32.8	33.2	33.5	33.8
Sheep (Dried Weight)										
World	399.7	391.3	379.1	389.3	387.8	399.1	411.6	419.2	420.0	405.2
Africa	38.8	39	38.3	40.1	46.4	47.7	50.9	51.8	52.4	52.8
Nigeria	5.2	5.1	5.3	6.0	7.3	7.5	7.7	7.9	7.9	8.0
Goats (Dried Weight)										
World	221.2	233.4	248.2	263.3	278.2	288.8	285.8	293.9	295.4	298.2
Africa	32.6	34.1	35.2	36.6	39	40.1	41.6	43.2	43.5	44
Nigeria	6.0	6.9	8.0	9.0	9.9	10.1	10.4	10.7	10.7	10.7

Source: World Statistical Compendium for Raw Hides and Skins, Leather and Leather Footwear, 1990-2009.

Table 3: Slaughter Statistics in Nigeria (2000 – 2009)

Year	Cattle	Sheep	Goats	Pigs	Camels	Dogs
2000	1,882,529	3,432,551	5,390,302	182,673	16,281	77,630
2001	2,431,014	3,402,068	5,901,292	200,505	25,285	70,871
2002	2,749,423	3,585,666	5,901,292	231,916	101,484	85,166
2003	2,367,899	3,151,779	4,740,304	226,913	78,389	105,669
2004	2,487,773	3,253,395	5,133,145	285,095	71,961	110,732
2005	2,350,845	2,902,405	4,576,544	330,940	54,055	148,363
2006	1,995,820	3,145,281	4,597,593	329,520	27,766	86,789
2007	2,522,956	1,526,579	2,382,578	168,910	42,612	67,255
2008	2,168,230	1,464,094	2,462,315	169,509	58,412	94,605

Source: Federal Department of Livestock, Abuja

Domestic production of hides and skins has been affected negatively through the consumption of this by-product. Hides and skins serves as a local delicacy especially in the southern part of Nigeria. While official statistics are not available to gauge the proportion that goes for consumption, it is believed that it could be significant. This is boost by the fact that the product is cheap and easily accessible to the low and medium class. The increase in the consumption of hides and skins arose from the rumor, especially among the elites and upper class that hides and skins are good for the diabetics and the aged ones. Though awareness has risen that hides and skins when consumed as food lacks nutritional value or little, if any.

Official statistics has indicated that Nigeria is not an importer of hides and skins made from cattle, sheep and goats. But there is an indication that leathers made from the reptile family are imported.

5.3 Direction of Trade

The demand for Hides and skin is derived demand. The raw hides and skins are processed into finished leather, which is then converted into footwear, garments, furniture, vehicle upholstery, etc. These products have both domestic and industrial uses. In the footwear industry, finished leather is used for shoe uppers, linings and soles. It is also used extensively in the production of belts, various types of bags, home/office decorations and fittings, etc. The international leather market is currently undergoing several changes. There has been devolution of processing from developed countries to developing countries, due to stringent environmental protection regulations in the developed countries and higher labour cost. This new development in the processing of hides and skins is driving up the demand for raw hides and skins for processing in the developing countries.

Leather Products: Leather products are mainly classified into Shoes and other leather products. There are over twenty major industrial-scale shoe manufacturers in Nigeria operating side by side with several small-scale manufacturers. Among the industrial manufacturers are FAMAD (formerly Bata), APIN footwear Ltd, Lennards, Silver Shoes, Limson, Rhino Shoes, and Perfecta. At full operation, FAMAD could process up to 22,000 square feet of leather in its daily productions, but actual operation is about 2,000 square feet daily (about 10% capacity utilization). Due to unfriendly business environment, most of the manufacturers have closed down, and most cases most sell franchise to small-scale manufacturers.

Right now, there are three major shoes manufacturing centres whose demands for leathers are quite high. These manufacturers are located in Aba, Lagos and Kano. The Aba shoes manufacturing cluster specialized in the manufacturing of military and paramilitary shoes, as well as the oil industry shoes. FAMAD shoes manufacturing firm in Lagos specialized in school children shoes, like the Cortina types school shoes, The Kano shoes cluster manufactures sandals and other shoes. There are other minor manufacturers in Zaria, Maiduguri, Sokoto, etc.

Table 4: Activities in the Leather and Leather products subsector

		Tanning and dressing of leather (Sq.Metres)	Manufacturing of Luggage, Handbags and the like, Saddlery and Harness (kg)
2007	Quantity	98,125,928	2,174,281
	Value	16,451,751,840	4,105,107,304
2008	Quantity	2,685,391,285	8,775,722,693
	Value	875,971,744,198	324,456,159,397
2009	Quantity	8,212,270	30,900
	Value	2,877,759,770	133,055,000,000

Source: National Bureau of Statistics, Abuja

Table 5: Production of Leather shoes, all types

year	1990- 1992 average	1993-1995 average	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Million pairs	5.1	2.3	1.2	1.1	1.0	0.9	1.2	1.3	1.3	1.4	1.4	1.4	1.5	1.5 prel	1.5 est.

Source: World Statistical Compendium for Raw Hides and Skins, Leather and Leather Footwear, 1990-2009.

On regional trade, the products from Aba cover markets in Cameroon and Congo. The products from Kano, Maiduguri, and Sokoto cover markets in Cameroon, Chad, Niger, Burkina Faso, Mali and Senegal.

On International Market, leather products are not really sold internationally, but really one can find shoes and other leather products made in Nigeria but labeled as products from other countries being sold outside the West African region. Nigeria majorly exports hides and skins to the EU. The revolution in the processing brought the Lead Group (FATA Tannery), a Chinese firm to the leather industry in Nigeria; their leathers are exported to China for value addition.

5.4 Institutions involved in product development and marketing

The Nigerian hides and skins institute in Zaria was established as a research centre to develop new products and expand the market for hides and skins and by extension the leather industry. Also the institute is to build capacity for the industry. Surprisingly, no breakthrough has been recorded since its inception. Financial constraints have been given as reasons for non performance, as well as government inconsistent policy on the mandate of the institute.

5.5 Ranked major constraints of the leather and leather products subsector

i. Accessibility to single digit loans from the financial system
ii. Delay in the payment of the EEG
iii. Accessibility to the import of fine raw leather that can be processed; leather from the skins of reptiles are fine but not abundant in the country.
iv. Rejection of made in Nigeria products by Nigerians
v. Accessibility of black oil – LPFO

5.6 Stakeholders perception of solutions to the critical issues

i. Making available LPFO and at reasonable price
ii. All basic raw material and chemicals used by the industry be imported at duty free or a reasonable lower rate, if any.
iii. Payment of the EEG be made within four (4) months from the day submission of receipts of transaction was stamped.
iv. Single digit loan with a repayment period of not less than 10 years and access to the textile fund.

5.7 An Inventory of the modern industrial applications of the resource base

While hide tanning or curing may have been born out of necessity for early man and taken a rather rudimentary form by modern standards, the state of the industry today is due in large part to the technology and automation of the Industrial Revolution. The glitz, glamour, excitement, and insatiable appetite for extravagance that marked the age also fueled the development of newer, faster, more scientific methods for mass-producing leather products. Chromium tanning, fat liquoring, and hide splitting were just a few of the advanced techniques developed heading into the 20th Century.

Machines used in the Leather and leather products subsectors

- Flaying machine
- Sewing machines for leather
- Leather machines for cutting and skiving, splitting
- Sewing machines for littleway construction and repair
- Machines for finishing, sanding and polishing
- Cutting machines for steel rule dies
- Steel rule cutting dies
- Hide tumbler used to tumble hides for breaking and softening at the time
- Hide sander/Buffer for processing hides. It sands and buffs the leather
- Leather skiving machines
- Leather Embossing machines
- Leather splitting Machine/hot melt folding machine
- Blade brand precision leather slicing machine
- Leather Dedusting machines
- Leather coloring machines
- Leather engraving machine
- Vertical-type leather measuring machine
- Last-making machines
- Machines for assembling uppers and soles

Chemicals currently used in leather making

- Biocides prevent the growth of bacteria which can damage the hides or skins during the soaking process
- Surfactants are used to help with the wetting back of the hides or skins
- Degreasers help with the removal of natural fats and greases from the hides or skins
- Swell regulating agents help prevent uneven swelling of the hides or skins during liming
- Lime is used to swell the hides or skins
- Sodium sulphide chemically destroys the hair on hides or skins
- Sodium hydrosulphide chemically destroys the hair on hides or skins. It does not create as much swelling as sodium sulphide
- Low sulphide unhairing agents help to reduce the amount of sulphides used in a tannery thus reducing the environmental impact of tanneries
- Caustic soda is used during the liming process to help swell the hides or skins
- Soda ash is used during the soaking or liming processes to help raise the pH of the hides or skins
- Ammonium sulphate is used during the deliming process and helps remove lime from the hides or skins
- Ammonium chloride is used during the deliming process and helps remove lime from the hides or skins
- Sodium metabisulphite is used during the deliming process and helps prevent the formation of toxic hydrogen sulphide gas during deliming. It also acts as a bleaching agent
- Formic acid is used during the pickling process to lower the pH of the hides or skins
- Sulphuric acid is used during the pickling process to lower the pH of the hides or skins
- Salt is used during the pickling process to prevent acid swelling of the hides or skins
- Sodium formate is used during the tanning process to assist with the penetration of chromium tanning salts into the hides or skins
- Chromium sulphate is the tanning agent used to make wet blue
- Aldehydes are tanning agents used to make wet white
- Magnesium oxide is used during basification and raises the pH of the hide or skin to allow the chromium or aldehyde to chemically bind to the skin protein
- Fungicides are chemicals that are used to prevent the growth of moulds or fungi on tanned hides or skins
- Surfactants help in the wetting back of the wet blue in the dyehouse
- Degreasers help remove grease or fats that may be present on the wet blue as a result of the wet blue coming into contact with machinery
- Sodium formate helps raise the pH during the neutralization process
- Sodium bicarbonate helps raise the pH during the neutralization process
- Formic acid reduces the pH for the rechroming process or helps with chemically fixing dyehouse chemicals to the leather at the end of the dyehouse processes

- Chrome syntans are used during rechroming to improve the softness of the final leather
- Chrmium sulphate is used during rechroming to improve the softness of the final leather
- Syntans are used to give properties such as softness, fullness, roundness to the leather
- Resins are used to give fullness and a tight grain to the leather
- Polymers are used to give fullness and a tight grain to the leather
- Dyes are used to give the leather a colour desired by the customer
- Dyeing auxiliaries help disperse the dyes evenly
- Fatliquors are oils that are added to leather to give softness to the final leather finishing
- Acrylic resins give specific properties to the leather finish such as adhesion, water resistance
- Butadiene resins give specific properties to the leather finish such as good coverage
- Polyurethane resins give specific properties to the leather finish such as good toughness and good lightfastness
- Fillers help fill small blemishes on the leather surface
- Dullers help reduce the gloss of the finish
- Crosslinkers are used to toughen the leather finish and improve the water resistance properties of polyurethanes
- Handle modifiers are used to give the leather surface a waxy or slippery feel
- Nitrocellulose lacquers are used in the top coat of a leather finish
- Acrylic lacquers are used in the top coat of a leather finish
- Polyurethane lacquers are used in the top coat of a leather finish
- Viscosity modifiers are used to increase the viscosity of a finish mixture
- Pigments are colouring agents that help hide defects on the leather surface
- Dyes are colouring agents that are used to slightly change the colour of the leather finish or to give the leather finish a more natural look
- Defoamers are used to prevent bubbles from forming in the finish mixture

5.8 Nigeria's distance to world's best practices in processing, design and marketing

A good example of good practice in the leather industry is the Chennai leather cluster in Indian. Chennai is a metropolitan city located in the state of Tamilnadu, in South-East India. The estimated household population is 6.9 million (2006). Chennai and its nearby districts accounted for more than 60 per cent of leather production in India in 2006 (Padmanand, 2008). About 55 per cent of the tanneries in India are located in Tamilnadu contributing to around 6 per cent of the world's supply of finished leather. Export and export intensity in the surveyed firms rose from $61.3 million and 93.0 per cent in 2000 to $91.4 million and 94.5 per cent in 2006.

Drivers of firm-level performance[2]

- Abundant supply of low wage skilled labour (mean wages in Chennai's leather firms is $0.3 an hour)
- Abundant supply of raw materials (India accounts for 10 per cent of the world's raw materials)
- Removal of export restrictions on leather products in the 1990s
- Growing export and domestic demand (The growing middle class of about 90 million households has helped expand domestic demand for firms to engage in large scale operations.)
- Strong support from embedding high tech institutions (There is a network of institutions - Central Leather Research Institute, Footwear Design and Development Institute, Central Footwear Training Institute - providing design, training, and technical inputs.)
- Strong financial incentives
- Tariff privileges given to leather firms
- Supreme court decision in the mid-1990s imposing conditions on environmental compliance forced exporting firms to acquire environmental best practices.
- De-reservation of items earlier reserved for manufacturing by small scale industries
- The dynamic role played by the Integrated Leather Development Scheme, providing generous subsidies for modernization.
- Strong public-private partnership
- Good infrastructural base in two industrial parks established in Chennai, stimulating agglomeration synergies.
- Infrastructure provided in the two industrial parks established in Chennai has stimulated agglomeration synergies
- Demonstration effects of foreign firms for local technological upgrading.

The Nigerian raw hides and skins, wet blue, and semi finished leather seem to be very close to world best practices in terms of processing, design and marketing. The leather produced by the tanneries are competing internationally. Most of the tanneries major markets are from abroad: 95 percent of the products are for export, while 5 percent only is for local market. Quality has been the driving force in the export market, and this message has also gone down to those who supply hides and skins for processing. There is dependence on hides and skins from free range because of the quality of such skins. The government has provided fiscal and non-fiscal incentives for exports and imports of equipment used in the industry.

5.9 Assessment of Nigeria's distance to the technological frontier

[2] Background paper for UNIDO industrial development Report (2009)

At first, the science of leather tanning was accidental. Yesterday, tanning harnessed the best practices of an agrarian craft and transformed it into a modern industry. Today, research and development is a systematic process that maximises the benefits of animal hides and skins as an important natural resource while minimising stress on the environment. Tomorrow, the European leather industry will continue to develop innovative clean technologies that bring sustainable solutions to complex ecological, safety, aesthetic and performance challenges.

Europe is an important player in the international leather trade. Tanners in Europe have a long tradition of producing all kinds of leather, from bovine and calf leather to sheep and goat leather, from sole and exotic specialities to double-face garment leather. Their expertise contributes to the success of leading footwear, garment, furniture and leather goods manufacturers. This solid experience and the outstanding know-how of European tanners and dressers is displayed at major international fairs. All this explains the continuously strong demand for their products on international markets.

Small and medium sized companies predominate in the European tanning sector. The consequent flexibility, adaptability and the quick response to demand constitutes one of the industry's most important assets. Larger companies, however, excel, thanks to their capacity to be at the forefront of technological developments and to constitute reliable partners in global business activities. Technological leadership, fashion, design, quality, excellent raw materials and the sense of service to the customer are all factors contributing to the strength of European tanners. Continuing modernisation combined with investment in training, environmental infrastructure, R&D and export promotion allows the industry's operators to look to the future with confidence.

GERIC is the Grouping of European Leather Technology Centres in Europe. GERIC constitutes the technological backbone of Europe’s Leather industry. In a series of projects that have gained the financial support of the EU and National Research funding, GERIC has produced numerous tools for improving the technological performance of the leather industry and the training skills of its human resources. GERIC institutes provide testing, training, consulting, project and research services to domestic and foreign customers with guaranteed superior quality.

In terms of developing indigenous technology, Nigeria is miles away from the developed world. The reasons for this are the long neglect of the industry, and the domination of the subsector by foreign firms whose interest is short run profit maximization. The subsector has been described as a cartel and they prefer to import all their equipment instead of them to develop indigenous technology.

In terms of the technology used in the tanneries, the Nigerian leather subsector is very close to the world technological frontier. The latest technology in the sector is quickly acquired which made them to be competitive. Their foreign partners ensure that they do not lack the knowledge or recent developments in the field. There is an easy transfer of technology through the train-trainers training scheme. However, this process of technology acquisition/transfer is not open to Nigerians.

5.10 Product specific policy agenda for action

5.10.1 Common facilities for collective response to enhance efficiency gains

- Improvement in general infrastructure, especially electricity and water supply
- Institutions to reinforce standards and quality, especially among indigenous firms
- Data base to be build up to support the industry
- Stability of government policies
- Reduction of environmental pollution as a factor for competitiveness
- Trade promotion strategies by NIPC and NEPC
- Improve transparency in the industry; there now low local content, and technology transfer due to the cartelization of the industry
- Increase in labour productivity

5.10.2 Special purpose vehicles for production development and marketing

An industrial cluster needs to be established that would house, tanneries, manufacturers of leather products and machines for the subsector. It is imperative that government should create incentive for entrepreneurs to come together (under a special purpose vehicle) to set up production units in the industrial clusters for efficiency gains. The proposed industrial cluster is to address the infrastructure constraints faced by the subsector in the country. This is a holistic approach to the problem of infrastructure – power, water, effluent treatment system,

etc. This would enable the subsector to improve its global competitiveness, apart from meeting the regulatory and trade related compliances.

Development of leather industry in clusters has starting gaining importance in European, Asian and Latin American countries. A special purpose vehicle (SPV) formed by a group of private entrepreneurs that are engaged in leather tanning, manufacturing of leather and non-leather goods and components, and other activities associated with the industry. The leather industrial cluster would be implemented by the entrepreneurs through the SPV for the cluster. The cost of developing the cluster and infrastructure will be shared by the government and the SPV. The SPV would be a legal entity registered with the CAC. Ministry of commerce and industry shall set conditions for establishment and membership of the SPV.

5.10.3 Business support services for production and marketing

Small and medium-sized enterprises that are striving to achieve and maintain a competitive edge in the regional and global market need to be backed by efficient and strong national trade support institution. This is very important for the sustained and improved access to trade related services such as financing, help in maintaining quality standards, advice on export packaging and ready information on legal requirements of international business.

The International Trade Centre (ITC) assists countries in purchasing the goods required to meet their people basic needs, and in improving the effectiveness of their government procurement. ITC works with national institutions to improve their ability to provide consulting support, information and training covering the whole purchasing and supply chain. This involves diagnosing supply bottlenecks and problems, monitoring supply markets, implementing effective purchasing strategies, optimizing the quality of goods, managing the inbound logistics process and protecting imported goods against damage, loss and inefficient utilization.

The china international trading centre services is a business matching platform for international purchase based on enterprise specific demands for the buyers. It also offers the services of technology transfer by brining in the most advanced technology and equipment. In terms of technology transfer services, they provide the latest information about technology and equipment for manufacturing and processing, including design ideas, implementation and solution. They have a database of top engineers all over the world and keep a cooperative

relation with them to achieve technology transfer, including patent purchasing, technology support and equipment transfer.

The special purpose vehicles created to take advantage of common facilities provided by government to enhance efficiency gains in the industry will align with these and other business support services providers for technology, processing/production techniques, designs, and marketing strategies.

5.10.4 Institutional framework for capacity building

The college of chemical and leather technology was established with a mandate to provide courses for institutional training and research in the field of leather product technology and conduct research and development on leather technology and goods production.

The mission of the college is:

- To provide globally competitive and environmentally friendly technologies for leather and leather products and allied industries
- To acquire and maintain world class technical capacity and reputation to offer science based consultancy services in leather and leather products, production and marketing quality control and related areas
- To provide technologists and technicians with sound understanding of necessary science for the production of chemicals, polymers, leather and leather products and the technologies and to provide service support to the industrial sector.

  The first institution for the development of capacity in the leather and leather products subsector was the leather research institute of Nigeria and it was established in 1976, the institution was latter refocus and was known as National Research Institute for Chemical technology in 1982, it was not until 2006 that the College of Chemical and Leather Technology (Cheltech) Zaria was given a unique entity to carry out the mandate with the set out mission above.

  - Government in conjunction with developmental partners should equip the college with modern training facilities in order to build relevant capacity
  - The National Research Institute for Chemical Technology (NARICT) Zaria should be well equipped and further training be provided to enable the institute support the industry with modern chemicals. Adhesives are necessary

especially in the leather products making; its demand is quite high and can easily be produced domestically

5.10.5 Strengthening local and regional value chains

The supply chain in the leather and leather products subsector involves the animal husbandry and the processing of the hides and skins, and the manufacturing and marketing of leather products. The process is described as follows:

- The Recovery of hides and skins from slaughtered animals in farms and abattoirs
- The conversion of hides and skins into leather in tanneries, normally requiring substantial investment in equipment
- The manufacture of leather products often carried out in labour-intensive small workshops with less need for substantial investment in equipment or in larger capital-intensive factories.
- The marketing, both domestic and export of intermediate and end products at different stages of the supply chain. The global market is controlled by international marketing agents who have the market knowledge and the wide market network.

  Each of these processing stages requires inputs, policies and support systems if the whole chain is to function effectively.

Specific policy agenda for action:

- Provision of easy access to micro-finance for micro-entrepreneurs engaged in the hides and skins trade
- Promote more market-oriented approach to livestock rearing among livestock producers
- Provide training to a wide range of people in both urban and rural areas in slaughtering and flaying skills, in preservation techniques, and in applying grading and standards. The training programme should establish linkages among the people operating in different sections of the chain through the train-the-trainers programme
- Establishment of Leather and leather production cluster in the six geopolitical zones. The Aba cluster is an example. We need one especially in Kano
- Adopt an environmentally friendly technology available in the market

- Enforcement of effluent standards that are appropriate for local conditions and in keeping with global market requirements
- Enterprises should be encouraged to enter into sub-contracting agreements with foreign companies as independent enterprises or in groups in order to accelerate the transfer of technology and business know-how
- Participate in joint ventures to attract cheaper capital, obtain updated technology and modern management techniques, and gain better access to global markets.
- The research

5.10.6 Specific fiscal and non-fiscal instruments

- Government to grant a tax holiday to indigenous firms that have made new capital investment towards increasing plant output
- Special incentives to foreign owned firms that has demonstrated high level of local content in its processing system
- To persuade banks to increase sectoral allocation of credit to the real sector
- The sector to benefit from the textile fund

5.10.7 Strengthening sectoral innovation systems

- Learning and capabilities development by domestic firms through R&D
- Government policy interventions for domestic capacity and capability building
- Skilled labour force is required
- Entrepreneurship and development of SMEs
- Enhanced adaptive capacity and capability to use modern technology and device, and to commercialize new knowledge, paving the way for strengthening sectoral innovation system.

5.10.8 Specific measures for spreading the impact of FDI on domestic capacity and capability building

- Extending/enforcement of the local content Act, as well as ensuring value addition
- Overseas training
- Special incentive for the transfer of technology
- Joint venture with foreign partners
- Transparency in the subsector:

- Recipes for leather production be made known to locals
- Disclosure of marketing strategies
- Complementarities for capacity and capability building

5.11. Mechanisms and framework for implementing the agenda for action

a. The leather and Leather Products Development Council

The leather and leather products development Council will be composed of stakeholders in the primary production, processing and marketing of leather and leather products with value addition as a key strategy for industrialization. The council will be responsible for the sector specific implementation plan and would also interact with government for policy changes in the sector.

i. A stakeholders forum will be convened for identification of operators in the sector and as well as building commitments to establish the council

ii. Establishment of a steering board to be composed of principal officers of each representative unit to run the council and do the following:

- Create standards for the industry
- Establish mechanisms for quality measurement, grading and buy-in among industry stakeholders
- Provision of technical assistance to help stakeholders meet accepted industry standards
- Develop information sharing mechanism, market and financial linkages, and determine the fees for services provided which would be used in running the council.
- Monitor compliance with standards and the impact of the council services on the industry performance

b. Domestic Leather production

Hides and skins are majorly produced from cattle, sheep and goat; for industrial expansion, farmers will be enhanced and encouraged to produce more of these animals through extension and training services. Agricultural extension and training will be focused on improving the yield, quality, and average size of recovered hides and skins as well as their post recovery handling and grading, including conformity to industry standards.

This will involve:

- Identification of stakeholders in this phase

- Assist public and private agencies to acquire land for the production and multiplication of livestock as well as the production of support inputs such as hay, silage, mineral licks, livestock handling and processing equipment, veterinary drugs and services, etc

- Identification of areas for capacity building, especially in production, post recovery handling/techniques and preliminary processing

- Expand technical assistance to increase awareness of the benefits of proper slaughtering of hides and skins, especially at the local level

- Provide technical assistance in establishing production and processing plants

- Introduce new and improved practices to improve production, post-recovery handling and processing of hides and skins to target groups

c. Processing

- Assist producers or stakeholders to increase value added processing of hides and skins even at the local level

- Assist the federal government in developing policies, public health acts and regulations that will ensure that meat markets and restaurants source their meat from only certified meat packing plants or abattoirs

- Provide technical assistance in hides and skins processing, leather products manufacturing and plant management

- Help processors obtain quality management certification, as needed, to facilitate exporting to developed economies

d. Marketing and Exporting

- Increase public awareness on the need to patronize only certified meat and meat products sold according to standards and in certified meat markets

- Increase campaign to increase local production and consumption of shoes and other leather products made in Nigeria

- Provide technical assistance in packaging, packing and transportation to reduce cost and improve product condition on arrival

- Develop networking and create market linkage among producers, processors, exporters and importers

- Disseminate information about services of the Nigerian export-import bank (NEXIM)

e. Government participation

- Take steps to reduce costs of materials and equipment for livestock production and processing

- Accelerate delivery of Duty Credit Certificates in the Export Expansion Grant Scheme and streamline procedures of the Export Development Fund Scheme

- Encourage more favorable fiscal and non-fiscal incentives

- Assist with export promotion in cooperation with the Nigerian Export promotion Council (NEPC)

f. Evaluation and Feedback

The council will provide monitoring and evaluation of result; success in this program will be measured by the following

- Employment in livestock production, meat processing and leather products industry in Nigeria

- Number of women employed

- Tonnage of livestock produced and marketed according to standards and regulations

- Number of shoes produced and marketed to standards in the domestic and international markets

- Hides and skins recovery rate

- Reduction in shoe importation

- Exporting Earnings

CHAPTER SIX
CHEMICAL AND PHARMACEUTICALS

6.1 Overview of the subsector

The chemicals and pharmaceuticals subsector is the second largest manufacturing subsector in Nigeria (next to the food, beverages and tobacco subsector). The subsector is reckoned to have a potentially large market in Nigeria and the West African sub-region. Over the years, there has been significant increase in the number of Nigerian companies participating in the subsector, though it is still dominated by subsidiaries of multinational companies and other foreign chemicals and pharmaceuticals companies. The mission of the subsector as stated in NV2020 is "*to produce at least 75 per cent of the nation's drug needs by 2020.*" The subsector however currently produces only 35 per cent of the country's drug supplies. Specifically, the Nigerian pharmaceutical industry is reported by NV2020 to consists of 128 registered local pharmaceutical manufacturing companies in 2009, 292 registered importers, 724 registered distributors as well as a large number of unregulated manufacturing, importing and distribution businesses. The size of the unregulated market is difficult to accurately quantify because the operators rarely make returns to industry associations or regulatory bodies.

The first set of firms in this subsector was established as manufacturing plants of major multinational drug companies in the 1950s and 1960s. As indicated by the National Agency for Food and Drugs Administration and Control (NAFDAC), the subsector has passed through a tortuous path, from the rudimentary era of the 1950s to the foundation-laying era of the 1960s, through the oil boom era of the 1970s, to the harrowing experiences and decline of the 1980s and 1990s, and the renewal and potentially bright prospects of the recent years. Starting from a few multinational firms in the 1950s, the subsector now has over 100 formal sector firms with aggregate investments in excess of N300 billion ($2 billion), and employing over 600,000 persons in manufacturing plants and marketing outlets. The product constitution of the subsector as stated in NV2020 comprises:

- Paints, Vanishes and Allied Products
- Industries, Medical and Special Gases
- Soap and Detergent
- Petrochemicals
- Agro-Chemicals (Fertilizers and Pesticides)
- Pharmaceuticals
- Safety Matches
- Domestic Insecticide and Aerosol
- Dry Cell Battery
- Gramophone Records and Musical Tapes
- Candle manufacturing
- Printing Ink manufacturing
- Toiletries and Cosmetics,
- Ball Point Pen manufacturing

- Basic Industrial Chemicals
- Automotive Battery

For each of the products in the list, there has been evident significant manufacturing presence in the past. However, while most of these products are still being manufactured, it is pertinent to note that there has been exit of notable manufacturers and existing manufacturers are faced with enormous challenges that pose significant threat to their ability to sustain production activities.

According to ISIC Revision 4 of 2004, the pharmaceutical industry includes the manufacture of pharmaceuticals, medicinal chemicals and botanical products; while the chemical industry consists of the manufacture of the following chemical products:

- basic chemicals (e.g. petrochemicals);
- fertilizers and nitrogen compounds;
- plastics in the primary forms and synthetic rubber;
- pesticides and other agrochemical products;
- paints, varnishes and similar coatings, printing ink and mastics;
- soap and detergents, cleaning and polishing preparations;
- perfumes and toilet preparations; and
- man-made fibres.

With the exception of the manufacture of primary plastics and synthetic rubber, all the ISIC components are essentially included in the NV2020 definition of the chemicals and pharmaceuticals subsector.

In the Nigerian chemical industry, the most active segment is the manufacturing of paints. As reported by NV2020, the Nigerian paint sector is relatively highly competitive due to considerably large number of operators. There is free entry and exit due to the relatively low capital requirement for setting up a paint manufacturing factory. Additionally, operating costs are also relatively low, thereby increasing the number and longevity of players that exist. There are more than 1,000 paint manufacturing plants, and inefficient regulatory monitoring is believed to have inevitably led to the lowering of standards because fringe players produce cheaper sub-standard paints.

In order to understand the structure of the pharmaceutical industry, it is important to note that the industry can be divided on the basis of form, therapeutic application and patent protection. On the basis of form, the industry can be categorized into bulk drugs and formulations. On the basis of therapeutic application, it can be divided into various therapeutic segments. On the basis of patent protection, it can also be segmented as generics and patent protected drugs.

Bulk Drugs and Formulations: Bulk drugs are the Active Pharmaceutical Ingredients (APIs) with medicinal properties, which are used to manufacture formulations. APIs cannot be administered directly to the patient, and other substances called excipients are added to stabilize the mixture. This end product, which includes the API and the excipient, is referred

to as a formulation. Formulations can take the form of tablets, capsules, syrups, ointments, creams, injectables, etc.

Generics and Brand name drugs: Brand name drugs are innovator drugs patented by pharmaceutical companies to prevent them from being copied or reverse engineered by other companies; while generics are copies of off-patent brand-name drugs that come in the same dosage, safety, strength, and quality and for the same intended use. These drugs are then sold under their chemical names as both over the counter and prescription forms. The generics segment can be further segmented into two: 1) *Plain vanilla generics*, which are commodity generics that are "off-patent" in the regulated markets. They offer little or no innovative value over the innovator's product; 2) *Branded generics*, which are generic drugs for which a drug manufacturing company has attached its brand name and may have invested in its marketing to differentiate it from other generic brands.

In the production of bulk drugs and formulations, whether branded or generics, excipients and diluents play important roles. An *excipient* is generally a pharmacologically inactive substance used as a carrier for the active ingredients (API) of a medication. In many cases, an API such as acetylsalicylic acid may not be easily administered and absorbed by the human body. The substance may therefore be dissolved into or mixed with an excipient. Excipients are also sometimes used to bulk up formulations that contain very potent active ingredients, to allow for convenient and accurate dosage. In addition to their use in the single-dosage quantity, excipients can be used in the manufacturing process to aid the handling of the API concerned. Depending on the route of administration, and form of medication, different excipients may be used. For oral administration tablets and capsules are used, while suppositories used for rectal administration. Often, once an active ingredient has been purified, it cannot stay in purified form for long. In many cases it will denature, fall out of solution, or stick to the sides of the container. To stabilize the active ingredient, excipients are added, ensuring that the active ingredient stays "active", and, just as importantly, stable for a sufficiently long period of time that the shelf-life of the product makes it competitive with other products. Thus, the formulation of excipients in many cases is considered a trade secret. It is also important to note that pharmaceutical codes require that all ingredients in drugs, as well as their chemical decomposition products are identified and guaranteed to be safe. For this reason, excipients are only used when absolutely necessary and in the smallest amounts possible. *Diluents* are also very important in the pharmaceutical industry, often as a form of excipients. They are inactive ingredients that are added to tablets and capsules in addition to the active drug. For example, a Tylenol 325 mg tablet does not weigh 325 mg. This is the weight of the active acetaminophen, while the tablet weighs more due to other additives known as diluents. These additives may be used as binders, disintegrants (help the tablet break apart in the digestive system), or flavor enhancers. Some very common diluents in tablets include starch, cellulose derivatives, and magnesium stearate (a lubricant).[3]

[3] This paragraph draws largely from Wikipedia Free Online Encyclopedia.

The chemicals and pharmaceuticals subsector is one of the five high priority manufacturing subsectors which are considered as having a high potential for development in the short to medium term for the realization of the NV2020.

Key policy reforms that have helped the development of the chemicals and pharmaceuticals subsector in recent years include:

- The amendment of the Essential Drug List (EDL) decree restricting the application only to public health institutions. With the amendment to this decree, companies were able to expand their product base, resuscitate abandoned product lines, and increase their volume, turnover and profit margins.
- The abolition of the import license system also brought succour to the industry. Foreign exchange, which hitherto was an object of political patronage, became available to the real industrial sector. Industries were able to source their raw materials and equipment, free from encumbrances.
- The abolition of Value Added Tax (VAT) on pharmaceutical raw materials, coupled with the reduction of tariff on raw materials and equipment.
- NAFDAC's differential tariff and its war against fake drugs have created credibility and trust especially for the pharmaceutical industry.

6.2 Resource base and import-dependence for production

The chemicals and pharmaceuticals subsector is one of the manufacturing subsectors that highly depend on natural resources either in the plant or biodiversity domain or hydrocarbon resources. Nigeria is endowed with vast and treasured forest resources with biodiversity that have been important sources of raw materials for chemical and medicinal products even before the advent of modern chemicals and pharmaceuticals production in Nigeria. However, harnessing and integrating the local or indigenous knowledge in this respect has remained a major development challenge in the subsector. Moreover, Nigeria is one of the world's major producers of crude hydrocarbon resources. Nigeria has been unable to transform part of the hydrocarbon base into critical petrochemicals that are major inputs into the production of chemicals and pharmaceutical products. Nigeria is also naturally endowed with deposits of several solid minerals in commercial quantities from which ingredients for the production of chemicals and pharmaceutical products could be sourced.

From past studies, some of the locally available raw materials or intermediate products that could be exploited as inputs into the manufacturing of chemicals and pharmaceuticals products are:

- Industrial starch from cassava: Nigeria is the world's largest producer of cassava. There are local manufacturers of starch in Nigeria but none of them currently produce pharmaceutical grade starch.
- Salt (sodium chloride and potassium chloride).
- Granulated sugar.
- Alcohol.

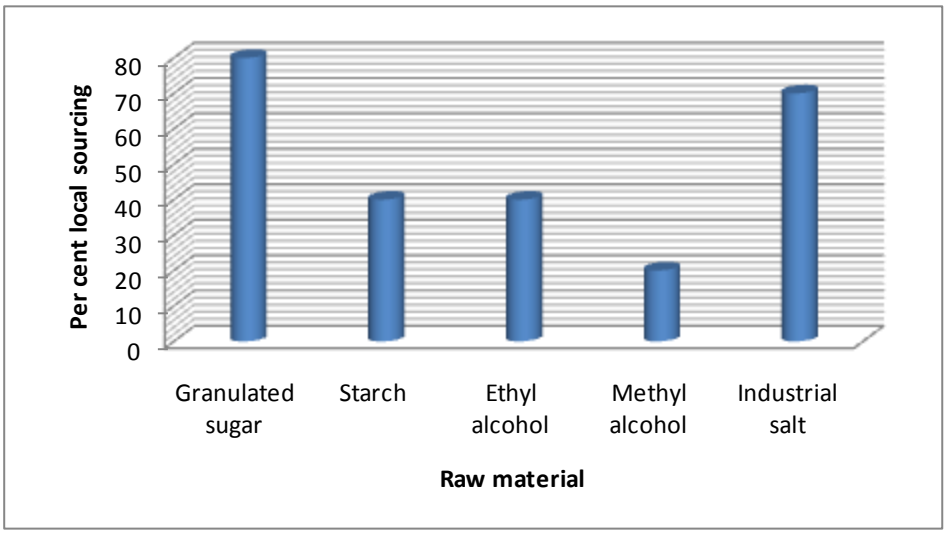
- Glycerin.
- Petroleum jelly.
- Vegetable oil.
- Acacia.
- Kaolin/Talc.
- Limestone.
- Packaging materials (e.g. glass, plastics, wood board, cellophane, aluminum foil, etc.).

In the early 1990s, it was reported that 90per cent of the raw materials in the subsector were being imported. These included:

- Active *pharmakon* substances, which constituted between 50 and 75 per cent for most products and preparations. These are mostly petro-derived fine chemicals or sometimes plant-based medicinal materials.
- Solid diluents, which include dextrose and lactose (starch), cellulose, and industrial salt.
- Binders, which include acacia, glucose starch, and mucilage.
- Disintegrants, which include starch obtainable from maize, rice, borax, calamine, and chalk (gypsum).
- Sweetening agents, which include granulated and liquid sugar, and saccharin.
- Flavouring agents, which include volatile oils.
- Liquid diluents, which include ethanol, methanol, isopropyl, alcohol, kerosene, and propylene glycol.

Though a few of these items were locally obtainable, their supply was often not reliable and industrial grade quality was not always satisfied. As at the period of the study in the early 1990s, Figure 1 shows the per cent of a few of the raw materials that were locally obtained.

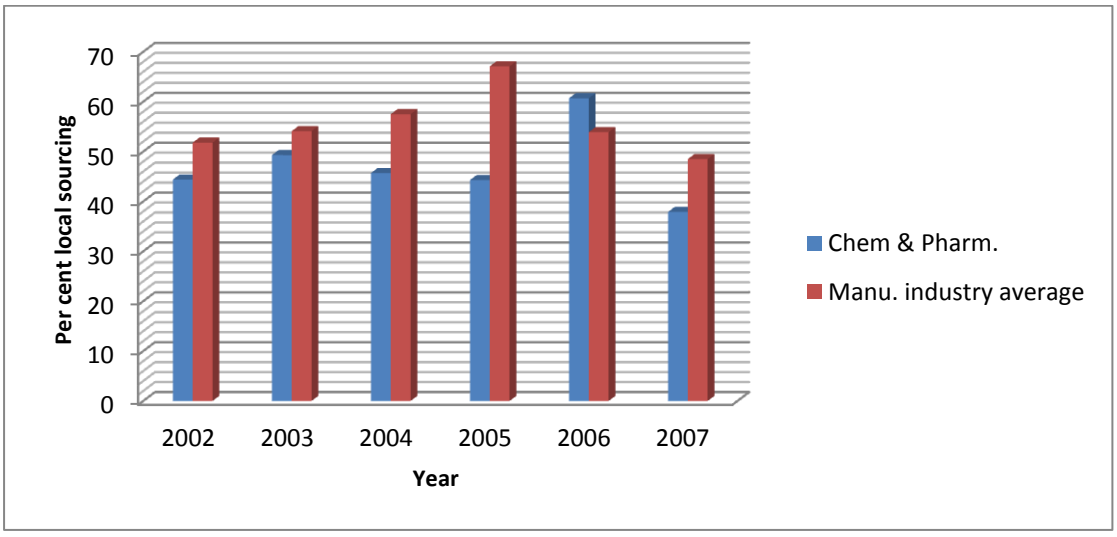
Figure 1. Proportion of selected raw materials obtained from local sources in the early 1990s



***Source**: Data compiled from MAN Economic Review, 2003-2006, 2006-2007.*

The trend in local sourcing of raw materials in the chemicals and pharmaceuticals subsector in recent years is shown in Figure 2. The trend shows that the local sourcing of raw materials in the subsector has remarkably improved from the reported 10 per cent in the early 1990s to 44.4 per cent in 2002. However, further increases in the local sourcing of raw materials between 2002 and 2007 have been unsteady or volatile. It decreases from 49.3 per cent in 2003 to 44.3 per cent in 2005, reached a peak of 60.7 per cent in 2006 but declined to about 38 per cent in 2007. This volatility may perhaps be explained by the uncertainties often associated with implementation of industrial policy, and the sharp decline from 2006 to 2007 might have resulted from the impact the crisis that attended the largely flawed 2007 general election. It is also noteworthy that the per cent of raw materials locally obtained for the chemicals and pharmaceuticals subsector is generally lower than the manufacturing industry average for all the years except 2006. The relatively high local sourcing of raw materials by the chemicals and pharmaceuticals subsector in 2006 is short-lived and therefore does not suggest attainment of significant capacity in local sourcing of raw materials. It may thus be concluded that, compared to other manufacturing subsectors, the chemicals and pharmaceuticals subsector is relatively more import dependent in the sourcing of raw materials.

Figure 2. Trend in the local sourcing of raw materials, 2002-2007



Source: Data compiled from MAN Economic Review, 2003-2006, 2006-2007.

6.3. Firm size, ownership and location

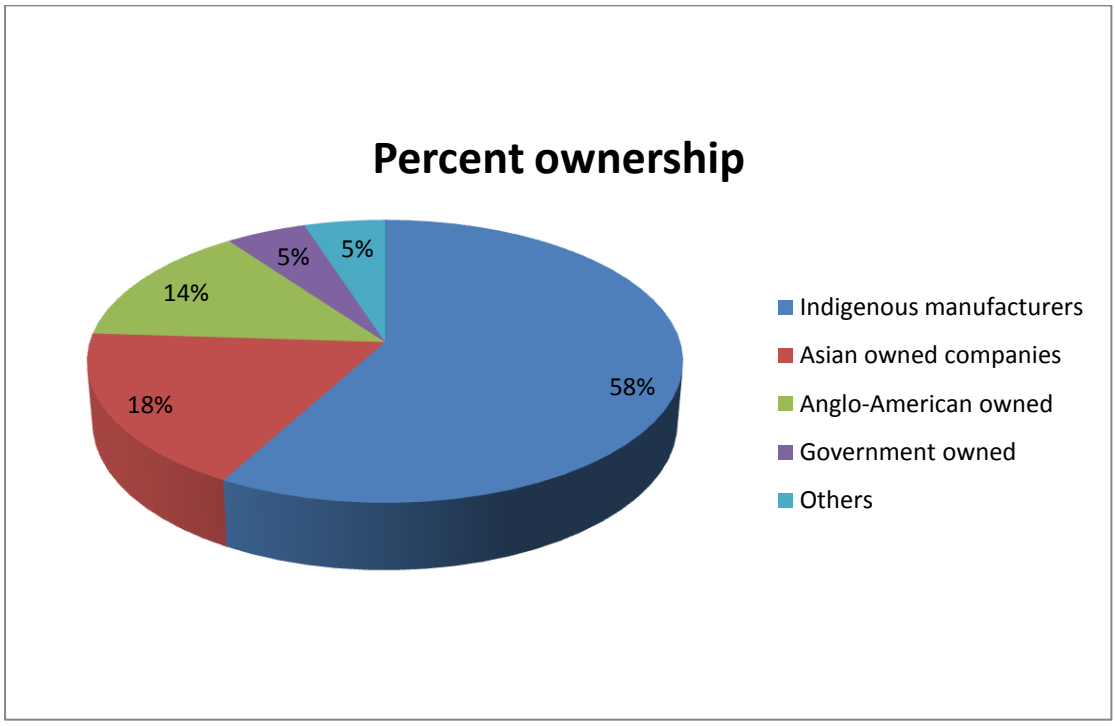
Firm ownership in the chemicals and pharmaceuticals subsector was initially dominated by major multinational drug companies establishing production plants in Nigeria. As reported by NAFDAC, these companies include Glaxo (1958), Pfizer (1962), Sterling (1963), Wellcome (1967), PZ (1968), and Pharchem (1968), SmithKline Beecham (1973), May & Baker (1977), and Hoechst (1982). These initial start-ups were largely successful and many of the companies expanded and built modern factories. This was essentially part of the import-substitution industrialization (ISI) which was import-dependent and entail little or no local

value addition. The hitherto imported chemicals and pharmaceutical products were produced locally with almost all inputs from foreign origin. The oil boom of the 1970s helped sustained the ISI regime, and the companies were solely owned and operated by foreigners with little or no Nigerian indigenous participation.

The enactment of the Indigenization Policy in 1978 forced most of the multinational companies to sell 60 per cent of their shares to Nigerian investors. The period also saw the emergence of indigenous companies such as Biode, Rajrab and Leady Pharma (1980), Biomedical Services (1981) and many others. The Federal and the then Bendel State Governments also set up manufacturing facilities in the country. Indigenous companies began to combine the formulation of simple dosage forms with the manufacture of more sophisticated dosage forms. By 1980, the local production of drugs had increased from less than 5 per cent to 20 per cent. This stage of the development of the chemicals and pharmaceuticals subsector was a very positive stage for the country's pharmaceutical industry. It engendered prospects for many Nigerian investors and improved the chances of expansion with consequent positive growth impact on the Nigerian economy.

The overwhelming dependence on imported inputs for the manufacturing was also accompanied by unbridled importation of finished products during the oil boom era. The consequence was a severely damaged economy, which the World Bank and the International Monetary Fund (IMF) inspired economic Structural Adjustment Programme (SAP) unsuccessfully sought to repair in the late 1980s. With the dwindling economy and severe shortages of foreign exchange, goods became scarce and the scarcity of chemicals and pharmaceutical products became a new phenomenon. The Nigerian government implemented an import license regime, which was mainly on the basis of political patronage. Many people who had no business with drugs and pharmaceuticals got the licenses and became importers, while pharmacists, genuine manufacturers and importers were denied access to foreign exchange or forced to repurchase the import licenses from those whose plants and offices were located in their briefcases. With the import licensing regime, the drug importation and distribution system in Nigeria became chaotic. The country's markets were flooded with all sorts of fake/counterfeit and substandard products. A positive outcome of this situation was the emergence of more indigenous pharmaceutical manufacturers, such as Emzor, Mopson, Barewa, Geonnasons, Continental, Ashmina, and Afrik. As a result, the proportion of local manufacture grew to 40 per cent especially in the pharmaceutical group. Subsequently, the local ownership has been improving since the mid 1990s, and figure 3 shows the current ownership structure for the pharmaceutical group as reported by NAFDAC. It is remarkable that indigenous manufacturers presently control about 58 per cent of the total production of pharmaceuticals in Nigeria.

Figure 3. Ownership structure of the Nigerian pharmaceutical industry, 2009



***Source**: Data compiled from NAFDAC website*

It is pleasing to note that increasing presence of indigenous companies in the industry will create jobs for Nigerians and encourage the development of products that are relevant to the Nigerian healthcare needs. It should also encourage and support full implementation of the Essential Drug List as it ensures availability, accessibility, affordability, and rational use of drugs that are very crucial to the success of the Nigerian health policy. Despite the apparent growth in the number of indigenous players in the industry, there still remains the fact that no company has set up a basic active raw material manufacturing plant in Nigeria, not even for Paracetamol or Aspirin.

6.4. Recent trends in production, exports, and investment flows

The chemicals and pharmaceuticals subsector has been relatively highly regulated in recent years, and consequently, the quality of the products of the subsector has improved significantly. There is a large domestic market and there is evidence of export especially to the Anglophone countries in the West African sub region. As indicated in the NV2020 document, the mission of the subsector is: "to produce at least 75 per cent of the nation's drug needs by 2020". It is reported by NAFDAC that the subsector presently produces only 30 per cent of the nation's drug needs. Bridging the gap is a major challenge, and in this section we review recent trends in the production, exports, and investments in the subsector. It is however pertinent to note that a study by NISER in the early 1990s also reported that local production is about 30 per cent of total drug consumption as at 1990. It was estimated that total local drug production in 1990 was N508 million and total market N1.69 billion or about US$212 million. The turnover of the ten leading company for the first half of 1990 is as shown in Table 1.

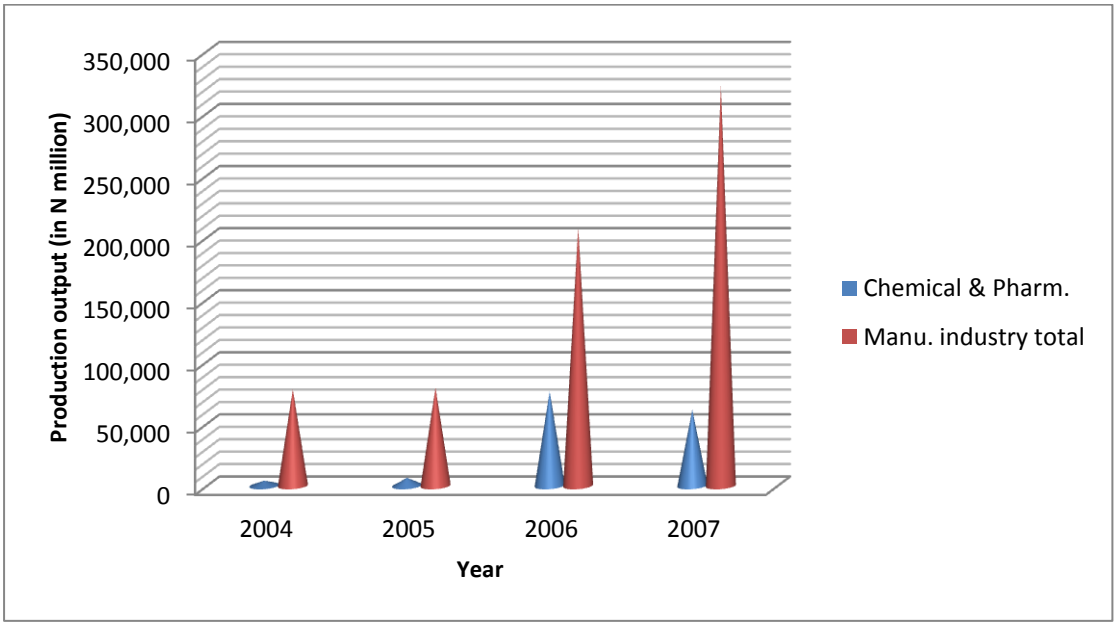
Table 1: Ten leading pharmaceutical companies in Nigeria, 1990

Company	Sales Jan.-Jun. 1990 (N million)	Market share (per cent)	Rank
Glaxo	53.10	20.93	1
Nigerian Hoechst	36.23	14.28	2
May and Baker	29.36	11.57	3
Pfizer	25.37	10.0	4
Christlieb	19.01	7.49	5
Roche	16.62	6.55	6
Swiss Nigerian	14.36	5.66	7
Emzor	12.55	4.94	8
Swissco Nigerian	7.16	2.82	9
Farmex	7.02	2.77	10
Total	**220.78**	**87.01**	

***Source**: NISER (1991)*

Figure 4 shows the trend in production output of the subsector in recent years. While total manufacturing output increase from 2004 to 2007, the output of the subsector increases up to 2006 but declined in 2007. It is however important to note that there was a major improvement in the level of output in previous years compared to the 2006-2007 output levels. The same trend is generally observable in the entire manufacturing industry. The underlying factors are not explicit, but we cautiously suggest that this indicates improvement in the real outputs of the subsector. The renewed confidence in the chemicals and pharmaceutical drugs manufactured in Nigeria should have contributed to these observed positive trends.

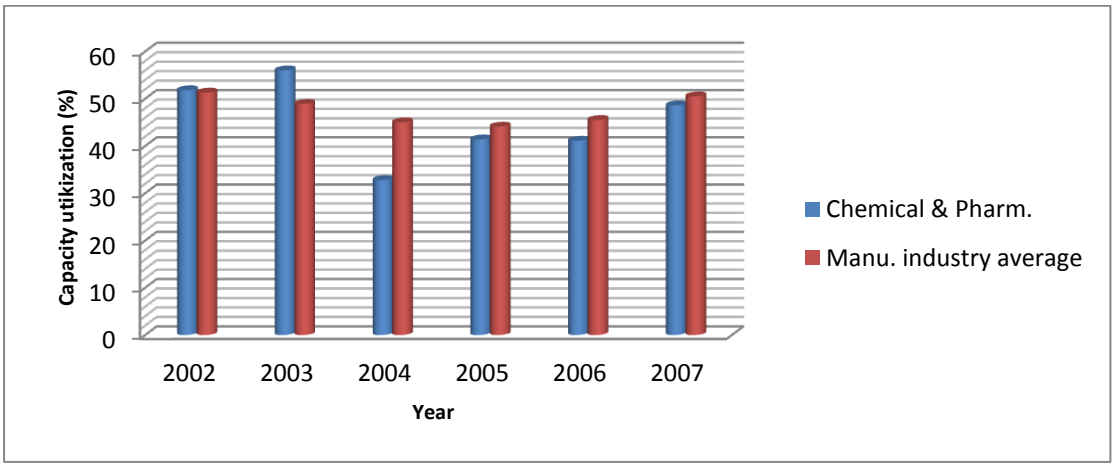
Figure 4. Trend in production output, 2004-2007



***Source**: Data compiled from MAN Economic Review, 2003-2006, 2006-2007.*

Despite the observed increases in output, the capacity utilization in the subsector has remained relatively low in recent years, and generally lower than the industry average. As shown in Figure 5, the capacity utilization reached a peak of 56 per cent in 2003 and declined sharply to about 33 per cent in 2004 and did not substantially recovered until 2007 when it attained 48.6 per cent.

Figure 5. Trend in capacity utilization, 2002-2007



***Source**: MAN Economic Review, 2003-2006, 2006-2007*

Export of manufactures in Nigeria is very low. It is widely known that Nigerian export is dominated by minerals, fuels, lubricants and related materials, all of which account for up to 95 per cent of exports in recent years. Non-oil exports which include export of agricultural commodities and manufactures account for only about 5 per cent of the exports. From the data in Table 2, export of chemicals and pharmaceutical products account for about 16 per cent of manufacturing exports in 2003. Considering the fact that improvements in the regulatory activities of agencies such as NAFDAC and Standards Organization of Nigeria (SON) in recent years have resulted in production of high quality products that satisfy international standards, it can be presumed that the current share of exports from the subsector in total manufacturing exports would be in excess of 16 per cent.

Table 2: Nigeria's manufactured exports, 2003

No.	Commodity	Net Weight (kg)	Value (fob) (₦ '000)	per cent of total value
1.	Vegetable products	5.512,353	200,873	2.9
2.	Animal and vegetable fats and oil	4.600,090	201,615	2.9
3.	Prepared food stuffs; beverages, spirits and vinegar; tobacco	8,322,257	393,655	5.7
4.	Products of the chemical and allied industries (paints, pharmaceuticals, soap & detergents, cosmetics, etc.)	1,338,714	1,110,656	16.2
5.	Plastic, Rubber and articles thereof	6,998,289	2,725,067	39.8
6.	Goat or kid skin leather, prepared after			0.8

	tanning	9,271	54,075	
7.	Paper making materials, paper and paper board articles	2,181,695	100,422	1.5
8.	Textiles and textile articles (yarn and fabrics, wearing apparel/garments, etc.)	931,684	1,338,154	19.5
9.	Footwear, headgear, umbrellas, sunshades, whips, etc.	2,600,826	407,201	5.9
10.	Articles of stone, plaster, cement, asbestos, mica, ceramic	1,521,053	81,922	1.2
11.	Miscellaneous manufactured articles (Furniture, mattress, mattress support, cushion, etc.)	176,334	239,200	3.5
	Total	**34,192,566**	**6,852,840**	**100.0**

***Source**: NBS (2003) 'Nigeria Foreign Trade Summary', National Bureau of Statistics, Central Business Area, Garki, Abuja.*

It is also known that foreign pharmaceutical firms have long regarded Nigeria with interest, chiefly because of its massive middleclass population and rising GDP, though purchasing power is still relatively low. The major risks for the development of the chemicals and pharmaceuticals subsector in Nigeria are still generally perceived to include:

- poor infrastructure;
- weak regulatory environment;
- existence of counterfeit drugs;
- sporadic law enforcement for shutting down illegal pharmacies;
- low per-capita spending on medicines;
- supply chain weaknesses;
- power generation and supply;
- poor infrastructure; and
- high unemployment and a limited skilled workforce.

Most infrastructure investments in the past have focused on transport and power generation. In spite of this, the railway is non-functional, the roads are bad, the ports' operations are cumbersome, and when power stations are operating, there are frequent outages. For chemicals and pharmaceuticals firms with high logistics requirement and heavy energy demands, this means high investment in own infrastructure especially separate electricity generators to prevent losses during production.

The Nigerian population growth rate is about 2.8 per cent, while real GDP growth rate is expected to continue to be about 7 per cent in the short term. Unemployment has been, and is set to remain high. High unemployment depresses the per capita purchasing power, and the per capita spending on pharmaceuticals was a meagre ₦600 (US$4) in 2009. In spite of the low per capita spending on drugs, it has been reported that the Nigerian drug market is still attractive to foreign investors because of the large population. The drug makers with keen interest on the Nigerian market are those that produce generic medicines and essential over-the-counter (OTC) drugs. The OTC is mainly analgesic OTC drugs which feature heavily in

terms of sales volumes, and it is believed that spending in this segment will continue to be about one-fifth of total pharmaceutical spending in Nigeria over the medium term. Nigeria is considered to be very much in the stage of high essential medicine demand, which is a key reason for the OTC market comprising a generous proportion of all medicine expenditure.

As shown in Table 3, there has been growth in the investment flow into the subsector in recent years. While investment flows into total manufacturing improved from 2004 to 2005 but declined in 2006, investment into the chemicals and pharmaceuticals subsector improved continuously from 2004 to 2006. In fact, the increase from 2005 to 2006 was more than four-fold. Though this is difficult to explain, it makes a strong impression that there was a considerable increase or boom in investment flow into the subsector in 2006. This trend has apparently not been sustained. It is however important to stress that the subsector has undoubtedly continued to attract a relatively high proportion of investments in the manufacturing sector.

Table 3: Trend in investment, 2002-2007

Year	Investment (N billion)	
	Chemical & Pharm.	Manufacturing industry total
2004	2.46	351.31
2005	4.49	357.74
2006	46.19	326.93
2007 (Jan-Jun)	11.40	190.85

***Source**: MAN Economic Review, 2003-2006, 2006-2007.*

6.5 Institutions involved in product development and marketing

In Nigeria the institutions involved in product development and marketing of chemicals and pharmaceutical products are mainly regulatory agencies and professional associations. There are two major public research institutions in the subsector: The National Institute for Pharmaceutical Research and Development (NIPRD), and the National Research Institute for Chemical Technology (NARICT). Important regulatory agencies are:

- The NAFDAC
- The Standard Organizations of Nigeria (SON)
- The National Drug Law Enforcement Agency (NDLEA)
- The Federal Environmental Protection Agency (FEPA)

Professional associations include:

- The Pharmacists Council of Nigeria (PCN)
- The Pharmaceutical Manufacturers Group of Manufacturers Association of Nigeria (PMG-MAN)
- The Consumer Association of Nigeria
- Pharmaceutical Society of Nigeria (PSN)
- Patent and Proprietary Medicine Dealers Association (PPMDA)

The NAFDAC and SON are particularly active. The functions of NAFDAC are to:

- Regulate and control the importation, exportation, manufacture, advertisement, distribution, sale and use of drugs, cosmetics, medical devices, bottled water and chemicals.
- Conducts appropriate test and ensure compliance with standard specifications designated and approved by the council for the effective control of quality of food, drugs, cosmetics, medical devices, bottled water and chemicals and their raw materials as well as their production processes in factories and other establishments.
- Undertake appropriate investigation into the production premises and raw materials for food, drugs, cosmetics, medical devices, bottled water and chemicals and establish relevant quality assurance system, including certification of the production sites and of the regulated products
- Undertake inspection of imported food, drugs, cosmetics, medical devices, bottled water and chemicals and establish relevant quality assurance system, including certification of the production sites and of the regulated products.
- Compile standard specifications and regulations and guidelines for the production, importation, exportation, sale and distribution of food, drugs, cosmetics, medical devices, bottled water and chemicals.
- Undertake the registration of food, drugs, medical devices, bottled water and chemicals.
- Control the exportation and issue quality certification of food, drugs, medical devices, bottled water and chemicals intended for export.
- Establish and maintain relevant laboratories or other institutions in strategic areas of Nigeria as may be necessary for the performance of its functions.
- Pronounce on the quality and safety of food, drugs, cosmetics, medical devices, bottled water and chemicals after appropriate analysis.
- Undertake measures to ensure that the use of narcotic drugs and psychotropic substances are limited to medical and scientific purposes.
- Grant authorization for the import and export of narcotic drugs and psychotropic substances as well as other controlled substances.
- Collaborate with National Drug Law Enforcement Agency in measures to eradicate drug abuse in Nigeria.
- Advise Federal, State and Local Governments, the Private sector and other interested bodies regarding the quality, safety and regulatory provisions on food, drugs, cosmetics, medical devices, bottled water and chemicals.
- Issue guidelines on, approve and monitor the advertisement of food, drugs, cosmetics, medical devices, bottled water and chemicals.
- Compile and publish relevant data resulting from the performance of the functions of the Agency or from other sources.
- Sponsor such national and international conference as it may consider appropriate.
- Liaise with relevant establishments within and outside Nigeria in pursuance of its functions.

In Nigeria, the standardization and regulation of quality of all products are carried out by the Standards Organization of Nigeria (SON) established in 1971. The functions of SON are to:

- Organise tests and do everything necessary to ensure compliance with standards designated and approved by the Council of SON.
- Undertake investigations as necessary into the quality of facilities, materials and products in Nigeria, and establish a quality assurance system including certification of factories, products and laboratories.
- Ensure reference standards for calibration and verification of measures and measuring instruments.
- Compile an inventory of products requiring standardisation.
- Compile Nigerian standards specifications.
- Foster interest in the recommendation and maintenance of acceptable standards by industry and the general public.
- Develop methods for testing of materials, supplies and equipment including items purchased for use of departments of the Government of the Federation or a State and private establishments.
- Register and regulate standards marks and specifications.
- Undertake preparation and distribution of standards samples.
- Establish and maintain such number of laboratories or other institutions as may be necessary for the performance of its functions.
- Compile and publish general scientific or other data - resulting from the performance of its functions; or from other sources when such data are of importance to scientific or manufacturing interests or to the general public and are not available elsewhere.
- Advise departments of the Government of the Federation or a State on specific problems relative to standards specifications.
- Sponsor such national and international conferences as it may consider appropriate.
- Co-ordinate all activities relative to its function throughout Nigeria and to co-operate with corresponding national or international organisations in such fields of activity as it considers necessary with a view to securing uniformity in standards specifications.
- Undertake any other activity likely to assist in the performance of the functions imposed on it under this act.
- Undertake such research as may be necessary for the performance of its functions, and for that purpose have power to make use of research facilities available in other institutions, whether public or private upon such terms and conditions as may be agreed upon between the Organisation and the institution concerned.

6.6 Major Constraints

As reported by a comprehensive study of the subsector in the early 1990s, the main constraints on the subsector are:

- Overdependence on imported raw materials;
- Inadequate infrastructure;
- Weak technology and engineering base;
- Fake and counterfeit products;
- Weak R&D and industrial linkages;
- Inadequate local manpower;

- Poor funding and lack of access to credit; and
- Bureaucracy.

From our interview with stakeholders and subsectoral challenges enumerated in the NV2020, all these constraints still subsist. Two additional constraints that were mentioned include:

- Multiple taxation/levies; and
- Inconsistent government policy.

Overdependence on imported raw materials

It was estimated that about 90 per cent of the raw materials were being imported with consequence of escalating production costs. Key elements of this constraint are:

i) Lack of production of essential raw materials is regarded as due to the poor state of the Eleme Petrochemical Complex Limited (EPCL). EPCL has been bought by the Indorama Group. Presently, the only useful product from EPCL is HDP (high density polyethylene). There are 10 grades of HDP. EPCL currently produces only one.
ii) There are strong complaints about middlemen who do not allow firms to buy directly from EPCL. EPCL should sell HDP directly to the plastic firms to ensure that firms appreciably enjoy the benefit of local production of HDP.
iii) Monopoly of local production of HDP by EPCL is a problem for firms because firms could not bargain well with EPCL.
iv) Regulatory and environmental agencies sometimes also constitute major constraints on sourcing of inputs. For example, the processing of NAFDAC's permit to import is expensive and time consuming. The permit fees are too high: it is more for revenue generation than for control.

Inadequate infrastructure

Infrastructure development was traced to the early 1970s and assessed to have improved but the improvement had no significant impact because the growth in demand for infrastructure far outweighed its supply. Problems of water and power supplies were identified to have become severe, and almost every company operated its own water borehole and electricity generator for most of the production time. Communication infrastructure, especially local and national was adjudged to be weak, and thus necessitated the frequent employment of personal courier services which are considerably expensive. Roads were also identified as often in a state of disrepair with attendant relatively high costs of motoring and logistics. Currently key elements of the inadequate infrastructure are:

i) Poor power/electricity supply: 60-65 per cent of electricity currently used by industry is self-generated, leading to considerably high profile of production costs. Most firms now use gas instead of diesel. Gas has the advantage of being less polluting and cheaper than diesel. However, it is relatively more expensive in Nigeria than elsewhere. For example, it costs N35/m^3 in Nigeria while it costs only about ₦24.5/m^3 in the USA. The frequent increases in the price of gas also make production planning difficult. For diesel, the main challenge is fluctuation in prices, which makes production planning difficult. Nigeria Gas Company (NGC), a subsidiary of NNPC, supplies the gas through Gaslink Ltd. Gaslink is a private company.

ii) Bad roads and absence of functional railway: this creates logistic problems that aggravate risks associated with movement of goods, products and raw materials. For example, cost of transport of goods from Lagos to the East increased from ₦120,000 to N300,000/trailer from 2nd to 3rd quarter of 2009.

iii) Scarcity of LPFO (Low Pour Fuel Oil, *aka* Black Oil): None of the four refineries currently produce LPFO, and LPFO is therefore imported. This is actually the reason for the collapse of textile subsector. When produced locally, LPFO is ₦24.25/l but ₦78/l when imported.

Weak technology and engineering base

Weak technology and engineering facilities were reported to have kept the level of technology in the subsector low compared to not only industrial countries but also some developing countries such as India and Egypt. Drug production was concentrated on non-steroidal, non-nactic analgesics (Aspirin and Paracetamol), haematinics (blood tonics), anti-maleria, simple anti-allergics, common anti-bacterials (tetracycline, ampicillin, contrimoxazole, and sulfa drugs), disinfectants and antiseptics, and large volume parenterals. Analgesics accounted for 36.5 per cent of the preparations while haematinics accounted for 14.7 per cent, thus making these two drug families more than half of the local drug production. The absence of fine pharmaceutical chemical industry was a major constraint. There was also no significant local research, and the existing pharmaceutical firms produced and market patent expired drugs. Machinery and equipment are also sometimes inefficient due to ageing or obsolete technology.

Fake and counterfeit products

It was reckoned that there was a sudden and dramatic rise in drug faking and adulteration from about 1986. This resulted in the enactment of a series of Decrees with increasing penalty for the perpetrators of the importation, manufacture and distribution or sale of fake and counterfeit chemicals and pharmaceuticals products, and the eventual establishment of NAFDAC in 1993. Between 1988 and 1990, the percentage of fake drugs in circulation in Nigeria was estimated to range from 32 to70 per cent. Though faking and counterfeiting are still major constraints on the subsector, the regulatory and standard enforcement activities of NAFDAC and SON are believed to have achieved significant reduction in the incidence of faking and counterfeiting in recent years. Presently, faking and counterfeiting are still main concern in the following respects:

i) Porous borders are notably responsible for influx of fake chemicals and pharmaceuticals despite the ban on such products.
ii) Sources of fake products are Asian countries such as China, Indonesia, Taiwan, etc.
iii) Efforts are required to improve GMP and achieve WHO GMP certification for pharmaceutical companies.
iv) A major challenge of the subsector is the chaotic distribution system, which has compounded logistics and made eradication of faking and counterfeiting difficult. The present distribution systems are not standardized or modern and hence not up to international standard. In addition, most goods are still sold in the open market.

However, there is presently a consensus among the stakeholders that a sanitized distribution system for chemicals and pharmaceuticals products is desirable and achievable.

v) With respect to herbal drug manufacturers, very few meet set standards and the quality of their products is still considered to be relatively poor.

Weak R&D and industrial linkages

Though opportunities exist for R&D that could help harness the vast locally available raw materials, the multinational companies that have resources for R&D consider R&D as highly risky and depended mainly on their parent companies. The public sector R&D was considered to be only rudimentary and of no significance consequence. It was reported that drug research on African plants by scientists in universities and research institutes have outcomes that have documented several recipes and potential plant medicines but no marketplace new drug has been developed. Commercially exploitable pharmaceutical minerals include precipitated calcium carbonate, kaolin, zinc oxide, bentonite, dark brown oxide of iron, and plaster of Paris. Research outcomes on these minerals remained only on the shelf. Linkages with key sectors such as the petrochemicals and iron and steel are poor. The Nigerian iron and steel industry produce only flat sheets that are rarely relevant for forging and fabricating of the pharmaceutical industry's needed dies and cuts for tabletting or other machinery and spare parts. It was however reported that there was some development in local fabrication of liquid steel mixing vessels and their accessories in the early 1990s. Local secondary fabrication by the plastics industry was also supportive of pharmaceutical packaging but the plastics industry itself was heavily dependent on imported granules.

Inadequate local manpower

In the mid 1980s, 90 per cent of the companies had expatriate managing directors, 70 per cent and 50 per cent had expatriate factory managers and factory engineers respectively. Though other positions were staffed by Nigerians, it was reported that they were largely pharmacists and pharmaceutical scientists, installation and maintenance engineers, and accountants. Existing dosage form processing plants, bulk pharmaceutical production plants require, in addition, chemical engineers for plant design and maintenance; organic chemists for manufacturing process development; and industrial fermentation experts for the routine control of manufacturing and process equipment. There were no programmes for developing these high-level skills.

Poor funding and lack of access to credit

Funding has been critical constraints on the subsector and the manufacturing industry in general since the early 1980s. Import licensing was introduced in 1984 due to foreign exchange constraints, and the economic structural adjustment programme introduced in 1986 was attended by high inflationary trends which made both public and private sector capital projects to suffer from poor funding. The cost of working capital for industry also became very high. In the public sector, funding for R&D and infrastructural support services worsened severely. For example, the National Institute for Pharmaceutical Research and Development (NIPRD), Abuja, which was established in 1987 did not receive the start-up

grant until 1991 when its take-off budget of N50million was funded with only N10 million. The following are the main elements of the extant funding constraint on the subsector.

i) Interest/lending rate is too high, currently 22-30 per cent for local SMEs. MNCs could get 12-14 per cent. Interest rate depends on the banks perception of risks associated with each lender. MNCs often get fund from home countries at lower rates than available in Nigeria. Bank of Industry (BOI) offers 10 per cent interest rate to local firms (SMEs), and offers 7 per cent interest under the CBN special intervention fund. The ₦500b intervention fund is shared thus: ₦300b for the power sector, ₦150b for the manufacturing industry, ₦50b for the aviation sector. The power fund is also available for power generation to serve industrial clusters such as Ikeja industrial estate. The ₦150b for industry is however only for existing SMIs with loans that are going bad. It is not for Greenfield investment. It appears that the intervention is more of bank stabilization fund rather than for stimulating improved industrial production.

ii) Unlike in other industries, many chemical and paint manufacturers do not have established relationships with financial institutions. This limits their ability for organic growth with many of the firms limiting their financing sources to internally generated funds. Also, many of the companies in the sector are not publicly quoted and as such cannot easily generate funds from the Nigerian capital market when needed.

iii) Concentration risk exists in the chemicals industry. Many producers run the risk of concentrating on a rather limited income stream with products such as paints, adhesives, wood finishes and other allied products making up a large portion of their product portfolios. The companies are therefore not well diversified and therefore cannot take advantage of risk spreading.

Bureaucracy

Bureaucracy and red tape created considerable inertia for start-up and growth of firms. Dealing with government officials retarded the operating efficiency and effectiveness of private sector companies. To address these challenges, the chemicals and pharmaceuticals subsector established formal communication and representation to government through the chemicals and pharmaceuticals group of the Manufacturers Association of Nigeria (MAN). In spite of the fact that communication has been intensified with government through MAN, individual government officials are still regarded as being difficult to relate with.

Multiple taxation/levies

Manufacturers claimed that businesses in Nigeria pay more than 100 types of taxes/levies instead of the 39 approved taxes/levies. Multiple taxation is largely due to two factors:

- There is weak law enforcement and weak institutions for tax administration. The businesses pay the taxes to reduce delays and avoid adverse consequences that illegal tax/levy collectors may inflict on their businesses.
- Taxation/levies seen mainly as instrument of revenue generation and extortion of businesses.

Inconsistent government policy

Too many policies that are often uncoordinated create obstacles to the growth of existing firms and new start-ups. Sometimes genuine incentives are provided for industry; however changes occur before industry stabilizes on assimilating extant policy or incentive regime.

Ranking the constraints enumerated above is difficult. This notwithstanding, it appears that the following six constraints are currently the most emphasized and could be ranked in the following order of importance:

1) Inadequate infrastructure;
2) Overdependence on imported raw materials;
3) Poor funding and lack of access to credit;
4) Fake and counterfeit products;
5) Multiple taxation/levies;
6) Inconsistent government policy.

6.7 Stakeholders' Perception of Solutions to the Critical Issues

The stakeholders' perception of solutions to the critical issues in the chemicals and pharmaceuticals subsector was aptly captured by NV2020 recently. As earlier mentioned, the subsector is regarded as one of the five priority subsectors with potential for rapid growth in the short to medium term. Table 4 presents the specific strategies and initiatives enunciated by stakeholders as means of growing the subsector in the short to medium term, especially for the achievement of the NV2020 mission of locally producing 75 per cent of Nigeria's drug and chemical supplies by the year 2020.

Table 4: Stakeholders' perception of strategies to address critical challenges in the chemicals and pharmaceuticals subsector

Strategies	Initiatives
1. Achieve WHO GMP certification for the top 25 Pharmaceutical manufacturers in Nigeria	▪ Obtain special long term funds to build/refurbish plants – CBN/Banks with FGN subsidy ▪ Hire global consultants to lead the certification efforts – FGN, NEPAD, ECOWAS, WAHO to support
2. Increase local sourcing of raw materials to achieve at least 50 per cent of total inputs	▪ Establish primary production plants – FGN subsidized funding, multilateral agency funding ▪ Strengthen local R&D facilities – FMST to ensure pharmaceutical agencies are focused on backward integration
3. Expand range of products	▪ Obtain special long term funding ▪ Invest 10-25 per cent of profits in R&D ▪ Enter into strategic alliances – acquisitions & mergers, franchises and partnerships
4. Eliminate unfair trade practices	▪ Strengthen NAFDAC ▪ Strategic alliance with border control – Train Immigration/Customs, introduce intelligence surveillance, incentivize security agents
5. Restructure the distribution system	▪ Encourage OPS investment in distribution ▪ Strengthen key regulatory agencies – PCN/NAFDAC
6. Provide at least 25 per	▪ Push for regulatory harmonization – WAPMA/WAHO intervention

cent of all drugs supplied to the ECOWAS region	▪ Push for ECOWAS trade liberalization protocols – ECOWAS/Presidency intervention ▪ Remove all non-tariff barriers ▪ Promote intra-regional transportation network – airlines, shipping lines, road transportation
7. Upgrading of quality of locally sourced materials	▪ FG to institute and/or upgrade R&D/quality control institute for the raw materials utilized in the industry.
8. Encourage pharmaceutical industrialists to invest in the production of fine chemicals	▪ FG and OPS to form joint ventures ▪ FG to provide tax and tariff relieves

***Source**: NPC (2009) Draft NV2020 Report on the Manufacturing Industry*

As a fundamental aspect of growing the subsector, the strategies for the development of the hydrocarbon based industries, especially petrochemicals, were also emphasized by stakeholders. It is expected that the development of the petrochemical industry would accelerate production of basic raw materials such as polypropylene, poly-vinyl chlorides, linear-alkyl benzene, resins and other polymers used in paints, pharmaceuticals, and other hydrocarbon based products such as plastics, foam, printing and publishing, etc. Strategies enunciated for the general development of the hydro-carbon based industry are as follows:

- Establishment of private refineries and privatization of existing petrochemicals and oil refineries.
- Resolution of the petroleum products pricing/subsidy issue.
- Phased import deletion of chemicals that can be produced locally.
- Partnering with R&D institutes and energy companies to increase availability of basic raw materials.

From the interviews conducted in the course of this study other specific suggestions from stakeholders for addressing the challenges of the subsector include:

- *Patronage of local chemicals and pharmaceuticals products:*

There should be sustained policy to encourage the patronage of local products. The patronage of locally manufactured chemicals and pharmaceuticals will boost local production, and further ability to source raw materials locally. Besides, local production of chemicals and pharmaceutical goods is a good economic diversification strategy.

- *WHO certification:*

There should be WHO certification for pharmaceutical companies and access to internationally certified GMP consultants would be helpful. The certified GMP consultants will provide manufacturers with state-of-the-art knowledge and understanding of internationally accepted manufacturing standards and practices. They could also help provide training on critical issues such as “GMP validation and documentation”, “Stability issues”, and “Risk management”. As at January 2010, only three African manufacturers have been pre-qualified so far by the WHO. These companies are: 1. Aspen pharmacare Ltd., Port

Elizabeth, South Africa (2007), 2. Maphar SA, Casablanca, Morocco (2008), and 3. Quality chemical industries Ltd. (QCIL), Kampala, Uganda. (2010). In essence, there is no local pharmaceutical manufacturer in Nigeria or in the entire West Africa that has been pre-qualified by WHO. However, the following eight Nigerian manufacturers have commenced the WHO pre-qualification process:

1. Afrabchem Limited
2. Evans Medical PLC
3. Daily Need Industries Limited
4. Fidson Healthcare PLC
5. Juhel Nigeria Limited
6. May & Baker Nigeria PLC
7. Nigerian German Chemicals PLC
8. Swiss Pharma Nigeria Limited

The West African Health Organization (WAOH) has assisted two Nigerian companies (EVANS and MAY & BAKER) by appointing a certified GMP consultant at a cost of $300,000 (in addition to two other companies in Ghana & Cape Verde).

- *Local manufacture of pharmaceutical grade starch:*

As earlier mentioned, there are local manufacturers of starch in Nigeria but none of them produces pharmaceutical grade starch. Yet the pharmaceutical sector requires over 100,000MT of pharmaceutical grade starch and allied products such as pre-gelatinized starch used as binder in the industry and Dextrose Mono Hydrate marketed as glucose powder and a major ingredient in intravenous infusions. It has been reported that the Nigerian Institute of Pharmaceutical Research and Development (NIPRD) has developed a successful pilot scale plant for the manufacture of pharmaceutical grade starch, awaiting a scale up. It is noteworthy that core investors in Nigeria and South Africa have been identified, though none of them has made any commitment to adopt the technology.

- *Establishment of a mega distribution company:*

As earlier mentioned, a major challenge of the pharmaceutical sector in Nigeria is the chaotic distribution system. There is strong suggestion from the Pharmaceutical Group of MAN for the establishment of a mega distribution company that would be responsible for distribution of pharmaceutical products under a public-private sector partnership arrangement. There is a positive development is this respect and a consensus by all stakeholders has emerged stressing that a sanitized and orderly distribution system is both desirable and achievable. A recent study by the World Bank International Finance Corporation (IFC) recommended "establishing a consortium-based Distribution System" which would make a real and substantive difference to the market in Nigeria by helping to resolve a major area of dysfunctionality, and help pave the way for a strategic approach to "formalizing the informal sector". Besides, the new distribution system will hopefully become a good investment opportunity with the prospect of handsome returns. Similarly, for the paints manufacturers, it is observed that an effective and efficient distribution network is a key requirement for the success of paint manufacturers in Nigeria. Since paints are in high demand in virtually all

areas of the country, it is pertinent that the end product gets to the final consumer as at when needed. An efficient distribution system is needed to achieve this.

- *Development of active pharmaceutical ingredients/ fine chemicals industry:*

This industry will be expected to process pharmaceutical chemicals into synthetic medicinal substances including the output of several intermediate substances. Thus, a new primary manufacturing venture may start its operation with relevant intermediates and then proceed to final synthetic processing of medicinal, e.g., an acetylating plant produces aspirin, paracetamol and phenacetin; a sulphation plant produces key sulpha drugs like trisulphonamide (sulphatriad), sulphathriazole (Thiazamide) and pthalyl sulphathiazole (Thalazole); a nitration plant produces such drugs as nitrofurantoin, nitrofurazone and metronidazole.

- *Quality control in paint manufacturing:*

As observed by NV2020, the Standards Organization of Nigeria (SON) has made stringent efforts to maintain minimum standards for paint manufacturing. Such standardization should be intensified as it has served to improve the overall quality level of paints in recent times.

6.8 Assessment of Nigeria's Distance to the Technology Frontiers and World's Best Practices[4]

To assess Nigeria's distance from technology frontiers and world's best practices, we will compare Nigeria with two leading developing countries which have made significant progress in the chemicals and pharmaceuticals subsector. With a specific focus on the pharmaceutical industry in Brazil and India, it would be possible to illustrate how far Nigeria has lagged behind in best practices in processing and technological development in the subsector. A common feature of the three countries, Brazil, India and Nigeria is that they are all high population countries that have potentially large markets. They are also all developing countries, and India and Nigeria are particularly overwhelmed with tackling the challenge of poverty among the larger proportion of their population. This notwithstanding, all the three countries have emerging middle class with potential for providing market opportunities for products of the chemical and pharmaceutical companies.

As presented in a recent report[5] by IMaCS, the global pharmaceutical market reached US$712 billion in 2007, an increase of 6.4 per cent from the previous year sales of US$649 billion. The global pharmaceutical market was expected to grow 4.5 - 5.5 per cent in 2009, and the global was estimated to reach US$820 billion in 2009. The growth is generally

[4] This section draws largely from Guennif, Samira and S. Ramani (2010). Catching-up in Pharmaceuticals: a Comparative Study of India and Brazil, UNU-MERIT Working Paper Series No. 2010-019, UNU-MERIT, Maastricht, The Netherlands.

[5] This is an undated report titled, 'Human Resource and Skill Requirements for the Chemicals and Pharmaceuticals Sector (2022)' prepared for the National Skill Development Corporation (NSDC), India by IMaCS (ICRA Management Consulting Services Limited). Accessed on 29 September 2010 at www.nsdcindia.org.

regarded as being driven by a sustained double-digit growth in production by key emerging markets such as China, India, Brazil, South Korea, Mexico, Turkey, and Russia; while more established markets in the USA, EU and Japan have considerably slower pace of growth.

As reported by Guennif and Ramani (2010),[6] India's pharmaceutical industry started from a remarkably similar condition with Nigeria. The starting conditions were described by Guennif and Ramani as follows:

> "When India attained its independence in 1947, its pharmaceutical industry was of a very modest size with market sales of about $28.5 million. Western multinationals (MNCs) held about 80per cent of the market with the remainder being served by several Indian owned companies operating on a much smaller scale. No Indian company had manufacturing capabilities in either bulk drugs or formulations. There was heavy dependence on imported drugs, which were marketed directly by the MNCs established in India and local agents of MNCs that did not have a local presence. MNCs mainly formulated their drugs in India, importing the bulk drugs from their home countries; their contention being that the locally available bulk drugs were not of the desired quality. In the process, not only were technological externalities and knowledge transfer absolutely minimal but Indian drug prices were among the highest in the world. Thereafter, the evolution of the Indian pharmaceutical industry can be divided into four phases". Guennif and Ramani (2010, p.8).

The Indian pharmaceutical subsector has evolved through the identified four phases guided by strong industrial policy and commitment to building local manufacturing capabilities and innovation capacity. The phases include:

- Phase 1: reduction of dominance of foreign firms;
- Phase 2: development of re-engineering capabilities and conquest of internal markets;
- Phase 3: development of regulation handling capabilities and assault on international markets; and
- Phase 4: the quest to build new drug discovery capabilities in the post-TRIPS era.

In each of these four phases, there were evident improvements in industrial production capabilities but the Indian pharmaceutical companies began to reach the frontier and challenge established multinational companies in phase 3 which began in the 1990s. The decade of the 1990s witnessed a number of extreme changes in the Indian regulatory environment resulting in apparent increase in technological capabilities in almost all industrial subsectors. The Indian liberalization regime effectively set in 1991, and the pharmaceutical subsector was delicensed. It thus became unnecessary to obtain license to expand manufacturing base, export or import goods. Indian firms with foresight like Ranbaxy recognized that the Hatch-Waxman Act in the USA in combination with the liberal economic policies in India was opening up new 'windows of opportunity'. Such leader firms

[6] Guennif, Samira and S. Ramani (2010). Catching-up in Pharmaceuticals: a Comparative Study of India and Brazil, UNU-MERIT Working Paper Series No. 2010-019, UNU-MERIT, Maastricht, The Netherlands.

immediately attracted followers, which also attempted to penetrate the regulated markets of the USA and Europe. In addition to exporting medicines to unregulated Southern markets, from 2000 onwards Indian firms began to get supply contracts from international organizations (e.g. WHO, PEPFAR program, Global Fund, etc.) that were supporting public health programs in developing countries. Furthermore, in order to sell generics in western regulated markets, Indian firms had to upgrade their regulation handling capabilities, i.e., initiate routines to document the entire production process under specific formats. For example, to enter a Western market, say that of the USA, Indian firms had to upgrade their 'Drug Master Files' procedure by increasing the comprehensiveness of the details supplied on the manufacturing and distribution process, to satisfy the requirements of the US Food and Drug Administration (FDA). The generics producer also had to prove that its manufacturing methods conformed to current 'good manufacturing practices' (GMP), as defined in the US Code of Federal Regulations. Then it could apply for an ANDA or 'Abbreviated New Drug Application' under four types of filings termed paragraphs, which even permit the entry of generics before patent expiration. Ranbaxy was the first Indian firm to use the ANDA filing route to enter the US generics market, leading others to follow. Such building of regulatory handling capabilities resulted in India having the largest number of manufacturing units validated by the FDA outside of the USA by 2007: India had 75, Italy 55, Spain 25 and China 27.

The fourth phase has brought Indian firms to the technological frontiers of the pharmaceutical industry, though they still face considerable challenges of catching-up in terms of developing drug discovery capabilities. Indian firms have become so capable that they are becoming attractive to global players. For instance, the Indian industry has been marked in recent years by the buying-out of its star performer Ranbaxy, by the Japanese company Daiichi-Sankyo making the threat of foreign buy-outs a credible one for all major Indian firms. Daiichi-Sankyo has business operations in 21 countries, while Ranbaxy is present in 56 countries, including Emerging and Transition economies in which Daiichi has not entered. Ranbaxy is among the international leaders in generics with a renowned low-cost manufacturing infrastructure, but it is struggling to gain expertise in biotechnology and new drug development. Daiichi is weak in generics, but has a good R&D expertise and a solid position in patented drugs. The growth potential for generics, especially in Japan, is high. The complementarities between the two companies led to the merger or effective buying out of Ranbaxy in 2008 with the assurance that Ranbaxy will operate as an independent subsidiary of Daiichi under the leadership of its Indian CEO.

Generally speaking, the growth of the Indian pharmaceutical industry is good example of technological catch-up. In 1970, eight of the top ten firms in the Indian market were MNCs, but by 1995, only four of the top ten firms were MNCs (Athreye et al. 2008). The share of MNCs in the Indian market was 68 per cent in 1970, 60 per cent by 1978 and 50 per cent by 1980. By the mid-1980s leading Indian pharmaceutical firms were already producing both bulk drugs and formulations for the domestic market. By the end of the 1980s, India was exporting bulk drugs and final therapeutics, supplying many parts of the developing and

developed world. It is also noteworthy that a recent report[7] by IMaCS indicates that the Indian pharmaceutical industry has become one of the world's largest and most developed, ranking fourth in terms of volume, and thirteenth in terms of value in 2008. India currently accounts for an estimated 8 per cent of global production and 2 per cent of world markets in pharmaceuticals. India has the world's third-largest Active Pharmaceutical Ingredient (API) manufacturing industry. Currently, India's drug industry produces more than 400 different APIs and is among the world's top five API producers accounting for approximately 6.5 per cent of the world's API production. It has been estimated that India's share of the world API market will grow to 10.5 per cent by 2010 as patented blockbuster drugs lose their patent protection. Approximately 80 per cent of Indian domestic production consists of formulations, and more than 85 per cent of those formulations are sold in the domestic market, whereas at least 60 per cent of bulk drug production is exported. The same report also demonstrated that India has become a major producer of chemical products. India manufactures more than 70,000 chemicals and is the 12th largest producer of chemicals in the world. The size of India's Chemical industry is estimated to be about $35 billion. The chemicals industry constitutes about 3 per cent of GDP and 17.6 per cent of manufacturing sector. India's share of the global market is reported to be 1.9 per cent of global sales and 1.5 per cent of international trade in 2008. The expertise that the Indian chemicals and pharmaceuticals subsector developed in reverse engineering and production of generic drugs can be directly attributed to the effects of Governmental policy such as the Patents Act of 1970 which played a major role in shaping the industry and bringing it to the present enviable position. The Patents Act excluded product patents on pharmaceuticals, allowing the mushrooming of a vigorous generics industry in India which could meet not only domestic demand for drugs but also become a major exporter.

As explained by Guenif and Ramani, in defining innovation capabilities, it is useful to distinguish between 'reengineering skills' and 'new drug discovery skills'. Usually a late-comer country firm starts by building reengineering skills i.e. by independently developing new processes to produce copies of existing drugs. Once a firm learns to manufacture bulk drugs and eventually API, it can envisage investing in the development of 'new drug discovery capabilities'. Capabilities in new drug discovery can take the form of integration of biotechnology and/or research capabilities in one or more of the steps in the new drug discovery process. To date, no developing country firm has patented a new chemical entity. This is currently the limit of Indian pharmaceutical firms.

The starting conditions of the Brazillian pharmaceutical industry were reported by Guennif and Ramani to be considerably ahead of India and by implication, Nigeria. Brazil attained political independence in 1822, more than a century earlier than India and Nigeria. At the beginning of the 20th century, Brazil had a nascent pharmaceutical industry and some public laboratories. However, unlike India, Brazil's pharmaceutical industry suffers from market

[7] This is an undated report titled, 'Human Resource and Skill Requirements for the Chemicals and Pharmaceuticals Sector (2022)' prepared for the National Skill Development Corporation (NSDC), India by IMaCS (ICRA Management Consulting Services Limited). Accessed on 29 September 2010 at www.nsdcindia.org.

domination by foreign multinationals and a lack of backward integration of local firms to incorporate manufacturing capabilities in active pharmaceutical ingredients (API) required for capability in bulk drug production. Both these limitations are likely to worsen in the future given the increasing presence of new players from emerging countries headed by India and China.

From the foregoing exposition on Indian and Brazil, it is apparent that the case of the Nigerian chemicals and pharmaceuticals industry presented in this paper is far from the technological frontiers in industrial processing and innovation capability. The following key features of the Nigeria's chemicals and pharmaceuticals subsector earlier expatiated confirm this assertion:

- the subsector is still highly import dependent;
- production is dominated by foreign multinational's subsidiaries;
- no pharmaceutical manufacturer in Nigeria has been pre- qualified by WHO;
- critical capital production equipment are all imported;
- no bulk drug manufacturing facility;
- lack of significant public and private sector R&D; and
- supply of drugs depends heavily on imports.

6.9 Development of Local Petrochemical Industry[8]

Every segment of the chemicals and pharmaceuticals subsector depends on critical raw materials that are sourced from the outputs of the petrochemical industry. The state of the petrochemical industry therefore determines to a large extent, the ability of the chemicals and pharmaceuticals subsector to cope with the competitive challenges of the modern industrial enterprise.

In Nigeria, the need for the development of the petrochemical industry has been recognized in the development plans as far back as the early 1970s. It was however, not until 1978 that the idea of using some refinery by-products as feedstock to produce some petrochemical products was conceptualized. The Nigerian petrochemical industry is currently focused around the three plants established by the NNPC at Kaduna, Warri and Eleme. The Kaduna Refining and Petrochemical Company (KRPC) operates the complex Kaduna refinery. The refinery produces linear alkyl benzene, benzene, and kerosene solvents. During the 1990's there have been numerous stoppages at the Kaduna refinery and in October 1999 there was strong evidence that the Kaduna refinery was in substantial trouble. It is still yet to fully

[8] The evolution and description of the state of the Nigerian petrochemical industry presented in this section are drawn from the websites of the Nigerian National Petroleum Corporation (NNPC), the Indorama Group, and Mbendi.com: http://www.nnpc-nigeria.com/epcl-history.htm (Accessed 24 September 2010); http://www.indorama.com/companies/eleme/ (Accessed 24 September 2010); http://www.mbendi.com/indy/oilg/ogrf/af/ng/p0005.htm (Accessed 24 September 2010)
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recover from its technical setbacks. The Warri Refining and Petrochemical Company (WRPC) has a complex 125,000 bpd refinery. The petrochemical plant produces polypropylene and carbon black. Stoppages and equipment failure have resulted in falling outputs. The Eleme Petrochemical Company was established by NNPC in 1988 as part of the phased programme of the development of the petrochemical industry.

The Phase I of the Eleme Petrochemicals Complex Limited (EPCL) came into operation in 1995. Since then, it has generated $130 million from the sale of products. It is associated with the two Port Harcourt refineries at Alesa-Eleme. In May 1999, a second petrochemical plant at Eleme was inaugurated representing phase II of the petrochemicals project. The complex has an ethylene plant and subsidiary plants producing polyethylene, ethylene glycol, polypropylene and polyvinyl chloride. In 1999, phase I of the Eleme petrochemical plant was producing at 60 per cent capacity for polypropolylene and 50 per cent for polyethylene. The phase II of the petrochemicals project cost US$2 billion, and was expected to produce over 40 different grades each of polyethylene and polypropylene products used in industrial productions. Other projects include an integrated 680,000 million tonnes/year methyl tertbutyl ether (MBTE) and methanol complex. The owners of EPCL were NNPC (30 per cent), Ferrostaal, Germany (40 per cent) and a private Nigerian group (30 per cent).

The Eleme Petrochemical Complex was considered of great strategic importance to Nigeria's development, and its stated objectives include:

- To provide basic Petrochemicals Raw Materials locally;
- To utilize Nigeria's abundant Natural Gas Resources, a substantial part of which would otherwise be flared;
- To provide job opportunities: it is believed that in developing countries, one job in a Petrochemicals Complex generates on the average, seven additional jobs outside due to downstream activities;
- To save foreign exchange via import substitution;
- To act as a catalyst to Nigeria's industrial expansion and diversification of the economy;
- To enhance the acquisition of modern technology and know-how in the country.

The plant commenced operations with a total number of 1,376 staff, made up of 138 expatriates Technical Back-Up Services (TBS), and 1,246 Nigerian Staff. The Technical Back-Up Services were provided by Foster Wheeler Management Operations Ltd, UK (31), Technimont SpA, Italy, (66), and Comerint SpA , Italy (33). Some Nigerian staff was trained in similar facilities abroad, while bulk of the Nigerian Operations and Maintenance staff were trained at the Petroleum Training Institute (PTI), Warri and at the Kaduna, Warri and Port Harcourt Refineries. However, in 1999 EPCL started a gradual phase-out of the TBS Personnel when it ascertained that most Nigerian staff had gained adequate experience on the operation and maintenance of the Plants.

Like other refineries and petrochemicals complexes in Kaduna and Warri, the EPCL came under pressure due to high overheads and core technical and management challenges. As part

of Nigeria's programme of privatization, EPCL, which was a 100 per cent subsidiary of the Nigerian National Petroleum Corporation (NNPC), was divested to the Indorama Group. The Group was declared core investor by the National Council of Privatization in 2005. The Indorama Group is a leading manufacturer of petrochemicals and associated downstream products up to textile raw materials. Moreover, the Indorama Group is a multinational company with its products shipped to over 90 countries. The privatization process of EPCL began in May 2005 and was completed in May 2006. As earlier mentioned the EPCL is located in Eleme town near the Nigerian city of Port Harcourt in Rivers State. It was built in 1995 by a consortium comprising of Chiyoda, JGC, and Kobe Steel, of Japan, Technimont of Italy, and Spie Batignolles of France. As reported by the Indorama Group, the complex presently comprises of an olefins unit, a polyolefin unit, a captive power plant and other supporting units. EPCL is regarded to be strategically positioned to feed the growing demand of plastics in Africa. With state-of-the-art manufacturing facilities, the complex consists of a gas feed cracker unit and two main downstream plants. The total production is over 550 KTA of world-class olefins and polyolefin. The company focuses on providing world-class products at competitive prices and customized grades to suit the customer's specific requirements.

The Eleme Complex is designed to produce 240,000 metric tons per year of polyethylene, and 95,000 metric tons per year of polypropylene. To produce these resins, natural gas liquids are cracked in a M.W. Kellogg (USA) licensed olefins plant. Indorama plans to make this complex the petrochemical hub of Africa by bringing it up to its full design capacity, and then undertaking expansion plans. The current capacity of the EPCL manufacturing units is shown in Table 5.

Table 5: Capacity of EPCL's manufacturing units

Units	Capacity (KTA)	Technology
Cracker	550	M.W. Kellogg (USA)
Polyethylene (LLD/HDPE)	240	Nova Chemicals, Canada
Polypropylene	95	Basell (Italy)
Naptha (C5+)	100	

***Source**: EPCL, Indorama Group website, September 2010*

The EPCL presently produces High density polyethylene (HDPE) and Linear low density polyethylene (LLDPE). The various grades of these products produced as at September 2010 are shown in Tables 6 and 7. HDPE finds use in the manufacture of plastic bags, containers, water pipes, lamination, liners, household containers like buckets, mugs, caps, etc. LLDPE is used extensively for its high tensile strength and puncture resistance in applications like stretch cling film, heavy duty films, general purpose film, laminations, etc. Its outstanding properties like ease of processing makes it a material of choice for water storage tanks, chemical tanks, garbage bins, toys, telephone booths, etc. The grades of Polypropylene (PP) manufactured by EPCL and their applications are shown in Table 8. PP has numerous

applications like food packaging, textiles, plastic containers, injection moulding, toys, packaging etc.

Table 6: Grades of HDPE produced by EPCL and their applications

HDPE Grade		Application
Blow moulding	HBG00356	Recommended for medium size containers like lube oil, edible oils, general purpose, etc.
	HBG00346	Excellent ESCR properties. Recommended for small containers like lube oil, detergent, cosmetic, pesticides, pharmaceutical, general purpose, etc.
Film	HFG00356	Carry bags, grocery bags, trash bags, liners, co-extrusion, etc
	HFG00346	Co-extruded structures, lamination, liners, grocery bags, etc.
Raffia	HEG00952	Stretched tapes for woven fabric, jumbo bags, tarpaulins, mono-filaments for rope, etc
Pipe	HPG00340	Small / medium diameter pipe for potable water system, OFC ducts, sewage and irrigation areas
Injection	HIG07060	Tote boxes, crates, luggage shells, chair shells, etc
	HIU07060	UV stabilized grade and recommended for beverages, crates, tote boxes, crates, luggage shells, chair shells, etc
	HIG20060	Household containers like bucket, mug, general-purpose house-ware, caps, lids, small size paint pails, etc

***Source**: EPCL, Indorama Group website, September 2010*

Table 7: Grades of LLDPE produced by EPCL and their applications

LLDPE Grades		Applications
Film	BFY00919	With slip and anti-block, suitable for heavy duty films, for industrial liners, general purpose film, liquid packaging, lamination film etc
	BFG00919	No slip, stretch wrap, lamination, co-extrusion etc
	BFY01419	With slip and anti-block, general purpose film, liners, over wraps etc.
	BFG01419	No slip, stretch wrap, lamination, co-extrusion, thin films etc.
Rotomoulding	BRG04235	Water storage tanks, chemical tanks, loft tanks, milk cans, pallets, refuse carts, storage bins, garbage bins, etc.

***Source**: EPCL, Indorama Group website, September 2010*

Table 8: Grades of PP produced by EPCL and their applications

PP Grades		Applications
PP Homopolymer- Extrusion grades	HPRG030	Raffia tapes for woven sacks forfertilisers, cement, grains, industrial packaging, carpet backing, jumbo bags, chemical packing, FMCG goods, etc.
PP Homopolymer- Injection moulding grades	HPIG035	General-purpose injection moulding, household articles, toys, technical items etc.
	HPIG060	General purpose injection moulding
	HPIA100	Antistat properties, general purpose injection moulding, furniture, thermoware, houseware etc
	HPIG110	General purpose injection moulding, household articles, toys, packaging etc
	HPIA250	Antistat properties, general purpose injection moulding, thin wall injection moulding

***Source**: EPCL, Indorama Group website, September 2010*

6.10 An Agenda for Action

The foregoing has highlighted the critical elements and components of the chemicals and pharmaceuticals industry, the constraints on the subsector, stakeholders' perception of the solutions to the critical issues, and Nigeria's distance to the technology frontiers and world's best practices. In order to stimulate growth of the subsector in Nigeria, the following policy agenda should drive appropriate actions for reviving ailing firms, improving performance, and encouraging innovative and job creating green field investment. In effect, the agenda for action will directly address the constraints on the subsector.

6.10.1 Common facilities for collective response to enhance efficiency gains

Though there is increasing participation of local firms, the production activities in the Nigerian chemicals and pharmaceuticals subsector is still largely by subsidiaries of multinational companies. The exception is the paints industry which is dominated by local small and medium sized producers. Some of the common facilities that may require collective response are:

- Improving infrastructure such as power supply;
- Collective procurement of critical raw materials; and
- Establishment of an efficient distribution system.

Improving infrastructure, especially electric power supply remain critical area of common response for the development of the manufacturing industry in Nigeria. For the chemicals and pharmaceuticals subsector, firms located within notable clusters such as Ikeja Industrial Estate could organize for independent power production to seize the opportunity presented by current reform in the power sector. The firms would operate the power plant as an Independent Power Producer (IPP) and charge individuals consumers (firms). The IPP would be a new business enterprise in which all the firms located in the cluster has a share or stake.

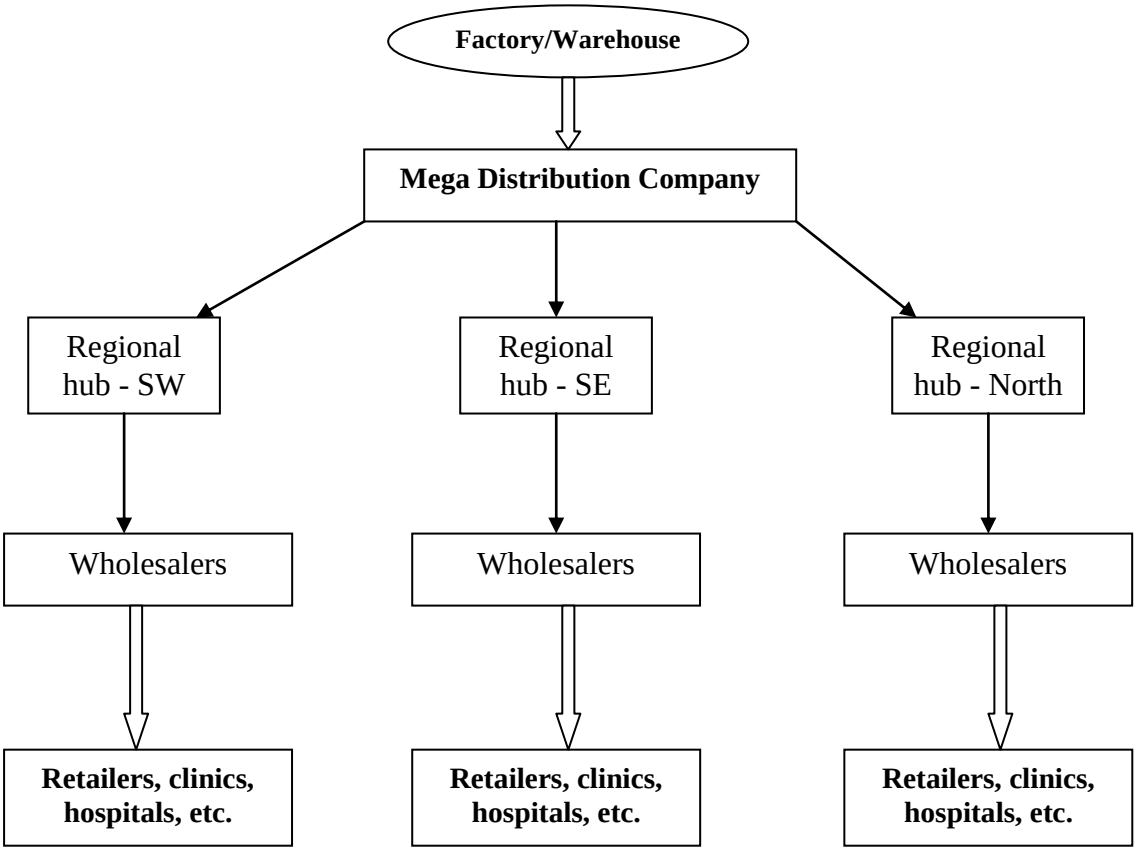
The development of the local petrochemical industry would considerably reduce the overdependence on imported raw materials, thus saving foreign exchange, improve employment, and enhance diversification of the productive base of the economy. The privatization of the Eleme Petrochemical Complex Limited appears to be acceptable to most stakeholders. It is however yet to be seen whether the expected outcome of significant expansion and diversification of outputs would be realized.

6.10.2 A mega distribution system for pharmaceuticals

The establishment of a modern distribution system for the subsector is still under consideration by the stakeholders. An example of a model which we believe might be worth promoting is presented in Figure 6. The model is based on a suggestion by the Pharmaceutical Group of MAN which indicates an emerging consensus on the nature of desirable and feasible distribution system acceptable to the stakeholders. The model envisages the establishment of a mega-distribution company that receives products directly from the factory or company warehouse, and thereafter send the products to three regional distribution hubs located in Southwest, Southeast and the North. The regional hubs sell to the

wholesale concerns, which further distribute the products to retailers that relates directly with the consumers. Depending on the type of products, the retailers could be shops, supermarkets, pharmacies/chemists, clinics, hospitals, etc.

Figure 6. Model of a mega-distribution company



***Source**: PMG MAN*

At this juncture, it is important to state that the establishment of the mega distribution company discussed in this subsection is a key business support service desirable for the growth of the chemicals and pharmaceuticals subsector. Other business support services may include joint procurement of raw materials, especially imported inputs, by SMEs. This will engender cost reduction, and ensure improved quality of inputs.

6.10.3 Strengthening local and regional value chains

Chemical products are often used as intermediate products for the downstream manufacturing activities in the chemicals and pharmaceutical subsector and many other industrial subsectors. Most of the chemicals used in the chemicals and pharmaceuticals industry are hydrocarbon based and hence the emphasis on the significance of the petrochemical industry for the chemicals and pharmaceuticals subsector.

The local value chain can be strengthened through development of petrochemicals and development of agro-industry at the local and regional levels. The petrochemical industry

will produce several feedstocks into the chemicals and pharmaceuticals production, while agro-processing could produce important raw materials such as industrial starch, alcohols, etc. In the area of plant medicine, several plants have been identified as holding great potentials for development and use as source of active pharmaceutical ingredients and/or excipients. The process of their exploitation however still remains difficult especially to local pharmaceutical firms. Presently, there appears to be little and inadequate interaction between the Nigerian traditional herbal medicine practitioners who are the custodian of indigenous herbal knowledge and the medical plant researchers. Similarly, industrialists in the pharmaceutical industry have no channel of communication with traditional herbal medicine practitioners. There should be opportunities for stakeholders at different levels of production and product development to interact and provide information/data that are critical for other stages in the value chain. This should take place at the local and regional levels.

6.10.4 Strengthening sectoral innovation systems

An industrial system of innovation focuses on the nature, structure, organization and dynamics of innovation and production in sectors considered strategic to industrial competitiveness and economic wellbeing. Factors at the base of innovation driven catching-up in sectoral systems include:

- Learning and capabilities by domestic firms;
- Government policy interventions for domestic capacity and capability building;
- Skilled labour force;
- Entrepreneurship and development of SMEs; and
- Spearheading of innovation by key large firms.

For the chemicals and pharmaceuticals subsector, each of these five key factors needs to be re-examined to promote industrial growth and development. Domestic firms should concentrate on learning and building local technological capability to competitively manufacture for local and regional markets. The development of a national system of innovation and specific sectoral innovation systems are critical in this respect. See Adeoti (2002)[9] for an elaborate analysis on the role of national system of innovation in building local technological capability in the Nigerian manufacturing industry. Government policy interventions should be consistent and aimed at ensuring sustained industrial growth and development. The aim should be to make firms become innovative and move towards the technology frontiers in the subsector. Skills development at the firm-level and strengthening of the educational institutions are also imperatives for an effective industrial innovation system. The outcome would be efficient and high performing firms able to compete globally but addressing the immediate challenge of satisfying local demands, and thereby considerably reducing dependence on exports of finished and intermediate products. In this respect, fostering entrepreneurship and development of SMEs are very important. The emergent of corps of creative and innovative individuals will enhance the formation and development of

[9] Adeoti, John O. (2002). Building Technological Capability in the Less Developed Countries: The Role of a National System of Innovation; *Science and Public Policy*, Vol.29, No.2, pp. 95-104.

innovative SMEs in the chemicals and pharmaceuticals subsector. This will certainly result in improvement in standards and quality of chemicals and pharmaceutical products. Spearheading of innovation by key large firms can be very helpful especially through horizontal competition and possible technology spill-overs, and through the backward and forward linkages that may engender learning and innovation in the value chain.

6.10.5 Reducing overdependence on imported raw materials

- Local production of essential raw materials has been highly constrained by lack of vibrant petrochemical industry and low R&D capabilities for harnessing the abundance of medicinal plants resources. This has resulted in overdependence on imported raw materials which are mainly intermediate products. The only functioning petrochemical complex, the Eleme Petrochemical Complex Limited (EPCL), has been privatized. Though this is highly commendable, the outcome of the privatization deal is far from achieving the objective of significant local production of intermediate inputs for the chemicals and pharmaceuticals industry. The EPCL must be made to embark on aggressive expansion programme that fulfils the original plans for the EPCL as a main source of raw materials for local firms. New incentives regime that will make this workable under the terms of the privatization programme should be agreed as soon as possible. For example, government should encourage the new owners of EPCL to embark on the original expansion plans with full securitization of all investment provided by government through a special purpose vehicle hosted by the Bank of Industry.
- A government policy should be introduced to compel EPCL to sell directly to firms without the middlemen who often create additional costs that aggravates the costs of local firms sourcing raw materials from EPCL.
- Aggressively implement extant frameworks for establishment of privately owned refineries and privatize other existing petrochemicals and oil refineries.
- Develop the active pharmaceutical ingredients/fine chemicals industry. This industry will be expected to process pharmaceutical chemicals into synthetic medicinal substances including the output of several intermediate substances.
- Public investment in R&D that is aimed at application of local plant resources and mineral resources for the production of chemical and pharmaceutical grade raw materials should be a development priority because this would provide opportunities not only for building local technological capability but also enable firms achieve significant cost reduction. The public investment in R&D should in the short-term be regarded as industrial subsidy and firms should be encouraged to partner with public sector R&D institutions under an IPR agreeable to all parties involved.

6.10.6 Tackling the challenge of inadequate infrastructure

- 60-65 per cent of electricity currently used by industry is self-generated, leading to considerably high profile of production costs. Ensure that the ongoing reform in the power sector delivers energy at an internationally competitive price to the subsector. A subsidy would be desirable to significantly reduce high cost of local manufacturing activities and to provide a competitive advantage for export opportunities.

- Most firms now use gas instead of diesel. The Nigeria Gas Company (NGC), a subsidiary of NNPC, supplies the gas through Gaslink Ltd. Though Gaslink is a private company, its price should be lower than international prices considering the fact that its raw material (gas) is locally available in abundance. The burden that makes Gaslink's price to be higher than gas prices in North America and Europe should be ascertained and urgently removed.
- Privatization of the Kaduna Refinery should be carried out to enable local production of LPFO.
- A fund for technology renewal should be provided with concessionary interest rate that encourages capital investment. This should be part of the CBN, BOI and NEXIM intervention mechanisms.
- Massive investment in a modern railways system, road networks and ports upgrading are major imperatives for accelerated industrial development. The drag in the development of this critical infrastructure should be addressed through public-private sector partnerships. Efforts so far in this respect are yet to yield desirable results signifying the urgent need for reappraisal and more radical approach aimed at addressing the obstacles.

6.10.7 Strengthening the technology and engineering base

Strengthening the technology and engineering base for local manufacturing would require implementation of fiscal policies that provide at least 40 per cent rebate for machinery and equipment imported by manufacturing firms. Engineering materials such as sheet metals should attract zero tariff and efforts at ensure compliance should be closely monitored to avoid abuse.

6.10.8 Eliminating fake and counterfeit products

- Stiff penalties that include life jail without the option of parole should be enacted into revised laws on faking and counterfeiting.
- An important means of limiting the penetration of fake and counterfeit products is patronage of local chemicals and pharmaceuticals products. There should be sustained policy to encourage the patronage of local products. The patronage of locally manufactured chemicals and pharmaceuticals will also boost local production, and further ability to source raw materials locally. Besides, local production of chemicals and pharmaceutical goods is a good economic diversification strategy.
- Customs and regulatory agencies such as NAFDAC and SON should be further strengthened to address the challenge of porous borders and tracking of fake and counterfeit products.
- Diplomatic efforts that enlist the assistance of countries of origin of fake and counterfeit products should be strengthened and success in this respect should be measured and monitored by clearly defined yardsticks. For example, annual records of the quantity and value of fake and counterfeit products seized by country of origin and destination of products.
- Increasing efforts are required to improve GMP and achieve WHO GMP certification for pharmaceutical companies.

6.10.9 Fostering R&D and industrial linkages

Upgrading physical and human infrastructure in the R&D institutes and universities is an imperative for fostering R&D and industrial linkages. Needs based designated centres of excellence on industrial relevant R&D should be selected and equipped with state of the art facilities. Government should serve as a catalyst for promoting the R&D through generous incentives that would encourage participating firms leverage the R&D risk against other competing demands for firms' often limited resources.

Other examples of R&D incentives that worked in India which may also help foster R&D and industrial linkages in Nigeria include:

- Fiscal incentives such as the benefit of 150 per cent of R&D expenditure weighted exemption of the Income Tax; Tax deductible are also investment made in land and building for dedicated research facilities, expenditure incurred for obtaining regulatory approvals and filling of patents abroad and expenditure incurred on clinical trials.
- Promotion of R&D intensive companies.
- Establishment of a Pharmaceutical Research and Development Support Fund (PRDSF).
- Development of orphaned drugs (drugs with expired patents).

6.10.10 Developing local human resources

- Addressing the constraint of inadequate local manpower in the chemical and pharmaceutical subsector would require deliberate policy aimed at attracting highly skilled Nigerians in the Diaspora to work in partnership with local institutions and firms. There should be a planned brain gain scheme that enable Nigerian scientists and engineers in the Diaspora to work for at least a year in Nigeria with generous incentives comprising of well equipped state of the art laboratory and a remuneration that is a little above what is obtainable abroad.
- Highly talented young Nigerian scientists and engineers should be targeted with very generous material incentives that would enable their retention in strategic well equipped R&D institutes and local firms. Such incentives should be tied to local R&D projects that involved partnership with the private sector willing to embark on commercial application of successful R&D outputs.

6.10.11 Improving funding and access to credit

There should be fund that are deliberately created to provide loans at single digit (maximum 5 per cent) real interest rate for industry's new investment and working capital irrespective of whether or not a firm is financially distressed. The manufacturing industry are major employers of labour, subsidies that enable their growth would assuredly improve employment and quality of life, and thus help in poverty reduction.

6.10.12 Reducing bureaucratic bottlenecks

- Reduce red tape especially in the facilitation of investment. The one stop facility for investors at the Nigerian Investment Promotion Commission should be strengthened and

stiff penalty should be meted to public servants that impede the process of facilitation of investment flows.

- South-south cooperation should be particularly emphasized in investment promotion and special incentives to this effect should be implemented within the existing institutional framework for south-south cooperation.

6.10.13 Stop multiple taxation/levies

- The payment of extra taxation/levies should not only be stopped but the current list 39 approved taxes/levies should be considerably reduced.
- The institutions responsible for tax administration should be strengthened and empowered to prevent illegal tax/levy collection.

6.10.14 Ensure sustainability and consistency in government policy

- Examine the existing menu of policies that relate to industrial development especially as applicable to the chemicals and pharmaceuticals subsector. Ensure the consistence and synergy among these policies at all levels of government (Federal, State and Local). In this respect, industrial policy, science and technology policy, investment policy, export promotion policy, environment policy, etc. should all be reviewed and made to be consistent with the aspirations of NV2020.
- Regulatory and environmental protection agencies should strive not to inadvertently constitute constraints to industry. For example, the processing of NAFDAC's permit to import is considered expensive and time consuming by some firms. The permit fees are regarded as too high, and thus, more for revenue generation than for control.

CHAPTER SEVEN
ELECTRICAL AND ELECTRONICS

7.1 Overview of the Subsector

The Nigerian electrical and electronics industry benefited immensely from the import substitution industrialization of the 1960s and 1970s. Products of the subsector in the years of boom include wires and cables, radios and televisions sets, lamps and bulbs, fans, fridges and freezers, and air conditioners. These products were of high quality and gained exports to neighbouring countries. In fact the Nigerian wire and cable was notably recognized as among the best quality in the international market.

However, the Nigeria electrical and electronic industry has been in decline since the early 1980s, and there is no evidence that the decline has been halted. As at 2004, a presidential committee assessed the industry and reported that many of the firms in the subsector have either closed down, change their line of business, or were operating at less than 20per cent installed capacity.[10] Notable among firms that have exited the industry in Nigeria include Adebowale Electrical Industries, PAN Electrics, Phillips, Sanyo, and Gacol. The NV2020 classified the Nigerian manufacturing sector into ten subsectors. Five subsectors were rated as high priority subsector, three as medium priority, and two were rated as low priority. The criteria for the prioritization include:

- availability of market/ potential market size;
- availability of local raw materials;
- availability and simplicity of technology;
- profitability of the subsector; and
- availability of skilled manpower.

The electrical and electronics subsector was one of the two subsectors rated as low priority subsectors. The other low priority subsector is motor vehicle and miscellaneous assembly industry. They are regarded as comparatively more technologically advanced subsectors producing medium to high technology products. It is expected that more focus on these subsectors would be in the long term (post 2020). Prior to 2020, it is envisaged that the key core-base industries producing intermediate inputs or raw materials for the subsectors, equipment and spare parts, would have been developed. In addition, the requisite infrastructure and high technology skills would be available locally. However, the electrical and electronics industry is internationally regarded as a major growth inducing subsector that should be given priority attention. According to ISIC Revision 4 of 2004, the electrical and electronics industry consists of the manufacture of electrical equipment, computer and electronics products. The electrical equipment products include:

- electric motors, generators and transformers
- batteries

[10] FMI (2004). Draft Report of the Presidential Committee on Electrical and Electronics Industry, Presidential Committee on Electrical and Electronics Industry, Federal Ministry of Industry, Abuja.

- wiring devices
- electric lighting equipment
- domestic appliances

Computer and electronic product manufacturing are classified in the same block, which comprises the following products:

- electronic components
- computers and peripheral equipment
- communication equipment
- consumer electronics
- measuring, testing, navigating, and control equipment
- irradiation, electromedical and electrotherapeutic equipment
- optical instruments and equipment
- magnetic and optical media

The composition of the Nigerian electrical and electronics industry as defined by NV2020 includes:

- Electronics;
- Refrigerators & Air conditioning / Domestic appliances;
- Electric bulbs, lamps, accessories and fittings;
- Electrical power control & distribution equipment; and
- Cable and wire.

Recent developments in Nigeria suggest that the sector has been terribly weakened by the predominance of imported electrical equipment and components, and consumer electronics from the East Asian countries such as China, Taiwan, and South Korea. The few existing local firms producing electrical goods such as Nigerian Wire and Cable PLC are known to be operating under considerable stress. A recent study by Egbetokun et al (2010)[11] disclosed that there are only 11 virile firms within Nigeria's cable and wire manufacturing industry, and SON is active in ensuring compliance with high quality standards. In fact, to a reasonable extent, Nigerian wire and cables companies have been able to maintain high quality, and their products are still acknowledged as of superior quality to imported wire and cables from Asia.

A few multinationals are also operating in the Nigerian electrical industry, and they are also not spared of the stress arising from the unconducive manufacturing environment. For example, ABB (Asea Brown Boveri, Switzerland) was reported to have sold its shares in ABB Electrical Systems Nigeria Ltd in 2006. ABB Electrical Systems Limited was incorporated in 1996 and was the local manufacturing unit of ABB. Initially, emphasis was put on the lower range of the Low Voltage Switchgear and Motor Control Centres. Subsequently, by 1997 production of 11 kV Switchgear and the higher range of low voltage

[11] Egbetokun, A.A., W.O. Siyanbola and A.A. Adeniyi (2010). Learning to innovate in Nigeria's cable and wire manufacturing subsector: inferences from a firm-level case study, *International Journal of Learning and Intellectual Capital,* Vol.7, No. 1, pp. 55-74.

switchgear. The company has to its credit several projects carried out for various major companies in Nigeria. The sale was part of the strategy to streamline ABB's operations in Nigeria, move its headquarters from Lagos to Abuja, and to primarily be involved in projects with relatively large content of ABB products and/or ABB technology. Besides, ABB's Power Technology Division has over the past few years gradually implemented a strategy of having focused factories. In Nigeria, the ABB Electrical Systems' factory does not fit within this strategy of focused factories. Consequently ABB parent company decided to sell its shares in ABB Electrical Systems to Shoreline Energy International, which is another multinational company with two Nigerian subsidiaries, Shoreline Power and Fortis Constructions. The company is active in project management for the power industry by providing power solutions.

The electronics industry has virtually collapsed, except for the emergence of some information technology firms engaged in the assembly of computers in recent years. Two notable examples are the Omatek Computers PLC and the Zinox Technologies Ltd.

Omatek Computers was established in 2000 by its mother company, Omatek Ventures Ltd, which has been in existence since 1986 as a computer training outfit, marketer and distributor of branded computer and accessories. By 1990, the company had become a major reseller for Compaq, IBM, ACER and Apple, among other world recognized computer brands. As a result of high sales volumes achieved, the company was appointed a premium partner for Compaq, senior partner for IBM, Apple and Microsoft for turnovers in excess of $1 million annually. In 1993, Omatek Ventures set up its first factory for the local assembly of computers from completely knocked down parts. Omatek Computers is a joint venture project of Omatek Ventures Ltd, Zenith Bank and Guaranty Trust Bank and according to its management, the company was committed to making computers cheaper and more affordable in Africa and also assisting governments to bridge the digital divide, which poses a major policy challenge. The company's products include fully-built desktop PCs, notebooks, casings, and speakers. It is also involved in the assembly of OEM brands for both local and foreign builders. The company uses technology from China, Singapore and India to implement OEM initiatives that are promoted by Intel and Microsoft. The company has a strong international quality consciousness for Omatek brand of products, and has succeeded in receiving more than 18 awards that signify the wide acceptance of its products. The company has also become the first computer firm to be listed on the Nigerian Stock Exchange, and has grown into a Group of Companies with the establishment of subsidiaries to strengthen its operations. Omatek Ventures Plc has therefore become the holding company with subsidiaries that include:

- Omatek Computers Ltd
- Omatek Computers (Ghana)Ltd
- Omatek Ventures (Ghana) Ltd
- Omatek Engineering Services Ltd
- Omatek Ventures Distribution Ltd

Zinox Technologies Ltd was launched in 2001 by a team of IT professionals for the production of computers locally. Zinox claimed to engage in significant research and development as part of its core operations from where products designed for the local markets are conceived, and innovative and customer-centric packages and products are designed particularly for the African market. Zinox was the first internationally certified branded computers OEM in West Africa. It is also the first computer company in the world to incorporate the Naira on its keyboard; and it aims at developing other digital solutions in areas other than computer manufacturing. Zinox has been reported to commence strategic investments in leading ICT companies and has made major investments in Technology Distributions Ltd, Task systems Ltd, AfriHub LLC, and Zinox Telecommunications Ltd. Both Omatek and Zinox brands have enjoyed favourable patronage from public and private sector agencies in Nigeria. The Federal Government in particular has an official policy that encourages its agencies to use Omatek and Zinox brands.

In the area of consumer electronics, the influx of foreign products has made local manufacturing difficult. A few companies that imports such as the South Korean LG also has a few assembly outpost. For example, LG has an assembly outpost in Kaduna. For electrical consumer durables such as air conditioners, refrigerators, deep freezers, etc. importation is dominant with few assembly plants. The following are succinct description of the current state of each of the branches of the electrical and electronics subsector in Nigeria.

Electronics

The electronics industry in Nigeria had at least 15 major firms in the early 1980s. However, only a few of them were into real manufacturing business while most of them assembled electronics products such as televisions, radios, video and audio tapes. With exception of computer equipment assembly, presently there is no significant manufacture of electronics products in Nigeria.

Refrigerators & Air conditioning / Domestic appliances

There are a few companies in Nigeria involved in the assembling of refrigerators, freezers, air conditioners, fans, cookers, sewing machines, blenders, mixers, immersion heaters, etc. As at 2004, there were only eight firms (a decline from 18 firms in the early 1980s) producing these products and investment in the firms was estimated to be at least N2.5 billion.

Electric bulbs, lamps, accessories and fittings

The number of firms in this subsector declined from 15 in the early 1980s to 7 in 2004. Total investment in the subsector is estimated to be at least N3 billion. The firms in the subsector presently produces only ceiling and wall light fittings, fluorescent fittings, and accessories. None of the firms operating in the subsector presently manufactures bulbs and fluorescents. One of such firms that stopped production (Nigeria Lamps PLC) has capacity to produce 25 million units of bulbs and 6 million units of fluorescent tubes per annum. The product mix of the subsector include tungsten bulbs, fluorescent tubes, switches, fixtures, sockets and plugs, fluorescent light fittings, wall brackets, ceiling fittings, street and highway lightings, chandeliers, flood lighting fittings, industrial and residential fittings.

Electrical power control and distribution equipment

This group had 25 firms in the early 1980s and was reported to have 18 firms in 2004. The investment in the subsector was estimated to be about N1.8 billion, and production capacity was estimated to be about 1.25 million units per annum. The product mix of the subsector are feeder pillars, fuse base switch panel, riser and bus bar, distribution board chamber, poly phase meter, single phase meter, mini circuit breakers, electrical power distribution board, change over switches, automatic light control kiosk, PHCN incomer panel, 1KV switch board, 33KV panel board, power generating tension panels, high compact substation, electrical porcelain insulators, cable joints and terminations, cable plugs and connectors.

Cable and wire

As at 2004, there were 14 firms manufacturing different sizes and grades of cables and wires in Nigeria, and investment in the subsector was estimated to be at least N3.5 billion. In the early 1980s, there were 20 firms in the subsector. The product mix of the subsector include aluminum conductors, bare and insulated cables, telecommunication cables, armoured and non-armoured cables, copper LV cables, and wiring cables.

7.2. Resource base and import-dependence for production

Nigeria's abundance deposit of mineral resources provides ample opportunity for local sourcing of raw materials for the electrical and electronics industry. However, while some resources can be of direct use as primary raw materials, others are secondary because of the need to process them into intermediate products that would serve as inputs into the subsector. Locally available primary raw materials include silica, mica, ceramics, wood, tin, rubber, iron ore, aluminum ore, copper ore, and hydrocarbon based materials. Among these materials, only wood has been exploited appreciably. There is still much to be done to develop significant use of the other materials by the electrical and electronics industry. The primary raw materials are used in the production of components such as resistors, capacitors, and insulators, which are regarded as secondary raw materials used in the manufacture of numerous electrical and electronic products. The following are the specific raw material context of each of the branches of the Nigerian electrical and electronics subsector.

Electronics

For the manufacture of electronics components, locally available primary raw materials include silica, mica, ceramics, wood, tin, rubber, iron ore, aluminum ore, copper ore, chemicals, and hydrocarbon based materials.

Refrigerators and Air conditioning / Domestic appliances

The major raw materials for refrigerators and air conditioners are imported and they include cold rolled steel sheets, steel rods, capacitors, resistors, inductors, Polyvinyl chloride (PVC) compounds, plastic granules, copper pipes, compressors and aluminum pipes. With the exception of some of the frames and casings that are fabricated locally, virtually all components of the products are imported as CKD or SKD.

Electric bulbs, lamps, accessories and fittings

Most of the major raw materials for the manufacture of electric bulbs, lamps, accessories and fittings are imported. These intermediate products include backlites (phenolic plastic), polycarbonate, PVC powder, steel sheet, copper, brass, aluminum components, pigments, plastic (UV protected) and glass parts, starter switches, capacitors, ballast, lamp holders, igniters, filaments, fluorescent powder and caps, clips, clamps, brackets, terminal blocks, industrial fasteners, screws, bolts and nuts.

Electrical power control and distribution equipment

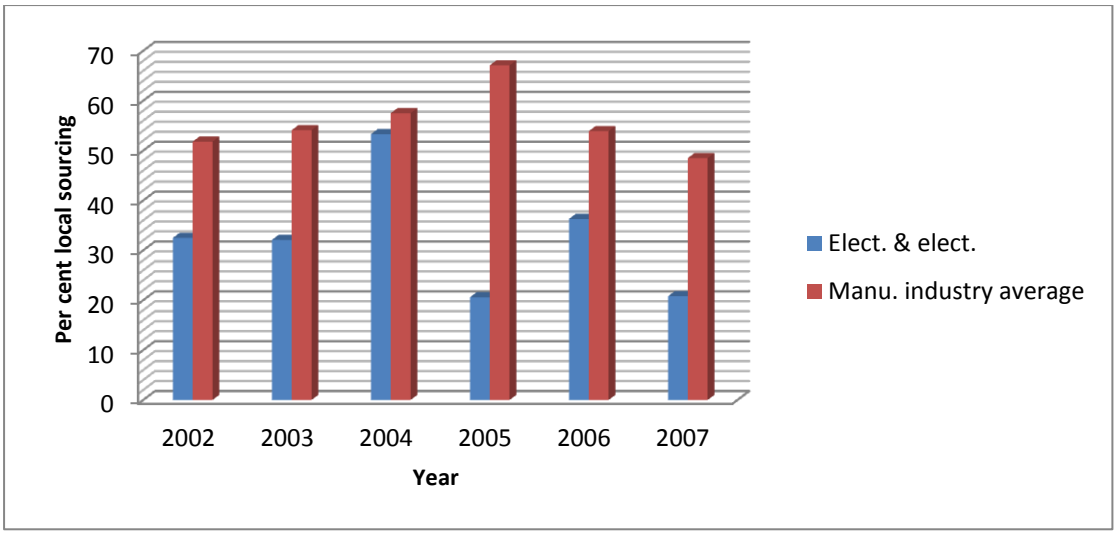
The major raw materials in the production of electrical power control and distribution equipment are copper bars and rods, fuses, polyester moulding compound, current transformers, ammeters, capacitors, fuse links, keys, circuit breakers, standoff insulators, locks, wrapping buckle, hinges, contactors, relays, timers, air circuit breakers, etc. Most of these raw materials are intermediate products imported for the mostly assemblage processes of the firms.

Cable and wire

The major raw materials for the cable and wire industry are copper wire, aluminum wire, PVC and polyethylene compounds and granules. A thriving local petrochemical industry would provide the critical PVC and polyethylene compounds for the subsector.

Figure 1 shows the trend in the local sourcing of raw materials by firms in the subsector from 2002 to 2007. In this respect, the peak of the subsector's performance in recent years was in 2004 when the per cent of raw materials obtained locally was about 53per cent. Subsequently, there has been decline without evidence of recovery. The trend also revealed that performance in local sourcing of raw materials has been generally lower than the average for the manufacturing industry in recent years. This indicates that the subsector has not been performing well as a user of locally available raw materials when compared to some other subsectors.

Figure 1: Trend in the local sourcing of raw materials, 2002-2007



***Source**: MAN Economic Review, 2003-2006, 2006-2007.*

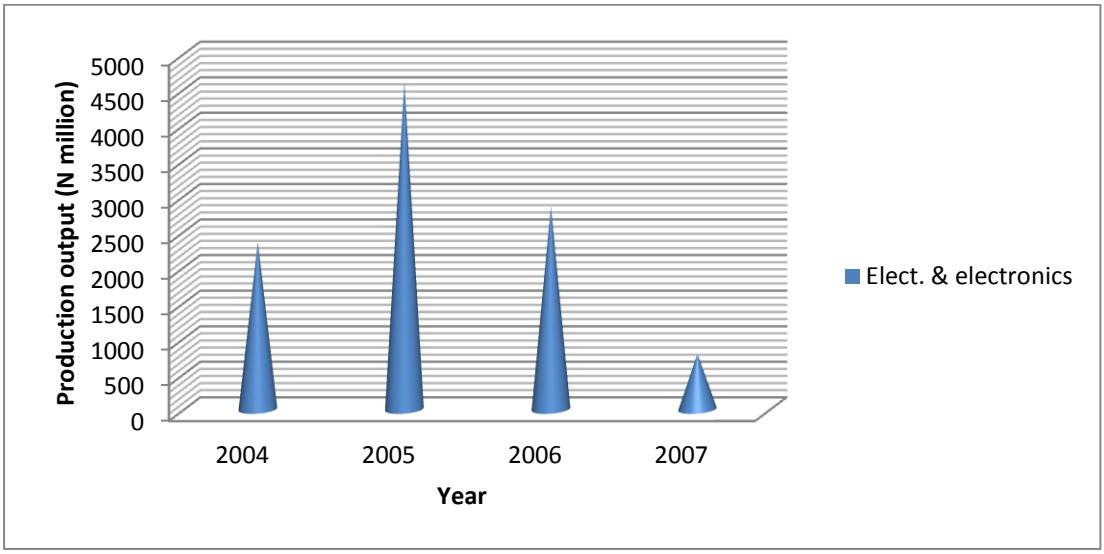
7.3. Firms' Size, Ownership and Location

Though there is lack of data on the size and ownership structure of firms operating in the subsector, it is useful to note that major current players in the subsector are multinational companies with sales outlet and few assembly outposts. Notable among these companies are LG and Samsung. In wire and cable manufacturing, local firms dominate. The locations of the companies are mainly in the Southwest Nigeria.

7.4. Recent Trends in Production, Exports and Investment Flows

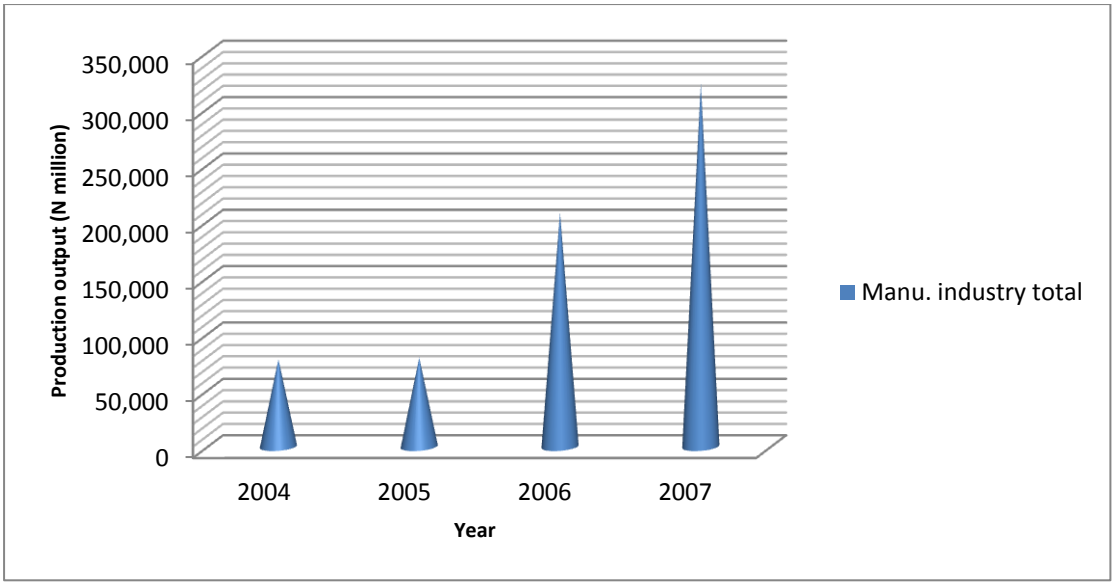
Figures 2 and 3 show the trends in the production output of the subsector and the entire manufacturing industry from 2004 to 2007. The subsector's output reached a peak of N4.6 billion Naira in 2005 but declined to about N2.8 billion in 2006, and only N776 million in 2007. Meanwhile, the total manufacturing output was consistently increasing from 2004 to 2007. This suggests that the subsector is among the manufacturing subsectors that have been under stress in recent years. As shown in Figure 4, the trend in capacity utilization also follow a similar trend except in 2005 and 2007 when capacity utilization in the electrical and electronics subsector exceeded the average for the total manufacturing sector.

Figure 2: Trend in production output of electrical and electronics subsector, 2004-2007



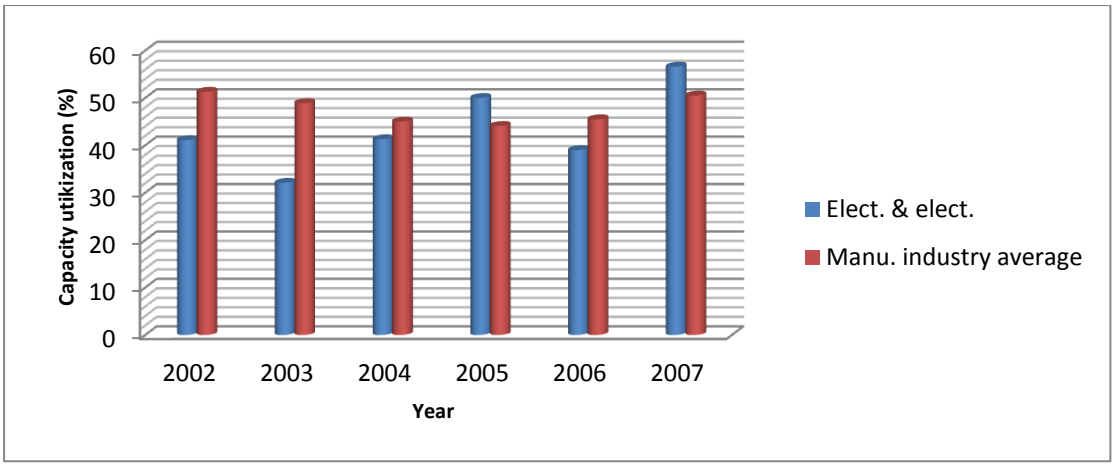
***Source**: MAN Economic Review, 2003-2006, 2006-2007.*

Figure 3: Trend in production output of the Nigerian manufacturing industry, 2004-2007



***Source**: MAN Economic Review, 2003-2006, 2006-2007.*

Figure 4: Trend in capacity utilization, 2002-2007



***Source**: MAN Economic Review, 2003-2006, 2006-2007*

Export of manufactures in Nigeria is very low. It is widely known that Nigerian export is dominated by minerals, fuels, lubricants and related materials, all of which account for at least 95per cent of exports in recent years. Non-oil exports which include export of agricultural commodities and manufactures account for less than 5per cent of the exports. From the data in 2008 World Development Indicators, the share of manufacturing export in total export was only 2.07per cent in 2005. Presently, there is no evident of significant export from the electrical and electronics subsector in Nigeria.

Table 1 shows the trend in the investment flow to the subsector and the total investment flow to the entire manufacturing industry from 2004 to 2007. While the total investment in the manufacturing industry was appreciably steady from 2004 to 2007, the investment in electrical and electronics industry ballooned from about N4 million in 2004 to nearly N17 million in 2006. The nature of the investment in 2006 is unclear, and generally speaking, the total manufacturing investment is considerably low. For example, Nigeria is one of the largest recipients of Foreign Direct Investment (FDI) in Africa. The annual FDI inflow to Nigeria in recent years has been in excess of US$2 billion, and mainly in the oil and gas, and the telecommunication sectors. When viewed in this context, the investments in the electrical and electronics in particular, and the entire manufacturing industry are terribly low and unlikely to make significant impact in improving industrial production.

Table 1: Trend in investment, 2004-2007

Year	Investment (N million)	
	Electrical & electronics	Manufacturing industry total
2004	2.48	351.31
2005	3.99	357.74
2006	16.77	326.93
2007 (Jan-Jun)	0.69	190.85

***Source**: MAN Economic Review, 2003-2006, 2006-2007*

7.5. Institutions Involved in Product Development and Marketing

In Nigeria the institutions involved in product development and marketing of electrical and electronics products are public sector agencies and private sector professional associations. There is only one public research institution, National Agency for Science and Engineering Infrastructure (NASENI), which has a mandate for development of a range of products and processes that are relevant to the electrical and electronics subsector. The Standards Organization of Nigeria (SON) plays important role as the main regulator of product quality. The professional associations such MAN and the National Association of Small and Medium Enterprises regularly make strong advocacy for policies and incentives that promote product development and industrial competitiveness.

NASENI was established in 1992, and executes its mandate through a network of product and process development institutes. These institutes are spread across Nigeria, and each of them aims at ceding the technologies developed to private sector agents especially SMEs. The institutes and their functions are as follows:

- *Scientific Equipment Development Institutes (SEDI) in Enugu and Minna*: develops and produces scientific equipment and their production systems.
- *Electronic Development Institute (EDI) - formerly Centre for Adaptation of Technology (CAT), Awka:* produces electronic devices and assemblies, computer technologies and their production systems.
- *Hydraulic Equipment Development Institute (HEDI), Kano*: develops and produces hydraulic and pneumatic machinery, materials, fittings and their production systems.
- *Engineering Materials Development Institute (EMDI), Akure*: develops and produces engineering materials and their production systems.
- *National Engineering Design Development Institute (NEDDI), Nnewi*: develops engineering design capacity in Nigeria through training and demonstrations projects.
- *Power Equipment and Electrical Machines Development Institute (PEEMDI), Okene*: develops machines to manufacture power equipment and electrical machines.
- *Prototype Engineering Development Institute (PEDI), Ilesha*: develops engineering prototypes and their production systems.

In Nigeria, the standardization and regulation of quality of all products are carried out by the Standards Organization of Nigeria (SON) established in 1971. The functions of SON are to:

- organise tests and do everything necessary to ensure compliance with standards designated and approved by the Council of SON.
- undertake investigations as necessary into the quality of facilities, materials and products in Nigeria, and establish a quality assurance system including certification of factories, products and laboratories.
- ensure reference standards for calibration and verification of measures and measuring instruments.
- compile an inventory of products requiring standardisation.

- compile Nigerian standards specifications.
- foster interest in the recommendation and maintenance of acceptable standards by industry and the general public.
- develop methods for testing of materials, supplies and equipment including items purchased for use of departments of the Government of the Federation or a State and private establishments.
- register and regulate standards marks and specifications.
- undertake preparation and distribution of standards samples.
- establish and maintain such number of laboratories or other institutions as may be necessary for the performance of its functions.
- compile and publish general scientific or other data - resulting from the performance of its functions; or from other sources when such data are of importance to scientific or manufacturing interests or to the general public and are not available elsewhere.
- advise departments of the Government of the Federation or a State on specific problems relative to standards specifications.
- sponsor such national and international conferences as it may consider appropriate.
- co-ordinate all activities relative to its function throughout Nigeria and to co-operate with corresponding national or international organisations in such fields of activity as it considers necessary with a view to securing uniformity in standards specifications.
- undertake any other activity likely to assist in the performance of the functions imposed on it under this act.
- undertake such research as may be necessary for the performance of its functions, and for that purpose have power to make use of research facilities available in other institutions, whether public or private upon such terms and conditions as may be agreed upon between the Organisation and the institution concerned.

7.6 Major Constraints

From review of recent reports (including NV2020) and interviews conducted with stakeholders, the constraints on the subsector that were reported by a presidential committee on the subsector in 2004, are still main constraints on the subsector. They may be itemized as follows:

- Lack of basic infrastructure and high production costs due to high tariff on basic utilities;
- Inconsistency of government fiscal policies and inappropriate duty imposed on raw materials and finished products;
- Undue competition due to the proliferation of Nigerian market with imported electrical and electronics products, most of which were substandard or products highly subsidized by countries of origin;
- Preference by local buyers/consumers, including public sector agencies, for imported electrical and electronics products;
- Multiple taxation/levies *by government and its agents*;
- High cost of borrowing from banks and other financial institutions.

Lack of basic infrastructure

Poor power supply, bad roads, and lack of water supply from public utility were identified as major constraints arising from inadequate infrastructure. They engender high cost of production arising from additional private investment to ensure the provision of these essentially basic infrastructures.

Inconsistency of government fiscal policies and inappropriate duty

Inconsistency in government fiscal policy has manifested variously in unstable and often inappropriate duty imposed on raw materials and finished products. The raw materials are essentially intermediate or semi-processed products imported from abroad. There is inadequate tariff differential between CKD and FBU especially for air conditioners and refrigerators. The duty on intermediate products is 10per cent while the duty on finished products is 20per cent. The gap between the two duty regimes is considered too low and unable to deter the importation of finished goods which are often cheaper than the local products produced under Nigeria's high cost manufacturing environment. Besides, the imported goods are often substandard products from China and other Asian countries. There is a duty deletion scheme which expects manufacturers to produce intermediate raw materials after five years of operation. However, the small gap between the duty on the raw material (10per cent) and duty on the finished products (20per cent) makes the duty deletion scheme of no significant effect so far.

Undue competition

The key elements of undue competition as a constraint which adversely affects the manufacture of electrical and electronics goods in Nigeria are identified as follows:

- Undue competition with imported cheaper products especially from China.
- Manufacturers in the subsector estimated the cost of manufacturing in Nigeria to be nine times that of China, hence the local electrical and electronics industry need protection.
- Imports of fully built products make assemblers in Nigeria to survive: Every manufacturer in Nigeria is also a potential importer because manufacturing environment is too costly. It is far more profitable to invest in importation of finished products than engage in manufacturing in Nigeria. In fact, it is known that those that are surviving as manufacturers in the subsector are heavily supported by trading activities comprising the importation of finished products. The trading activities provide support for the local assembly of the finished products, and hence such companies are able to remain profitable.
- Thermocool Nigeria still manufactures but the bulk of its products are imported. The company currently exists in Nigeria largely due to the support it receives from its parent company.
- Though the wire and cable products produced in Nigeria are better than the imported ones, without effective protection or significant reduction in production costs the industry is considered to be at high risk because the Chinese cable products are also improving in quality while retaining relatively lower prices.

Preference by local buyers/consumers for imported products

Preference by local buyers/consumers, including public sector agencies, for imported electrical and electronics products manifests in direct procurement of foreign products which are also locally produced or have locally manufactured equivalents. Besides, it has been observed that tariff concessions are granted to some industrial users (e.g. oil companies, telecom companies, PHCN, etc.) of electrical and electronics finished products to import instead of patronizing local producers. Nonpayment or delayed payment of local contractors by government agencies are also identified as constraining the ability of local contractors to obtain products from local firms to which they have not fulfilled outstanding contractual obligations.

Multiple taxation/levies by government and its agents

It has been estimated by manufacturers that businesses in Nigeria pay more than 100 types of taxes/levies instead of the 39 approved taxes/levies. Multiple taxation is noted to be due to two main factors, viz.

- There is weak law enforcement and weak institutions for tax administration; and hence, businesses pay the taxes to reduce delays and avoid adverse consequences that illegal tax/levy collectors may inflict on their businesses.
- Taxation/levies are seen mainly as instrument of revenue generation and sometimes extortion of businesses by some security agencies and illegal tax/levy collectors.

High cost of borrowing from banks and other financial institutions

Interest/lending rate is too high, currently 22-30 per cent for local SMEs. MNCs could get 12-14 per cent. Interest rate depends on the banks perception of risks associated with each lender. Even interests obtainable from the Bank of Industry (BOI) which offers 10 per cent interest rate to local firms (SMEs), and 7 per cent interest under the CBN special intervention fund, are considered too high if manufacturing activities should be competitive.

Ranking the constraints enumerated above is difficult. This notwithstanding, it appears that based on the emphases placed on the constraints by the stakeholders interviewed, the constraints could be ranked in the following order of importance:

1) Inconsistency of government fiscal policies and inappropriate duty
2) Lack of basic infrastructure
3) Undue competition
4) Multiple taxation/levies
5) Preference by local buyers/consumers for imported products
6) High cost of borrowing from banks and other financial institutions.

7.7 Stakeholders' Perception of Solutions to the Critical Issues

From the interviews carried out and the recommendations of the 2004 presidential committee on the subsector, the perceived solutions to the critical challenges faced by the subsector can be enumerated as follows:

- Concessionary tariff should be granted on import duty paid for essential raw materials. This should not be more than 2.5per cent and given only to genuine or bonafide manufacturers.
- There should be stocklist that imports intermediate raw materials instead of individual manufacturers importing for own use. For example, in the UK stockists import the raw materials, and the firms buy directly from them. This saves the firms from having to deal with issues of port transactions, foreign purchases, etc. The stocklist should be private actors but strongly supported by government.
- The import duty on FBUs should be increased substantially to discourage imports and encourage patronage of local equivalents. Importation of finished products for which there are local capacity to meet local demand should attract 100per cent duty.
- The incidence of smuggling and dumping should be combated effectively by the Nigerian Customs Service and SON through intensive policing of their sources of entry into the country and unpredictable raiding of their sources of outlet.
- Public and private sector agencies or companies should be encouraged to buy products of the Nigerian electrical and electronics industry. For example, the ongoing power projects including the IPPs (Independent Power Producers) should patronize Nigerian firms for inputs. Government could also issue necessary directives to various organs of government, consultants and contractors to patronize locally made electrical and electronics products.
- More stringent measures such as constant raiding of warehouses and stores should be applied to importers of used fridges and air conditioners and other domestic appliances that are currently banned.
- Government should remove import duty on machines and equipment for the production in the subsector to enable replacement of old machines, improvement of production capacity and technology upgrading.
- There is need for manufacturers to know each other and exchange information on how they can feed into each other. For example, sheet metal and paints are intermediate products that are raw materials for the electrical and electronics subsector. It would be useful to relate with local manufacturers that are capable of producing these intermediate raw materials.

7.8 Assessment of Nigeria's Distance to the Technology Frontiers and World's Best Practices

The global electrical and electronics industry is concentrated on a few subsectors which include electronic components, computer and office equipments, telecommunications, consumer electronics, and industrial electronics. The components electronics industry is the most competitive of the subsectors, and is engaged in designing, manufacturing, marketing, supporting, selling and distributing of broad range of electronic components such as bolts,

clamps, fasteners, lighting, semi conductors, integrated circuits, microprocessors, cables and wires, switches, sensors, keyboards, sockets, solar devices, test and inspection equipment, etc. Contemporary worldwide market leaders in electronic components are the United States of America, European, and Asian countries like Japan, China, India, Taiwan, and Hong Kong.

To assess Nigeria's distance from technology frontiers and world's best practices, we will compare Nigeria with two leading developing countries which have made significant progress in the electrical and electronics subsector. With a specific focus on the electrical and electronics industry in India and Malaysia, it would be possible to illustrate how far Nigeria has lagged behind in best practices in processing and technological development in the subsector. A common feature of the three countries, India, Malaysia and Nigeria is that they are all countries that provide potential large markets for electrical and electronics goods. They are also all developing countries, and India and Nigeria are particularly overwhelmed with tackling the challenge of poverty among the larger proportion of their population. This notwithstanding, all the three countries have emerging middle class with potential for providing market opportunities for products and services of the electrical and electronics firms.

The Electrical and Electronics Industry in Malaysia

As reported by MIDA,[12] the electrical and electronics industry is the leading sector in Malaysia's manufacturing sector. The Malaysian manufacturing output is 29.3 per cent of total output, 55.9 per cent of total export, and provided 28.8 per cent of total employment in 2008. In 2008, gross output of the manufacturing industry was US$53.9 billion, exports were US$75.4 billion, and the manufacturing industry employed 296,870 people. In 2008, Malaysia exported electrical and electronic products valued at US$3.8 billion while import of electrical and electronic goods was valued at US$2.8 billion. In particular, the Malaysian electronics industry has developed significant capabilities and skills for the manufacture of a wide range of semiconductor devices, high technology consumer electronic and Information and Communication Technology (ICT) products. See Rajah et al (2008)[13] for a more detailed analysis of the innovation capacity and competitiveness of the Malaysian electronic industry. Electronics manufacturers in the country have continued to move up the value chain to produce higher value-added products. The success achieved has been noted to be the outcome of the intensification of research and development efforts and outsourcing of non-core activities by multinational companies to domestic firms. The electrical and electronics industry in Malaysia can be categorized into three subsectors that include electrical products, consumer electronics, and electronic components.

[12] MIDA is Malaysian Industrial Development Agency. This subsection draws largely from the report of MIDA on the electrical and electronics industry present in MIDA website http://www.mida.gov.my/en_v2/index.php?page=ee (Accessed 02 October 2010). The data on the state of the Malaysian electrical and electronics industry are also obtained from MIDA website.

[13] Rajah, Rasiah, X. Kong, Y. Lin and J. Song (2008). Explaining Variations in Semiconductor Catch-up Strategies in China Korea, Malaysia and Taiwan, Draft Paper for Technological and Economic Catch-up Workshop, UNU-MERIT, The Netherlands, Feb. 2008.

i) Electrical Products

The electrical products in Malaysia are categorized into three groups which include:

- industrial equipment;
- electrical component; and
- Household appliances.

The major electrical products manufactured in Malaysia are household appliances such as air-conditioners, refrigerators, washing machines, vacuum cleaners and other household electrical appliances. The manufacturing activities have evolved from mere assembly to design and marketing of Malaysian brands for the regional and global markets. There are more than 381 firms manufacturing a wide range of electrical products such as household electrical appliances, wire and cables, and electrical industrial equipment.

ii) Consumer Electronics

This subsector includes the manufacture of colour television receivers, audio visual products such as Digital Versatile Disc (DVD) players/recorders, home theatre systems, blue-ray, mini disc, electronics games consoles and digital cameras. Major players in this subsector include many Japanese and Korean multinational companies, which have contributed significantly towards the rapid growth of the sector. The leading companies are now undertaking R&D activities in the country to support their Asia Pacific markets. Export of consumer electronic products in 2008 was valued at US$6.9 billion.

iii) Electronic Components

Products and activities which fall under this subsector include semiconductor devices, passive components, printed circuits and other electronic components such as media, substrates and connectors. The electronics components are the most important subsector in the Malaysian electrical and electronics industry, and accounted for 58.7 per cent of the total investment approved in the electronics sector in 2008.

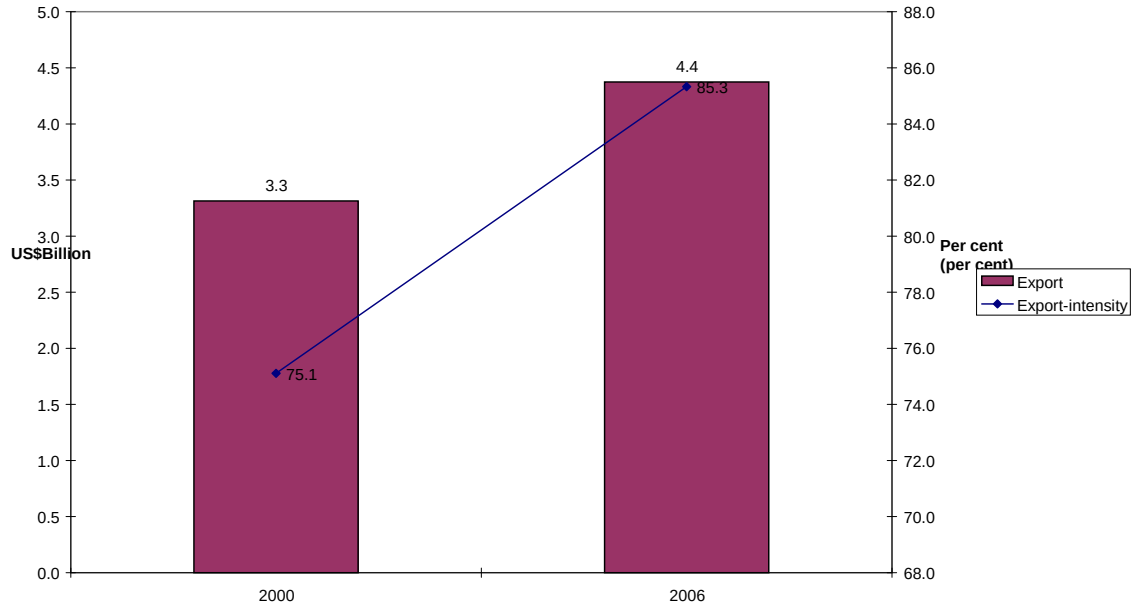
Majority of the investments were by foreign investors, and the subsector is dominated by the semiconductor players, mainly undertaking packaging, assembly and test. The electronics components accounted for 38.4 per cent of the total export of the electrical and electronics industry in 2008.

Promotion of dynamic industrial location: the example of Penang electrical and electronics cluster

Penang is the largest of the three major regional clusters of electrical and electronics manufacturing firms in Malaysia. Malaysia's first export processing zone was opened by the government in 1972 to attract foreign electrical and electronics firms to stimulate investment and employment, and poverty reduction in Penang. The attractive financial incentives, excellent basic infrastructure helped attract giant American, Japanese and European firms such as Intel, Advanced Micro Devices, National Semiconductor, Hewlett Packard, Seagate, Hitachi, Sony and Siemens to Penang. The relocation of these flagship firms helped stimulate the development of local supplier firms.

The electrical and electronics industry became the leading contributor to manufacturing value added, employment and exports in Penang since 1980. As shown in Figure 5, export and export-intensity of electrical and electronics products from Penang rose from $3.3 billion and 75.1 per cent in 2000 to $4.4 billion and 85.3 per cent in 2006. Box 1 enumerates the drivers of the impressive firm performance observed in the cluster in recent years.

Figure 5: Export and export intensity of output, electric-electronics, Penang, 2000-2006



Source: UNIDO, Survey of Dynamic Industrial Locations, 2007/08

Box 1. Drivers of firm-level performance at Penang cluster

- Excellent basic infrastructure, namely, good transport services, power supply, water supply, telecommunication network, public health facilities, schools, security and customs services.
- Strong cluster networks between firms, and basic infrastructure and intermediary organizations such as the Penang Development Corporation (PDC), the Free Trade Association of Penang (FREPENCA) and chambers of commerce.
- The role of Penang Skill Development Corporation in providing firm-oriented skill training
- Compliance with environmental standards helped adoption of environmental best practices.
- Upgrading of production in transnational corporations from low to high value added activities has stimulated transformation of flagship firms such as Intel, Motorola, Advanced Micro Devices, Fairchild, Hewlett Packard and Dell into designing activities.

- Penang's open system framework has enabled the movement of human capital for the ramping up of new firms and the co-evolution of complementary industries such as machine tools and plastics.

The performance of the Penang electrical and electronics cluster has considerable impact on employment, wages and environmental practices in the Penang region. A recent survey of firms in the cluster showed that employment and monthly wages in the electrical and electronics firms grew from 61,289 workers and $581 in 2000 to 77,577 workers and $649 in 2006. The expansion of the electrical and electronics exports helped reduce unemployment rate to 0.5 per cent in 2006, which was much lower than the national rate of 2.5 per cent (see Chandran, 2008; Rasiah, 2008).[14] The mean household assessment of emissions from manufacturing firms in Penang of 3.1 using ratings from 0 to 5 was well above the average score for the region. The standard deviation was only 1.3.

The Electrical and Electronics Industry in India[15]

Like every other industrial sector in India, the Indian electrical and electronics industry is slowly emerging from the protectionism regime. The subsector had been inward looking in the past fifty years, and there has been no significant exposure to global players and competition, with the result that the industry grew up in a sheltered environment, dependent on the government for everything, from licenses to protection tariffs. Each one of these interventions was aimed at securing protection for the manufacturing enterprise and ensuring growth for each firm. Lack of global competition encouraged the transfer of every conceivable cost increase to the consumer, and there was thus no motivation to reduce costs.

With de-licensing, decontrol and deregulation, Indian manufacturing industry has become exposed to global competition since the beginning of 1990s. India has witnessed what global players have achieved and what they are capable of achieving, and they are becoming aware of competition. Almost every company complains of increased competition, lower order books and shrinking margins. The Indian electrical and electronics industry is further constrained by lack of investment in the power infrastructure. The prospect of growth in the Indian power sector is however considered good, and it will undoubtedly boost demand from the Utilities, quite apart from the industrial demand which will continue to grow with increased industrial output.

The electrical and electronics industry in India is growing, and it is expected that in the coming few years India will be recognized for attaining world leadership position in high

[14] Chandran, Govindaraju (2008) "The Electronic Cluster in Penang", Background paper prepared for 2009 UNIDO Industrial Development Report; Rasiah, Rajah (2008) "Drivers of Growth and Poverty Reduction in Malaysia: Government Policy, Export Manufacturing and Foreign Direct Investment, *Malaysian Journal of Economic Studies*, forthcoming.

[15] The report and data presented in this subsection draw largely from http://www.allelectricalproducts.com/indian-electrical-industry.html (Accessed 02 October 2010).

quality electrical and electronics products. The industry is reported to be growing at 20per cent and should continue at the same level for the next few years. Factors that have encouraged the growth of the industry in India are:

- Research and development in innovative and higher-value added electrical and electronics products. Innovation plays critical roles in the electrical and electronics industry to address the challenge of increasing demand for newer and faster products and applications.
- Foreign investments accelerated growth in production and export. Foreign companies in India have done huge investments in the electrical and electronics industry.
- Global industries in sectors such as medical, telecommunications, industrial and automotive industries have major linkages with the electrical and electronics industry.
- Increase in income changed living standards of the significant proportion of the Indian population and also in many parts of the world, and thus leading to expanding middle class. Consequently, there is increasing demand for electronics goods, especially consumer electronics products locally, and also globally.
- Electrical and electronics industry is highly fragmented and comprises of many small and medium sized enterprises resulting in a huge industry that creates large employment opportunities in a high population country such as India.
- Asia Pacific region is emerging as the most spinning place for the consumer electronics industry, as the markets remain largely untapped, and thus a main target for India as an emerging economy.

7.9 An Agenda for Action

The foregoing has highlighted the critical elements and components of the electrical and electronics industry, the constraints on the subsector, stakeholders' perception of the solutions to the critical issues, and Nigeria's distance to the technology frontiers and world's best practices. In order to stimulate growth of the subsector, the following policy agenda should drive appropriate actions for reviving ailing firms, improving performance, and encouraging innovative and job creating green field investment. In effect, the agenda for action will directly address the constraints on the subsector.

7.9.1. Promotion of dynamic industrial location

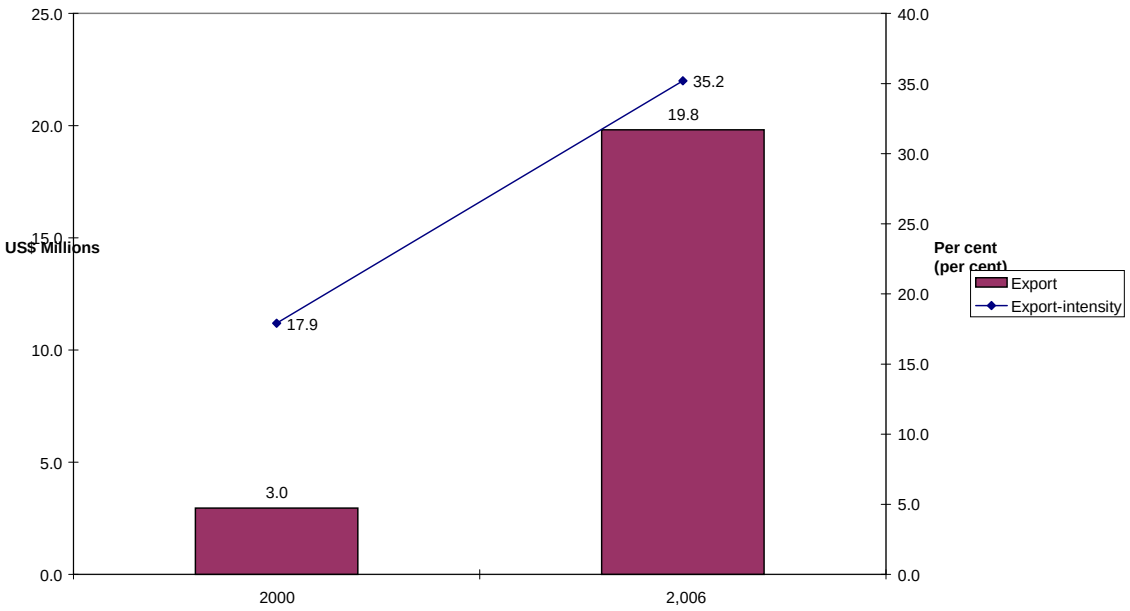
The example of the Penang electrical and electronics cluster in Malaysia demonstrates that a dynamic industrial location based on clustering of related enterprises can be promoted in the electrical and electronics industry. An interesting example in Nigeria is the Otigba computer hardware cluster located in Ikeja, Lagos State. Oyeyinka (2006)[16] provides a detailed description of the evolution of the cluster. The cluster evolved around a hostile regulatory environment. Firms' activities range from the assembly of low risk parts and trading to knowledge-intensive computer and software development. The expansion of the cluster has helped provide employment not only for low skill trading in computer components but also

[16] Oyeyinka, Banji (2006). Learning Hi-Tech and Knowledge in Local Systems: The Otigba Computer Hardware Cluster in Nigeria, Discussion Paper, DP 2006-07, UNU-INTECH, Maastricht, The Netherlands.

for highly educated and skilled entrepreneurs educated in electronics engineering and computer sciences.

The Otigba cluster is located at the heart of Ikeja, Lagos, with a population in the excess of 7 million. The core firms in the cluster manufacture cloned products from imported components. From a survey of the firms in the cluster carried out in 2007/2008, the estimated number of computer and component enterprises rose from 2,500 in 2002 to around 7,000 in 2007. As shown in figure 6, export and export-intensity of computer and components in Otigba grew from 3 million dollars and 17.9 per cent in 2000 to 20 million dollars and 35.2 per cent in 2006. Although the numbers are small, employment and monthly wages in the surveyed computer-component firms rose from 184 workers and 356 US dollars in 2000 to 468 workers and 416 US dollars in 2006. Box 2 presents the drivers of the remarkable firm-level performance observed in the cluster.

Figure 6. Export and export-intensity of output, computer-components, Otigba, 2000-2006



Source: UNIDO, Survey of Dynamic Industrial Locations, 2007/08

Box 2. Drivers of firm level performance at Otigba cluster

- The high intensity (55-60 per cent) of graduates educated in electronics engineering and computer sciences.
- Strong networking arrangements coordinated by the Computer and Allied Products Association of Nigeria (CAPDAN) in Otigba that helped resolve institutional failures involving finance, technology, marketing, infrastructure and government regulations.

- Rising regional demand for cheap computers.
- Strong emphasis on knowledge activities has helped firms coordinate smoothly with changes in demand.
- Strong emphasis on in-house apprenticeship training has produced strong knowledge spillovers for the growth of more firms.
- A key IT hub in West-African with significant cross-border trading in IT products.
- A strong entrepreneurial culture enabling it to grow despite very weak or nearly non-existent government support.

The strength and dynamism gained by the Otigba cluster through its organic growth processes can be harnessed for rapid industrial transformation of the computer electronics industry in Nigeria by learning from the example of the support provided for the electrical and electronics cluster in the Penang province of Malaysia. In this respect, specific action would include the following:

- Provision of excellent basic infrastructure (e.g., good transport services, power supply, water supply, telecommunication network, public health facilities, schools, security and customs services) for Otigba cluster.
- The National Information Technology Development Agency (NITDA), CAPDAN (Computer and Allied Products Dealers Association of Nigeria), and Lagos Chambers of Commerce and Industry (LCCI) should work together with the aim of finding solutions to the problems that had confronted the cluster, like the issue of space, tax, infrastructure and access to credit. Strong cluster networks between firms and active support of NITDA and intermediary organizations such as CAPDAN and LCCI would enable the best potentials of the cluster to be realized with speed that can make the cluster an important regional centre for innovation in computer electronics products.
- The government in partnership with CAPDAN should establish a centre for skills development within the Otigba cluster to enhance skills upgrading and development of new and emergent skills that have relevant application in firms located within the cluster.
- Compliance with environmental standards within the cluster should be actively encouraged to enhance the development eco-friendly products and the adoption of environmental best practices.
- To address the current congestion problem at the cluster, there should be a mutually agreed phased plan for the relocation of the cluster to a modern industrial layout with excellent infrastructure that would enable improves performance of the firms. Government and CAPDAN should carry out the relocation with care and cognizance of the imperative of not disturbing or distort the current growth path or dynamism of the enterprises.

7.9.2 Strengthening local and regional value chains

The local value chain can be strengthened through development of petrochemicals and development of the power and telecommunications sectors that use locally produced electrical and electronics products. The petrochemical industry will produce several inputs into the electrical and electronics products manufacturing; while the power and telecommunication industries would draw inputs from the subsector. At the input and output levels, high quality and standardization are major challenges that should be tackled to achieve effective and thriving local and regional value chains. There should be opportunities for stakeholders at different levels of production and product development to interact and provide information/data that are critical for other stages in the value chain. This should take place at the local and regional levels.

7.9.3 Strengthening sectoral innovation systems

An industrial system of innovation focuses on the nature, structure, organization and dynamics of innovation and production in sectors considered strategic to industrial competitiveness and economic wellbeing. Factors at the base of innovation driven catching-up in sectoral systems include:

- Learning and capabilities by domestic firms;
- Government policy interventions;
- Skilled labour force;
- Entrepreneurship and development of SMEs; and
- Spearheading of innovation by key large firms.

For the electrical and electronics subsector, each of these five key factors needs to be re-examined to promote industrial growth and development. Domestic firms should concentrate on learning and building local technological capability to competitively manufacture for local and regional markets. The development of a national system of innovation and specific sectoral innovation systems are critical in this respect. See Adeoti (2002)[17] for an elaborate analysis on the role of national system of innovation in building local technological capability in the Nigerian manufacturing industry. Government policy interventions should be consistent and aimed at ensuring sustained industrial growth and development. The aim should be to make firms become innovative and move towards the technology frontiers in the subsector. Skills development at the firm-level and strengthening of the educational institutions are also imperatives for an effective industrial innovation system. The outcome would be efficient and high performing firms able to compete globally but addressing the immediate challenge of satisfying local demands, and thereby considerably reducing dependence on exports of finished and intermediate products. In this respect, fostering entrepreneurship and development of SMEs are very important. The emergent of corps of creative and innovative individuals will enhance the formation and development of

[17] Adeoti, John O. (2002). Building Technological Capability in the Less Developed Countries: The Role of a National System of Innovation; *Science and Public Policy*, Vol.29, No.2, pp. 95-104.

innovative SMEs in the Nigerian electrical and electronics industry. This will certainly result in improvement in standards and quality of electrical and electronics products. Spearheading of innovation by key large firms can be very helpful especially through horizontal competition and possible technology spill-overs, and through the backward and forward linkages that may engender learning and innovation in the value chain.

7.9.4 Consistency of government fiscal policies and appropriate duty

- There should be consistency in government fiscal policy and changes should be discussed with manufacturers with the aim of reach agreement on timing and mode of implementation of changes.
- The current import duty on intermediate products is 10per cent while the duty on finished products is 20per cent. The gap between the two duty regimes is too low and unable to deter the importation of finished goods which are often cheaper than the local products produced under Nigeria's high cost manufacturing environment. The tariff differential between CKD and FBU especially for air-conditioners, freezers and refrigerators should be at least 30 per cent to ensure effective deterrent to imports and promote local assembly and eventual production of critical parts. The increase in the duty gap would also encourage the effectiveness of the extant duty deletion scheme which expects manufacturers to produce intermediate raw materials after five years of operation.

7.9.5 Provision of basic infrastructure

- 60-65per cent of electricity currently used by industry is self-generated, leading to considerably high profile of production costs. Ensure that the ongoing reform in the power sector delivers energy at an internationally competitive price to the subsector. A small subsidy would be desirable to provide a competitive advantage for export opportunities.
- Most firms now use gas instead of diesel. The Nigeria Gas Company (NGC), a subsidiary of NNPC, supplies the gas through Gaslink Ltd. Though Gaslink is a private company, its price should be lower than international prices considering the fact that its raw material (gas) is locally available in abundance. The burden that makes Gaslink's price to be higher than gas prices in North America and Europe should be ascertained and urgently removed.
- Massive investment in a modern railways system, road networks and ports upgrading are major imperatives for accelerated industrial development. The drag in the development of these critical infrastructure should be addressed through public-private sector partnerships. Efforts so far in this respect are yet to yield desirable results signifying the urgent need for reappraisal and more radical approach aimed at addressing the obstacles.

7.9.6 Reduce dependence on imported inputs

- Local production of essential raw materials has been highly constrained by lack of vibrant petrochemical industry and low R&D capabilities for harnessing locally available raw materials. This has resulted in overdependence on imported raw materials

which are mainly intermediate products. The only functioning petrochemical complex, the Eleme Petrochemical Complex Limited (EPCL), has been privatized. Though this is highly commendable, the outcome of the privatization deal is far from achieving the objective of significant local production of intermediate inputs for the several industries. The EPCL must be made to embark on aggressive expansion programme that fulfils the original plans for the EPCL as a main source of raw materials for local firms. New incentives regime that will make this workable under the terms of the privatization programme should be agreed as soon as possible.

- There should be a policy that would compel EPCL to sell directly to firms without the middlemen who often create additional costs that aggravates the costs of local firms sourcing raw materials from EPCL.
- Public investment in R&D that is aimed at application of local mineral resources for the production of electrical and electronics components or intermediate products should be a development priority because this would provide opportunities not only for building local technological capability but also enable firms achieve significant cost reduction. The public investment in R&D should in the short-term be regarded as industrial subsidy and firms should be encouraged to partner with public sector R&D institutions under an IPR agreeable to all parties involved.

7.9.7 Remove undue competition and engender preference for local products

- Products manufactured under subsidized regime or with substandard qualities have posed great threats to the subsector. The undue competition created by the importation of these products can be stopped by patronizing locally made products, by strengthening customs to reduce porous borders, and by strengthening regulatory agencies such as SON to ensure prompt seizure and destruction of sub-standard products.
- Trading activities by companies which should assemble or manufacture products locally should be discouraged by increasing incentives for local manufacture/assembly and increasing tariff on imported FBU. Concessionary tariff should be granted on import duty paid for essential raw materials. This should not be more than 2.5per cent and given only to genuine manufacturers. The import duty on some FBUs should be increased substantially to discourage imports and encourage patronage of local equivalents.
- Public and private sector agencies or companies should be encouraged to buy Nigerian products of electrical and electronics industry. For example, the ongoing power projects including the IPPs (independent power producers) should patronize Nigerian firms for inputs, while the telecommunication industry should be provided incentives that would make local cables and wire their preferred choice.

7.9.8 Stop multiple taxation/levies

- The payment of extra taxation/levies should not only be stopped but the current list 39 approved taxes/levies should be considerably reduced.
- The institutions responsible for tax administration should be strengthened and empowered to prevent illegal tax/levy collection.

7.9.9 Reduce high cost of borrowing from banks and other financial institutions

- There should be fund that are deliberately created to provide loans at single digit (maximum 5 per cent) real interest rate for industry's new investment and working capital irrespective of whether or not a firm is financially distressed. The manufacturing industry are major employers of labour, subsidies that enable their growth would assuredly improve employment and quality of life, and thus help in poverty reduction.
- A fund for technology renewal should be provided with concessionary interest rate that encourages capital investment. This should be part of the CBN, BOI and NEXIM intervention mechanisms.

CHAPTER EIGHT
NON-METALLIC MINERAL PRODUCTS

8.1 Overview of the Subsector

Apart from cement, three major types of industries, each producing a variety of products, constitute the sub-system. These are the burnt bricks, the ceramics and the sheet glass industries.

The major products of the burnt bricks industry fall into four main categories; namely:

- The normal size bricks, used for wall construction and decorative purposes;
- Building bricks of different sizes used for inside and outside walls in both single and storey-buildings;
- Non-load bearing bricks, also of varying sizes, used as screening and partition walls and for decoration purposes; and,
- The special products, used for paving of floors and facing of walls.

Ceramic products consist of wall and floor tiles, sanitary wares, table wares, and ceramic plates. As in the case of burnt bricks the products vary widely in their sizes, and use.

Sheet glass is mainly used for louvers, mirrors, sheets, and vehicle windscreens. The products can be differentiated on the basis of their thicknesses (ranging from 2mm to 26mm), and widths (some are up to 360cm), and colour. In the Nigerian market, the following ranges of products are most common:

- 6mm (thick) clear glass, used for louvers and sheets.
- 6mm (thick) obscure glass, also used for louvers
- 5mm (thick) clear glass
- 5mm (thick) obscure glass
- 3mm (thick) clear glass
- 2mm (thick) clear glass

Other thicknesses can also be made to order by the industries. Clear glass is usually coloured into three main types: namely:

- Dim-grey glass – a neutral grey – tinted glass, to provide a comfortable interior brightness
- Dim-bronze glass, a transparent metallic oxide tint to reduce solar brightness.
- Dim LBG glass, a transparent tint to offer aesthetic attraction to environment while permitting more than 70per cent light transmittance.

Obscured glass is usually obtained by sand-blasting or frosting the clear glass.

8.2 Resource base and import-dependence for production

The sub-system holds great promises for the promotion of industrial dispersal within the country because of the availability of the raw materials in different parts of the country. For example, it is estimated that the clay ball used in domestic ceramic wares and building construction has a proven reserve of more than 50million tonnes, which are enough to meet all of the raw materials requirements of the existing industries and additional ones.

Both the raw-materials like clay, sand, feldspar and others and the finished products like baths, cisterns, and sheet glass bricks are very heavy. In the light of this, many actors in the sub-system are those which derive most of their heavy raw materials near the factory site and in the same vein have their market nearby. One observation in the case of brick factories is that those which locate near markets with the raw-material near-by find it difficult to satisfy theirs while those which locate near the source of raw material and away from the market, have the problem of selling their products.

Table1: Critical raw material spread across the country

MINERALS	QUANTITY	LOCATIONS	USES OF MINERALS
TALC	40,000,000 Tonnes not yet quantified	Kumunu in Niger state Tezina and Manu in Niger state	-Paint industries -Paper industries
	Not yet quantified	Okdom/Ilorin in Kwara	-Soap and tyre industries -Ceramic industries
	Not yet quantified	Isanlu in Kogi state	-Cosmetics industries
	Not yet quantified	Zonkwa in Kaduna state	-Insecticide and fertilizer
	Net yet quantified	Ife/Ilesha in Osun State	
	Not yet quantified	Shagamu in Ogun State	
	Not yet quantified	Ijero Ekiti in Ondo State	
	Not yet quantified	Abuja in FCT	
FELDSPAR	Not yet quantified	Kogi state in Egbe, Okene, Lokoja.	-Glass industry -Paper industry
	Not yet quantified	Osun state in Oshogbo	-Paint industry -Ceramic industry
	Not yet quantified	Ondo state in Ijero-Ekiti	-Chemical industry
	Not yet quantified	Borno State in Gwoza	-Plastic industry -Rubber industry
	Not yet quantified	Parts of Taraba and Adamawa states	-Pharmaceutical industry
BENTONITE	700,000,00 Tonnes	Borno /Yobe states -Damboar, Maiduguri, Dilwa-Ngala	-Metallurgy -Textiles -Ceramics
	Not yet quantified	Taraba /Adamawa states	-Paper -Agriculture
	Not yet quantified	Mayo Belwa	-Civil Engineering insulation
	Not yet quantified	Abia state – Bende, Uturu,	-Cement clinker additive

	Not yet quantified 90,000,000 tonnes	Umuahia, Ishiagu. Anambra State – Awka Edo State – Afuze and Okpebho	-Decolourising agent in food industry -Component of drilling fluids -Beading agent -Oil refining Soil conditioner
BARYTES	730,000,000 tonnes	Plateau State – Shendam Nasarawa State – Azara and Awe Taraba State – Wukari, Ibi, Dansel and Alosi in Taraba State. Enugu State / Abakaliki, Ebonyi State Cross River State Benue State	-Petroleum well drilling -Glass making -Paint making -Paper making -Leather industry -Chemical industry -Oil cloth production -Flux in brass melting -Barium compounds
SODA ASH (TRONA)		Borno / Yobe States Manga, Tula, Geidam, Yusufari, Kukawa	-Glass manufacture -Chemical production -Sodium silicate production -Caustic soda production -Crayon production -Petroleum refining -Paper pulp production -Water treatment
ZINC ORE		Cross River State – Adua Enugu State – Ishiazu and Abakaliki, Ebonyi State Plateau State – Arufu, Wase and Zurak	-Battery production -Electrical cables -Lead foils -Bearings -Solder -Glass making -Protective coatings for other metals
ASBESTOS		Shemi in Katsina State Tungum Dutse in Niger State	-Asbestos -Brake pad and shoe
COAL	500,000,000 tonnes	Enugu, Plateau, Kogi, Taraba, Bauchi, Edo, Anambra, Abuja(FCT), Adamawa, and Benue States	-Gases -Cement steel mills -Industrial boilers -Carbonization plants
DOLOMITE	10,000,000 tonnes	Kogi, Kwara, Oyo, Kaduna and Niger States	-Refractory bricks -Flux in steel making -Cement manufacture

			-Petroleum industry
FLOUSPAR (FLUORITE)	Not yet known	Benue State FCT	-Hydrofluoric acid -Production glass -Ceramic -Enamels -Metallurgical fluxes
FIRE CLAY	20,000,000 Tonnes	Anambra, Katsina, Ogun and Sokoto States	-Low to high temperature -Alumina silicate refractoriness
GEMSTONES -Aquamarine -Chubby -Emerald -Amethyst -Tourmaline -Topaz -Zircon -Sapphire -Agate etc		Plateau, Bauchi, Yobe, Borno, Ogun, Ondo, Imo, Kano, Oyo and Osun States	-Ornamental jeweler -Industries
LIMESTONE	Most of the deposits have not been quantified. They are however known to be very large.	Benue State, Kogi State Niger state, FCT, Sokoto State Bauchi State Adamawa State in Numan, Nkalagu in Enugu State, Okpela and Silk in Edo State Ewekoro and Shagamu in Ogun State Mfamosing in Cross River State	-Cement making -Water treatment -Food industry -Metallurgical industry -Agricultural sector -Building industry -Environmental protection -Paper industry -Tannery -Caustic soda production -Calcium carbonate production -Citric acid production -Phosphate chemical production -Sugar refining -Softening of water
GYPSUM	141,000,000 tonnes 3,500,000 tonnes Not yet quantified	Borno / Yobe Bauchi State Taraba / Adamawa - Shellege, Guyuk, Gwallum,	-Plaster of Paris (POP) -Wall titles -Flooring tiles -Ceramics -Cement -Plaster boards -Medical plaster

	5,000,000 tonnes Not yet quantified Not yet quantified	Jiu, Ngurore, Numa, Ledime, Karim- Lamido, Ibi, Buissa, Lamja, etc Edo state – Agbede, Auchi, Aviele, Eoli, Oke-ora, Sabo gida-ora Benue State – Ekobi, Lobbo, Makurdi, Otukpo, Umogidi etc Imo / Abia	-Pharmaceutical products -Fillers in paints -School chalk -Pharmaceutical formulations Paint production -Cosmetics
KYANITE	20,000,000 tonnes Not yet quantified	Birnin gwari in Kaduna State Masukum Kuta in Niger State	-Cement industry -Manufacture of refectory bricks and mortals
MARBLE	1,980,000,000 tonnes	Kwara, Edo, Benue, Oyo, Kaduna and Plateau States	-cement -Hydrated lime production -Metallurgy -Building construction -Chemical industry
GLASS SAND FOUNDRY SAND	150,000,000 tonnes Not yet quantified	Ondo, Plateau, Lagos, Enugu, Anambra, Rivers and Delta States Ondo and Kogi States	-Glass manufacture -Foundry -Ceramics

In the past, the industries in the sub-system made attempts to introduce technology to improve the quality of the locally available raw materials. For instance, the glass-making group embarked on plans to purify the silica sand in order to produce high quality flint glass tableware. But at the initial stages of the plan in 1985, it was discovered that the cost would be prohibitive in the region of five million pounds. The plan was subsequently jettisoned. In many cases, even when some raw materials are believed to be present in Nigeria, studies have not been carried out to determine their extent (SEE Table 1 for indicated knowledge gaps), quantities and chemical and physical properties as a means of determining their availability for use in industries. For instance, some parts of Sokoto state are known to contain fuller's earth, a major raw material in the sub-system, but detailed investigations still have to be carried out to determine the stated properties; and this is well beyond the means of the industries. The same problem applies to the supply of diatomite, which is reported to occur in Balaraba, Alarakire and Gujba in Borno State.

Other raw materials which are locally available, but for which further work need to be done to determine quantity and quality include the following:

- Barytes, which is believed to exist in commercial quantities in many parts of the country.
- Gypsum, traces of which have been reported in Borno and Sokoto States.

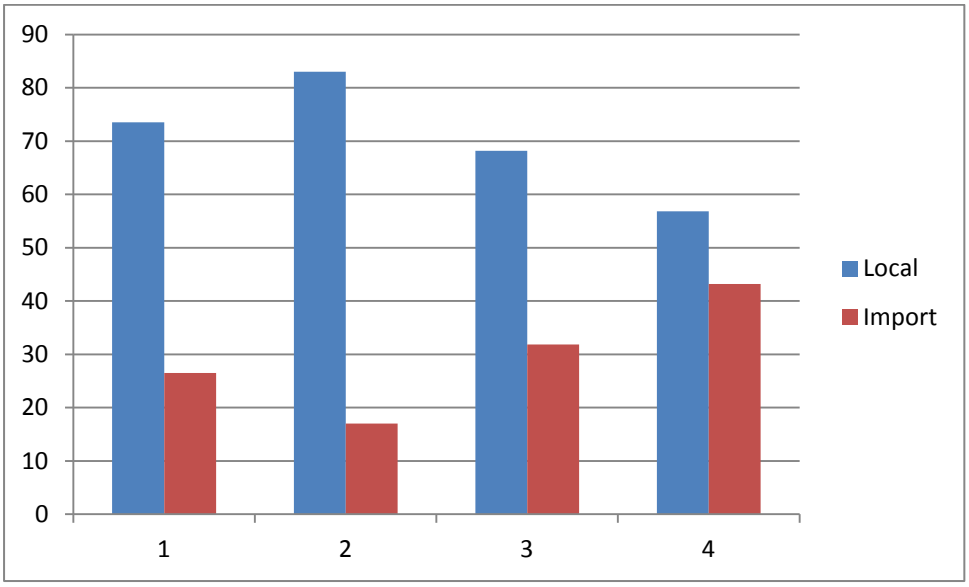
(i) Some of the raw material requirements, although vital, are too small in quantity to justify investments on industries on them and therefore have been imported.

In respect of the ceramic industry, for example, such raw materials include white cement, pigment carborundum, pumice, foundum and cutting discs. In the glass industries, such vital raw materials include colourants, refining agents, decolourizers and oxidizing agent. The role of raw materials required for the development and manufacture of ceramics are abundantly deposited by nature in Nigeria with nearly every local government area having one type of ceramic mineral or the other.

However, the naturally occurring ceramic minerals are found in their raw state with varying degree of impurities. There is virtually no raw materials industry in Nigeria because the practice is such that a ceramic product manufacturer often has to quarry his own raw materials. In any appropriately planned economy, two major industries are the focus which is the primary raw material processing industry and the manufacturing industry. The Nigeria example has been a case of jumping into the manufacturing industry without the raw materials processing industry, an imbibed culture when at one time in our history, it was easier and cheaper to import every damn thing, from technology, experts, machinery and the raw materials processing inclusive. In a nutshell, the lack of primary raw materials processing industry is one of the major factors responsible for the failure of many industrial processes Nigeria.

In respect of the importation of raw materials, the major problems centre on the high costs, the importation bottle-neck and subsequently the delays in obtaining them as and when required. In the past, a major problem was the fact that import licenses for the importation of essential raw material like soda ash were not issued to bonafide manufacturers, but to general trading companies which then sold at exorbitant prices to the manufacturers.

Figure 1: Raw Material Source (per cent) of the Sub-Sector (2004-7)



*Source: MAN **Economic Review**, 2003-2006 (Jan-March); 2006-2007 (Jan-March)*

One of the very weak points of the sub-system is its technology dependence on foreign sources as the technology in use in most of these plants are imported mainly from West Germany, Italy, France and the USA. These plants have been difficult to operate and maintain due to lack of adequate local skilled manpower and spare parts. Before the privatization programme, most of these plants were owned by the Federal and state governments and because of these ownership structures some of the problems being experienced by the plants were perceived to be as a result of frequent government interference in their management.

One objective linkage between demand and supply forces on any product is the level of capacity utilization. As Table 2 shows, in the sub-sector in general, the figure stands at 65.3per cent over the period, 2003-2007. This clearly compares favourably with most other sectors in the economy.

Table 2: Percentage Capacity Utilisation in the Sector, 2003-2007

Year	per cent
2003	57.5
2004	60.6
2005	77.35
2006	64.55
2007	66.5

*Source: MAN **Economic Review,** 2003-2006, 2006-2007*

Marketing

This sub-system suffers from the absence of intermediate industries to process available local mineral product into inputs to the sub-system. Although a number of mineral products relevant to the sub-system productive capacity have been discovered, they are yet to be processed into industrial use. The sub-system in order to be in business therefore has to import all those inputs not available locally from abroad. For example intermediate processes to transform talc into talcum powder, convert salt into soda ash, manufacture refractory bricks and others.

The heavy dependency on imports for raw-materials, machinery and spare parts renders the sub-system vulnerable to international economic shocks and foreign exchange fluctuations. The sub-system has no organized market information system to help consumers. There are no standard prices and products. All the foregoing notwithstanding, the sub-sector holds a bright future in Nigeria.

8.3 Firm size, ownership and location

A major characteristic of the sub-system is that most of the industrial units, especially in the ceramics and burnt bricks sector, belong to the small and medium-scale ranges. Even though the flat sheet manufacturing units are relatively larger, they are nonetheless small in comparison with similar units in many parts of the world. Investigations have shown that in most of these industries, given the available technology especially the brick-making industry, small units are uneconomic, because it tends to increase the unit cost of production, a situation which seriously impairs the advantages which the industries have over other competing products.

Industries in the sub-system are located at or very near the sources of raw materials because of the bulky nature of the main raw materials. However, since these major raw materials are often available in rural, often isolated areas, the industries, particularly the burnt bricks industries, are often far removed from and have to be transported at great costs to the major markets.

The development of the industries in the sub-system was similar to that in the other sub-systems of the economy. The early industries were established in response to the import substitution strategy of the early independence era. For instance, the use of burnt bricks for wall construction was first adopted by the colonial settlers who were already used to burnt bricks in their own country. Most of the burnt bricks used during this period were imported and the majority of the buildings built with bricks then were public buildings. This trend was adopted by the local people who set their own small production units especially in places far away from Lagos. Severe interruption of importation of burnt bricks during the Second World War and thereafter necessitated the setting up of local burnt bricks factories.

Cement

The first cement manufacturing firm in Nigeria was established at the initiative of the Nigerian government. In 1950, the colonial government invited the Associated Portland Cement Manufacturers (APCM), later renamed Blue Circle Industries, to establish a plant in Nigeria. APCM spent about 2 years surveying Nigeria's limestone deposits but then decided not to go ahead with the plant. In 1954, the government convinced the Danish cement-equipment manufacturer, F.L. Smidth, and the firm's British associate, Tinnel Portland Cement Company, to enter a joint venture to build a cement-manufacturing plant in Nigeria. In 1957, the plant was built in Nkalagu, in eastern Nigeria, and the company was named the Nigerian Cement Company (Nigercem). Its structure was somewhat different from the structure of the next cement company to be brought into being shortly after, the West African Portland Cement Company Ltd (WAPCO). NIGERCEM was entirely government owned. There was no foreign equity participation, as there was with WAPCO, instead foreign expertise was brought in through a Danish consulting company, F.L. Schmidt. NIGERCEM's management was completely indigenous, and functioned quite well. NIGERCEM's problems were mainly with the politically appointed Board of Directors. At one time when the factory was not in production, the Board was said to have placed a large order for empty bags. NIGERCEM was not alone in its structure and management arrangements. The other cement companies with a similar arrangement are Okpella Cement Co. in the Midwest Region, and Calabar Cement Company (CALCEMCO) in the Eastern Region. The three plants were all located in areas or regions controlled by the same political party hence it should be no surprise that their structure and management were different.

The primary input for the production of cement is limestone. Secondary materials are gypsum, shale or clay, and fuel oil or coal. More than 95per cent of the sector's materials are obtained locally (most companies import the gypsum). The main raw materials for manufacturing ordinary Portland cement (OPC) are limestone or chalk, shale or clays, minor or corrective components, fuel, gypsum, and extenders. OPC clinkers are composed mainly of lime, silica, alumina, and iron compounds. Each of these components is found in the various minerals that are the raw materials for OPC. Lime is the principal constituent of limestone or chalk (calcareous components). The other components, silica, alumina, and iron compounds, are present in various proportions in shale or clays (argillaceous components). Marls and other materials containing significant proportions of all the four oxides (i.e., lime, silica, alumina, and iron compounds) are frequently used. Some minor components, like magnesia, zinc, copper, fluoride, and phosphate, are also introduced through the calcareous components.

In some cases, corrective components are added with the raw materials to compensate for defects. Such components may include sand (to increase the silica), iron oxide or bauxite (to increase the alumina, especially in special types of cement), and china clay (to minimize the iron in white cement). Calcium fluoride and calcium sulphate are useful in lowering the temperature required for a given combination of raw materials and may yield an improved quality. Gypsum is added to retard setting in the finished product. Powdered blast-furnace slag may be used as an extender to reduce fuel consumption in the manufacturing process.

Following government involvement in the cement industry in the post cement armada era of the mid 70s the cement industry grew from 5 plants in 1970 to 8 Plants and local cement production rose from about 1.4MMT to 2.8MMT over the same period and peaked at about 3.6MMT in 1986. Unfortunately, by the turn of the century in 2000, only 4 out of the 8 cement manufacturing plants were operational with a cumulative output of 2.2MMT. Cement imports, on the other hand which correspondingly came down with the investment in cement plants in the 70s (to as low as 0.8MMT in 1980) steadily rose to over 6MMT by 2002.

Table 3: Summary of Major Operators in the Sub-sector

S/N	Companies	Location	Date of Commissioning	Installed Capacity (MMTPA)	Ownership
1	Nigercem	Malaga	1957	600,000	Eagle Cement of PH
2	WAPCO Lafarge - Ewekoro	Ewekoro	1960/ 2003	1,000,000	Lafarge Group
3	WAPCO Lafarge -Sagamu	Sagamu	1978	900,000	Lafarge Group
4	Cement Company of Northern Nigeria	Sokoto	1967	500,000	Damnaz Cement Company Limited
5	Ashaka Cement	Ashaka	1979	700,000	Lafarge Group
6	Benue Cement	Benue State	1980/2004	3,000,000	Dangote Group
7	Obajana Cement	Kogi	2006	5,000,000	Dangote Group
8	United cement company	Calabar	2009	2,500,000	Flour Mills
9	Purechem Nigeria	Isolo, Lagos	2006	150,000	Enpee Group
	TOTAL			**13,750,000**	

By 2008, the total supply of cement-imported plus local production-stood at 6,425,880 metric tons. Details of the breakdown over the period 1986-2008 are as displayed in Table 4.

Table 4: Cement Plants in Nigeria as at June 2009

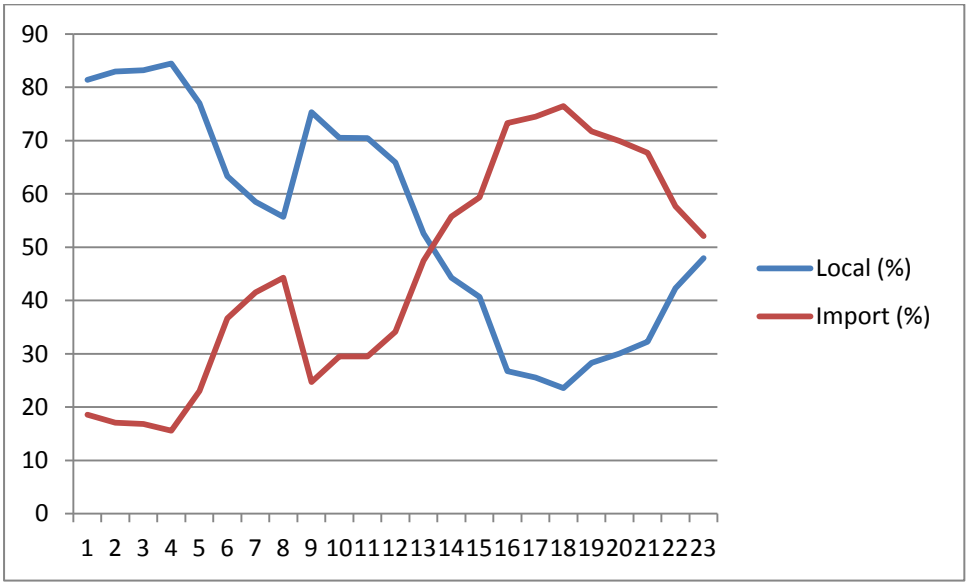
Year	**Imports**	**Local**	**Total Supply**	**Market Share**	
	(Mmt)	**(Mmt)**	**(Mmt)**	**Local (per cent)**	**Import (per cent)**
1986	800,000.00	3,500,000.00	4,300,000.00	81.40	18.60
1987	700,000.00	3,400,000.00	4,100,000.00	82.93	17.07
1988	688,341.00	3,400,000.00	4,088,341.00	83.16	16.84
1989	543,621.00	2,950,000.00	3,493,621.00	84.44	15.56
1990	905,595.00	3,030,000.00	3,935,595.00	76.99	23.01
1991	1,693,200.00	2,924,072.00	4,617,272.00	63.33	36.67
1992	1,985,655.00	2,797,202.00	4,782,857.00	58.48	41.52
1993	2,085,826.00	2,622,218.00	4,708,044.00	55.70	44.30

1994	859,886.00	2,619,908.00	3,479,794.00	75.29	24.71
1995	1,091,232.00	2,610,752.00	3,701,984.00	70.52	29.48
1996	1,060,300.00	2,530,998.00	3,591,298.00	70.48	29.52
1997	1,304,582.00	2,517,413.00	3,821,995.00	65.87	34.13
1998	1,992,588.00	2,206,355.00	4,198,943.00	52.55	47.45
1999	3,112,685.00	2,472,099.00	5,584,784.00	44.26	55.74
2000	3,336,134.00	2,285,506.00	5,621,640.00	40.66	59.34
2001	5,937,000.00	2,168,000.00	8,105,000.00	26.75	73.25
2002	6,041,000.00	2,071,000.00	8,112,000.00	25.53	74.47
2003	6,437,000.00	1,981,000.00	8,418,000.00	23.53	76.47
2004	5,920,000.00	2,337,000.00	8,257,000.00	28.30	71.70
2005	6,629,000.00	2,849,000.00	9,478,000.00	30.06	69.94
2006	6,753,000.00	3,219,722.00	9,972,722.00	32.29	67.71
2007	6,327,000.00	4,642,668.00	10,969,668.00	42.32	57.68
2008	6,977,000.00	6,425,880.00	13,402.880.00	47.94	52.06

Source: Dangote Group

As Table 4 and more graphically Figure 2 show, the relationship between local production and importation of cement has been oscillatory-with the appearance of contest for supremacy. However, it is noteworthy that while local production is yet to recover its initial advantage, importation is yet to lose the upper hand it gained since 1999.

Figure 2: Local and Imported Cement Profiles, 1986-2008



8.4 Recent trends in production, exports, and investment flows

The sub-system is currently oriented towards satisfying the domestic market. There are currently many products of the sub-system yet to be produced domestically and have to be imported. Examples of such expensive produce of the sub-system which are yet to be produced in Nigeria which could form area of expansion for the sub-system, include refractor, bricks, ceramic pipes, crucibles, nozzles, tubes and spark plugs.
There are raw material supply bottlenecks in the sub-system. Although in some cases, the primary raw-materials exist, they lacked the intermediate refinement required for usage in the sub-system. It is encouraging to note that some of these problems are gradually being overcome as a few companies have started the production of Kaolin and Plaster of Paris both of which are used in the ceramic industry.

Pricing

The pricing of the products of the sub-system is not regulated or controlled by any government legislation rather it is affected by market forces propelled by the fiscal and monetary policies of government. For example a substantial proportion of the raw-materials of the sub-system by value are imported and so depreciation in the naira exchange rate increases the cost of production in the sub-system and in order to break-even, these extra costs must be passed on to consumers. The sub-system is an energy-intensive subsystem and as such any increases in PHCN tariff rate, Kerosene, Gas, Diesel, and Black Oil prices will further accentuate the cost of production in the sub-system to the extent that the comparative advantage of the sub-system over its competing alternatives like roofing tiles (made of Zinc) are almost wiped out.

Cement

After independence in 1961, federal and regional government participation in industry and manufacturing in general became more pronounced because it was considered politically expedient to participate in the ownership of industrial enterprises. This development orientation explained the series of measures taken by the respective regional governments of the time. In 1962, the northern regional government commissioned a German firm, Ferrostahl A.G., to install an integrated cement plant at Sokoto; in 1964, the eastern regional government commissioned a cement plant at Calabar; and in 1965, the Midwestern region (now Bendel State) commissioned Continho Caro for the construction of a cement plant at Ocilla. This pattern continued with the establishment of Ashaka Cement Company and Benue Cement Company. By 1978, there were seven cement-manufacturing companies in Nigeria.

In 1978, at the peak of the oil boom, the federal government went into a joint venture with Benin Republic to build a cement plant at Onigbolo in Benin. The philosophy behind this international collaboration was that some of the cement produced would be sold in Nigeria, which has a large market for it. Nigeria's Cement industry has become a critical sector in the quest for the country to transform its economy into a modern one. To address the short supply of cement by local industries, government allowed importation of Cement, such that while the local industries supplied 30 per cent, imported Cement made up the 70 per cent to meet

Nigeria's demand. The cement sub-sector also received a major boost by a combination of two main factors: privatization; and the emergence of other major players as industrialists.

The 8 existing plants as at 2008 covered only 25per cent of the country's needs. Since the privatization process initiated in 1999, this sub-sector has expanded substantially, however with increased space for the importation component. In 2005, the European Investment Bank signed loans amounting to 123 million euro with Obajana Cement Plc, a subsidiary of Dangote Group, for funding the construction and exploration of a new cement plant, with a capacity of 4.4 million tons per year. Cement consumption in Nigeria is currently one of the lowest in the world. The estimated consumption is at around 91kg per capita, well below the global average of 450kg per capita and those of other African countries such as South Africa, Egypt and Morocco. China dominates global cement consumption at 1,105kg per capita, representing about 50per cent of global cement consumption. While Nigeria's low consumption reflects the historically weak investment in infrastructure for socio-economic and political reasons, it also lends support to the long-term growth potential of the industry. The Federal Government's commitment to revamping the nation's infrastructure should spur cement consumption in coming years.

Due to inherent industry challenges, local production has remained at 50per cent of installed capacity. The government recently announced a ban on importation of bagged cement in an attempt to enhance greater market competition, encourage new investments, and stem the continuous rise in the price of cement. Such efforts have not yielded any benefits as the price of cement has increased by significantly since 1999 and the problem of supply insufficiency still exists. According to industry watchers, one of the main challenges confronting the industry is the lack of sufficient funding to carry out operations, especially on a large scale. Most of the cement manufacturers reportedly do not have the financial capacity to operate at optimal levels and hence are unable to meet up to the high demand for cement. Dangote and the Lafarge Groups clearly do not fall into this financially constrained bracket of cement producers given their outreach efforts at home and abroad.

Cement is a product that is costly to transport over land. Consequently, the radius within which a typical cement plant is competitive extends for no more than 300 kilometers for the most common types of cement. However, cement can be shipped economically by sea and inland waterway over great distances, significantly extending the competitive radius of cement plants with access to waterborne shipping lanes.

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from about 1.4MMT to 2.8MMT over the same period and peaked at about 3.6MMT in 1986. Unfortunately, by the turn of the century in 2000, only 4 out of the 8 cement manufacturing plants were operational with a cumulative output of 2.2MMT. Cement imports, on the other hand which correspondingly came down with the investment in cement plants in the 70s (to as low as 0.8MMT in 1980) steadily rose to over 6MMT by 2002.

The industry is entering a phase of major change, as producers expand capacity to cope with the country's critical infrastructure and housing needs. The larger cement companies are beginning to find their own resources to overcome the gas and power shortages that have hampered production for years. Old production plants are being replaced with newer and more efficient assets. The result is a dramatic change in the fortunes of Nigeria's cement industry.

As experienced in other economies, demand for cement is generally driven by the growth in per capita income. In sum, demographic growth, industrialization and urbanization progress tend to trigger a rapid growth in housing and infrastructure needs, leading to increased cement consumption.

In 2008, the Nigerian cement industry had an estimated market size of N361 billion (US$2.4 billion), or in aggregate consumption terms, 13.4 million tonnes, of which 46per cent (6.2 million tonnes) was produced in Nigeria. The Federal Ministry of Commerce and Industry estimates that effective demand was around 18 million tonnes. Driven by the acute infrastructure deficit and significant demand for housing, domestic production volumes have grown at 25per cent over the last four years. Given the strong correlation between GDP growth and cement consumption, cement production growth has also been helped by Nigeria's strong economic performance in recent years.

According to the Central Bank of Nigeria, the country needs US$510 billion in investments in infrastructure over the next eleven years if the nation is to achieve its vision of being one of the top-twenty economies in the world by 2020. The increasing demand for good quality housing, which is estimated at around 16 million housing units, is also expected to be a key catalyst for industry sales growth. Consequently, it is anticipated that demand will remain strong, with industry growth averaging between 12per cent and 15per cent in 2009 and 10per cent-12per cent in 2010, despite the weak economic environment occasioned by the global financial meltdown.

Cement consumption in Nigeria is currently one of the lowest in the world. It is estimated at around 91kg per capita, well below the global average of 450kg per capita and those of other African countries such as South Africa, Egypt and Morocco. China dominates global cement consumption at 1,105kg per capita, representing about 50per cent of global cement consumption. While Nigeria's low consumption reflects the historically weak investment in infrastructure for socio-economic and political reasons, it also lends support to the long-term growth potential of the industry. The Federal Government's commitment to revamping the nation's infrastructure should spur cement consumption in coming years.

The Dangote Group is by far the biggest player in Nigerian cement production, but several other major entities dominate their respective regions. As the industry leader, it has a market share of 60per cent of current installed capacity and around 48per cent of 2007 industry output. The Lafarge Group follows with 26per cent of the industry's installed production capacity and 45per cent of total output.

While Lafarge WAPCO dominates the south-west markets with the exception of Lagos, Ashaka controls sales in the north-eastern region of the country. Both Benue Cement (BCC) and Obajana Cement Company have their sales concentrated in the north and central markets (both part of the wider Dangote Group). The recently commissioned UNICEM cement company and the Cement Company of Northern Nigeria (CCNN) are strategically positioned to serve the south-eastern and the north-western markets respectively. This regional segmentation of the cement market in the country is largely due to high haulage costs, given the lack of basic transport infrastructure such as rail and good roads.

Significantly, Dangote cement has embarked on opening its share holding to the global arena. It is acquiring a 45per cent minority stake in South Africa based Sephaku Cement. The partnership with Dangote is primarily to finance the construction of a new US$375 million cement manufacturing plant in South Africa. The facility is expected to produce 2.2 million tonnes annually and should have come on stream by mid 2010. However, there is a simmering discontent with the growing dominance of the Dangote Cement Company as it is widely seen to be unduly favoured by government.

Also, the management of Lafarge Cement WAPCO, last year, secured about N45 billion syndicated underwritten multi-currency medium term facility from 13 banks led by Stanbic IBTC Bank. The deal launched on March 31, 2009, achieved 142 per cent subscription level. The project is to raise the output of Lafarge's two production plants in Ewekoro and Sagamu from a combined capacity of two million metric tonnes of cement per annum (mmtpa), by 2.2 mmtpa.

Ceramics

The ceramic factories in Nigeria specialize in the production of different products. For example modern ceramics in Umuahia produces sanitary wares, insulators, and cisterns while the Quality Ceramic at Uyo produces wall tiles and the Idah Ceramics at Idah produces baths and sanitary wares.

Most of these factories produce below their installed capacity and therefore are unable to meet expected production targets. Although the prices of the locally produced ceramics products compare favourably with their imported counterparts, their quality still requires some improvements.

Bricks

The market of the bricks industry in Nigeria is affected variously by location factors, economic factors and factors associated with the laying of the bricks. Artisans trained in the art of laying bricks are few in the country. This limits the use of bricks to those who can

afford to transport bricklayers from wherever they are found to their building sites at any cost.
Although once the bricks are laid they do not need plastering and painting, their transportation and laying cost are high enough to deny it that outright advantage over alternative like cement.

Glass
There are five glass factories that qualified for study under the (IMP) non-metallic building material sub-system out of which all but one – Oluwa Glass (Nig) Ltd, were either closed down or were importing finished products and selling same. Oluwa Glass would have therefore qualified for a monopolist if not for imported alternatives.

School Chalk

The market for chalk is huge and the demand for chalk is on the increase. Available records show that tonnes of chalk are being used daily in this country. Gone are the days when Nigerians rely heavily on imported chalk. Due to availability of raw materials and ease of production, most of the chalk used in the country is now being produced locally.

Asbestos

Asbestos is a commercial term for six fibrous minerals of which chrysotile (white asbestos), the fibrous form of serpentine, is the only form of asbestos now worked (see www.mcgroup.co.uk).

Asbestos fibers are harmful when inhaled over a period of time. Two major lung cancers-asbestosis and mesothelioma have been linked to asbestos fiber inhalation. When the fibers are inhaled, they travel to the lungs and because they are not degradable, they stay there. After a while, sensing that foreign objects have invaded it, the lungs begin to make and secrete acid to "break down" the asbestos fibers. However, instead of breaking down the asbestos particles, the acid begins to attack the lung tissues, commencing an irreversible lung damage that culminates in metastasis and attendant cancer. The process takes place over a period of time so victims do not often know when the damaging health effect began.

In the USA, where the use of asbestos in buildings has basically been outlawed for years, the lingering effects of exposure can still be seen in the many asbestos-related deaths. A report published in 2004 by Medical News Today, noted, "In the USA about ten thousand people die each year from diseases caused by asbestos." This is an alarming number for a nation that has taken positive steps to end the practice of using asbestos as an insulating material in buildings. One therefore wonders what the death statistics is in a developing country like Nigeria where most buildings have asbestos ceilings which were installed by unsuspecting workers without masks years ago. Causes of deaths, from specific diseases, are not tracked and recorded in Nigeria. It will therefore be difficult to know the extent of havoc asbestos has

caused in Nigeria. All we know is that there are many cases of pulmonary-related deaths but no one has been able to trace these deaths to the exact cause.

The problem of asbestos fiber inhalation does not only rest with the workers who do the removal or those who installed them years ago. During building remodeling, when workers saw-cut and yank out the asbestos panels, the fiber particulates float into the air and later settle, like dust, on the walls of the house being remodeled. If the walls of the house are not properly cleaned, it will be the turn of the occupants of the house to be exposed to asbestos.

Asbestos related health risks are well documented in epidemiological and basic science literature; but a direct correlation between a given asbestos exposures to the health hazardous outcome continues to be difficult to quantify. The US Environmental Protection Agency (EPA) as well as the International Agency for Research on Cancer of the World Health Organization has declared asbestos as a human carcinogen. Specifically, in studies of occupational exposure, inhalation of asbestos fibers has been shown to cause asbestosis (pulmonary fibrosis), pleural or peritoneal mesothelioma, and bronchial carcinoma

Asbestos is considered to be a Type A1: Confirmed Human Carcinogen. Observation of increased mortality and incidence of lung cancer, mesotheliomas, and gastrointestinal cancer in occupationally exposed workers are consistent across investigators and study populations. The mutagenicity shows the increase in chromosome numbers and chromosome breaks in eukaryotic cells. (For more information on asbestos as a carcinogen

Asbestos exposure may cause a scarring of the lung tissue leading to asbestosis. Exposure to asbestos in addition to smoking cigarettes causes a synergistic effect that may lead to lung cancer or other cancers. Most fatal of the consequences of asbestos exposure is mesothelioma. It is a nodular cancer of the plural lining of the lung. It has a long latency period, 25-40 years, and always is fatal.

All the above is to discountenance further production of asbestos in Nigeria. Incidentally, the product is still seen by some interests as necessary for the country. According to a survey conducted among dealers by M2, a market research firm, asbestos roofing sheets are still relevant in the roofing sheet market and will remain so in a long time to come. The survey was carried out to ascertain the performance of asbestos considering purported decline in the price of aluminum roofing sheet by its dealers. Speaking to M2 in Ikeja, a dealer responded that despite the introduction of aluminum roofing sheets some years back, asbestos market has remained viable. While acknowledging the beauty that aluminum sheets add to buildings, he added that, “Even with the said decline in its price, aluminum sheet remains more expensive and still out of the reach of many people.” This according to him leaves a large chunk of the market for asbestos which he says is very much within the reach of both middle and lower income earners. At Amu Market one dealer argued that asbestos resist heat better than aluminum, while its heavy nature helps it withstand heavy wind better.

Clearly, poverty and ignorance laced by desperate irrationality are at play here. Thus, as reported in TerraDaily (July 21, 2010-ref: www.terradaily.com), "despite proven links to cancer, a ban in the European Union and four other countries, and damning scientific studies, asbestos is still selling like hotcakes in the developing world. An investigation conducted by the International Consortium of Investigative Journalists and the BBC found that the asbestos industry has ignored waves of asbestos-related disease that have led to bans or restrictions in 52 countries, and continues to ply the mineral in developing nations. More than half of the two million metric tonnes of asbestos that were mined worldwide in 2009 was exported to developing countries. A concerned commentator's remark sums up the tragedy aptly: "The really unfortunate part is that, though they know it's dangerous, they still live with it because it's cheap and abundant."

Happily, the World Bank last year told borrowers it expects them to use alternatives to asbestos whenever possible (ibid); also that Nigeria is not as periled as China or India.

8.5 Institutions involved in product development and marketing

- Federal Institute of Industrial Research, Oshodi (FIIRO)

Apart from its in-house R&D activities, the Institute renders services within the framework of its technical capability and cooperation with the public. Through these services, it puts its human resources and expertise, as well as its infrastructural facilities, at the disposal of real and prospective industrialists within and outside Nigeria. Thus it assists them in solving their problems concerning raw materials, process know-how, machinery and equipment, etc.

Government agencies and non-government local and international organizations commission the Institute to carry out research works on their behalf and at their expenses. The projects are generally for the benefit of the public and the sponsoring organizations rarely have any private commercial interest in them. The results are, therefore, made available, both to the sponsors and any interested persons

Private companies commission the Institute to carry out research on contract basis, on agreed fees and terms. The fees charged cover use of equipment, consumables, staff time, overheads and incidental costs. Results are kept confidential and communicated only to the clients.

The analytical laboratory of the Institute is one of the few well-equipped laboratories in Nigeria today. It boasts of being a centre of excellence in analytical services

8.6 Major Constraints on the sector

While the industries in the sub-system source an appreciable proportion of their raw materials locally, they nonetheless have many problems with the supply of raw materials.

In respect of locally-sourced raw materials the problems include:

i) Inadequate quantities of local supplies, in many instances, even when raw materials are locally available, they are not available in sufficient quantities to meet the needs of industries. This is the situation with the supply of limestone power, a key input into the glass-making industry. The raw material is only available at the Jakura Marble Industries, and the quantity

supplied cannot meet the needs of the industry. The problem has been compounded with the coming on stream of the International Glass Industries at Aba.

ii) Deficiencies in the properties of available local raw materials: This is a major problem confronting all the industrial groups in the sub-system:

-In the glass making industry, for example, sand which is the largest component is normally expected not to have iron content in excess of 0.20per cent, in order to allow scope for limestone or dolomite which frequently contains 0.1per cent iron. However, the iron content utilized by the Nigeria glass industry lies with the range of 0.05per cent to 0.12per cent Fe 0. Similarly although kaolin and fireclays used in the clay products manufacturing occur extensively in Nigeria, they have higher amounts of iron and titanium oxides than those specified for the various industrial use. These clays therefore need to be processed and refined to render them suitable for a variety of industrial uses.

-In addition, majority of clay units in most of the Nigerian sedimentary basins classify more readily as ballclays rather than kaolin or fireclay/refractory clays because of the following properties: high plasticity, fine texture; and appreciable amount of organic matter and expendable simectitc/mixed layer clays. Although these are used in some ceramic industries, non-plastic mineral components have to be added to reduce plasticity and shrinkage upon firing.

The technologies utilized in this sub-system are largely imported. This in itself constitutes a problem. The operators at the sub-system have to contend with the following constraints:

- Lack of spare parts
- High cost of equipments
- Shortage of technical manpower

The scarcity of spare parts is attributable to the fact that imported parts required for the imported machineries are very costly due to the bad foreign exchange situation. Added to this the spare parts manufacturing industry is largely undeveloped. Where parts are manufactured locally, they have proved to be incomparable in quality characteristics. This has made the imported technologies difficult to sustain.

The high cost of equipment is also attributable to the fact that more of the machinery is imported under an unfavourable foreign exchange situation. The low level of development of the steel and machine tools industry makes the manufacturer of the available equipment difficult for now. Machineries required by this sub-system are sophisticated because of the need to ensure good quality products. Local design of machineries has not been encouraging. For example the bricks manufacturing plant designed by the Nigerian Building and Road Research Institute has not been properly evaluated to ascertain its performance characteristics. The design can be categorized as intermediate as it requires more labour to operate. If finally found appropriate, it could be expected to have a ripple effect on the

employment situation in the sub-system. Current technologies in use are not very labour intensive.

The lack of development of local designs of machinery and parts is also traceable to the inadequate supply of technical manpower required to service this sub-system in particular and the manufacturing sector as a whole. An insignificant proportion of admissions into tertiary institutions are in the area of engineering. This drawback may take some time to reverse as it requires some long term plant to ameliorate.

Production problems encountered by this sub-system include:

i. Low capacity utilization
ii. Lack of standardization
iii. Lack of appropriate technical manpower

For example the brick sub-sector has an installed capacity of 200 million bricks per annum, but it is doubtful if it has produced up to 90 million bricks in any one year in the last four years. This low level of utilization is traceable to the exorbitant cost of spare parts require to operate the imported machineries. Poor quality and reliability characteristics of the local manufactured parts militate against the resolution of this problem. In general the utilisation level has continued to go down in the last few years.

The lack of appropriate technical manpower constitutes a serious problem. Due to the limited number of tertiary institutions offering such courses as Glass, Ceramic and Building technology, few Nigerians have training in these disciplines. This militates against the development of local innovations in the sub-system. Added to this, the production operation requires specialized personnel. The number of Industrial and Production personnel required for the production operations functions can only be made up by increasing the number of tertiary institutions offering such disciplines. Presently, about two universities offer industrial engineering programmes, while about four offer the production engineering option. Production operations require more than basic engineering qualifications. Many companies presently convert graduates of other disciplines to carry out the production functions. This has cost implication as effectiveness is usually impaired.

Product Quality

The production techniques in the sub-system are many and varied. However, the major problems of most of the output revolve around product specifications, standardization and quality.

The field survey conducted by the Ministry of Commerce and Industry revealed that product dimensions and specifications vary almost from one factory to another for the same products. The practice does not ensure a degree of uniformity in the construction materials and it makes it difficult to find alternative sources of supply for a particular product. Also, the practice does not make it easy for architects to standardize designs or specify products for use. Finally, it does not promote competition among the various companies.

On standardization, the field survey revealed that the industries rarely make their products to conform to any national and international standards. This practice does not help the industry to explore the export market. Also, lack of standards results in poor quality products. The lack of product standardization also constitutes a problem for the sub-sector. It is difficult to plan effectively for the array of different products designs currently manufactured by the sub-system. There is a need to harmonise product design specifications for the sub-sectors in the sub-system with a view to minimizing production stoppage due to equipment set-up and tear-down operations associated with product change-overs. This would also minimize financial outlays required for such equipment units such as moulds.

Many of the locally produced non-metallic building materials like bricks, tiles and glass are of varying low quality and do not confirm to recognized standards. In the case of bricks, there is usually no uniformity in dimensions, there is frequent occurrence of cracks and they are not as durable as expected. Similarly, in the case of sheet glass, the glass usually has visual defects, bubbles, cord and waviness. Also, cutting room losses are high (over 30per cent). The effect of poor quality is manifested in poor sales.

Some of reasons for the poor quality of the products are:

(a) Poor quality of raw materials
(b) Lack of experienced, skilled manpower to operate the plants
(c) Lack of quality control laboratories for testing both the raw materials and the finished products. Where laboratories exist, the testing procedures are often not reliable
(d) Absence of national standards for the products

Although the various technologies employed in the industries appear relatively simple, a high degree of skill, experience and know-how is necessary for a successful and efficient operation of the plants. There is therefore the need to train technical manpower for the industries. This can be achieved if relevant courses, such as ceramic technology, glass technology are introduced into the curriculum of our universities and polytechnics.

- In the case of bricks, there is a need for standard quality control laboratories in all the factories, while testing procedures should be standardized for each industry. This will enable each factory to check whether its products satisfy the specified standards and help in the continuous development of its clay products. Production of good quality brick of regular shape and accurate face dimensions will be easy to lay, will require less mix if leering is necessary, and will attract customers due to its view. The same applies for ceramic products and glass.
- On the issue of poor quality raw material, there is an urgent need to intensify research into our locally available raw materials in order to determine their properties and specifications. From these results, a proper classification of their use can be carried out.

- One of the reasons for the poor quality of locally manufactured non-metallic building materials is the inadequacy of highly skilled and experienced technical manpower. In this sub-system, specialists in the fields of ceramic technology, glass technology, and others are needed for an efficient operation of the plants. Unfortunately, these specialists are rarely available, and it is a problem for the industries in recruiting such staff. The solution is to introduce these specialized courses in our universities and polytechnics. In addition, since the ceramic industry requires considerable time in the acquisition of production techniques and the training of skilled workers, there is need to step up the training of their technical manpower both in plant and in similar plants abroad.

- There is also a dearth of trained bricklayers who can lay bricks and tiles properly. Some of the problems cause by the lack of experienced bricklayers are:
  (a) High cost of labour for laying the bricks because of the high demand for the few experienced bricklayers. A previous study shows that it costs about four times the cost of laying sandcrete blocks of the same surface area
  (b) Poor quality jobs as many users employ any available mason for the laying
  (c) Low patronage from prospective users since they are more familiar and comfortable with the use of sandcrete blocks

In regard to Ceramics Challenges

The challenges facing ceramics and its glaze component manufacturing in Nigeria are enormous. There are a number of crucial factors necessary for the development and growth of ceramic and glaze technology and manufacture in Nigeria. Such factors are many and varied from government policy frame work, financial structures, politics, expert manpower, technology, to availabity of appropriate raw materials. Of significance is to acknowledge the science and engineering nature of the ceramic discipline. This fact is not in doubt in the developed and developing worlds, except in the under-developed worlds where a degree of lack of knowledge exist in the area of pottery, its technology and engineering.

Since ceramic has been known to be a mixture of crystalline phases and glasses with each made up of a wide range of different compositions, the compositions are usually combined with porosity in various and diverse proportions and arrangements.

The origins, the structure, their influence on the properties of ceramics require a good knowledge and understanding to produce high quality products. First and foremost, the raw materials used in ceramics have their origin in the elements of earth, water, air and heat in which the complex alumina-silicate system is derived. Therefore, considering the various parameters, the technology of ceramic manufacturing rests on the appropriate determination and measurement of the structural and chemical properties of the raw materials used in ceramic systems. The many properties encountered in forming and firing ceramics found to be the consequence of the interaction of two or more of a limited number of fundamental features which are employed in their characterization. Such features include viscosity, plasticity, shrinkage, strength, archeology, thermal behaviour, absorption, chemical analysis, microstructure and a host of others.

A scientific discipline and approach is significantly required in ceramic production because it is necessary to understand why the fired body colour of a vitreous China ware is more critical than for sanitary ware which requires that the effect of Fe2O3 and TiO2 must be controlled to desirable level when formulating china-ware. On the other hand, the presence of mica may have negative effect on other ceramic preparation, whereas it improves the casting rate and quality of sanitary wares.

Consequently, the skilled and unskilled manpower requirement of the ceramic industry in Nigeria is that of a basket of mixed blessings. Obviously, Nigeria is blessed with enormous human resources in such a way that manpower is available and cheap. However, the skilled manpower, comprising trained and skilled experts in the field of ceramic science and technology is not adequate. The available skilled manpower in this sector has either been frustrated into changing into other profession or is redundant, leaving the stage for pseudo-experts in ceramics.

In the area of equipment, Nigeria's machinery and system building capabilities is very low and this sad situation has reflected on the level of production, huge import bill, poor maintenance culture and a high failure rate of industrial projects. With particular reference to ceramic manufacturing in Nigeria, the dependence on imported machinery, remains high as the most vital systems must be imported, maintained and operated efficiently for a sustainable production process.[i]

The reasons most ceramics companies in Nigeria have collapsed are tracked to a number of forces, principally: lack raw materials and expertise. There is no raw materials base for the industries to survive. Consequently, many have collapsed.
Allied to the problem of skill is that their products are of poor quality when compared to those brought from China.

On cement, the key constraints identified by stakeholders are as follows:

- Fraudulent Importers Practices in manipulating production
- Abuse of the Import duty Waivers
- Inefficient distribution system
- Poor Quality of Cement

More general constraints identified include:

- High reliance on short term financing
- Credit crunch in the local financial market leading to rising interest rates
- Inadequate physical infrastructure in the country
- Depreciation and devaluation in the value of Naira

8.7 Stakeholders' Perception of Solutions to the Critical Issues

The perception of the stakeholders on the solutions to the problems/constraints facing the sector is understandably coloured by their location within the industry.

With specific focus on cement, solutions proffered include:

- ✓ Immediate Review and Liberalization of the current Cement Policies
- ✓ Eradication of Monopolistic clauses
- ✓ Open up the Market and make it competitive
- ✓ Eliminate retrogressive and stringent requirements to attract new Investors
- ✓ Grant Import Duty Waivers only to Foreigners who have big projects in Nigeria. Compliance is recommended for this set of Investors.
- ✓ Reduce the Import Duties on Cement.

Across the sector, there is evident need for an intensive programme to train a large number of engineers, artisans and craftsmen. The training should be organized by different relevant groups and institutions such as an association of the brick manufacturers, Nigerian Building and Road Research Institute, Technical Colleges and the National Directorate of Employment. When more experienced bricklayers are available, the cost of laying bricks will stabilize, if not reduced and the quantity and the quality of work will improve while more people will be interested in using bricks for building.

8.8 Assessment of Nigeria's Distance to the Technology Frontiers and World Best Practices

Cement consumption in Europe, including Turkey, is estimated at 310 million tonnes in 2007, representing a 2.75per cent increase over 2006, and is forecast to rise strongly to 2012. Growth in consumption of cement in Russia and Eastern European countries, such as Poland and Romania, has been particularly strong, due to large infrastructure and housing programmes. The current construction boom in the Middle East is on an unprecedented scale. Cement consumption in the Arab Union countries was an estimated 144 million tonnes in 2007, which is predicted to rise to 180 million tonnes by 2010. Egypt is the largest cement producer in the region, with production of 37.1 million tonnes in 2006, followed by Iran at 35.8 million tonnes.

Changes in industry structure over the last decade show significant consolidation and vertical integration. The global leaders in the industry include Lafarge (France), Holcim (Switzerland), Cemex (Mexico), HeidelbergCement (Germany) and Italcementi (Italy). Other global players include: Cemex (Mexico), Anhui Conch Cement (China), Taiheiyou Cement (Japan),and Votorantim (Brazil). In the drive towards vertical integration, a number of large cement manufacturers have acquired construction companies that produce ready mixed concrete such as the purchase in 2007 of UK-based construction company Hanson by the German cement producer HeidelbergCement. Many multinational cement producers are also capitalizing on the strong growth in Asian markets (such as in China and India) and Middle Eastern markets, often through joint ventures with local cement producers.

Environmental Issues

The cement industry has been proactive on environmental issues through use of energy saving technologies, alternative fuels and recycled raw materials. Nigeria has a lot to learn along these lines. The use of waste products as fuel in European cement plants is already saving the equivalent of 3 million tonnes of coal per year. The use of blended cements, incorporating recycled products such as pulverized fuel ash or granulated blast furnace slag, is also growing steadily.

8.9 Development of Local Iron & Steel Industry

One simultaneous cause and result of the lagging status of the sub-sector is the slowed infrastructural development, notable index being the slowed housing and real estate development which falls far short of the needs of the growing population. An integrating factor is the high price of cement resulting in costly execution of projects that depends on cement usages.

Also worth noting is a factor that ensues from the overall business environment resulting in loss of interest by foreign investors as well as loss of revenues to the country due to abuse of import duty waivers. The ultimate grand and most penalizing outcome is the loss of employment and associated effects on Nigerians.

8.10 An Agenda for Action

From the continental scene, there are guidelines already articulated for adoption by member countries; so, Nigeria has a ready reference for action. Specifically, African heads of state met in an African Union (AU) Summit from 31 January to 2 February 2008, discussing the issue of industrial development in Africa. During the Summit, a "Plan of Action for the Accelerated Industrial Development of Africa" was adopted. The Plan was adopted during the 18th Conference of African Ministers of Industry (October 2008). The consensus which has emerged through successive Conferences is that the priorities to unleash the potential of African industrialization are:

- value addition and processing of Africa's agricultural and mineral resources is the quickest industrialization path;

- the development of infrastructure to sustain and promote industrialization, such as energy, communications, transport and water;

- improving human capital through health, education and training policies;

- increase competitiveness and productivity through the adaptation of technologies and increased research and development (R&D); and

- Private sector development and the promotion of SMEs; in particular, the Conference confirmed the need for participatory approaches to industrial policy making, particularly through a more institutionalized participation of the private sector.

Key Proposed Actions

On Cement:

- Liberalization and opening up of the industry to new producers and reduce import duty on the product in order to increase local production and bring down the price. Implementation timeframe :during **first half of 2011**

On Glass:

- Special training programme to develop high skilled hands under a structured industry-education collaboration framework
- Revitalize and give institutional support to PRODA with explicit mandate on glass challenges

Ditto for ceramics

CHAPTER NINE
BASIC METAL, IRON AND STEEL AND FABRICATED PRODUCTS

9.1 Overview of the Subsector

As it is well appreciated, basic and fabricated metal, iron and steel products form the basis of most material inputs for other industries including oil and gas, automobiles, building and construction, transportation, ship building. This sub-sector has the capacity to revolutionize the industrial and the real sector of the nation. The properties of steel, in particular, make it useful in the capital intensive oil and gas industry. Over the course of the 20th century, production of crude steel has risen at an astounding rate, now fast approaching a production level of 800 million tons per year. Today, it is difficult to imagine a world without steel.

A dynamic industrial infrastructure usually comprises numerous strategic industries in a national economy, and includes basic metals, chemicals, metal-working and engineering. The basic metal industry is often composed of the ferrous metals (iron and steel) and the non-ferrous metals, like copper, tin, zinc, lead and nickel and involves mining, metallurgy, rolling, extrusion and drawing that produce intermediate goods. These goods serve as inputs into the metal working industry.

Broadly, the metalworking industry can be divided into three parts: metal forming (forging and foundry), metal cutting (milling and machining), and sheet-metal working (fabrication). This industry is crucial to the production of capital goods and spare parts for industrial parts and equipment. The engineering industry comprises certain elements such as engineering design and development, tool engineering and production, production engineering, materials engineering, and maintenance engineering. Together these translate science and technology (S&T) innovations and developments into new, more efficient and more economical machines, plants and equipment. The major intermediate goods in making pig iron and steel products are iron ore and scrap, which are processed and result into a definite quantity of output; and coke, limestone, electricity and water, which are consumed during the production process.

The Iron and steel industry in Nigeria was first conceptualized in 1958 when the idea was mooted by Nigeria's national development planners. At this period widespread consultations took place both within and outside the country with western experts as to the viability and economic advantages of large-scale steel production. The general opinion however, was that Nigeria was not yet ready for a project as demanding and sensitive as a steel plant. The primary reason canvassed was the high cost of the technological and associated infrastructural development necessary for a full-scale steel industry in Nigeria. In addition, it

was thought that the country would be unable to provide the required manpower and skills necessary to put a steel plant into successful and continuous operation.
It was however, from 1967 that significant progress was made towards the establishment of an iron and steel plant in Nigeria following the involvement of the then Soviet Union. In 1967, a team of Soviet experts arrived in Nigeria to conduct a feasibility study on the establishment of an iron and steel plant, as a follow-up on a technical/economic agreement between the governments of Nigeria and the Soviet Union In their report, the use of the blast furnace process was recommended for the proposed steel plant. The report also observed that the then known iron deposits in the country were of poor quality and suggested further geological surveys to see if better ores could be found. Therefore, in 1968, the Soviet geological experts after a general geological investigation of Nigeria reported that there were high prospects for finding rich iron ore and coal deposits in the country. Consequently, Nigeria signed a contract in 1970 with Techno export of the then Union of Soviet Socialist Republics (USSR) under which they agreed to provide specialists and equipment to carry out further geological surveys in order to determine the quantity of the deposits of iron ore and coal resources that could be used in the proposed iron and steel industry.

The Vision 202020 captured the significance of the sub-sector as it noted:

Of the nine (9) priority sub-systems that possess the ability to stimulate the laying of a favourable industrial base and provide a catalyst to industrialization in Nigeria, the following are recognized as inclusive pilot sub – systems, namely:

- Foundry and forges:

- Metal fabrication:

In Section 2 of Nigeria's Metal Policy document (p.38), the metals industry s is recognized as one of the most valuable sectors of an industrialized economy. For its linkage to other sectors of development and its enormous capacity to support and stimulate growth in virtually all sectors of the economy, the development of the metal and mineral sector is generally seen as a major index of national prosperity.
However, the metal sector in Nigeria is yet to reach its full potential particularly in the development and consumption of key metallic products (such as) iron, steel, copper, aluminum, tin lead, zinc, etc. With the nation's capacity, potential and resource base, all the products can be readily developed and used to jumpstart the rapid industrialization and the economic growth of the economy.

9.2 Resource base and import-dependence for production

This sub-sector comprises industries engaging in a wide range of activities including castings and forgings, fabricated metal products, components for mechanical and electrical equipment, etc. The major raw materials include basic metal like steel, aluminum, copper in the form of

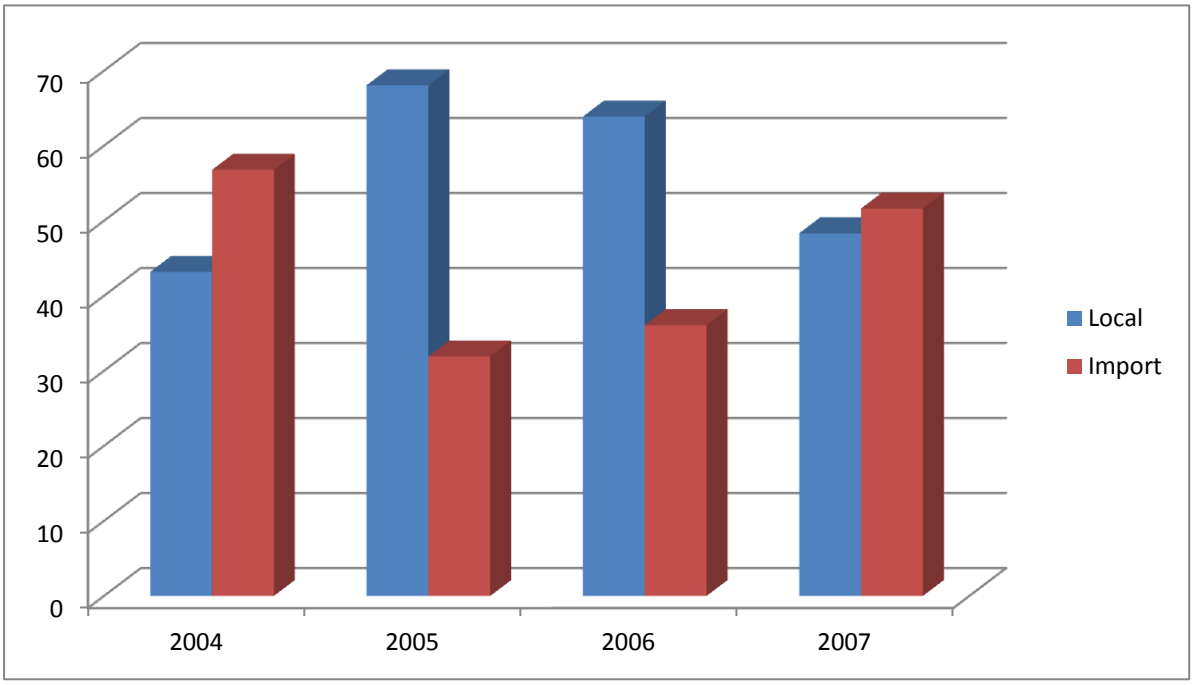
profiles, flats, angles, stripes, etc. The products of metal fabrication are innumerable; some of the more prominent ones include: doors and windows, wire products, nails, screws, bolts and nuts, machetes, drums and roofing sheets, tanks, vehicle bodies and furniture. Thus the sub-sector constitutes the bedrock for the effective industrialization of any economy. It is also a veritable source of employment.

The availability of raw materials is a key consideration in the establishment of an iron and steel plant since it usually takes some time for steel companies to break even. In this case, the Nigerian authorities started early to look for sources of raw materials within the country in other to be able to select the appropriate technologies that could be used and ensure that the industry is viable. The Soviet specialists and the NSDA exploration division worked extensively over a large area of the country exploring for deposits of iron ore, coking coal, limestone, dolomite and refractory clays. Areas of the country explored in detail included Birnin Gwari and Ababa in Kaduna state, Ejigbo in Oyo state and Agbado-Okudu in Kwara state for iron ore deposits. In addition, Afuze in Edo state, Danduya and Gombe deposits in Bauchi state were also explored for coking coal. However, it was the discovery of the Itakpe iron ore deposit in 1973 by the soviet aero-magnetic survey team that catalyzed the development of the steel industry in Nigeria. Fairly good iron ore deposits were discovered at Itakpe, Agbaja, Ajabanoko and Chokochoko all in the region around Okene, Kabba and Lokoja in present Kogi state of the country. British surveyors, who were earlier appointed by the Federal Government of Nigeria to carry out initial feasibility studies, also found that there were large iron ore deposits at Agbaja near Lokoja and Udi near Enugu. Coal was also discovered in large quantities at Enugu and limestone at Jakura near Lokoja

Coal deposits from Lafia/Obi were also investigated, but the quality of the coal was impaired by high ash and sulphur contents with the deposits occurring in seams that are difficult to mine. Overall however, Nigerian coal is said to be one of the most bituminous in the world owing to its low sulphur and ash contents and therefore the most environmentally-friendly. There are nearly 3 billion tonnes of proven coal reserves in the country presently (BPE, 2005). In a study carried out by a business consultant, SKOUP and Company involving extensive chemical testing of various samples of coal from deposits from the South and North locations, it was found that some Nigerian coal were suitable for coking using the direct reduction method in steel-making

Other raw materials required in the industry that were discovered and found suitable included Jakura limestone, Ubo marble, Mfamosing limestone, Burum dolomite, Osara dolomite and Onibode/Oshiele refractory clay. The picture emanating from these successful explorations, especially the Soviet-Nigerian joint efforts, which arose from the Moscow Protocol of 1970 proved contrary to the then prevailing view that Nigeria had no iron ore nor coking coal suitable for steel production.

Figure 1: Raw material sourcing in the sub-sector, 2004-2007 (per cent)



From 1971 the National Steel Raw Materials Exploration Agency (NSRMEA) has been at the fore-front of exploration activities of raw materials. Investigation by the Agency revealed that Nigeria has five major classes of steel making materials, which are now at various stages of development. They are as follows:

1) Iron Ores and Ferro Alloys (Manganese, Ferromanganese, Chromites etc)
2) Coal
3) Fluxes (Limestone, Dolomites, Bauxites, etc.)
4) Refractory clays, magnesites, etc
5) Foundry Raw Materials (silica sands, quartzite, etc).

Iron Ores

Detailed investigation in the banded iron ore belt of Okene/Lokoja indicates a reserve estimation of 200 million tonnes at Itakpe Hill. Ajabanoko, Agbaja, Chokochoko, Agbado Okudu and Tajimi deposits are in various stages of investigation with total estimated reserve of about 2.2 billion tonnes. These are suitable for the Blast Furnace and Direct Reduction processes at Ajaokuta and Delta Steel Plants.

Coal

In furtherance of the drive to source coal for iron and steel making locally, the NSRMEA has embarked on preliminary activities on the proposed Lafia/Obi coking coal "In-Seam exploration".
Ajaokuta Steel Plant is designed to consume about 1.3 million tonnes of coking coal annually to produce 1.3 million tonnes of liquid steel. The importation of this quantity of coal annually will cost over US$150 million (of May 1999). Hence the need to emphasize local sourcing of available cokable coal. Current investigation activities are targeted to coal seams 12 and 13 which are the tow promising economic seams out of the 36 seams encountered in the Lafia/Obi coal field. However, there is need to conduct an in seam exploration.

Fluxes
Investigation of fluxes raw materials since the eighties have indicated 1.7 million and 4 million tonnes respectively of dolomite at Osara (Kogi State) and Burum (FCT), 28 million tonnes of limestone at Mfamosing (Cross Rivers State), 20 million tonnes of marble at Ubo (Edo State) and 75 million tonnes at Jakura (Kogi State).

Refractory Clays
A survey of Onibode Clay was concluded in the early eighties with 2 million tonnes of estimated reserve. The Alumina content of the clay, indicates its suitability of Ajaokuta's needs. However, because of the long distance to Ajaokuta, it is advantageous to intensify explorations at Auchi/Jattu and Oza-Nagogo (Edo/Delta States) which is nearer. Preliminary investigation of these clays indicate that the qualities are suitable. Chemical analyses of Tsakasimta Magnesite (Borno/Adamawa State) indicate that the deposit will meet the metallurgical grade requirement of Ajaokuta when beneficiated. The inferred reserve is at least 5 million tonnes.

The National Iron Ore Mining Project (NIOMP) at Itakpe is earmarked to supply the total 2.155 million tons per year iron ore requirement of the Ajaokuta Steel Project. In addition, it is contemplated that the project would also supply about 40per cent of the requirement of the Delta Steel Company for super-concentrate iron ore fines (grading 68per cent Fe) which were largely imported from Brazil.

9.3 Firm size, ownership and location
In Nigeria, the steel industry is still at its infancy. The industry did not witness any significant growth until about 10 years ago. In the 1980s the steel industry was totally under the control of two groups represented by Hoesch and First Universal group. The two groups were engaged in the manufacture of iron rods, pipes, profiles etc. The next competitor was Wrought Iron, a group which concentrated on fabrication activities until 2005 when they installed a corrugating plant. Though the Hoesch and First Universal groups are still the big players in the industry today, since the 1990's, many Nigerian companies have come into the industry venturing into areas such as fabrication and corrugating.

Competition and Competitiveness: There is no stiff, overt competition in the industry due to the excessive demand and the wide supply gap. The moderate advertisements on bill boards

and promotions etc are merely for information purposes only rather than competition. Given the existing sellers market, operators at any level can dictate price, delivery and payment conditions. Consumers are simply price takers. Under the subsisting monopolistic market situation, there is very little need for any serious competition. However, it is expected that as more investors enter the industry, the market will become more competitive (BSS, 2008).

Before the advent of privatization, the Nigerian public steel sector was composed of the nine sister companies, namely:-

- Ajaokuta Steel Company (ASCL)
- Delta Steel Company (DSC)
- National Iron Ore Mining Company (NIOMCO)
- Katsina Steel Rolling Mill Company (KSRMC)
- Jos Steel Rolling Mill Company (JSRMC)
- Oshogbo Steel Rolling Mill Company (OSRMC)
- National Metallurgical Development Centre (NMDC), Jos
- National Steel Raw Materials Exploration Agency (NSRMEA), Kaduna
- The Metallurgical Training Institute (MTI), Onitsha.

The Ajaokuta Steel Company was not completed nor commissioned. Delta Steel Company was completed, commissioned and operated till it was finally shut down due to lack of operating funds. The three Inland Rolling Mills (Katsina, Jos and Oshogbo) operated epileptically for some years and were finally grounded due to lack of billet supply from Delta Steel Company.

The National Iron Ore Mining Company, produced beneficiated ore (with less than 10per cent of the mining equipment and machinery but was stalled due to lack of patronage from the Ajaokuta Steel Company.

The National Metallurgical Development Centre, the National Steel Raw Materials Exploration Agency and the Metallurgical Training Institute are service delivery organizations to the above integrated steel plants. They are still being run skeletally to fulfil this mandate.

Table 1: Capacity of Completed Units of Ajaokuta Steel Plant.

S/N	Plant Unit	Capacity (p.a)
1.	Light Section Mill	400,000 tonnes
2.	Wire Rod Mill	130,000 tonnes
3.	Billet Mill	795,000 tonnes
4.	Medium Section & Structural Mill	560,000 tonnes
5.	Thermal Power Plant	110 MW
6.	Engineering Works Complex compromising:	
a.	Foundry & Pattern Making Shop	7,000 tonnes
b.	Forge & Fabrication Shop	4200 tonnes forges

		4,600 tonnes fabricated
c.	Machine & Tools Shop	19,000 tonnes
d.	Power Equipment Repair Shop	150,000 units of electric motors & generators
e.	Raw Materials Preparation & Handling System	2,640,000 tonnes
f.	Alumino-Silicate Refractory Plant	43,400,000 tonnes
g.	Tar-Bonded Dolomite Refractory Plant	8,800 tonnes
h.	Lime Plant	91,000 tonnes
i.	Coke-Oven Battery (1 of 2 completed)	880,000 tonnes capacity – 440,000 tonnes completed
j.	Oxygen Plant	36,000 m^3/hr

Source: AISA

Apart from the public sector steel concerns, there are also other privately owned companies, mainly Mini steel companies engaged in the re-rolling of billets. These are mini-mills, some of 50,000 and 100,000 tonnes capacities or less. However, the combined efforts of all these mills, over ten of them, have never really added more than 300,000 tonnes annually to the overall production capacity in the country mainly due to either operational inefficiency or lack of working capital or sufficient electric power

Table 2: Location and Installed Capacity of Privately owned Rolling Mills in Nigeria

FIRM	**LOCATION**	**CAPACITY 10,000t/yr**
Qua Steel	Eket	10
Universal Steel	Ikeja	8
Continental Iron and Steel	Ikeja	15
Sels Metal	Ikeja	10
Federated Mills	Offa	14
Allied Steel	Onitsha	10
General Steel Mills	Asaba	5
Nigerian-Spanish Engineering	Kano	19
Mayor Engineering	Ikorodu	29
Kwara Commercial Metal and Chemical Industry	Ilorin	4
Asiatic Manjarin Industries	Ikorodu	6
Niger Steel	Enugu	3
Metcom (Nigeria) Ltd	Owerri	3
Others (estimated)		2

Sources: World Bank (2009:44), Osita Ogbu (2007).

9.4 Recent trends in production, exports, and investment flows

The Nigerian steel industry is estimated at above N35 billion (thirty five billion naira) with a business turnover of over N60 billion annually. About 150,000 direct workers are employed in the industry. Being a young and fast growing industry, it is expected to reach about N50 billion in the next years. The main features of the industry are:

a. All the big players operate on both the upstream and downstream sectors. The downstream facilities provide them with captive markets for upstream products.

b. High import dependency, as steel products are globally controlled.

c. Increasing involvement of Nigerians in the industry.

d. High concentration of operators in the south, particularly in Lagos.

Presently, Nigeria consumes about 1.5million metric tons of steel products per annum. These figures are still very low compared to other developed countries. In the last 8 years, the industry has witnessed rapid growth due to massive real estate and construction activities in the country particularly in Abuja and Lagos.

Table 3: Production of Finished Iron and Steel, 2003 - 2007

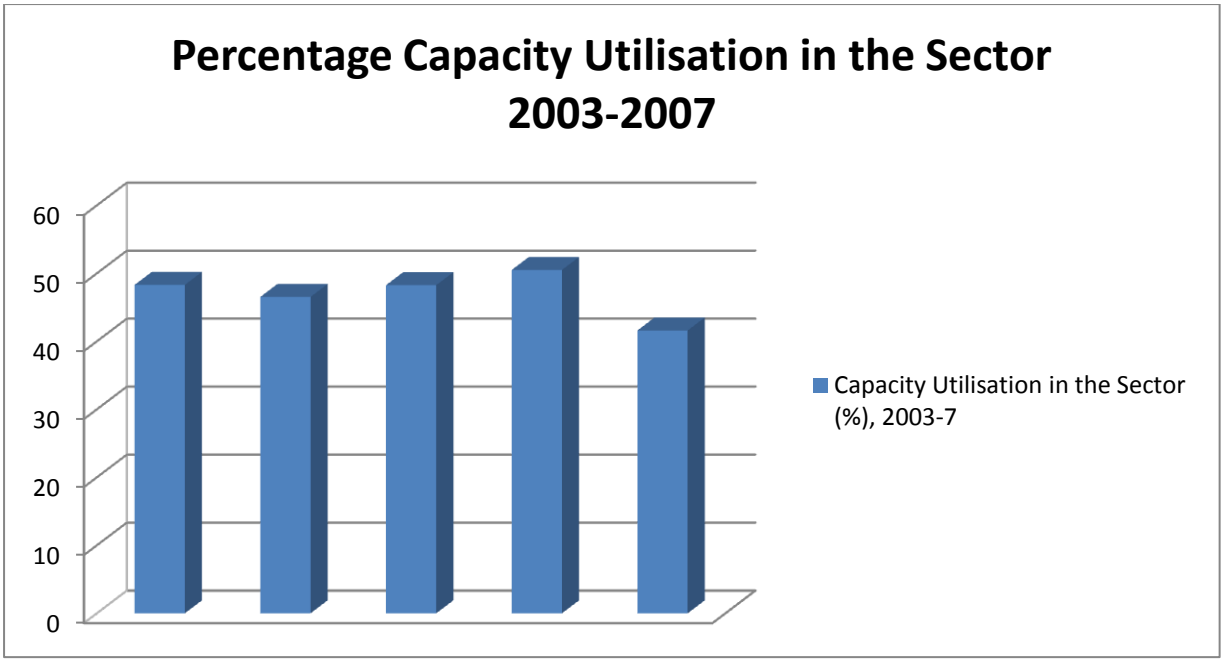
Products	2003	2004	2005	2006	2007
Rods and Bars for Reinforcement	-	-	93,165	104,228	-
Wire Rods in Coil	-	730	12,087	-	-
Rolled Products	-	-	-		- 116,886
Total	-	730	105,252	104,228	116,886

Note: - = nil

Source: Bureau of Statistics [Ajaokuta, Delta and Oshogbo Steel Companies].

A large market currently exists in Nigeria for steel products especially iron rods which current local production levels cannot satisfy. These steel products include flat sheets and structural steel of various dimensions in addition to iron wires, iron rods and other specialty steel. This chronic undersupply of steel products including iron rods has been responsible for the growing number imports and a significant increase in the price of steel products in Nigeria over the recent past. For instance, the price of a ton of iron rods has increased sharply over the last few years: a ton which used to cost about N150,000 has increased sharply to more than N200,000 per ton. The significant increases in the volume of imported steel and corresponding price structure have resulted in a gap in the market which can successfully be exploited by harnessing local production. Presently, the installed capacity of all public and private steel rolling mills is about 4 million metric tonnes for all kinds of steel products but actual production capacity is considerably less at about 1 million metric tonnes.

Figure 2: Capacity Utilization (per cent) in the Basic Metals Sector , 2003-2007



Source: MAN Economic Review, 2003-2006; 2006-2007

The present economic environment is conducive for profitable investments in the manufacturing of steel products especially iron rods. End-users of iron rods include the construction sector which is set to witness enhanced activity because of the current FGN focus on public infrastructure via road construction, bridges, and especially housing construction. The effect of this will be even greater demand for iron rods. Long span steel for example has become the most generally accepted and patronized construction material in Nigeria today. Similarly, the use of steel doors and window frames has become a fad in the real estate industry.

Unfortunately, as Figure 2 depicts, the capacity utilization in the local industry hovers below 50per cent annually. This unimpressive capacity utilization notwithstanding, more and more mini-steel mills are positioning strategically to play in the steel products sector. One such company is Dana Steel Mills. With a view to diversifying its business, Dana Steel acquired a modern steel rolling mill in Katsina State in 2006, strategically located in the North-West part of Nigeria. The mill which has an installed capacity of this mill is 207,000 MT per annum, has started producing reinforced and general purpose steel from billets for the construction sector.

Going by current growth trends and ownership patterns, it is expected that in the next 10 years, about 80per cent of the steel industry in Nigeria will be concentrated in the hands of Nigerians in real terms and volume of business.

In line with the government's determination to reposition the steel plants for effective service delivery, ASCL and the other inland rolling mills were privatised. The Osogbo Steel Rolling Mill, privatised on Aug. 27, 2002, became Integrated Steel, a division of the Dangote Group,

while Katsina Steel Rolling Company became Dana Steel Limited. The Jos Steel Rolling Company became a private outfit Zuma Steel West Africa Ltd. Ajaokuta Steel Company was first concession to Solgas Energy Ltd., in June 2003. The concession agreement was terminated in August 2004. Immediately thereafter a new concession agreement was signed with Global Infrastructure Holdings Limited (GIHL) covering the Ajaokuta Steel Company and the National Iron Ore Mining Company. Following myriads of complaints from stake holders on the failure of GIHL to comply with the terms of the agreement, the Nigerian Government instituted an Administrative Panel of Inquiry, whose recommendations led to the termination of the concession agreement. Thereafter an Interim Management Committee (IMT) has been emplaced to administer the affairs of both companies.

Global Infrastructure Holdings Limited bought 80 per cent shares of Delta Steel Company, while 20per cent was to be equally shared by Government and the host community. As of today, it is not clear whether this 20per cent ownership was ever implemented.

The three Rolling Mills were liquidated and eventually sold to private investors in 2005. Of the three only Katsina Steel Company is still operating, while the Jos Rolling Mill is engulfed with litigation. The Oshogbo Rolling Mill has been put under lock and key since acquisition.

The three service organs of the Steel Industry – the National Metallurgical Development Centre, the National Steel Raw Materials Exploration Agency and the Metallurgical Training Institute are hanging with no clear mandates.

9.5 Institutions involved in product development and marketing

As expected, a number of institutions are officially involved in the sector whose activities for good or ill, impact on the fortunes of the sub-sector. Among them are the following:

1) The Nigerian Steel Raw Materials Exploration Agency, Kaduna and
2) The National Metallurgical Development Centre, Jos

The first has the mandate of exploration for raw materials for the steel industry, while the latter has the responsibility for testing, characterizing and qualifying such raw materials. These organizations should be further developed and supported to fulfil their mandate especially in the area of identifying sources of suitable coking coal, which has so far not been fully established in the country.

3) Federal Institute of Industrial Research, Oshodi (FIIRO)

The analytical laboratory of the Institute is one of the few well-equipped laboratories in Nigeria today. It is a centre of excellence in analytical services. It renders the following service to the public:

- Design and fabrication of equipment and machinery
- Cutting of various types of gears
- Machining of spare parts
- Production of cast components of iron and aluminium materials up to 200kg weight.
- Glass blowing
- Refurbishing of sparkling plugs
- Electroplating of metals

- Metal forming, rolling, cropping and aluminium welding
- Foundry casting

The Institute is obliged to put the results of its R&D work at the disposal of interested Nigerians, to enable them exploit such results for better living and economic benefits. Towards this end, it transfers the process technologies and production know how of its ready for commercialization projects to the public, through scheduled training workshops, technical assistance services, acquisition of machinery and equipment and licensing.

4) National Agency for Science and Engineering Infrastructure (NASENI)

Its mandate: The Mandate of NASENI is specifically in the area of capital goods research, production, and reverse engineering with respect to the following broad areas:

- Engineering materials (notably irons, steels, non-ferrous metal and alloys, plastics, glass, ceramics, polymer electronics and nanotechnology); Industrial and analytic chemical materials including industrial gases;
- Scientific equipment and components for education, research and industry; including measuring instruments, electronic components, communication equipment and computers;
- Engineering accessories (mechanical, hydraulic, pneumatic, electrical and electronic);
- Power equipment (generation, transmission, distribution, prime movers); and
- Mechanical Engineering tools (power tools, hand tools, cutting tools and machine tools).

The agency operates through Development Centres:

- **Scientific Equipment Development Centres (SEDI)** in Enugu and Minna – develop and produce scientific equipment, then transfer these technologies to private sector satellite industries.
- **Centre for Adaptation of Technology (CAT), Awka** – develop and produce electronic devices and assemblies, computer technologies and their production systems, then transfer these technologies to private sector satellite industries.
- **Hydraulic Equipment Development Centre (HEDI), Kano** - develop and produce hydraulic and pneumatic machinery, fittings and their production systems, then transfer these technologies to private sector satellite industries.
- **Engineering Materials Development Centre (EMDI), Akure** - develop and produce engineering materials and their production systems, then transfer these technologies to private sector satellite industries.
- **National Engineering Design Development Centre (NEDDEC), Nnewi** – develop engineering design capacity and transfer to SMEs with a view to ensuring that made-in-Nigeria products attain standard specifications, global competitiveness and acceptability.

5) The Nigerian Steel Raw Materials Exploration Agency, Kaduna and

6) The National Metallurgical Development Centre, Jos

Aluminum Industry Players:

- Tower Group, a Pioneering Leader of aluminum products in West Africa, is the single largest vertically integrated group in the aluminum field in Nigeria, with five major businesses: Rolling, Roofing, Kitchenware, Extrusion and Flexible Packaging. The five divisions of Tower Aluminum are (company brochure):

a. Aluminum Rolling Mills, Otta - (Plain coils, circles)
b. Tower Extrusions, Lagos - (Extrusion powder coated profiles)
c. Tower Holloware, Lagos - (Kitchen wares, pots, pans)
d. Tower Houseware, Lagos - (Pots and pans)
e. Tower Building Products, Lagos - (Roofing Sheets)

- First Aluminum Nigeria Plc is an indigenous company that deals in the manufacture of aluminum coils, sheets, circles, and tubes (laminated and seamless plastic). Incorporated in 1960 as Alcan Aluminum of Nigeria Limited, the company later changed its name to First Aluminum Company (Nigeria) Plc in 1991. As at May 2008, the Group's annual sales averaged N7.12bn (US$60.34mn) over the past 5 years with its market capitalization currently standing at N7.45bn (US$63.1mn).

- **Nail & Wire Production**
- Nigeria Gas Products Limited is now a fully fledged industrial set up. It specializes in the production of Round and Square Pipes, Cut to Length Flat Sheets, Corrugated Sheets, Z-Purlin, Nails of all sizes as well as Hard Drawn Wire. Autonomously located in Oregun Industrial Estate, Ikeja, Lagos, Nigeria Gas Products Limited produces in excess of 42000 tons of processed steel a year with an installed capacity of 62000 tons.

- **Electrode**
- In Nigeria, about 98per cent of manufacturers in the welding electrode coating industry have wound up due to high production costs; a principal proportion going to the cost of purchasing industrial coating machines. Epileptic electric power supply to operate these machines as well as the high cost of diesel to operate high powered stand-by electric generators to sustain production, are also principal culprits. The 2 per cent of manufacturers that manage to remain operational sell their coated electrodes at exorbitant prices. Therefore, the need to produce a simple reliable, easy to use coating machine was expedient. A manually operated coating machine was designed and manufactured, its major advantage, is that it would not require electricity to operate. The main disadvantage is in its very low speed and production capacity when compared to the automated industrially available ones. However, it has

demonstrated comparable performance capacity in terms of its mechanical properties, along with expert evaluation tests.

9.6 Major Constraints

- Energy: The cheapest source of energy, PHCN is the most erratic, unreliable and problematic. Thus, energy costs have moved up due to the failure of PHCN.
- General Infrastructure
- Government Policy uncertainty
- Absence of supporting institutions
- Lack of political will to develop a grand vision for infrastructural development for the nation. Various governments over the years have paid lip services to the development of infrastructure in the country-but there was no consistent vision and mission.
- Lack of maintenance culture. The few existing infrastructure are never maintained.
- Lack of participation by all stakeholders in engineering infrastructure policy making process
- The Nigerian economy lacks a skill mass of relevant skilled manpower for engineering and technology applications
- Inadequate resource commitment to the sector
- Non-recognition and consequent absence of challenge to the available skilled manpower
- Inadequate funding for R&D
- Poor linkages between R&D institutions and the industry
- Difficulties in commercializing R&D results
- Absence of a technology culture in the society
- Poor power and utility supplies

9.7 Stakeholders' Perception of Solutions to the Critical Issues

Way Forward

Stakeholders are united by and large on the following approaches to moving the industry and economy forward:

- Promotion of local content of industrial machinery- this calls for understanding between manufacturers and industrialists. Projects can start with the local production of spare parts and gradually graduate into the design and fabrication of individual units of process lines and complete process lines.
- Investment in emerging technology development-the only way to halt the widening technological divide-calls for substantial investment outlay

- Development programme for SMEs –to make them technology-driven. This may involve the promotion of interactive sessions and participatory programmes that will generate the emergence of relevant technologies and engineering infrastructure for the SME sub-sector.

- Upgrading of "Mechanic Villages"

- Establishment of mini-foundry in tertiary institutions-expanding and promoting the NASENI initiative

- Conscious and sustained promotion of human capacity development in engineering design and development

- Adequate and efficient infrastructure facilities and the supply of reliable utilities are mandatory requirements before the steel industry in Nigeria can attain its full potential in the production of competitive iron and steel products for both domestic and international markets.

- The provision of adequate and dependable supply of quality electric power and other sources of energy (e.g., gas and coke) is an important parameter in the operation and competitiveness of any steel plant. Furthermore, the availability of low cost reliable power is necessary for the development of the downstream industries and the economy in general.

- Although PHCN may be able to meet the electric power demand of the steel plants, the reliability of supply still needs to be improved upon. For example, frequency fluctuation on the National grid can damage sensitive electrical control systems in the plant .At the time of visiting with a PHCN official the frequency meter on his table was reading 51.08Hz. This is outside the permissible fluctuation range for a number of electrical control systems in a steel plant (i.e. frequency, 1.5per cent; voltage, 10per cent)

Institution-specific suggestions on solutions to the sector's problems/constraints are as itemized below:

1. The National Iron Ore Mining Company (NIOMCO):

This Company should be re-commissioned to produce beneficiated iron ore for the primary iron making plant. There is also the fact that government is yet to complete the installation of the super concentrate line at Itakpe which will supply Delta Steel Company. The equipment are on site and should be installed and commissioned. After successful operation, Government may privatize this facility, but should retain golden share.

2. The Metallurgical Training Centre (MTC), Ajaokuta:

Nigeria lacks a well-equipped institution for training high grade artisans, craftsmen and technicians. The Metallurgical Training Institute (MTI), Onitsha, now being considered for accreditation to offer diverse courses in various engineering applications, has contributed in the training of artisans and craftsmen. The MTC, Ajaokuta being captive

facility is more readily available to train specifically for ASCO and NIOMCO. This Centre has all the equipment to undertake such training, a fact attested to by the fact that many of the present crew of competent artisans, craftsmen and technicians in Ajaokuta were trained in this Centre. We recommend that government in partnership with some competent private sector partner(s) run this Centre to produce graduates to man steel plants and engineering industry in general. Government may gradually fully privatize the centre once established and functioning.

3. The Repair Shop Complex:

This complex comprise of foundry shop, pattern making shop, forge and fabrication shop, machine and tools shop, power equipment repair shop etc.

Government should partner with a private firm to operate this Complex to provide spare parts and engineering components for both the steel industry and engineering industry in general. Government should gradually pull out in favour of the private sector.

4. The Wire Rod Mill (WRM) and the Light Section Mill (LSM):

Both Mills should be re-commissioned, recapitalized and run smoothly. Thereafter, they can both be privatized.

5. The Medium Section and Structural Mill (MSSM) and the Billet Mill:

The MSSM has an in-built capacity to produce rails that can be used for the revamping of the railways and providing new tracks in the new rail network master plan. Hence the MSSM is of strategic importance nationally, especially in view of the huge cost savings in foreign exchange involved if the rails can be produced locally. Furthermore, the Billet Mill is not a standard mill in steel plants in developed countries of the world, given huge strides in continuous casting technology. Again products of the MSSM/Billet Mill are uniquely needed in our development plans especially in the areas of heavy engineering.

In view of the above, we recommend that government in privatizing this group of rolling mills should retain majority shares to enable it deploy these mills strategically to meet national objectives.

6. The Power and Utilities Units:

Most steel plants and especially the integrated plants face horrendous problems in the area of constancy and adequacy of electrical energy supply. In the power and utilities units at Ajaokuta, there is need to embark on far reaching rehabilitation and re-commissioning of plant and equipment. We therefore recommend that government should tackle this problem to ensure the ability of these units to serve the rolling mills and especially the primary units. When they are functioning adequately a gradual withdrawal of government should be embarked upon with complete government pull-out undertaken just before the privatization of the primary units.

7. The Primary Units (the Blast Furnace and Steelmaking Complex:

Here there are ponderous problems of supply of local raw materials such as iron ore, coking coal, limestone, dolomite, refractory clays etc. Except for iron ore, there is need to:

- Open up mines;
- Provide access roads/rails to and from mine sites;
- Provide loading and off-loading facilities at both the mine sites and plant site; and
- Extend the supply of electrical energy and other utilities to mine sites.

All relevant infrastructural requirements should, therefore, be provided by Government, prior to privatization.

A concrete example may help illustrate the point. At the 1.3 million tonnes first phase of Ajaokuta Steel Project, about 700,000 metric tonnes per year of limestone must be supplied by Jakura Marble Company. Assuming that Jakura Marble can deliver this volume of limestone, the only viable method of transporting this to the plant is by rail. No private company can solve the problem of obtaining the right of way land for laying the track, not to talk of the funds needed. Hence Government must be involved and cannot just privatize the primary units "as in".

Government should develop raw material sources; rehabilitate, complete and commission the primary units; and finally run them continuously for some time before embarking on a gradual process of privatization similar to that used in privatizing British Steel, in the United Kingdom, and currently being practiced in China.

8. Mines And External Infrastructure

The operation of an integrated steel plant requires various raw materials such as iron ore, coking coals, limestone, dolomite, refractory clays etc. for each of these raw materials there is need to:

(i) Locate an economic deposit;
(ii) Build a mining company; and
(iii) Mine and beneficiate concentrate then deliver to plant.

Since such raw materials are heavy and bulky, such mines must be connected by rail network to the steel plant site. Furthermore, there is need to have a network of roads, rails and water transport to move both raw materials to the plant site and finished goods to various markets.

- To ensure sustained operation and production, river Niger should be dredged as this will ensure timely delivery of essential imported raw materials and evacuation of finished products to and from the Company.

The operations of a steel plant requires constant discovery and characterization of new sources of raw materials such as iron ore, coking coal, limestone, dolomite etc, for sustainable long term operations. There is therefore need to support the following organizations, which have been established for the aforementioned purpose:

At the more embracing level of consideration, government should encourage linkage between industry and institution of higher learning to relate research work to industrial application as well as making the institutions to be supply source for relevant man power. It should be mandatory for industry like ASCO and NIOMCO to offer industrial training places for students.

Some of the Stakeholders interacted with are also of the view that government should pursue the Mambila (Adamawa State) hydro-electric power project as this will complement the already existing Kainji dam facility (Niger State) to enhance quality and quantity supply of electricity power to Ajaokuta in particular and the nation in general.

At the bottom, what all the foregoing points to is the need for the Nigerian Government to give steel development programme all the strategic attention it deserves and should finance all the completion and rehabilitation exercises. This will go a long way in boosting the current Government's plan to make Nigeria one of the 20 top economies in the world by the year 2020.

9.8 Assessment of Nigeria's Distance to the Technology Frontiers and World's Best Practices

Modern steel plants operate very close to the limits set by physics. Advanced technologies maximize the efficiency of production and minimize the emission of CO2 to the atmosphere. The integrated iron and steel mills in Europe feed all their waste gases back into the production process, thus increasing carbon efficiency, reducing external energy needs and reducing greenhouse emissions to a minimum. As acknowledged by the World Steel Association, many steel plants around the world-evidently including Nigeria- operate nowhere close to such efficiency levels. Clearly, there is the huge challenge of upgrading the country's steel production industry to the best standards without compromising the drive to social and economic wellbeing. Some technology transfer is inevitable. Happily, there is the technology transfer initiative of Asia Pacific Partnership (APP)-involving Australia, China, India, Japan, South Korea and the United States-that encourages cooperation on the development and transfer of best practice technology, with the goal of radically reducing CO2 emissions. In any case, steel industries in developing countries are active participants in the Clean Development Mechanism (CDM), a financing initiative launched as a result of the Kyoto protocol. The main purpose of CDM is to bring about a reduction in emission of greenhouse gases, and it guides investment to this end in new technology projects within developing countries. To be eligible, however, projects must be able to deliver additional reductions in CO2 emissions over and above normal investments.

There are efficient and inefficient plants, and more importantly there are good and bad locations for making steel, both between regions and within them. The most dramatic differences are between regions. North America, Europe and Japan have very efficient operating practices and make much of the high quality, value-added products. Nevertheless their steel making can be US$100- 150/ton more expensive than in regions with cost advantages in either or all of the following inputs: iron ore and coal (usually via lower freight

costs), energy and labour. Furthermore these differences will become wider. Many of the producers in the low-cost regions can make further gains as they re-invest their profits and improve operating efficiency. By contrast, environmental costs are rising in the developed regions which in turn will add to costs and push up energy prices. The latter is particularly true in the EU where the emissions trading system will add to costs significantly.

Steel company profits and strategies

- There is a movement towards making steel in lower cost regions and rolling it nearer to the market. It is in steel making itself where the economies are to be found and the developed countries still have the best finishing equipment and technical know-how. The slab trade is currently quite small but this will change with intra-company movements taking the place of market transactions.
- There are co-operative efforts to grow the size of the market, especially in construction where steel is thought to hold many advantages over more traditional concrete based methods. There are opportunities here to grow both the absolute volume and, more importantly, the value of the steel sold.

Finally, there are many different market strategies. The main choice seems to be to "join the giants" or to remain small and focused on particular segments of the market. Sometimes the smaller niche steel makers make more profits than the less-focused giants. This is especially true when they co-operate with their customers and really understand and develop their business together.

Trends in demand

Throughout the 1990's the steel intensity of the world economy drifted downwards. In nearly every year GDP growth exceeded that of the demand for steel. This changed at the turn of the century and for the last five years the reverse position has held. In absolute terms there has also been a change in the pace of growth. From 1995 to 2000 demand increased by about 20Mt per year; but from 2000 to 2005 it increased by over 50Mt per year. The big change of course was China, but most of the so-called developing world has seen annual growth rates of 10per cent or more in overall consumption. The reason, of course, lies in the level of investment being experienced throughout the world. The last few years have seen low real interest rates and globalization has encouraged industrial investment in "low-cost" regions which in turn adds to the demand for infrastructure and housing. Something like 50per cent of all steel is used directly in the construction sector but when one includes new plant, transport equipment (lorries, railway rolling stock and ships), oil and gas pipelines, and other capital goods, around 80per cent of steel demand is actually driven by investment. We should not be surprised therefore that steel demand has increased so rapidly in recent years. Investment is "lumpy", however, and rather more volatile than consumption. The dependence of the steel industry upon investment is one of the reasons for its highly cyclical behaviour. In contrast to the newly emerging markets demand has been relatively stagnant in North America, much of Europe and Japan. Not only do these regions have lower rates of GDP growth, but much of it is in services rather than manufacturing or construction. There is a constant drift of manufacturing towards low cost regions which in turn keeps the level of investment at a lower proportion of GDP. The consensus view regarding the future economic outlook for the

next few years seems to be a continuation of growth in the developing regions of the world. However it is also widely recognized that the situation is much more uncertain, with major questions remaining about the US deficits and hence the value of the dollar, trade wars and possible protectionism, the oil price, and security concerns in the Middle East and elsewhere.

Country experiences

For Nigeria to make a success of its iron & steel sector, attention must be paid to the experience of other countries that have become reference points in the industry globally:

USA

The steel industry is vital to U.S. economic competitiveness and national security. It employs over 150,000 people in well-paying jobs and is among the most productive, efficient, and technologically sophisticated industries in the world. For example, many grades of steel in use today could not have been made even 10 years ago. Traditionally valued for its impressive strength, steel has also become the most recycled material, with 55 per cent of U.S. steel now produced from scrap. Since energy represents about 15 per cent of the total manufacturing cost for steel, steelmakers are highly motivated to reduce energy intensity. In 1995, industry leaders joined the U.S. Department of Energy's Office of Industrial Technologies (OIT) in a unique partnership known as Industries of the Future. This innovative partnership strategy aligns public and private R&D resources to address some of the industry's toughest technological challenges. This strategy is helping the U.S. steel industry prepare for success in tomorrow's global markets while advancing national goals for energy efficiency and the environment.

Industry sets the goals and priorities: Under the leadership of the American Iron and Steel Institute (AISI) and the Steel Manufacturers Association (SMA), the U.S. steel industry is actively engaged in the Industries of the Future strategy. By reaching a consensus on industry-wide goals and R&D priorities, the industry has succeeded in attracting public and private investment for new technology development. Collaborative teams share the costs and risks of R&D to accelerate meaningful technology advances.

Vision: Led by the American Iron and Steel Institute, the industry reached consensus on broad goals for the future and established a unified research agenda, Steel: A National Resource for the Future, to guide collaborative research, development, and demonstration (RD&D).

Road Map: In 1998 the industry mapped out the pathway for achieving its vision in the Steel Industry Technology Roadmap. This landmark document describes priorities, key milestones, and performance targets for collaborative RD&D.

Implementation: Guided by industry-defined priorities in the steel roadmap, OIT currently provides funding to nearly 50 steel-specific R&D projects worth a total of roughly $68 million in public-private investment. OIT provides approximately two thirds of the cost-share

for these competitively awarded projects that also help meet national goals for energy and the environment.

New Technology Direction: The industry reaffirmed its commitment to the partnership by signing a new compact with OIT in February 1999 and by revising the 1998 roadmap to reflect new developments and priorities. The revised roadmap will guide new public-private R&D investment in improved steel technology. In addition, the new Steel Industry Research Challenge will foster the development of revolutionary steel technologies for the 21st century.

Since blast furnaces must reach temperatures of about 2,800° F, it is not surprising that iron making is the most energy-intensive part of the steelmaking process.

California Steel Industry

This is a very reputed steel producing company situated in the Western provinces of the United States Of America. The company is specialized in the production of Flat-Rolled Steel. **California Steel Industry** has the largest capacity of flat rolled steel production in the entire Western provinces of USA. The workers who are associated with the company are highly skilled ones and are dedicated in the production of high quality products for their customers through the utilization of latest technologies. The total strength of the workers in **California Steel Industry** is near about one thousand. According to the industry parameters, the productivity of each worker in this company is above par.

The first ever steel coils were produced in the year 1984. With every passing year the production level has frog leaped to astonishing heights and has trebled in just one and a half decade. It was recorded that in the financial year 1999, **California Steel Industries** has been able to export almost two million tonnes of finished products ranging from coils to pipes to sheets. The total sales figure associated with such high end steel export is near about seven hundred million US Dollars [Economy Watch].

BRAZIL

Brazil Steel Industry has been instrumental in the utilization of the latest technologies in the field of steel production. Most of these technologies had been imported from foreign countries among which the most significant technology was “Blast Oxygen Furnace”. Some of the other more important and advanced technologies that are being used in the **Brazil Steel Industry** include:

- Increased importance has been given to the utilization of the continuous casting
- More and more use of automated machineries in the process of steel production
- Adoption of the special techniques in the field of steel production

The rapid development in the **Brazil Steel Industry** can be observed during the decade 1996 to 2006. Brazil has posted an absolute increase in the production of steel by 5.7 million

metric tonnes which tantamount to a positive percentage increase of 22.4 per cent during the period 1996 to 2006. With the passage of time, the market share is aggressively and surely drifting away from the OECD countries to the trio countries including China, India and Brazil. It has been seen in the recent past that the steel companies are shifting their base from European countries to Brazil. These steel producing companies are finding the cost slab system more lucrative to build their set-up

Some of the advantageous aspects of Brazil Steel Industry include the following points:

- Abundance of raw materials (ore of iron, non renewable energies, coke or charcoal, etc) required for steel production
- The labour available are cheap in nature in comparison with the OECD countries
- Availability of cutting edge technology in the production of steel [Economy Watch, 2006]

China

China **Steel Industry** is the largest steel producing nation in the whole world. The amount of production **China** is always on an upward slope with every passing year. In the year 2003, the total produced steel output was around two hundred and twenty million tonnes which increased to around two hundred and seventy three tonnes during the fiscal 2004. This increasing trend was maintained during the fiscal year 2005 and the total amount of steel production was hovering around three hundred and fifty million tonnes. A high degree of correlation can be seen between the rate of growth of the Chinese economy and that of the demand for steel in China. Both are growing more or less at a rate around ten per cent. The percentage share of steel consumption of China in the whole world is approximately thirty one per cent. The main reason for the astronomical growth of **China Steel Industry** is the constant support and assistance from the Chinese government. The **China Steel Industry** is basically a fragmented and scattered one even after some of M&A and consolidation has taken place in the Chinese steel market.

Some of the important facts and figures concerning **China Steel Industry** are:

- The tremendous growth of the steel industry in China has been possible due to constant back up from the Chinese government through huge amount of subsidies

- The total amount of the consumption of the Chinese market is the largest in the whole world, but the market research by various agencies and organizations say that the optimum level of steel consumption has still not yet been reached

- Though the domestic supply of steel exceeds that of the domestic demand of China, still it has to import steel from foreign countries. The only reason behind this is that the total amount of quality steel produced is relatively low compared to the total produced steel [Economy Watch[

Indian Steel Industry

There are mainly four industry types which are generating the domestic demand for **Indian Steel Industry**:-

- Infrastructure industry (both private and public projects)
- Construction industry
- Automobile industry
- Real estate industry

In terms of quantity of production, the **Indian Steel Industry** has a world ranking of seven. The first steel industry was established in the year 1953 in Rourkela in Orissa with a production capacity of one million tonnes per annum

Indian Steel Industry has some advantages that give it the extra sought after mileage over its peers from other countries which can be summed up as follows:

- Low wage rates in the sector
- The base for production of steel is a mature one
- The automobile industry in India, one of the main demanders of steel, has a steep upward moving slope
- The construction as well as the infrastructure industry, big demanders of steel, are also on an upward slope due to the government policy regarding emphasis on developmental works
- The workforce associated with the **Indian Steel Industry** are highly knowledgeable and experienced

The most significant news regarding **Indian Steel Industry** is TATA Steel's acquisition of the Corus group after going through a strenuous bidding. Ultimately, TATA Steel was able to buy Corus at eight billion US dollars which makes the deal to be fixed at 455 pence per share which are needed to be paid in cash by the TATA Steel to the shareholders of Corus. This deal is a highly expensive one and comes only after the Mittal-Arcelor deal of thirty eight billion US Dollars. The finalization of TATA-Corus deal has catapulted TATA Steel from 65th position to 5th position in terms of productive capacity. This has not only strengthened the **Indian Steel Industry**'s position in the Asian market but also on the productive capacity of the whole world. Some of the relevant and striking facts about **Indian Steel Industry** are:

- Huge capital base of
- The contribution of this industry to GNP of India is almost six per cent.
- The weightage assigned to **Indian Steel Industry** in the Industrial Production is 5.13.

According to the 11th Five Year Plan (2007-2008 to 2011-2012), some of the projections related to **Indian Steel Industry** are:

- Domestic Supply of steel would reach a whooping target of seventy seven million tonnes which is approximately 66 per cent higher from 2007-08.

- Domestic demand for steel would touch a milestone of seventy million tonnes which is approximately 4 per cent higher from 2007-08.

Importance of recycling: Steel is a material which is indefinitely recyclable at a higher level than any other material. This property enhances its sustainability as well as entailing much lower energy consumption. Currently, Europe recycles more than 90per cent of the steel used in automobiles.

In the last one year, the world has seen two big M&A deals take place:
• The Mittal Steel, listed in Holland, has acquired the world's largest steel company called Arcelor Steel to become the world's largest producer of Steel named Arcelor-Mittal.

• Tata Steel of India or TISCO (as listed in BSE) has acquired the world's fifth largest steel company, Corus, with the highest ever stock price.

- Experience has now shown that privatization, when hurriedly applied without following the laid down guidelines, can bring about negative results leading to asset stripping, cannibalization, unemployment, low employee morale and capital flight culminating in re-nationalization of the enterprise.
- Steel Industry is becoming more and more competitive with every passing day. During the period 1960s to late 1980s, the steel market used to be dominated by OECD (Organization for Economic Cooperation and Development) countries. But with the fast emergence of developing countries like China, India and South Korea in this sector has led to slipping market share of OECD countries. The balance of trade line is also tilting towards these countries. The main demand creators for Steel Industry are Automobile industry, Construction Industry, Infrastructure Industry, Oil and Gas Industry, and Container Industry.
- New innovations are also taking place in Steel Industry for cost minimization and at the same time production maximization. Some of the cutting edge technologies that are being implemented in this industry are thin-slab casting, making of steel through the use of electric furnace, vacuum degassing, etc. The Steel Industry has enough potential to grow at a much accelerated pace in the coming future due to the continuity of the developmental projects around the world. This industry is at present working near its productive capacity which needs to be increased with increasing demand.

It is against the aforementioned countries and their respective steel companies as well as other best practices that Nigeria's approach can be objectively assessed. One clear measure of the lagging status of Nigeria's public policy in relation to the Iron and Steel sector is its

privatization. An informed analyst has provided a comparative review of this issue and it is here reproduced at length:[18]

South Africa

The South African Government drew up methodology and guidelines in which they identify communication as one of the most important attributes in a period of privatization. If workers are uncertain about their future, they will probably be less productive than they ought to be. Personnel should be kept informed throughout the transitional period, and should be reassured of their importance in achieving the desired objective in order to keep morale at high level. Funds obtained from the selling of state assets will be used to reduce debts and to support the Reconstruction and Development Program (RDP). The government will invest the income from privatization in such a way that the physical results of these investments will be seen, for example implementing its RDP.

The first parastatal to be privatized was ISCOR. This was not a difficult task because this entity was already being managed like a private company. This privatization was approved after three separate investigations by ISCOR itself, Senbank and the Finance Bank. ISCOR did an internal investigation in April 1988. It appointed Senbank as its private consultant and the State appointed the Finance Bank. Together these two financial institutions were asked to make acceptable price estimates. In February 1989, the State declared that it was going to privatize its shareholdings in ISCOR (Saayman 1989:34 Cf Office for Public Enterprises 1995). Initial reaction from the employees and the management were rather skeptical. Employees feared job losses. The management realized that privatization would not have any influence on the business philosophy of the entity, because the enterprise was structured according to the Companies Act of 1973 and was managed like a private entity. It was also decided that the shareholder's structure should be spread as widely as possible to prevent any single company or person taking control of South Africa's Iron and Steel production. An extensive marketing campaign was launched to change the perceptions of both the public and employees. The task of the management was to provide information to all interest groups and also to create awareness that shares would be available to the general public. Management also tried to keep the more than 58,000 workers informed of all developments. A shareholding scheme for workers was developed and information and training sessions in shareholding were initiated. Management personnel were also trained in privatization at special seminars. Publications, intensive press campaigns and interviews with financial analysts and the top management were used for marketing purposes. A visit of 20 overseas bankers and company clients was arranged to inform them of the developments and implications of privatization. In the end ISCOR was successfully sold for R3.7 billion.

The South African government is cautious when it comes to replacing public monopolies with private ones, because this could lead to a possible alienation of civil servants and a potential increase in unemployment. To win civil servants over to the idea of privatization,

[18] See paper delivered by Sanusi Mohammed, "Privatization of the Iron and Steel Industry in Africa" at the 8th international Iron & Steel conference held at Dohar, Qatar, March 17-19, 2008.

government must offer them assurances that staff reductions will be achieved through voluntary retirement or attrition. Employees who retired were not replaced; some resigned voluntarily: and different duties were combined to eliminate the need to hire additional staff.

Egypt

The Egyptian Iron and Steel Company (EISCO) has been in existence for over 50 years now and is wholly owned and operated by the Egyptian Government as a public concern. The recent idea of privatizing the company was brought up with the same stereo-type World Bank/IMF findings that the Company has been declaring losses annually. The Government noted the findings but counter it that profitability is not only measured in terms of the accountant's balance sheet.

Multiplier effect, technological, security, social, and socio-economic potentials of an enterprise are greater indices in measuring profitability. Nearly 10 years on, EISCO still remains a public enterprise.

The second integrated steel company, the Alexandria Iron and Steel Company (ANSDK), using the Direct Reduction technology, has been privatized already. ANSDK's main shareholders include a number of Egyptian public sector companies (64per cent), its Employees (14per cent), a Japanese Consortium (JC-10per cent) composed of all Nippon Kokan, Kobe Steel and Toyo Menka Kaisha (renamed Tormen) and IFC (5per cent). In November 1997, the Company decided to increase its capital in two tranches in order to partly finance the proposed flat steel project. A number of public sector shareholders refrained from participating in the first tranche, which was implemented in December 1997, thereby diluting their combined shareholding from 64per cent to about 56per cent. Public sector shareholding further decreased to less than 50per cent after the second tranche of the capital increase was mobilized. New private shareholders include Schloemann – Siemag AG (SMS) of Germany, a major steel equipment supplier, which own about 1.5per cent of ANSDK's capital. The JC maintained its shareholding at 10per cent, while the Employees increased their share to about 16per cent. The project Cost about US$625 million (including an IFC 'A' loan of US$60 million, a 'B' loan of about US$100 million and an equity investment of about US$11 million equivalent thereby maintaining IFC's shareholding of 5per cent).

Now, a look at the Nigerian approach.

Nigeria

Nigeria made a second attempt at privatization by inaugurating the National Council on Privatization (NCP) in 1999. During the inauguration ceremony, the President of Nigeria presented an inaugural speech, part of which is hereby reproduced:
"Up till recently, there have been many years of exhaustive deliberations by stakeholders on how to put the Nigerian economy on the path of sustainable growth and development. Right now, a consensus has emerged on the imperative of privatization and commercialization of State-owned enterprises".

He also gave some assurances.

(i) "We are privatizing for the benefit of our economic recovery and our social life. We are not embarking on this exercise to please the World Bank or the IMF"

(ii) (ii) "It is not designed to share our national assets to a few rich people. We are not about to replace public monopoly with private monopoly".

(iii) "… we want to remove the financial burden which these enterprises constitute on the public and release resources for the essential functions of government".

(iv) "We want to ensure that many more service providers are brought in to compete and thereby regulate the market for fairer pricing. We want to ensure that these utilities work and deliver quality services."

(v) "The process will avoid any possibility of further hardship to the public. A vigorous public enlightenment programme will ensure that as many Nigerians as possible do participate in the programme".

The president also assured the world that:

(vi) "The process will be transparent and guided throughout by the best interest of the country and the Nigerian public…. As part of the efforts to ensure transparency, our Privatization Programme will involve international privatization advisers. This will not only enhance credibility but also guarantee access to the special skills and knowledge required for handling the Privatization of utilities. It is expected that the international advisers working with Nigerian professionals will help to provide the desired investment climate."

(vii) "Privatization is also one of the reforms we have to undertake to integrate our economy into the mainstream of world economic order.

There are two inter-related aspects of this integration. In the first place, we need the technology; the managerial competence and the capital from the developed world to enhance the performance of our utilities. Another group that will be involved will be Core Group Investors. These are experienced groups with the capabilities of adding value to enterprise and making it operate efficiently in the face of international competition. They should also possess the capabilities of turning around the fortune of such unhealthy enterprises. The Core Groups must not only possess the technical know-how in relation to the activities of the enterprises they wish to invest in but also possess the financial capacity to pay competitive price for the enterprise and increase their capital base…. Secondly, there are very serious linkages between the efficient functioning of our utilities and our ability to attract foreign investments. We cannot be talking about creating a conducive environment for foreign investments if the performance of our transport, telecommunication and energy sectors remain dismal and epileptic".

This is where privatization began and ended in Nigeria. There are three public steel rolling mills at Jos, Oshogbo and Katsina which have been liquidated some 7 or so years ago. Observers have argued that the companies were actually sold to private entrepreneurs at ridiculous prices. The Katsina Steel Rolling mill is the only one that has been producing epileptically, and has never exceeded 10per cent of capacity utilization following the privatization exercise. Oshogbo and Jos have not commercially produced 1 kg of rolled products till date.

Metals industry privatization in Nigeria so far involves giving away the steel plant assets to incompetent private companies, with very marginal participation by Nigerians. In privatization exercises in the metals industry it is strongly advocated that there must be provision for participation by the public in the form of buying shares in these companies, with special provisions made for the staff of the parastatals and their unions. Such participation, as demonstrated in the South African example, helps to legitimize the privatization process and to enhance transparency in the subsequent operation of the resulting new companies.

It would be recalled that the minister of mines and steel development, Chief Sarafadeen Isola, had, on the orders from the presidency, set up a 5-man committee on October 30, 2007 to look into the Concession and Share Sale/Purchase Agreement that was entered into between government and the Indian steel company.

LEADERSHIP can authoritatively report that the report of the Mallam Magaji Inua-led committee, which is coming out nearly three months after it was originally billed to be submitted six weeks from the day of the committee's inauguration, spells doom for the Indian company. Part of the report, which agreed that the agreement was not in the over-all interests of the country, reads:

"An overview of the agreement reveals that the covenants were largely skewed in favour of the Concessionaire (GIHL) to the detriment of the government. The panel viewed the conditionality of submission of Business Development Plan five months after assuming full management and control of the company as not to the best interest of the nation as this gave room for complacency. Three years after assuming full control, no workable Business Plan has been submitted to the FGN by the Concessionaire". Noting the failure of the whole agreement, the report said that "The basic purpose of the ASCL Agreement is to rehabilitate, complete, commission and operate the Ajaokuta Steel Plant with a view of producing liquid steel within 12 months, increase the production capacity, maintain the existing facilities of the township for the employees, complete the balance of the civil engineering works necessary for the completion of the project and to submit within five months of the date execution of this agreement, an initial Project Business Plan to the Ministry. From all indications, the basic purpose of the agreement has been defeated as none of those stipulations has been satisfactorily carried out".

It further disclosed that members of the committee also observed that there were so many clauses in the agreement that dispossessed the federal government of powers, and, therefore, recommended that in future, agreements of such nature should be drawn and vetted by the office of the Attorney General of the Federation (AGF). It also reported that the agreement required GIHL to pay a concession fee of 1 per cent of turn-over annually to government, but the panel could not establish the annual turn-over of the company due to lack of records, adding that there was no evidence that GIHL had paid any concession fee to date.

The panel observed that the company adopted an unwholesome accounting practice by running ASCL and NIOMCO and Delta Steel Company, Aladja as one financial unit, differentiating them only with 'Memorandum Records', and noted that this contravened Provision 7.1 of the Concession Agreement. The committee members also reported several other breeches of the covenants of the agreement like cannibalization and vandalisation of plants and equipment, dangerous engineering practices bordering on lack of maintenance, exporting premium scraps imported for the project by government.

From the above, it can be seen that the privatization exercise in South Africa and Egypt has followed due process and is a success case, while that of Nigeria is laden with arbitrariness, insincerity and fraud exhibiting a typical case of unsuccessful privatization model.

9.9 Development of local iron & steel industry

Steel being a basic industry, it generates substantial growth of both upstream and downstream facilities. According to some estimates one person-year of employment in the steel industry generates 3.5 person-years of employment elsewhere. Considering all these, total employment generation will be substantial (Wikipedia).

Generally, steel has great advantages for Nigeria. It will not only enable the country to build a strong industrial base, it will also provide employment opportunities for thousands of Nigerians as well as foster the transfer of technology to Nigerians. It is also expected to conserve foreign exchange since the country may be able to export steel to the neighbouring countries. The development of this industry in the country will also help to jump-start an agricultural revolution, while also contributing to the defense capability of the country since it will be easier for the country to make its own weapons. It is therefore quite logical to state that given the attention of the government to this industry and the cooperation from private investors, this industry is indeed, a strong basis for industrial take-off and economic development of Nigeria. When fully on stream the industry together with its spread of industrial expansion could provide jobs for between 400,000 and 600,000 Nigerians whose effective demand for consumer durables and non-durables could generate a multiplier effect. In a survey carried out by a consultancy agency of the Obafemi Awolowo University, Ile-Ife, it was discovered that over 100 downstream industries sprung up as a result of the Ajaokuta Steel Plant.

In addition, the industry has the potentials for forward linkages. For example, slag impurities from the integrated steel plants could serve as good materials for cement making in the viable Nigerian construction industry. Argon, packaged by Delta Steel is indispensable in the production of electric lamps, while burnt and hydrated lime is used for water treatment and fertilizer production. Ajaokuta's scrap metal requirements could exceed 273,000 tonnes annually, enough to make scrap-salvage a lucrative multi-million dollar enterprise. While Delta Steel could make between 4-5 billion Naira on direct sales of primary and auxiliary products, Ajaokuta could make at least N100 million annually from de-mineralized water alone even if the company sells at 50 per cent market value. For this industry, there has been

an increase in activities associated with the use of iron and steel. The construction industry is still very much active in the major cities of the country, while the assembly plants are increasing in number. The demand for flats in the country has outstripped that for long products. Indeed, at a point in the early 1990s import of flat sheets was as much as 58 per cent, 20 per cent for beams and 20 per cent for rods and other products

The Ajaokuta steel company Ltd was designed to produce 1.3 tonnes of cast steel yearly in the first stage and expansion to 2.6million tonnes then to 5.2 million tonnes annually.

The company was to use the blast furnace to produce liquid steel using raw materials such as iron ore, coking coal, limestone, scraps, bauxite, dolomite, refractory clay and manganese ore. The plant was designed with three rolling mills to produce saleable billets, beams, channels, angles, broad flanges, rounds, hexagonals, strips, wire rods and reinforcement rods and flat steel.

The expected by-products of Ajaokuta Steel Plant are dehydrated tar, ammonium sulphate, fertilizer, benzene, toluene, xyelene, naphtha, etc.

In addition to the main products and by-products, the Steel Complex has a captive Thermal Power Plant (TPP), which has the capacity of producing 110MW of electric power.

According to estimates, the Ajaokuta steel mill has a capacity of employing over 20,000 work force and occupies a span area of about 10 radius square metres with abandoned houses which are meant to have been the staff quarters at different stages of completion. This is also the same at Kaduna and Delta State, the whole steel sector has been suffering neglect from the government.

The iron and steel industry in Nigeria has the capacity to produce most of the iron billets, steel bars, and iron rods used in the country if well developed and harnessed; instead, the government is killing the industry by awarding waivers to manufacturing and construction companies to bring in iron for use in the country.

The quality controller of Universal Steel Limited is reported to have claimed that the steel companies in Nigeria can produce steel bars in form of iron rod and angle bars used mostly for constructions, however the government is making the iron and steel business difficult for Nigeria because of its frequent concessions of waivers to companies and individual to import iron rods and this is killing what is remaining of the industry. “The selling prices of these imported rods are not making the locally produced iron to compete effectively in the market. Most of our rods don’t get sold in the market and we have to reduce the price to meet those imported. This is making the company run at a loss” he was quoted as saying.

Steel Pipes

Nigerian Government has been called to fast track the resuscitation of Ajaokuta Steel Mill to provide raw materials for the growing steel pipe industry pioneered by SCC Nigeria to reduce

imports from South Africa, America and other European countries. Besides, the Federal Government has also directed for giving special preference to locally manufactured products or ban imports of steel pipes into the country as a way of nurturing local production Mr. Yuval Levy MD of SCC, Nigeria's spiral welded pipe company, said that the ban of imported steel pipes would not only boost local economy, but would also protect the local industry, reduce unemployment, raise skill acquisition, and save foreign exchange. SCC Managing Director, the pioneer spiral welded steel pipes company, Mr. Yuval Levy said this while addressing newsmen on the milestone certification of its products by both American Petroleum Institute (API) and International Standards Organization (ISO), making Nigeria the other country in Africa apart from South Africa with the authority to stamp both API and ISO logo on its pipe products. SCC located in Abuja, with a current capacity of processing 100,000 tons of steel annually, was established in 2001 for the production of pipes needed for the Gurara Water Project. It has recently obtained certification of its products by American Petroleum Institute API.

Aluminum

Analysis of Competitive Intensity and Attractiveness of the Nigerian Aluminum Industry shows the following influencing factors:

•Bargaining Power of Customers: Nigerian aluminum companies fall in the category of industry producing intermediate products serving the input needs of related industries in downstream lines. Relatively, bargaining power leans more in favour of buying companies which include builders, architects, engineers and manufacturers of pharmaceuticals, cosmetics and food products, as they cut down cost from bulk purchases and contract supplies. However, sustainable and reliable demand for output is a positive factor for the aluminum producing companies.

• Threat of New Entry: Huge capital intensity, long gestation period of investment, and economies of scale enjoyed by existing companies in the aluminum industry raise entry barrier to prospective new entrants with inadequate technological and manpower savvy to compete profitably. Hence, competitive threats posed to aluminum manufacturers companies in Nigeria are basically those coming from foreign competitors. Huge initial capital outlay has made foreign firms embark on importation as a cost cutting strategy. Inferentially, the major threat to domestic aluminum-related companies in Nigeria is importation of cheaply produced aluminum products.

• Threat of Substitute Products: The nature of the output in the aluminum industry makes the threat of substitute product to viable. Though enormous resources go into Research & Development (R&D) for the improvement of a viable substitute, at present, the most potent threat to aluminum products (especially in the area of packaging) are plastic and steel. The producers of these products continue to erode the huge market share once enjoyed by aluminum products.

• Bargaining Power of Suppliers: Unreliable and shoddy nature of domestically sourced raw materials (specifically aluminum ingot) places domestic manufacturers of aluminum products at the mercy of foreign input suppliers. This singular factor of foreign-input dependence constitutes a strain on the bargaining power of Nigerian companies in sourcing for intermediate inputs such as aluminum ingot. The effect of this is much more pronounced in huge production costs and low margins. This phenomenon has its root in the inception (in the late 70's) of commodity trading in aluminum ingot on the London Metal Exchange (LME). It was the above scenarios that sparked the beginning of the breaking apart of the supply chain, triggering a shift from producer pricing to terminal-market pricing

• Competitive Rivalry: Though with few major players (including First Aluminum Plc, Aluminum Extrusion Industry Plc, Aluminum Manufacturer of Nigeria Plc, and Tower Aluminum Plc) and other fringe players, the aluminum industry is faced with more than industry-based competition. The major competitive forces emanate from companies producing substitute products such as plastic packages, steel and juice boxes.

Growth Prospects and Opportunities: Compared to other emerging economies, the per capita consumption of aluminum in Nigeria is ridiculously low which provides enormous upside potential for the industry as the economy grows. Indian, for instance, has a per capita consumption that is 300 per cent of the consumption level in Nigeria while Brazil consumes as high as 1500 per cent!

Currently, the upstream end of the sector is yet to reach its full potential. The moribund state of ALSCON, which was meant to produce 193,000 metric tonnes of aluminum ingots and billets, added to the challenges of the sector. However, recent development occasioned by injection of N18bn (approx. US$150mn) by UC Rusal, a Russia-based aluminum producing giant, into ALSCON, might well be the required impetus to set the sector free of its low developmental pace. The odds are high in favour of a functional ALSCON as UC Rusal has 77.5 per cent stake in the company. At present, ALSCON has commenced the exportation of locally produced aluminum ingot while the local demand is expected to be filled. This development presents a bright prospect for aluminum ingot-dependent companies. It is expected that the fresh funds from UC Rusal, and other stakeholders, Ferrostaal AG (7.5 per cent) and the Federal Government (15 per cent), will in the next three years facilitate the growth process in the industry.

9.10 Agenda for Action

In the Vision 20:2020, it is appropriately appreciated that to achieve the overarching goal of increasing Nigeria's per capita steel consumption from less than 10kg to 100kg by 2020 (average for industrialized nations is 130kg), an increase in steel production capacity and volume to about 12.2million tonnes per annum will be required by 2020. Harnessing the associated demand for Iron Ore, Coal, Limestone and other minerals to achieve this steel production target, and the attendant multiplier effect in stimulating activity in the prospecting, exploration and production segments of the mining industry value chain are at the core of the

NV20:2020 strategy for the minerals and metals sector. To this end, effort at reviving the primary steel sector will be focused on the completion, commissioning and commencement of operations at both the Ajaokuta Steel Company Ltd (ASCL) and the Nigerian Iron Ore Mining Company (NIOMCO) by 2011. The strategy is to achieve the commencement of

As repeatedly emphasized, basic and fabricated metal, iron and steel products form the basis of most material inputs for other industries including oil and gas, automobiles, building and construction, transportation, ship building.

Strategic imperatives include:

- Urgent resolution of problems with ASCL and NIOMCO
- Government funding to restore ASCL and NIOMCO to their installed capacity
- Commencement of privatization process only after plants are functional and working with a provision for investors to commit to capacity expansion with a view to achieving a target of 12.2million tonnes of primary steel production by 2020, and a steel consumption per capita of 100kgt
- Development of an intensive manpower development programme is recommended to guarantee supply of quality personnel, while providing a low labour cost advantage to the sector.
- Stop the influx of substandard aluminum products, especially the illegal dumping of substandard coated aluminum coils

As recommended by the World Bank (2009:15-16) but duly moderated to align with national interests, Nigeria should follow a growth strategy based on the following features:

- Domestic led initially; focus on exports to regional and international markets at a later stage.
- Targeted interventions to remove constraints in value-chains with high employment and growth potential in both formal and informal sector value chains, including in the self-employed sector.
- Adoption of a national skills development framework.
- Selective liberalization of trade policy.

In the Bank's framework, growth would follow three phases: Phase 1 would be dominated by capturing larger shares of the domestic market; Phase 2 would focus on extending Nigeria's access to regional markets; and Phase 3 would promote access to the international market. These phases do not need to be sequential. In particular, while Nigeria's growth over the short to medium term is likely to continue to be driven by higher domestic demand, Phase 1 would likely also witness the increased export orientation of parts of the economy. In fact, encouragement by the Nigerian Government to export would be a continuous feature of the growth strategy. This phased approach would differ considerably from that of other countries that have grown through an initial focus on the manufacturing sector, and would be distinctly Nigerian.

The phased approach focuses on the domestic market at the outset because, in view of the severe cost disadvantage of Nigerian industry, resulting primarily from the lack of power and high costs of transportation, it is unrealistic to expect Nigeria to be able to compete in the international marketplace *in the short term*. Instead, growth is likely to continue to be driven by sectors focused on domestic demand, especially in the service industries that have already significantly contributed to growth. Through the development of appropriate infrastructure, Phase 1 would create the platform for growth of manufacturing industries, which would then be oriented towards the regional and international markets in phases 2 and 3.

One point is beyond dispute: Firms in any part of manufacturing can only produce efficiently if they have access to suitable transport infrastructure and their production is not hampered by unreliable supply of utilities, such as energy and water. While the question of exactly how much infrastructure matters to growth are essentially an empirical one, the suggestion that infrastructure matters more for low-income countries are commonly accepted. According to the World Bank, the poorest countries need to spend around 9 per cent of GDP on operation, maintenance, and expansion of their infrastructure if they are to reach the Millennium Development Goals

9.11 SMEs in the Steel Sector

The Small and Medium Sector occupies an important place in the economy of a country. The SMEs all over the world have been recognized as the silent drivers of a nation's economy. Their enterprise is laudable and their ability to generate pools of growth and employment, invaluable. This is true for most developed, as well as developing economies. In the emerging economic order SMEs are the leading edge when it comes to innovation and entering new global markets.

However, SMEs are threatened under the contemporary and unfolding rules of the WTO. The SMEs in steel sector would not be able to compete with MNCs due to their inherent weaknesses such as obsolete technology, uncompetitive prices, poor quality of goods, costly credit, weak infrastructural facilities, plethora of labor legislation, lack of cohesion among SME units, ineffective associations, lack of up-to-date information, lack of international exposure to its products and lack of standards conforming to international standards etc. With the removal of quantitative restrictions, SMEs are subjected to foreign competition by way of cheap imports from neighbouring as well as other developing countries.

9.11.1 Opportunities for SMEs in the basic industry sector:

- Machine tools and parts fabrication
- Agricultural equipment, hand tools and accessories
- Domestic appliances and accessories production
- steel and non-ferrous metals (i.e pins, staples and clips)
- Nails and screws production

SME sector performance has hitherto not been too encouraging in view of the following challenges:

- ❑ Difficulty in access to financial sources
- ❑ Technological lag
- ❑ Insufficient information on markets
- ❑ Managerial capability lag
- ❑ High cost of machinery/equipment
- ❑ Lack of reliable data
- ❑ Uncompetitive products
- ❑ Lack of industrial site & enabling environment
- ❑ Societal attitudes i.e preference for imported goods
- ❑ Little knowledge of E-trade

9.11.2 What SMEDAN can do for investors

- Identify genuine SMEs to enter into partnership with
- Identify markets
- Facilitate establishment of industrial parks for ease of operations
- Assist in reducing registration and regulatory bottlenecks through on-going liaison with, CAC NAFDAC, SON, NIPC, Customs, NEPC, NEPZA, etc
- Facilitation of SME procurement process
- Enhance E-Business through Business Support Centres

Utilizing the insights of the World Bank, the **skills gap** could be reduced through targeted interventions such as:

- Reprioritizing government resource allocation to the technical and vocation education and training (TVET) stream of the educational system, and reconsidering the importance of the tertiary education system.
- Refocusing policies for skills development towards the identified employment-intensive value chains; and delivering training programs with a practical focus and content (e.g., meat sector programs leading to a Certificate of Hygiene or Master Butcher Certificate).

As the World Bank (2009: 22) correctly observed, the development of *basic principles* for the implementation of a growth strategy needs to build on lessons learned in the promotion of sector-specific growth in the past.

CHAPTER TEN
AUTOMOTIVE SUBSECTOR

10.1 Objective of focusing on the Automotive subsector

The automotive subsector promised high linkages. Its activities involve lots of components manufacturing which can be done by large firms as well as the small and medium scale enterprises. It is the believed that a country who wish to industrialized can quickly achieve that through the development of the automotive subsector. In line with the NV20:2020, this study has the singular objective to develop an implementation plan for the automotive subsector. Specifically, the study will;

- Examine the major constraints to the subsector
- Assess the country distance to world best practices in processing, design and marketing
- Assess the country distance to the technology frontier
- Develop policy agenda for action towards industrialization of the subsector, and
- Develop a mechanism and framework for implementing the agenda for action

10.2 Overview of the Automotive Subsector

The automotive industry was started in the 1890s in Europe and USA. It has since grown to be a major economy activity of many countries, not just in transportation of people, goods and services, but also in manufacturing activity. The manufacture of vehicles accounts for over 5%-10% of the GDP and 10% of the employment in economies with developed automotive industry. The automotive industry is involved in the design, development, manufacture, marketing, sale and maintenance of motor vehicles. The automotive industry requires raw materials from the following subsectors: metals (steel, aluminum, copper, etc), plastics, rubber, paint, industrial chemicals, glass, electronics, textile, etc. in fact the building of a car involves about 2000 components and parts. The linkages provided by the industry are the reasons that the revitalization of the industry will lead to industrialization. The industry is also linked to marketers, finance and credit, logistics, advertising, repair and maintenance,

petroleum products and services, insurance, service parts. It also increases agricultural productivity through farm mechanization and agricultural produce transportation. Also, the military and the paramilitary rely on the auto industry for products like personnel carriers, tanks, and motorized artillery and ship engines.

One of the policy objectives of this administration is to transform Nigeria into an industrial nation and one of the twenty largest economies in the world by the year 2020, among other things. In the 1980s, Nigeria was able to produce (assemble) certain brands of automobiles in which it exported to neighbouring countries and consequently realized foreign exchange. Unfortunately, presently, the country depends on imports for all its vehicles and their components, as the sector now operates at low level of capacity utilization of around 10 percent (a far cry from what it was in the 1970s and 1980s). To the average man on the street, Peugeot Automobile Nigeria (PAN) and Anambra Motor Manufacturing Company Limited (ANAMMCO) are the only automobile manufacturing companies that exist in Nigeria. Indeed we had more. In an attempt to reverse this trend, the Centre for Automotive Design and Development (CADD) was created and charged with the responsibility of ensuring automotive development in Nigeria.

In addition, the federal government established the National Automotive Council (NAC) by the Decree No. 84 in 1993. The Council was saddled with the responsibility to initiate policies and recommend policies including programmes that will facilitate the production of vehicles and their components using raw materials sourced within Nigeria; provision of soft loans to the sub-sector; development of an Auto Test Center to test locally produced and imported components; funding research and development in auto related projects; training and retraining of manpower for the auto industry. In fact, it was reported by the former minister of commerce and industry (Achike Udenwa) in January 2010, that the bill for the merger of CADD and NAC had successfully gone through 1st and 2nd readings at the House of Representative and Public hearing had been conducted, and that the bill was waiting to be passed into law. In line with the set objectives, the NAC has supported the Innoson Technical Company in completing an automobile plant in Nnewi so as to manufacture Mini-bus and light commercial trucks. Other steps taken by the government to develop the automotive sector include privatization programme where it divested its interest in Peugeot Automobile Nigeria, Volkswagen Nigeria as well as Steyr.

Beginning from late 2000s, the federal government again took a bold step to encourage production of cars via its loan facility to civil servants for the purchase of Peugeot cars produced in Nigeria. In fact, it has been reported that the units of Peugeot car is projected to increase from 14,500 (in 2006) to 15,500 in 2011. The ban on the importation of any car whose age is eight years starting from 1999 did not yield any significant result as it only led to smuggling of second hand cars from neighbouring countries. In fact, in 2001, ANAMMCO was able to increase its production to over 500 buses/trucks, while PAN more than doubled its production and sales of vehicles in 2003.

In 2009, Ndy Ekere and Godwin Nnnanna reported that the automotive industry had the capacity to produce 108,000 cars; 56,000 commercial vehicles; 6,000 tractors; 1.2 million motorcycles and one million bicycles annually. However, the sub sector has not been able to meet domestic demand for automobiles due to high costs of production, cheap tokunbo (second hand) cars, poor capital base, poor performance of local content suppliers, poor operating environment, and obsolete technology, among other things.

Table 1: Capacity Utilization, Sources of Raw Material and Employment Profile of the Automotive Subsector

Period	Capacity Utilization	Raw Material Sourcing		Employment
		Local	Import	
Jan-June 2002	40.1	32.2	67.8	67,215
July-Dec 2002	42.5	34.9	65.1	75,756
Jan-June 2003	31.5	37.3	62.7	73,585
July-Dec 2003	28.8	27.2	72.8	71,561
2004	33.7	29.8	70.2	78,330
Jan-June 2005	21.7	23.2	76.8	48,368
July-Dec 2005	30.2	40.5	59.5	55,468
Jan-June 2006	20.6	1.2	98.8	50,143
July-Dec 2006	47	7.3	92.7	63,380
Jan-June 2007	29	8	92	70,590
July-Dec 2007	26	35.4	64.6	

Source: Manufacturers Association of Nigeria Economic Review: Various Issues

Vehicle production in Nigeria reached a peak of over 100,000 in 1981, but steadily declined since to about 5,000 in 2008 as detailed in table 2. The current capacity utilisation in vehicle and component manufacture is below 10% and about 40% in motorcycle, and bicycle manufacturing. The current vehicle inflow into the economy is about 70,000 new and 150,000 used ones.

Table 2: Automobiles Production in Nigeria

Year	CARS	BUSES	TRUCKS	TOTAL
1992	77,306		25,911	103,217
1993	116,440	28,705	9,414	154,559
1994	59,313	21,081	9,162	89,556
1995	30,229	12,687	5,496	48,412
1996	7,663	3,249	4,294	15,206
1997	6,488	2,176	7,735	16,399
1998	12,365	3,384	4,841	20,590
1999	251,178	7,876	6,386	39,440
2000	53,933	18,460	9,675	82,068
2001	108,820	21,803	16,231	146,854
2002	63,962	18,000	14,126	96,088
2003	24,376	20,991	16,103	61,470
2004	27,280	22,447	12,504	62,231
2005	21,599	18,089	11,837	51,525
2006	39,160	28,588	16,531	84,279
2008	38,382	30,327	10,055	78,764
2009	75,340	66,331	53,377	195,048
Total	**787,834**	**324,194**	**233,678**	**1,345,708**

Source: National Automotive Council

Table 3: Production of Automobiles by companies

Plant	Installed capacity unit	Type of Automobiles	1980	1985	1990	1995	1999	2000	2002
ANAMMCO	7800		705	2097	367	190	445	197	416
GM	7500				690	313	229	412	444
SCOA	12000	Vehicles		10000	739	614	0	0	245
STEYR	8000 Vehicles 5000 Tractors	Vehicles M.Cycle	1471	287	0	4	0	0	0
						170			
PAN	63000	Vehicles	48324	36574	8774	3754	6004	7083	5000
VWN	45000	Vehicles	18506	20829	1466	0	0	0	0

Source: National Automotive Council

10.3 Ranked major constriants to the Automotive subsector

- Low local patronage: the governments at all levels and their agencies/parastatals, including the military have reneged on patronizing domestic assemble autos;
- Inconsistent policy: the lifting of ban on importation of autos and the subsequent lowering of import duties resulted to influx of both new and used autos, most of the used autos are not really environmentally friendly
- Weak and deteriorating infrastructure leading to high cost of operation and un competitiveness in regional and global markets.
- Lack of long term and cheap finance

10.4 Stakeholders' perception of solutions to the critical issues

- Unflinching support from government at all levels through the patronage of locally assembled autos. The military and MDAs must also be directed to patronize the locally assembled autos
- A special fund should be set outside for the revitalization of the auto industry
- Development banks whose mandates are to provide cheap and long term loans should be directed to support the industry
- A concrete effort must be made to track the challenge of inadequate power supply and other infrastructure issues
- Government should reinstate the ban on imported vehicles, especially the used cars

10.5 An inventory of the modern industrial applications of the resource base.

Some of the machines used in the automotive sector include:

- Computer Aided Design (CAD), Computer Aided Engineering (CAE) hardware and software
- CNC Machine tools
- Foundries
- Forges

- Robotic welders to spot weld all body panel
- Automates systems for installing the wheel tire and lug nuts
- Plastic injection extrusion and molding machine- use in making automotive plastic parts
- Roll forming equipment- used in manufacturing structural components to the automotives, it is used in manufacturing bumpers, chassis components, door windows runners, cross supports and critical crash sub-assembly systems.
- Bolt making machine
- Boring machine
- Injection molding machine
- Paint shop
- Alignment machine

10.6 Nigeria's distance to World's best practices in processing, design and marketing

Malaysia is the first less developed country in the world to have its own full automotive design and engineering capabilities. The automotive sector in Malaysia is characterized by several participants across the value chain. There are 4 passengers and commercial vehicle manufacturers. There are also 9 motor vehicle assemblers and 9 motorcycle assemblers. To support the manufacturers and assemblers, there are 343 motor vehicle components and parts manufacturers, of which, 23 are Tier 1 status. There are also 100 motorcycle components and parts manufacturers.

In terms of vehicle importers, there are 76 Open Approved Permit (AP) holders. On the sales and distribution side, there are a total of 1,978 dealers for motor vehicles and 158 dealers for motorcycles.

Underpinning the high activity in the Malaysian automotive sector is the substantial investment that has been made in the sector. As at 2004 about RM 11.2 billion have been invested by the manufacturers and assemblers, whilst automotive components and parts manufacturers have invested over RM8.2 billion. This is contrasted with investment in the Nigerian automotive industry; total investment in the Nigerian automotive industry rose from N15.86 billion in July-Dec. 2005 period to N27.35 billion in July-Dec. 2006 period, but fell to N0.35 billion in July-Dec. 2007 period

Sales in the automotive market have also been strong and on the upward trend. In 2004, there were 530,025 units of motor vehicles sold with passenger cars accounting for more than 420,000 of the sales. The total export in 2004 was more than RM2.4 billion.

Notably is the conscious policy of Malaysian government to the development of the country's automotive industry. Government of Malaysia ceaselessly tries to restructure the automotive industry market by encouraging the production of large number of cars to meet the growing demand. Government of Malaysia is providing a 50% refund on excise tax for domestic automotives. Overall, vehicle taxation structure is also going to be changed. Tariff on vehicles, which are imported from other ASEAN areas will also be lowered from 20% to 15%. Excise taxes will also be brought down.

Activities in the Nigerian automotive subsector have been affected; and really the subsector has been struggling very had to survive amidst great challenges ranging from lack of patronage, changing government policies on the subsector and on the general economy, as well as the dilapidated infrastructure. The inactivity in the subsector has rubbed away any gain that has been achieved earlier in terms of processing, design and marketing. It was anticipated that the Nigerian automotive sector would move from mere assembling to full manufacturing of indigenous automotives; nothing had really change in over three to four decades in the industry. The designs of automotives in Nigeria today are all foreign: Japanese, American, British, German autos are common sight in the country. Out of 2000 components and parts involved in the production of a vehicle, about 5% components and parts can be sourced locally now compared to the 1980s when the industry attained 30% of locally sourced inputs. It is when the components are manufactured locally that we can think of indigenous designs, etc.

In total, the Nigerian automotive subsector is very far to world's best practices in terms of processing, design, and marketing.

10.7 Assessment of Nigeria's distance to the technology frontiers

The Malaysian Automotive Institute was established to play a major role to serve as a focal point linking the automotive community (that is: the government, automakers, spare part manufacturers, supporting industries, research organizations, marketers, academic and training institutions) working together to develop and promote the competitiveness of the Malaysian automotive industry. The Malaysian automotive institute focused on 5 major roles:

- Strategic research
- Market assistance
- Human capital
- Supply chain
- Technology development

Another best practice in terms of technology in the automotive is the Argentina, Buenos Aires Automotive. The Buenos Aires is the main automotive production pole in Argentina

contributing about 70% of the total national automotive sector exports and about 50-60% of the production and employment in 2006.

Drivers of the firm level performance in the Buenos Aires Automotive industry:

- Technology transfer from parent companies to subsidiaries in Buenos Aires
- Strong networking among the leading assemblers has helped the appropriation of scale economics
- Stringent requirements imposed by transnational assemblers of completely built up (CBU), driving local suppliers to acquire quality assurance certifications and quality and inventory control systems (about 46% of the automotive firms in the survey reported having ISO 14001 and quality systems (QS))
- Precision requirements imposed by transnational and suppliers using state of the art machinery and equipment
- Participation of domestic suppliers in design and adaptive engineering to meet changing demands of transnational buyers
- Strong training regimes carried out in-house, by the machinery and equipment suppliers and by parents firms of transnational subsidiaries. It has been noted that firms of transnational subsidiaries spent 1% of their sales in training.

There are four identified classes of manufacturers of equipment and machines for the automotive sector. These are:

- Established Manufacturers: these constitute about 9% of the machine fabricators. They employed standard engineering procedures in their operations.
- Cottage level manufacturers: this class of manufacturers has limited engineering facilities and they belong to the micro/small scale-engineering enterprises. About 4% of Nigerian machine fabricators fall into this group
- Research and Development Institutions: these are mainly government agencies and higher institutions – universities of technologies, polytechnics, and other special research institution (like, CADD) that are involve in research and development of equipment and machines.
- Road side manufacturers: this group is mainly artisans; they use crude and manual processing method. Most of their materials are handled manually, and jobs are

mainly gas and welding operations. This group is commonly seen in places like Kaduna, Nnewi, and Ijebu Ode.

There has not been significant development in the automotive sector in term of technology development as the industry has not been operational in the real sense. The industrial capacity utilization has been below 30% in recent times, and for vehicles, it has been well below 10%. Coupled with dilapidating infrastructure, many of the fabricators are moribund, most institutions expecting to build capacity are not technologically equipped; Nigeria could be very far from the technological frontier.

10.8 Specific policy agenda for action for the Automotive subsector

10.8.1 Common facilities for collective response to enhance efficiency gains

- All Nigerians including foreign missions should patronize autos assembled in Nigeria
- Industrial cluster should be developed for the production automotive and non-automotive components.
- Government policy geared towards protecting the domestic industry must endure as well as the provision of common facilities.

10.8.2 Special purpose vehicles for product development and marketing

The Nigeria automotive industry has been awash with foreign designs. The industry has remained unchanged for two to three decades. The centre for automotive design and development (CADD) Zaria has the mandate to design and develop indigenous products. Regrettably the centre has not develop the capacity to achieve its primary mandate. The Capacity utilization in the Nigerian automotive subsector has been affected by unreliable power supply and the heavy importation of its raw material, as about 65% on average of its raw materials are imported. To address the infrastructural need of the automotive subsector, there need for the establishment of automotive industrial clusters across the country. Companies will be encourage to locate in these clusters through incentives and other assistance schemes. The concentration of automotive related activities in such

designated centres will encourage the sharing of infrastructure development costs and other common facilities, as well as enable efficient just-in-time manufacturing. It is imperative that government should create incentive for entrepreneurs to come together (under a special purpose vehicle) to set up production units in the industrial clusters for efficiency gains. Automotive manufacturers and assemblers, as well as components manufacturers most be encourage to come under a special purpose vehicle (SPV) recognized by the government in order to enjoy the common facilities provided in the industrial clusters.

To empower CADD and other institutions of technology to design and develop indigenous product that suit our environment. In the long run we should have automotives designed for different terrains.

- The centre should also be mandated to develop marketing strategies not only the finished products but intermediary products in the value chain system.

10.8.3 Business support services for production and marketing

Small and medium-sized enterprises that are striving to achieve and maintain a competitive edge in the regional and global market need to be backed by efficient and strong national trade support institution. This is very important for the sustained and improved access to trade related services such as financing, help in maintaining quality standards, advice on export packaging and ready information on legal requirements of international business.

The International trade centre (ITC) assists countries in purchasing the goods required to meet their people basic needs, and in improving the effectiveness of their government procurement. ITC works with national institutions to improve their ability to provide consulting support, information and training covering the whole purchasing and supply chain. This involves diagnosing supply bottlenecks and problems, monitoring supply markets, implementing effective purchasing strategies, optimizing the quality of goods, managing the inbound logistics process and protecting imported goods against damage, loss and inefficient utilization.

The china international trading centre services is a business matching platform for international purchase based on enterprise specific demands for the buyers. It also offers the services of technology transfer by brining in the most advanced technology and equipment.

In terms of technology transfer services, they provide the latest information about technology and equipment for manufacturing and processing, including design ideas, implementation and solution. They have a database of top engineers all over the world and keep a cooperative relation with them to achieve technology transfer, including patent purchasing, technology support and equipment transfer.

The special purpose vehicles created to take advantage of common facilities provided by government to enhance efficiency gains in the industry will align with these and other business support services providers for technology, processing/production techniques, designs, and marketing strategies.

It is important that automotive sector to set up workshops where client can have their autos check and maintained. Toyota, Honda, Peugeot has such business support services.

10.8.4 Institutional framework for capacity building

The automotive industry uses many raw materials in its production. The industry is one of the main users of iron and steel, computer chips, textiles, aluminum, copper, lead, plastics, vinyl, and rubber. Government should ensure that small enterprises developed to cater for the need of the industry. Therefore for capacity building:

- Training of manpower in different processes of the industry
- Centre for Automotive Design and Development (CADD) and Universities of science and Technologies/Polytechnics should be well equipped with both physical capital and human capital to build capacity for the industry

10.8.5 Strengthening local and regional value chains

There are about 100 to 120 components involved in manufacturing a vehicle; policy should therefore focus on development of automotive industrial clusters to strengthen the value chain system; the following issues must be address by policy:

- Quality: this must be maintained at any level of the value chain
- Research and development
- Regulations: to ensure standards and that they are not compromised

10.8.6 Specific fiscal and non-fiscal instruments

- Monetary policy
    - Banks should be encourage to lend to the real sector
    - Development Banks should provide term credit to the sector at comparatively low rate
- Fiscal and non-fiscal incentives
    - Tax break or holiday to auto firms that have made new capital investments towards increasing plant output or launching a new assembly line or pioneer product.
    - Grant tax relief on vehicles manufactured in Nigeria for export
    - A levy of 15% to be impose on imported fully built vehicles. This will be bring the import duty to 25% on commercial vehicles and 35% on cars; this is still a lower duty compared to developing economies like, Thailand, India, China, Malaysia
    - Setting up auto reviving fund

10.8.7 Strengthening sectoral innovation systems

- Investment in Research and Development, as well as training for capacity and capability building
- Research grants should be made available for technological breakthrough

10.8.8 Specific measures for the spreading the impact of FDI on domestic capacity and capability building

- Extending/enforcement of the local content Act, as well as ensuring value addition
- Overseas training
- Special incentive for the transfer of technology
- Joint venture with foreign partners
- Transparency in the subsector:
    - Marketing strategies are not disclosed

10.9 Mechanisms and frameworks for implementing the agenda for action

Mechanisms and frameworks for implantation of action plan must recognize the stages of catching-up industrialization, which are:

1. Arrival of Manufacturing
2. Agglomeration: this is the initial FDI absorption: this is actually the stage one of the steps towards industrialization. Here simple manufacturing takes place under foreign supervision. The Nigerian automotive sector has succeeded in assembling autos but has not been able to manufacture any.
3. Technology absorption: developing supporting industries, but still under foreign supervision. Building a new vehicle needs at least 2000 components and parts; small scale industries to provide these components must be seen to be operational. This is the stage two of the industrialization process.
4. Creativity: this phase involve the stage three and four stages of industrialization:
    i. Stage three: Internalizing skills and technology: here management and technology are mastered and high quality products can be produced locally
    ii. Stage four: Internalizing Innovation. Here, there is full capability in innovation and product design

It should be the objective of the Nigerian government to pursue visionary policy that would ensure that the automotive subsector could manufacture Nigerian automobiles in the following timeframes:

- ✓ A Nigerian Vehicle in 10 years
- ✓ A Nigerian Agricultural Tractor in 15 years
- ✓ A Nigerian Motorcycle in 7 years
- ✓ A Nigerian Bicycle in 5 years

1. Establishment of Automotive Fund

   The existing National Automotive Fund (NAF) should be made to work by easy accessibility of the fund, this will assist Nigerian auto manufacturers to face the challenge of competition and liberalization, as well as to cushion the effect of high operating environment due to inadequate infrastructure. The fund must be accessible at 5% interest rate

2. Provision of Incentives to Components and Spare Parts Manufacturers

   This is in two folds:

   a. Cooperation Projects

      Cooperation projects with bilateral trade agreements partners will be used to enhance the competitiveness of the Nigerian automotive sector, particularly the components and parts manufacturers. Areas of potential are quality upgrading, increasing market access, enhancing skills and establishing testing centers in Nigeria.

   b. Support for the regional supply program

      The regional supply program will be implemented to enable domestic components and parts manufacturers to expand into the regional supply chain of the major automotive companies. ECOWAS and AU will provide the fulcrum for the program, while trade agreements and negotiations will be relied to drive the program.

3. Provision of Training Grants

   Training grants will be considered for automotive manufacturers, assemblers and components and parts manufacturers, which undertake training for employees to

upgrade their skill levels and competency. The training could range from in-house training, local and overseas training in designated institutions. The industrial training fund should be used to develop, promote and encourage the acquisition of skills in the industry

4. Provision of Research and Development (R&D) Grants

   Research and Development grants are proposed for automotive manufacturers, and components and parts manufacturers which undertake research and development activities, including designing, prototyping, product development and improvement

5. Developing automotive industrial clusters

   Automotive clusters should be developed in the following places:

   Nnewi, Kaduna,

   Companies should be encouraged to locate in these clusters through incentives, especially the provision of basic infrastructure. The idea is that while they take advantage of the linkages such cluster will provide, they will share in the infrastructure development cost and other common facilities.

6. Ensuring Conformity and Technical Compliance

   The National Automotive Council (NAC) in conjunction with Standards Organization of Nigeria (SON) should undertake vehicle (Motorcycles, Bicycles) Type Approval which involves compliance with international safety standards. Ministry of environment will enforce the emission and fuel consumption standards as the case applies. Such enforcement of the mandatory standards of manufactured goods will prevent imports of sub-standard products

7. Extension of Petroleum Technology Development Fund

   The petroleum Technology Development Fund will be extended to technological developments in the automotive sector

8. Provision of Market Development Grants

   Market Development Grants will be provided to assist small and medium enterprises (SMEs) to undertake relevant activities for the development of export markets. Companies can obtain a 50% matching grants on the approved costs of eligible activities

9. Provision of Customized Incentives

   Customized incentives will be provided to automotive related companies, after due consideration and evaluation. These incentives include corporate tax exemption, training and R&D grants, as well as soft loans

   Provision of customized incentives will be evaluated based on the following criteria:

   - ✓ High value-added
   - ✓ Degree of technology transfer
   - ✓ Improvement level of expertise
   - ✓ Level of foreign exchange earnings
   - ✓ Strengthening of manufacturing value chain
   - ✓ Developing linkages within the industry
   - ✓ Undertaking of research and development

CHAPTER ELEVEN
IMPLEMENTATION MATRICES FOR THE SELECTED SUB-SECTORS, 2011-2014

The implementation matrices recommend initiatives comprising programmes and projects aimed at rejuvenating enterprises and stimulating sustainable growth towards realizing the objectives of NV2020. The detailed implementation matrices including the expected outcomes and outputs for each subsector during the plan period, is as follows:

FOOD AND BEVERAGES (F&B) SUB-SECTOR

Sub-sector Initiative	Objectives	Proposed Action	Expected Outcome	Output	Implementing Agency
1. Promotion of industrial clusters or cooperatives for joint procurement of raw materials	To generate economies of scale among F&B enterprises in raw materials procurement	-Establish industrial clusters in selected LGAs in production areas - Establish central collection point for raw materials/commodities	-Production cost is reduced -Products are competitive -Capacity utilization is boosted -Poverty is reduced	-Established clusters -Increased output generated -Employment generated	SMCI/FMCI, SMEDAN, BoI and UNIDO
2. Establishment of testing centres in clusters for commodity processors	To promote self determination of quality of flour among producers	-Establish testing centres in the developed clusters -Establish third party testing facilities	-High quality products produced and marketed -Market access for food and	-Established testing centres with the equipment -Quantity of high quality food and	SMCI/FMCI/NAFDAC, MAN, SON, NEPC, SMEDAN, BoI and UNIDO

			beverages products locally produced	beverages products generated	
3. Capacity development for local equipment manufacturers	To increase availability and use of local technology	-Establish a training centre on equipment fabrication in each geo-political zone of the country	-Indigenous technology is promoted and available -Sustainability of SMEs in F&B subsector guaranteed -Foreign exchange is conserved	-Established training centres in equipment fabrication -F&B machineries locally produced -Increased number of SMEs and functional F&B outfits -Employment generated	FMST, IITA, RMRDC, PRODA, NASENI, OPS, BoI and UNIDO
4. Supporting research and development of product and process technologies in R&D institutions	To generate innovative approaches for producing and processing new F&B products	-Provide funds for research into F&B products in government R&D institutions -- Promote R&D activities in F&B private companies.	-Appropriate product and process technologies are developed and adopted -Functional R&D institutes capable of developing cut edge technologies for F&B products development -Reduction in the cost of production	-Developed product and process equipment -New products arising from outputs of R&D institutions	ARCN/FMST, International Research and Development Agencies, IITA, ARCEDEM, PRODA, NASENI, RMRDC, BoI and UNIDO

5. Establishment of Industrial parks in each agro-ecological zone through PPP	To improve efficiency of production and reduce cost of infrastructure to F&B industries.	-Establish industrial parks at six locations And equip them with state of the art facilities/infrastructure	-Infrastructure and other services available for use by F&B industries at particular locations -Efficiency in production and product competitiveness	-Established six industrial parks -Increased output of F&B products -Employment generated	SMCI/ FMCI, FMST, BoI, UNIDO, etc
6. Establishment of inventory credit scheme through PPP to enable farmers earn remunerative prices	-To increase income of farmers in the production of raw materials for the F&B industries through PPP - To provide consumption loans to farmers in the off season pending sale of their produce - To improve the marketing of farm produce as raw materials for F&B industries	-Identify and support private investors in storage and preservation enterprises for F&B raw materials -Provide credit guarantee to farmers to enable them hold inventories for storage and preservation.	-Farm produce are preserved and held in storage till price is good for farmers to sell their produce Wastage of F&B raw materials is significantly reduced - Farmers sell their produce at more remunerative prices -Farming business becomes more lucrative and attractive	-increased income of farmers Availability of F&B raw materials throughout the year -New farmers attracted to the F&B subsector	FMCI/FMARD/SMCI/SMEDAN, CBN, Farmers Union, etc.

7. Developing pilot projects to demonstrate alternative uses of raw materials to the investment public	-To introduce innovations in using raw materials for adoption by entrepreneurs To increase investment in the processing industry for F&B products.	Empower the - R&D institutions to build pilot plants for demonstration purposes - Promote business visits to demonstration sites.	-Pilot plants are established and innovations demonstrated and adopted More investments generated in the processing industry for F&B products	-Establish pilot projects -New products in F&B subsector derived from alternative uses of available raw materials	FMCI/FMST/ARCN/SMEDA/PRODA/RMRDC, BoI, NIPC and UNIDO
8. Enhancing quality and enforcing standards and measures for different products	-To improve quality of raw materials for production To improve the quality of products in F&B industry	-Engage universities and research centres for induction/training on quality maintenance in F&B industry -Sensitize and train stakeholders in F&B subsector on products quality improvement and standardization	-Industries in F&B subsector use high quality raw materials and produce high quality products in sufficient quantity	-Regulatory document on raw materials and products standardization and regulation -Output of standardized and high quality products	Universities/FMST/Research Centres, SON, NAFDAC and UNIDO
9. Entrepreneurial skills development for the F&B operators	To promote entrepreneurship in the F&B industry	-Establish entrepreneurial skills training centres in the six geo-political zones for processing viable F&B commodities	-Successful and efficient F&B enterprises -Increased entrepreneurial knowledge base for business development	-Improved entrepreneurial skills in the sector --Increased production and sales of F&B products -Employment generated	FMCI/SMCI/SMEDAN, ITF and UNIDO

				-Employment generated	
10. Promoting agricultural production through farmer support and youth empowerment and development of farm input market locally and regionally (CAADP / ECOWAP)	To increase production and supply of raw materials for the F&B industry	-Provide farm input support to small-scale farmers -Conduct regular training for youth in different farm enterprises -Provide farm infrastructure and inputs to youths.	-Raw materials for production available for the F&B industry. -F&B industry operate with high level of efficiency	-Increased output of F&B products -Employment generated	FMARD/SMARD/ARCN/RMRDC/NCAM/NIFOR
11. Promoting right to food for generating incremental demand for local foods and beverages	To stimulate demand for regular and specialty products of F&B through the market mechanism	-Mainstream rights instruments in the industry action plan for F&B -Sensitization of the Nigerian public to the right to food	-Demand for regular and specialty foods and beverages is increased - Demand for raw materials in FBS increased -Industrial production of food and beverages is increased -Increased calorie intake Increased capacity utilization in the	-Increased quantity of F&B produced -Employment generated	FMCI/CSOs/FMH/FBOs/SMCI/SMH

			F&B industry		
12. Rejuvenation of commodity development and marketing companies	To establish a national market for food and beverage products dovetailed into the Abuja Securities and Exchange	-FMCI takes over the three agricultural commodities development and marketing companies from FMARD - Implement the recommendations of the Study Group on Commodities Development and Marketing Companies towards reorganizing and revitalizing the companies	-A national market is established for FBS products - The performance and efficiency of the three companies established by the Federal Government is improved to the advantage of FBS -Effective and efficient marketing companies -Enhanced market space for F&B products	-Established marketing companies -Output generated -Employment generated	FMARD/FMCI/CEC/SMCI/ F&B commodity associations
13. Price support for cassava exports	To promote the substitution of imported wheat flour and other products with cassava flour and other products	-Give export grant for cassava -Restructure tariff in favour of cassava production in the country -Impose tariff to discourage imports	-Export of cassava is increased -External market opens to cassava manufacturers -Increased production of	-Increased export volume of cassava products -Employment generated	FMCI/FMF/NEPC/SMCI/CBN

		of cassava products	cassava and cassava products		
14. Providing tax waivers and financial incentives for establishing factories for domestic manufacture of sugar and dairy products	To increase the domestic production of sugar and dairy products	-Grant pioneer status to companies -Grant tax relief for research and development in companies -Enforce minimum local content policy -Provide tax credit for minimum raw materials utilization	-New factories for sugar production and dairy products established -Increased local production of sugar and dairy products -Increased capacity utilization in the dairy and sugar industries	-Established sugar and dairy factories -Output of sugar and dairy products produced -Employment generated in the industry	FMCI/FMF/R&D Institutes/OPS
15. Establishment of innovation platforms for constant interaction and generation of new ideas for addressing constraints to production and processing of different raw materials at LGA and State levels	To bring the market actors in F&B together for smooth transactions, information sharing and innovation	-Establish Market Linkage Platform (MLP) to link farmers and industrial processors of agricultural raw materials	-Market transactions and information sharing is improved -Innovation is generated to the advantage of FBS producers of raw materials and processors -Policy service providers, input dealers and other	-Product and market efficiency in the F&B subsector	FMCI/FMARD/SMCI/LGAS/FMST/R&D Institutes

			market actors come together on the platform for enhanced stakeholders' interactions		
16. Improving the capacity of industry actors for proposing, negotiating and attracting investments into FBS from abroad	To enhance the capacity of and development of the F&B subsector using FDI	-Engage a professional organization in building capacity for writing proposal to different sources of FDI abroad -Organize trade missions abroad -Identify different sources of FDI in the international market -Build capacity for generating proposals from different sources including agricultural sector actors in trade missions abroad	-FDI is increased -Technology diffusion is enhanced	-Increased output of F&B subsector and contribution to manufacturing value added -Employment generated through FDI inflow to the F&B industry	FMCI/SMCI/FMI /NIPC

TEXTILE AND WEARING APPAREL SUBSECTOR

Sub-Sector Initiative	Objectives	Proposed Action	Expected Outcome	Output	Implementing Agency
1. Public policy reform	To prevent further decline of the textile industry	✚ Exempt locally produced textiles from VAT for three years ✚ Partly disburse Textile Development Fund on priority to the textile mills whose applications have already been assessed ✚ Allow imported spare parts, dyes and chemicals at 0% duty	✚ Temporary relief measures brought revival to ailing textiles industries and repositioned them for sustainability	✚ The revived textile industries ✚ Quantity of textile and apparel products ✚ Employment generated	FMCI, FMF, NTMA
2. Textile Development Fund	✚ To assist existing textile industries through a soft loan ✚ To ensure that ailing textile industries are rehabilitated and working	✚ Mandate BoI to manage the fund and fully disbursed in six months ✚ BoI should develop practical and attainable criteria for disbursement agreed by fund provider, BoI and beneficiaries ✚ Devote 5 per cent	✚ Textile industry back on stream and operating efficiently at least in the medium term. Some of the existing textile and garment companies which had borrowed at high interest rates could re-structure their funding ✚ Textile and garment companies which have already identified some	✚ The revived textile industries ✚ Quantity of textile and apparel products ✚ Employment generated	FMCI/ BOI/FMF/DMO/Commercial Banks/NTMA

	as well as enhance the capacities of existing downstream activities in support of the sub-sector	textile and garments import tax income to textile and apparel subsector development Rehabilitate and upgrade the capacities of identified downstream industries	new projects for up-grading could embark on the same without further delay Identified ailing textile industries rehabilitated and operational and able to meet a good percentage of demands by Nigerians locally Core industries working at optimal level Most of the industrial raw materials now sourced locally		
3. Dealing with smuggling and counterfeiting of textile and wearing apparel	To reduce the inflow of cheap and sub -standard products To enhance competitiveness of Nigerian textiles and wearing	Standards Organization of Nigeria (SON) and the Nigerian Customs Service (NCS) should be mandated to strictly monitor influx of counterfeit textiles from across the borders Increase enforcement of, and dialogue on anti-smuggling and anti-counterfeiting policies and programmes	-Reduction in smuggling and counterfeiting -Boosted capacity utilization -Increased demand for locally grown cotton	-Quantity of textile and apparel seizures and destroyed products -Quantity of locally produced textile and apparel products	FMCI/NCS/SON/Police

	apparels	- Warehouses and outlets selling fake textiles should be inspected; - Counterfeit materials should be seized and destroyed periodically; - Simultaneously the Government should draw the attention of the Chinese authorities to the serious injury caused by their exporters to the Nigerian cotton and textile sector and seek action against violation of IPR's and falsification of quality certification and country of origin markings			
4. Power supply	To remove obstacles to the smooth functioning of textile industries through reduction of cost of production	–Make adequate supply of LPFO directly from the refineries to the textile mills at the subsidized official price -The above should also apply to all other inputs critical for production	-Textile mills operate efficiently and produce competitive products	-Increased quantity of textile products -Employment generated -Volume of PLFO supplied to textile mills	FMCI/ FMF/NNPC/FMP

5. Human resource development for textile and apparel products	To make available adequate manpower for product development in the textile and apparel subsector	Strengthen existing institutions (e.g. Nigeria Customs Service and Nigerian Ports Authority) for skills development by: -Training key institutions to recognize, seize and destroy counterfeit textiles -Providing additional funds to identified institutions -Providing all necessary infrastructures, buildings, furniture, vehicles, etc needed for smooth running of the institutions under a PPP arrangement. This should apply to all stages of textile production	-Efficient performance of the textile and apparel subsector -Needed manpower for textile and apparel subsector is produced locally	-Functional and effective human resource institutions -Developed manpower -Volume of textile and apparel products produced	FMCI, BoI, OPS, ITF, SMEDAN, UNIDO
6. Institutional capacity building for product improvement	To improve on the quality of products in the textile and apparel subsector	Upgrade national regulatory institutions to improve Product standards: -Make SON to acquire and install relevant equipment not yet in place	-Marked improvement in the quality of products produced in the country -Market access for products in textile and apparel subsector enhanced	-Upgraded regulatory institutions -Produced national standards for textile and	SON/ FMCI OPS

		-SON to domesticate/popularize updated standards among manufacturers - SON to implement and enforce updated standards among manufacturers		apparel products	
7. Strengthening BoI to midwife the revival process of the textile and apparel subsector	To enable BOI extend medium to long term soft credit to all spectra of activities in the textile and apparel subsector	-Recapitalize BoI with the sum of N300.0 billion - BoI extends soft credit to identified genuine textile and apparel manufacturers	-Increased capacity utilization -Increase in the contribution of the textile and apparel subsector to manufacturing value added	-The recapitalized BoI -Number of textile and apparel companies that benefitted from soft credit from BoI	FMC&I, CBN, BoI, FMF
8. Promotion of Garment Export	To ensure that Nigeria takes advantage of policies like AGOA for the expansion of garment export	-Establish one Cluster per senatorial district for the promotion of Garment production -Organize entrepreneurial training (using the STEP model) for the Garment sub-	-Increased capacity of the numerous garment makers to improve on their products and meet specification for foreign markets -Increased contribution of the garment industry to the	-Quantity of garment products produced fro export -Value of foreign	FMCI, NEPC, OPS, SMEDAN, BoI and UNIDO

		sector	Nigerian economy and to exports	exchange earned through export of textile and apparel products	
9. Strengthening SMEs particularly in the Garment sector	To remove constraints to garment production and particular small scale fashion industry in Nigeria	-Provide grants to SMEs in this sector -Facilitate equipment leasing to assist production -Provide micro credit to SMEs in the textile and apparel subsector -Provide business support services to SMEs in the textile and apparel subsector for efficiency and sustainability	-Increased capacity of the garment subsector -Increased output and employment level of SMEs in the fashion and garment industry	-Established and functional SMEs in the textile and apparel subsector -Employment generated -Quantity of garment production emanating from SMEs in the textile and apparel subsector	FMCI, SMEDAN, OPS and UNIDO

LEATHER AND LEATHER PRODUCTS SUBSECTOR

Sub-Sector Initiatives	Objectives	Proposed Action	Expected Outcome	Output	Implementing Agency
1. Creation of Leather and Leather Products Development Council (LLPDC) with members from all sectors of the Industry	To ensure proper coordination of the subsector in terms of management	-Establish the Council drawing members from relevant stakeholders in the subsector - Provide adequate funding for efficient management	- LLPDC set up and operating effectively - Effective and efficient coordination of Leather and Leather products activities in the country - Production of high quality leather and leather products	-Established LLPDC -Increased output of leather and leather products -Employment generated	FMCI, MAN, NACCIMA and other OPS groups
2. Creation of Leather Development Fund through 1 % deductions of the import duties on leather and leather related products	To ensure that ailing and growing firms (especially, the local Tanneries and Footwear and other leather products manufacturers) are rehabilitated and functional	-Provide soft credit (5 per cent interest rate maximum) of ₦100 billion to identified ailing and growing firms. -Rehabilitate and upgrade the capacities of identified core firms -Banks to offer special loan (7 per cent interest rate maximum) to the sector	- Identified ailing firms rehabilitated and operational and able to meet a good percentage of demands by Nigerians locally. -Core firms working at optimal level - High percentage of industrial raw	-Increased output of leather and leather products -Employment generated Quantity of leather raw material	FMCI, CBN MAN, NACCIMA, Finance

			materials sourced locally		
3. Boosting energy source to the Industry	To increase the capacity utilization of the industry	-Make adequate and direct supply of LPFO to the industry -Supply LPFO at a subsidized price -Establish gas fired turbines to service leather and leather products clusters	-Increased capacity utilization reduction in unemployment -Increased output and contribution of the subsector to Manufacturing value added	-Leather and leather products output growth -Employment generated	NNPC, MAN
4. Establishment of 2 Industrial Clusters	To provide basic industrial infrastructure for the production of globally competitive leather and leather products.	-Develop the cluster for leather and leather products in Kano and Aba equipping them with relevant infrastructure(including secondary treatment facilities for effluent especially for Kano cluster) -Manage the clusters on PPP basis	-High quality leather and leather products available in sufficient quantities to meet domestic and international market	-Established clusters in Kano and Aba -Employment generated	FMCI, FMF, SMEDAN, OPS, Leather Associations in Kano and Aba,

5. Provision of Tax Holiday to indigenous firms that have made new capital investment towards increasing plant output	To encourage the local entrepreneurs to invest in machinery	-Grant tax exemption	-Procurement and installation of new equipment and operational leather firms	-Quantity of output generated -Employment generated	FMF, MAN, NIPC and FMCI
6. Provision of special grant to foreign firms that have demonstrated high level of local content, value addition, and domestic capacity building	To increase local resource utilization in the industry	-Grant 5 per cent total VAT collection of the firm -Enforce the local content act	-Increased local content in raw material used (including chemicals) -Increased local content in processing	-Increased output -Employment generated -Increased income created through industry use of local raw materials	FMF FIRS, FMCI,
7. Update of national regulatory requirements for creating enabling environment to improve Product standards	To improve on the quality of leather and leather products produced in the country	-Make SON acquire and install relevant equipment not yet in place -SON should domesticate/popularize updated standards among manufacturers	Marked improvement in the quality of products produced in the country.	-Produced regulatory materials -Quantity of improved leather and leather products generated	SON, OPS, State Governments and the Leather Associations in Kano and Abia States
8. Promotion of SMEs in the Leather and Leather Products sub-Sector	To develop SMEs in the leather and leather products subsector	-Provide common facilities for leather and leather products SMEs -Establish business support centres (BSCs) for SMEs in leather and leather products - Strengthen Credit	Increased output, employment generation, improved business knowledge and practices-with enhanced potential for	-Quantity of leather and leather products emanating from SMEs -Jobs generated in the SME sector	

		Guarantee Scheme for MSMEs akin to the Agricultural Credit Guarantee Scheme (ACGS)	growth		

CHEMICALS AND PHARMACEUTICALS SUBSECTOR (INCLUDING PETROCHEMICALS)

Subsector initiative	Objectives	Proposed Action	Expected Outcome	Outputs	Implementing Agency
1. Provision of Special Fund for the rehabilitation of ailing chemicals and pharmaceutical firms and the development of petrochemicals complex as a core industry	To rehabilitate ailing industries and make them work and enhance the capacities of existing petrochemical industries to operate at optimal level and provide raw materials needed in the manufacturing sector locally.	-Provide soft credit (at 5 per cent interest rate maximum) of N300 billion to identified ailing industries - Provide soft credit (at 5 per cent interest rate maximum) for the expansion programme of the privatised EPCL and the rehabilitation and eventual privatization of Kaduna Refinery & Petrochemical Complex	- Identified ailing industries rehabilitated and operational and able to meet local demands - Emergent petrochemical industry that is able to meet significant proportion of raw material demand of local firms.	- increased capacity utilization - increased employment in industry - locally produced fine chemicals in sufficient quantities - increased volume of locally produced chemicals and pharmaceuticals - improved manufacturing technology/technological upgrading	BoI In collaboration with: FMCI,CBN, FMF, NPC, MAN, NACCIMA, NASME, NASSI and NNPC
2. Recapitalization of Bank of Industry	To enable BOI extend short, medium and long term soft credit to all spectra of chemicals and pharmaceuticals	-Recapitalize BOI with the sum of N300.0 billion - BOI extends soft	-Increased capacity utilization -Increase in the	- increased quality and quantity of local manufactures	CBN In collaboration with: BoI, FMCI, FMF,

	firms to implement capital investment and cover critical working capital	credit to identified genuine manufacturers	contribution of chemicals and pharmaceuticals subsector to the GDP	- increased employment - improved manufacturing technology	MAN, NASME, NASSI, NACCIMA
3. Establishment of 5 Industrial Clusters	To provide basic industrial infrastructure and enhance product competitiveness.	-Identify and develop cluster sites -Equip developed clusters with relevant industrial Infrastructure -Manage them on PPP basis	-Available chemicals and pharmaceutical products at competitive prices - increased employment in industry - expanded industrial base/activities - use of new technologies - high quality products	-5 established chemicals and pharmaceutical clusters -Increased output of chemicals and pharmaceutical products in the country -Developed cluster infrastructure	SMEDAN In collaboration with: FMCI, OPS, FMF, State and Local Governments, UNIDO

4. Update of national regulatory requirements to improve product standards	To improve the quality of products produced in the country	-Make SON acquire and install relevant equipment not yet in place -SON should domesticate/popularize updated standards among manufacturers	Marked improvement in the quality of products produced in the country	- exportable products - improved manufacturing technology/technological upgrading	SON and NAFDAC In collaboration with: FMCI, OPS, Nigerian Institution of Quality Assurance, UNIDO
5. Establishment of a mega distribution company for pharmaceuticals	To ensure efficient distribution of pharmaceutical products and enable ease of tracking of genuine and fake products	- Register a mega distribution company and obtain necessary licenses - Provide warehouse and offices for the regional hubs and headquarters - Recruit personnel for the company	- Improved access to genuine pharmaceutical products - Reduction in the circulation of fake and counterfeit drugs	- Circulation of genuine products in sufficient quantities - Seizure and destruction of fake and counterfeit drugs - Prompt arrest and prosecution of persons involved in the circulation of fake and counterfeit drugs	PMG_MAN In collaboration with: FMCI, NAFDAC, SON, MAN
6. Establishment of a centre of excellence in pharmaceutical research	To carry out R&D on local medicinal plants, development of bulk drugs, and	- Upgrade and equip National Institute for Pharmaceutical Research and	- Linkage of R&D with industrial needs (demand driven	- Granted patents on new drugs and processes	FMST In collaboration with:

	manufacturing of generics.	Development (NIPRD) with state of the art R&D infrastructure -Establish a Pharmaceutical Research and Development Support Fund (PRDSF) - implement an incentive regime to attract Nigerian scientists in Diaspora and retain young and talented Nigerian scientists - implement generous incentives that enable firms to collaborate with NIPRD	R&D) - Discovery of new APIs - Discovery of new processes of manufacturing generics - Local research initiatives that address major and peculiar African drug challenges (e.g. malaria drugs/vaccine, HIV/AIDs drugs/vaccines)	- Generics manufactures and orphaned drugs (drugs with expired patents) developed - New drugs manufactures - New centre of excellence in pharmaceutical R&D -Increased employment - brains gained	FMCI, FMH, FMF, NPC, NACA, PMG-MAN, NASME, NACCIMA and other OPS bodies
7. Promotion of SMEs in the Chemicals and Pharmaceutical sub-Sector	Increase local production of Chemicals and Pharmaceutical products in the country	-Provide common facilities for Chemicals and Pharmaceutical clusters -Establish business support centres (BSCs) for SMEs in	Increased output, employment generation, improved business knowledge and practices-with enhanced potential for	-Quantity of Chemicals and Pharmaceutical products emanating from SMEs -Jobs generated in the SME sector	SMEDAN In collaboration with FMST, FMCI, BoI, PMG-MAN, NASSI and NASME

		chemicals and pharmaceutical products - Strengthen Credit Guarantee Scheme for MSMEs akin to the Agricultural Credit Guarantee Scheme (ACGS)	growth in the SME sector		

ELECTRICAL AND ELECTRONICS SUBSECTOR

Subsector initiative	Objectives	Proposed Action	Expected Outcome	Outputs	Implementing Agency
1. Provision of a Special Fund for the rehabilitation of ailing electrical and electronics firms.	To rehabilitate ailing industries and enhance their capacity utilization and local sourcing of raw materials.	-Provide soft credit (with 5 per cent maximum interest rate) of N300 billion to identified ailing industries.	- Identified ailing industries rehabilitated with improved capacity utilization and increased local content in operation	- locally produced electrical/electronic goods - increased capacity utilization - increased employment in industry - increased volume of locally produced intermediate products - improved manufacturing technology/technological upgrading	BOI In collaboration with: FMCI,CBN, FMF, NPC, MAN, NACCIMA, NASME, NASSI
2. Recapitalization of Bank of Industry (BoI).	To enable BoI extend short, medium to long term soft credit to all spectra of electrical and electronics firms to implement capital	-Recapitalize BOI with the sum of N300.0 billion - BOI extends soft credit to identified genuine manufacturers at	-Increased capacity utilization -Increase in the contribution of electrical and electronics	- Increased local production of high quality electrical and electronics products - increased employment	CBN In collaboration with: FMCI, FMF, MAN, NASME, NASSI, NACCIMA

	investment and cover critical working capital	single digit interest rate	subsector to GDP - increased quality and quantity of local manufactures - improved manufacturing technology		
3.Establishment of Industrial Clusters	To make available basic industrial infrastructure to reduce production cost and enhance manufacturing competitiveness.	- Identify and develop cluster sites and equip them with relevant infrastructures -Manage established clusters on PPP basis	- One electrical and electronics cluster established in each of the 6 geo-political zones -Products of these clusters meet local demand and export	- 6 established electrical and electronics clusters - increased employment in industry - expanded industrial base/activities - use of new technologies - high quality products	SMEDAN In collaboration with: FMCI, OPS, FMF, State and Local governments and UNIDO.

4. Update of national regulatory requirements to improve product standards	To improve the quality of products produced in the country	-SON acquire and install relevant equipment not yet in place -SON domesticate/popularize updated standards among manufacturers	Marked improvement in the quality of products produced in the country.	- Exportable products - improved manufacturing technology/technological upgrading	SON In collaboration with: FMCI, OPS, Nigerian Institution of Quality Assurance
5. Development of Industrial Data Base/Bank	To ensure the existence of reliable and up to date information/data on the manufacturing sector as well as update of same on regular basis.	-Commission a Consulting firm to handle the start-up infrastructure as well as identified data/information required for evidence-based policy advocacy	Information/data on the manufacturing sector captured and Industrial Database established for influencing policy dialogue	Reliable data on electrical/electronics subsector across time and space	NBS In collaboration with: FMCI, NISER, NPC, OPS, MAN, UNIDO
6. Establishment of 6 Vocational Centres in the Six Geo-political Zones	To provide adequate manpower needed and best practice for the manufacturing sector.	Identify and develop sites and provide themwith necessary infrastructures, buildings, furniture, vehicles, etc needed for the take-off of the vocational centres that will cater for all trade groups.	-Take off of the Vocational Centres -Most of the low to medium level manpower needed for the manufacturing sector available locally.	- Established 6 Vocational Centres in the Zones - increased number of employable and skillful Nigerians - increased employment - improved product quality	SMEDAN In collaboration with: FMCI, NASENI, ITF

7. Establishment of a centre of excellence in electrical and electronics research	- to carry out R&D on electrical and electronics equipment/appliances and components	- upgrade and equip *Electronic Development Institute (EDI)* with state of the art R&D infrastructure - establish an Electrical and Electronics Research and Development Support Fund (EERDSF). - implement an incentive regime to attract Nigerian scientists in Diaspora and retain young and talented Nigerian engineers/scientists - implement a generous incentive package that enables firms to collaborate with EDI	- linkage of R&D with industrial needs (demand driven R&D) - invention of new electrical/electronic equipments and components - adaptation of existing modern electrical/electronic equipment to local environment and applications - brain gain	- patents on new electrical/electronics inventions - improved manufacturing capability in the subsector - new centre of excellence in electrical & electronics R&D - increased employment	FMST In collaboration with: FMCI, FMF, NPC, MAN, NASME, NACCIMA, Computer Assoc. of Nigeria
8. Promotion of SMEs in the Electrical and Electronics sub-Sector	Increase local production of Electrical and Electronics products in the	-Provide common facilities for Electrical and Electronics clusters	Increased output, employment generation, improved	-Quantity of Electrical and Electronics products emanating from SMEs	SMEDAN, FMCI, FMF and the OPS

	country	-Establish business support centres (BSCs) for SMEs in electrical and electronics products - Strengthen Credit Guarantee Scheme for MSMEs akin to the Agricultural Credit Guarantee Scheme (ACGS)	business knowledge and practices-with enhanced potential for growth	-Jobs generated in the SME sector	

NON-METAL MINERAL SUB-SECTOR

Sub-sector initiative	Objectives	Proposed Action	Expected Outcome	Outputs	Implementing Agency
1. <u>Cement</u> **Promotion of the establishment of Mini Cement Plants**	-Increase the local production of cement -Increase local consumption of the product -Moderate and stabilize the price of cement locally - Environmental compliance in production process -Create a level playing field in the industry -Improved Quality of product	-Consistent implementation of government cement policy and opening up of the industry through transparent approach -Grant licenses for importation (to bridge supply-demand gap temporarily) and encourage housing construction and economic as well as social infrastructure generally -Reduce import duty on the product -Put an end to monopolistic practices in the industry -Introduce incentives to attract FDI into the industry	-More entry into the industry by smaller and new players -Self-sufficiency in cement production and potential for export -Increased consumption from current 91 kg/capita to 450 kg/per capita global average within three years-leading to improved economy characterized by rising contribution of cement to manufacturing value added and expansion of the Nigerian capital market (Stock Exchange) -Increase in competition and quality of products -More players and	-New cement plants constructed -Existing cement plants which operations have been boosted -Number of jobs generated -Quantity of cement produced locally	FGN in collaboration with: FMCI, OPS, FME, NASS, SON, etc.

		-Put a lid on profit margin as a temporary measure -Constant monitoring and enforcement of environmental standards as specified in extant and emerging policy documents -Formulate policy to end abuse of import waivers	increased output with logical impact on price level -Healthy balance between economic and social objectives and the facilitation of sustainable development -Increased consumer welfare and incentive for FDI inflow -Globally accepted quality cement and positive impact on construction work		
2. <u>Ceramics</u> Promotion of ceramics industry in Nigeria	-Increase earnings from the industry -Widen the scope of operations for optimal contribution to national development -Attain appropriate determination and measurement of the structural and	-Relax the constraints facing the industry in the areas of access to funds and appropriate raw materials -Train and develop skills of experts in the field of ceramic science and the deployment of appropriate technology	-Raise revenue generation to ₦50 billion annually within a short period -Enhanced impact on the economy -Increased local value addition	-Established and functional ceramics industries -Quantity of ceramics products in the country -Employment generated in the ceramics industry	All tiers of Government, FMST, NASENI, OPS, and PRODA

	chemical properties of the raw materials used in ceramic systems -Reduce dependence on imported machinery				
3. <u>Glass</u> **Promotion of local production of glass**	Increase local production-in quantity and quality	-Provide institutional support to manufacturers in the areas of infrastructure and finance - Provide institutional support to PRODA - Relax constraints to local production	Improved performance in the glass industry	-Established and functional glass industries -Quantity of locally produced glass in the country -Employment generated in the glass industry	Federal and State governments
4. <u>SMEs</u> Promotion of SMEs in the **Non-Metal Mineral** sub-Sector	Maximize the contribution of the SMEs to manufacturing value added	-Identify genuine SMEs in the subsector -Facilitate market Access -Establish Business Support Centres to upgrade SME operations to e-business level	Increased output, employment generation, improved business knowledge and practices-with enhanced potential for growth	-Quantity of glass emanating from SMEs -Jobs generated in the SME sector	SMEDAN

		-Strengthen Credit Guarantee Scheme for MSMEs akin to the Agricultural Credit Guarantee Scheme (ACGS)			

BASIC METAL, IRON AND STEEL SUBSECTOR

Sub-Sector Initiative	Objectives	Proposed Action	Expected Outcome	Outputs	Implementing Agency
1. <u>Iron and Steel</u> **Resuscitating the iron and steel industry in Nigeria**	-Strengthen the base of Nigeria's Iron & Steel Industry -Enhance the growth of Nigeria's industrial sector -Reduce Nigeria's dependence on steel import -Improve the quality and quantity of manpower in the metallurgy and materials industry -Reduce the cost of Steel production in Ajaokuta in particular and Nigeria generally -Enhance policy coordination in the industry -Enhance technology acquisition in iron & steel production - Enhance	-Reactivate the moribund Ajaokuta Steel Company Ltd and the National Iron Ore mining company at Itakpe -Revisit the privatization of Delta Steel company -Open up more steel plants and mines -Increase government investment and improve management in iron and steel plants -Increase and improve dialogue and collaboration between government and relevant professional bodies -Create special scholarship scheme for students pursuing	-Production of Nigerian Steel of high quality -Improved pool of skilled manpower -Internationally competitive steel prices -Improved decision making process and effectiveness of interventions -Improved Public Expenditure Management/Value for Money and Public Service Delivery	-Reactivated Ajaokuta Steel Company Limited and the National Iron Ore Mining Company at Itakpe -Functional Delta Steel Company -Established new steel plants and mines -Quantity of locally produced iron and steel products -Employment generated in the iron and steel companies -Nigerian experts with metallurgy and materials engineering qualifications -Dredged River Niger and navigable water ways	FGN with FMMSD with Steel Companies, AISA, NMS, Educational Institutions, State Governments, FMCI, FME, FMST, BPE, and OPS.

	effectiveness and efficiency in the management of steel plants	Metallurgy & Materials Engineering in local and foreign institutions -Hasten the completion of the Niger River Dredging Project -Put necessary external infrastructure (including road networks) in place in the various mining sites -Adopt and implement a robust consistent policy of technological transfer through agreement with reputable international firms in the industry noted for best practices -Establish a Nigerian National Steel Corporation		-Built physical infrastructures	

		-Enthrone Transparent Corporate Governance in the industry			
2. <u>Foundry</u> **Establishment of viable foundries in Nigeria**	-Rapidly increase the number and quality of foundries in the country -Elevate Nigeria to the rank of innovation-driven nations in foundry	-Retain steel scraps within the country for foundry usage -Develop human capital with strong entrepreneurial base; -Establish knowledge and software innovation parks in strategic areas of the country -Increase R&D intensity and infuse a technological culture and a new mindset among Nigerians -Establish Foundry Vocational Centres in each of the six geopolitical Zones	-Sprouting of foundries across the country (2,000 by 2015-from less than 100 currently) and job creation -Improved Quality Products	-Established functional foundries -Degree of innovation in established foundries -Established innovation parks -Established foundry vocational centres	FMCI With SMEDAN, NASSI, NASME, FME, FMST, NOA NASENI, ITF, and Polytechnics

3. <u>Machine Tools</u> **Retooling the machine tools industry**	-Develop the machine tools industry	-Review the privatization of the Nigerian Machine Tools Industry, Osogbo -Build a functional machine tools industry on a PPP arrangement	A solid base for the fabrication of machine tools developed	-Functional Nigerian Machine Tools Industry, Osogbo -Number of jobs generated	FGN with the OPS and National Steel Corporation
4. <u>Aluminium</u> **Evolving a world-class aluminium industry**	-Make locally produced aluminium competitive	-Explore improved local raw material input for aluminium production -Review the tariff rate on imported aluminium (plain coil) and streamline to stimulate local production and discourage cheap importation -Encourage the adoption of best production practices through the adoption and pursuance of aluminium measuring and benchmarking	Improved quantity and quality of aluminium production locally	-Quantity of aluminium products produced locally -Number of jobs generated	FGN with RMRDC, OPS, and FMCI, and MAN.

5. <u>SMEs</u> **Promotion of SMEs in the Basic Metal, Iron and Steel sub-sector**	-Increase the participation of SMEs in the sector -Improve quality assurance in the production process	-Introduce a regime of reduced interest rates and improved access to credit -Establish a sensitization programme on quality improvement among SMEs in the sub-sector -Establish business support centres (BSCs) for SMEs in basic metal, iron and steel subsector - Strengthen Credit Guarantee Scheme for MSMEs akin to the Agricultural Credit Guarantee Scheme (ACGS)	-Increased local output of Basic Metals -Improved quality Basic Metals of global standard	-Quantity of Basic Metal, Iron and Steel materials produced by the SMEs -Number of jobs generated by the SMEs	CBN with Bankers Committee, BoI, SMEDAN, FMCI, OPS, SON, and CPC

AUTOMOTIVE SUB-SECTOR

Sub-Sector Initiatives	Objectives	Proposed Action	Expected Outcome	Output	Implementing Agency
1. Provision of a Special Fund for the rehabilitation of automotive subsector	To rehabilitate the automotive subsector and make it work as it draws its raw materials locally	-Provide soft credit (at 3 per cent interest rate maximum) of N200 billion to automotive subsector -Rehabilitate and upgrade the capacities of identified SMEs (components manufacturers) to full capacity	- Rehabilitated and operational automotive subsector that meets the demand by Nigerians locally - Relevant SMEs working at optimal level - Automotive components are locally supplied	-Rehabilitated and operational SMEs in the automotive subsector -Quantity of automotive parts locally supplied	FMF FMCI,CBN NAC, NAMA, NACCIMA, NPC, MAN, NASME, NASSI
2. Domestic patronage of automotives assembled or made in Nigeria	To promote made in Nigeria automobiles	- Lift the suspension on the purchase of vehicles assembled in Nigeria -Make all MDAs to patronized made in Nigeria Autos -Make campaign for patronize of	-Evolvement of a made in Nigeria auto -Increased contribution of the automotive subsector to manufacturing value added	-Output of automobiles -Employment generated	Presidency, MDAs, NAC, NAMA, FMCI

		made in Nigeria autos			
3. Government provision of incentives and protection measures	To enhance the competiveness of the automotive subsector and promote more investment in the subsector	-Create tariff differential of at least 30 per cent between CKD and fully built units	- Increased output of the assembly plants - Increased investment in the subsector	-Built up Assembly plants -Quantity of assembled vehicles- -Employment generated	FMCI, FMF, NAC
4.Extension of the PTDF to the automotive subsector	To develop capacity in technology for the automotive subsector	-Give scholarship to students to pursue advanced degrees in auto-related courses locally and abroad -Give grants to researchers for research and development in auto	-Equipment and machines built to support the automotive subsector -Strong local capacity for auto development	-Number of scholarships and grants awarded -R&D outputs in the auto subsector	FMF, PTDF , NAC, BoI, ITF, SMEDAN, FMCI, Polytechnics and Universities

5. Establishment of two auto clusters	To reduce the cost of production by making available basic industrial infrastructure at these clusters	-Identify and develop 2 auto clusters and equip them with the relevant infrastructure -Manage them on PPP basis	Competitive auto products and components locally produced and available	-Established auto Clusters -Auto products and components produced -Employment generated	FMCI, FMF, NAC, NAMA, NACCIMA, MAN, NASSI, NASME, SMEDAN, UNIDO
6. Rehabilitation of Centre for Automotive Design and Development (CADD)	To ensure the availability of adequate manpower needed and best practice for the Automotive industry in Nigeria	-Rehabilitate the Centre and provide all necessary infrastructure and logistics for effective operatons -Recruit adequate staff (professional and administrative) -Provide adequate funding for running the centre	-Technical manpower needed for the industry available locally	-Rehabilitated and operational CADD -Auto designs and products -Employment generated	CADD, FMCI, NAC, FMF, Ahmadu Bello University, FMST
7. Retooling the Industrial Training Fund (ITF)	To promote and encourage the acquisition of industrial skills in Nigeria	-Restructure and resize the Fund for effective and efficient management -Set	-More people accessing the Fund -Improved quality of training offered by ITF	-Nigerians benefitting from the Fund -Employment	ITF, FMCI, FMF, Nigerian universities

		target for the Fund to achieve over the plan period -Provide adequate funding	- Widely dispersed information on the industry -Requisite industrial skills possessed by a critical mass of Nigerians	generated	
8. Establishment of regulator agency for automotive standards	- To ensure that parts and components and vehicles conform to safety and environmental standards - To conduct vehicle Homologation	Establish automotive test centre and safety standards	Automotives, spare parts and components meet environmental and quality standards	-Established auto regulatory agency -Quantity of auto parts and components produced according to established standards	NAC, SON
9. Enforcement of the local content programme	To encourage the replacement of imported CKD with local parts	Charge 35 percent import duty on parts and components that can be made locally	Increased local contents and value addition in the subsector	Quantity of automobiles benefitting from local content	NAC, FMCI, FMF, OPS
SMEs 10. Promotion of SMEs in the automotive sub-	-Increase the participation of SMEs in the subsector -Improve quality assurance in the	-Introduce a regime of reduced interest rates and improved access to credit	-Increased local output of auto parts and components -Improved quality auto parts and components of global standard	-Quantity of auto parts and components produced by the SMEs	CBN with Bankers Committee, BoI, SMEDAN, OPS, NAC, NAMA, etc

sector	production process	-Establish a sensitization programme on quality improvement among SMEs in the sub-sector -Establish business support centres (BSCs) for SMEs in the automotive subsector - Strengthen Credit Guarantee Scheme for MSMEs akin to the Agricultural Credit Guarantee Scheme (ACGS)		-Number of jobs generated by the SMEs	

PART C

CROSS CUTTING ISSUES

C H A P T E R TWELVE

FUNDING OF INDUSTRIAL DEVELOPMENT

12.1 Introduction

Improving industrial production in Nigeria requires considerable financial resources. With the focus of Government on its facilitator role, the private sector is expected to be the primary financier of industrial development. The liberalization policy of Government is to be pursued vigorously in order to attract private sector participation in the industrial sector. The tariff structure will be market-driven, enabling investors and operators to recover their investments over a reasonable period of time, in an open and competitive manner. Furthermore, there are several financing schemes in the newly created Bank of Industry for the provision of soft loans and advances to all categories of industries on concessionary terms. However, the magnitude of resources required for industrial development cannot be met by available domestic capital. Thus, there is need for Direct Foreign Investment (DFI).

Aims

(i) Provide greater opportunities for access to loanable funds to entrepreneurs and industrialists in the country;

(ii) Achieve annual growth of at least 30per cent in net capital inflow into the manufacturing sector consistently so as to meet the target of the contribution of industry to Gross Domestic Product.

Strategies

The strategies by which industries will be funded include:

i) The provision of credit facilities on concessionary terms by Development Banks such as Nigerian Agricultural, Co-operative and Rural Development Bank (NACRDB), and Bank of Industry.

ii) The provision of equity funds and long term loans by the Banking Sector for the promotion of small and medium enterprises.

iii) Commercial banks shall continue to be encouraged to provide funding for industrial development.

Bank of Industry (BOI)

Substantial resources have been allocated by the government for the funding of industrial growth through the Bank of Industry. This bank was created from the merger of the National Economic Reconstruction Fund (NERFUND), the Nigerian Bank for Commerce and Industry (NBCI) and the Nigerian Industrial Development Bank (NIDB). The Bank of Industry is one of the primary Development Finance Institutions in Nigeria for lending to industries. The bank will provide medium to long-term funds for investment in the productive sectors of the economy.

Nigerian Agricultural, Co-operative and Rural Development Bank (NACRDB)

The primary function of this bank is to promote the development of rural areas, through the exploration and initial processing of raw materials that are abundant in those areas. Accordingly, the bank is expected to facilitate the availability of primary industrial inputs through the provision of medium to long-term funds for agriculture and agro-allied industries. The bank resulted from the merger of Peoples' Bank, Nigerian Agricultural and Cooperative Bank, and Family Economic Advancement Programme (FEAP).

Funding of Micro, Small and Medium Industries

In line with the objectives of the national economic policy, the Micro, Small and Medium Enterprises (MSMEs) have been identified for promotion in order to achieve the goals of self-reliance, poverty alleviation, food security, employment generation and rapid industrialization. Furthermore, the CBN has encouraged the setting up of Micro Finance Banks while on the other hand, the Bank of Industry (BOI) has also set aside 85per cent of its resources for the funding of SME's. As a statutory source of funds for NAC, government's provision for 2per cent levy on the Cost, Insurance and Freight (CIF) value of all automotive products import to Nigeria, which is meant to administer the Council, support automotive research activities and support investment sector in the form of soft loans, should be exploited.

Foreign Capital

The attraction of foreign capital into the manufacturing sector is crucial to the attainment of many of the nation's policy targets. Indeed, new opportunities arising as a result of the restructuring of the economy, implementing liberalization and privatization policies and rewarding returns on capital investments are all factors which will combine to enhance the flow of foreign capital into Nigeria. Therefore Government has put in place structures which facilitate the inflow of foreign capital and modern technologies into the manufacturing sector in order to attain set policy goals.

(a) Deregulation of the Economy

It is realized that domestic capital is inadequate to promote rapid economic growth particularly in respect of the targets set by the Government. Therefore, attracting foreign capital into the manufacturing sector is crucial to the attainment of many of the policy targets. Indeed, restructuring of the economy through liberalization, privatization and other deregulatory measures taken would make the country more attractive to foreign capital. Through this, industries would have greater access to foreign exchange and investible capital for their activities.

(b) Good Governance/Policy Stability in the Country

Good governance and the rule of law are being pursued with vigour in order to encourage local and foreign investors. Policy stability has also been enthroned to generate investors' confidence and long-term planning.

(c) Reduction of the Multiplicity of Regulatory Agencies

Multiple regulatory agencies have been streamlined with the establishment of the one stop investment centre in the Nigerian Investment Promotion Commission (NIPC) to facilitate the inflow of foreign capital and technology into the Nigerian economy.

(d) Port Reforms

In order to reduce the cost of doing business in Nigeria, the ports are being reformed to facilitate the clearance of goods within 48 hours while numerous agencies at the ports are being reduced.

(e) Internationalization of Securities and Exchange Commission

In order to facilitate the inflow of foreign capital into the country, the operations of the Securities and Exchange Commission (SEC) have been internationalized to encourage foreign investors to own shares in the local industries.

(f) Facilities Available at the EPZ and FTZ

Through the administration, marketing and publicity of the incentive/facilities available at the Export Processing Zones (EPZ), and the Free Trade Zones (FTZs) in Nigeria, foreign investors are being encouraged to invest in these facilities thereby increasing the volume of capital inflow into the country.

(g) Provision of Infrastructural Facilities

In order to ensure efficient production, Government will continue to provide infrastructural facilities like roads, electricity, telecommunications, water, etc.,

(h) Technological Advancements

To improve domestic level of Technology, Government is attracting foreign capital and necessary skill into the Economy. Accordingly, various institutions such as National Office for Technological Acquisition and Promotion (NOTAP) and Technology Incubators are being strengthened to facilitate technology advancement.

C H A P T E R THIRTEEN
GEOGRAPHICAL DISPERSAL OF INDUSTRIES

Geographical dispersal of industries is a primary objective of Government. In a federal state like Nigeria, balanced development is an important objective of the state. The stability and coherence of the state depends on the inclusiveness of government policies at the individual and regional basis. The vision 20-2020 envisages an industrialization process that recognizes the regional comparative advantage of the various parts of the country and encourages the dispersal of industries across the nation. The existing State structure provides an adequate basis for dispersal of industries. Within this context the urban/rural divide is to be taken into account. Rural industrialization has been a major challenge in Nigeria since independence. The result has been the growing rate of migration to the urban centers. About 38 per cent of the country's population lives in urban centres because of the greater opportunities for gainful employment. This has resulted in the stretching of available facilities in these centres to the extent that in some cases, these facilities have broken down. Rural industrialization is critical in Nigeria to stem the flow into urban areas that are not able to absorb the migrants. Agro allied industries have the potential of using readily available raw material in the rural areas to sustain production and improve on their competitive advantage.

It is realized that location has to take certain basic economic realities into account. This fact will be borne in mind in locating industries generally. Emphasis will be placed on resource-based industries to ensure healthy dispersal of industries with minimum fear of wrong choice of location. Specific programmes that will aid dispersal of industries will include: establishment of Industrial Development Centres, Industrial Layouts and Industrial Estates. Within the limit of incentives and facilities provided by government, private investors will be free to locate their industries anywhere they choose without undue interference. Viability considerations will also receive necessary emphasis in deciding the location of enterprises.

Problems associated with the provision of these infrastructures are issues which Government would address in creating enabling environment for manufacturers. Every Local Government Area (LGA) is expected to map out and provide the necessary infrastructure in the industrial estates for private sector development. There are 774 Local Government Areas in the country

and if the locations of all the privately financed industries are even, it would imply that persons (employees of the industries) would not have left their areas of origin or would have been prevented from migrating to the urban centres. This would make for an even development, reduce avoidable pressure on the economy, reduce crime rate and increase the Gross Domestic Product (GDP).

The plan is to ensure that by the year 2015 at least 75 per cent of all primary products are processed within the Local Government Areas in which they are sourced.

The strategies to ensure the attainment of the target of the plan include:

- Provision of Infrastructural Facilities in all Local Government Areas - One of the problems of industrialization in Nigeria is over concentration of industries in a few industrial centres. In order to encourage geographical dispersal of industries, therefore, it is the intention of Government to encourage the provision of infrastructural facilities in all the Local Government Areas (LGAs). In order to achieve this, State and Local Governments are encouraged to establish Industrial Estates/Layouts in their respective areas. Similarly, generous incentives have been provided to encourage investment in industrially and economically disadvantaged areas of the country.
- Creation of Industrial Growth Poles through the use of Special Incentives -Another strategy through which geographical dispersal of industry is to be achieved is the creation of Industrial Growth Poles that requires the activities of free trade zones, enterprise development zones, industrial estates, industrial layouts and craft villages to influence the development of the catchment areas through the use of the relevant incentives for developing the peculiar business enclaves.
- Establishment of Industrial Estates by LGAs - By establishing infrastructural facilities like industrial estates, incubation centres and layouts by the LGAs in their respective domains, industries would be attracted to such LGAs thereby facilitating the geographical dispersal of industries in the country.

CHAPTER FOURTEEN
INDUSTRIAL SUPPORT INFRASTRUCTURE

All the subsectors covered by this report identified weak infrastructural support as a major constraint to development. Some infrastructural support cut across the various industrial subsectors. The primary determinant of development in every economy is the level of activity in commerce and industry within its territory. Investment is very important in this process. In fact, it is always the desire of every nation to attract sufficient investments (foreign and domestic) within its borders. But the ability to attract investments usually depends on the availability of an enabling environment including security, infrastructure, incentives, sound regulatory processes etc. Nigeria's efforts in the past have in most cases been thwarted by lack of favourable operating environment.

Nigeria has witnessed a paradigm shift in favour of Public Private Partnership (PPP), in which government becomes a major facilitator of business by investing heavily in infrastructure development, while the private sector will tap into the emerging opportunities by investing especially in the productive sectors and running successful enterprises.

Banking and financial services are essential to industrial development. The recent successful banking consolidation which has strengthened and deepened the capital base of Nigeria Commercial banks shall be further enlarged to promote industrial development. Similarly, government shall continue to stabilize the value of the naira and create a system to ensure that the country has sufficient foreign reserves at all times to cater for her needs in keeping with the spirit of the Vision 20/2020.

The provision of physical Infrastructure is also critical for making industry competitive and for the locational advantage within the region. In this regards government shall continue to develop centres of excellence for export-oriented industries to accelerate the country's economic development, including encouraging private sector participation in the provision and maintenance of infrastructural facilities at affordable prices and encourage the provision of infrastructure through the Build, Operate and Transfer (BOT) principle.

Industrial clusters have proven to be successful mechanism for industrial promotion in a number of countries and would be promoted to achieve the targets of this plan.
The primary determinant of development in every economy is the level of activity in commerce and industry within its territory. Investment is very important in this process. The clusters will provide an enabling environment including security, infrastructure, incentives, to attract sufficient investments (foreign and domestic).

The Cluster Concept is an effort to create a community of businesses located together in which members will seek enhanced environmental, social and corporate performance towards effective global trade competitiveness. Moreover, the concept will enable government to concentrate infrastructure and other amenities necessary for smooth operation of businesses in identified locations. The cluster Concept in Nigeria will operate at different levels: industrial parks; industrial clusters; enterprise zones and incubators.

Nigeria's new Industrial Development Strategy is anchored on the Cluster Concept. The point has been made that Nigeria's business environment is currently very harsh and not conducive for private sector activities, particularly the manufacturing sector.
The Cluster Concept is an effort to create a community of businesses located together in which members will seek enhanced environmental, social and corporate performance towards effective global trade competitiveness. Moreover, the concept will enable government to concentrate infrastructure and other amenities necessary for smooth operation of businesses in identified locations.
The cluster Concept in Nigeria will operate at different levels:

- Industrial Parks;
- Industrial Clusters;
- Enterprise Zones; and
- Incubators.

Industrial parks

These are mega parks covering areas of not less 30 50 square kilometers for large manufacturing companies with high value addition in the production of finished products or raw materials. Activities in these parks will focus on the development of the resources in

which the geographical zone has both comparative and competitive advantages. The parks to be established should concentrate on the following areas of business activity:

- North East :Agriculture and Solid Minerals e.g. Gypsum, Biomass, Ethanol, Biodiesel, Tropical fruits, etc
- North West: Gum Arabic, Livestock and Meat Processing, Tanneries, Biofuel, etc
- North Central: Fruit Processing, Cotton, Quarries, Furniture and Minerals
- South East: Palm Oil Refining and Palm Tree Processing into Biomass Particle Boards. Also, Manufacturing and over the counter drugs (OTC), plastic processing, leather goods, garments, etc
- South West: Manufacturing (especially garments, methanol, etc), distributive trade, general goods, plastics, etc and
- South-South: Petrochemicals, Manufacturing (plastics, fertilizers, fabrications, etc), Oil Services and Distributive Trade (TINAPA).

Each park will have:

• An independent Power Unit up to 50/100 MW;

• A Training School;

• Internal road Network and major road links to the highways;

• Rail links where possible;

• Security;

• New towns development;

• Water supply/sewage treatment;

• Airport within'100 km radius;

• Universities/polytechnics within 200km radius.

Financial requirements for setting up each of these parks could be between N60 billion and N150 billion ($8500m -$ 1 b) . It will also be managed by a Consortium of Companies. Generous industrial Incentives to be provided for businesses in these parks include:

- Tax rebate (0per cent import duty and VAT free on machinery/equipment)
- Special duty on raw material (max 2per cent)
- Low loan rate (max 4per cent)
- No stamp duties on new capital or expansion
- Training support, etc

Industrial clusters

Industrial Clusters are oases of industrial activities and commerce, covering areas of between 100 and 1,000 hectares, for the Organized Private Sector (OPS).

They are usually smaller in scope than Industrial parks. These Clusters will be established with the participation and assistance, of States and Local Governments. In addition to being enclaves of manufacturing activities, they could be used for breaking bulk.

- The sitting of Industrial Cluster must consider access road, railway, sea port or cargo airport and proximity to the city;
- Its finance requirement will be between N10 billion and N50 billion depending on the size;
- Management of the industrial Cluster will be by a Private Cluster Company
- Generous Industrial incentives similar to the Industrial Parks will obtain;
- Each Cluster will have a Skills Acquisition / Training Centre based on the module to be provided;
- Private Investors (property developers) could also establish and run Industrial Clusters in the States.

Enterprise zones

These are platforms of 5 - 30 hectares, targeted at scaling up the informal sector to the Organized Private Sector (OPS). The aim is to make effort to alleviate their problems, which range from skills deficiency, funding, access to credit and infrastructure.

- Enterprises Zones will be located in both state capitals and in every Local Government Area;
- Expectedly, these centres would accommodate mechanics, block makers, small-scale furniture manufacturers, timber merchants, welders/metal fabricators, garment makers, and other categories of artisans and vocational workers who constitute over 70per cent of Nigeria's Private Sector;
- A Skill Acquisition/Training Centre will be located in each Enterprise Zone for skills upgrading while management of the Enterprise Zone would be by a private sector company;
- Funds required to set up an Enterprise Zone will be between N2 billion and N5 billion depending on the size. However, this could be much lower especially if it is sector specific, e.g. for mechanics, cane-furniture makers, etc

Incubators

An incubator is a start – up centre for new and inexperienced entrepreneurs, such as graduates of tertiary institutions, inventors and vocational persons wishing to set up their own businesses. In these Incubators, prospective start-up companies are thus equipped with entrepreneurial skills and programmes aimed at nurturing them from scratch to maturity.

- These Incubators will have shared facilities essentially to reduce cost. They will also be provided with mentors in their respective areas of business activity who would guide this early phase of business;
- Success of these companies is valid to the economy and so they would enjoy an array of incentives from government;
- Incubators would promote businesses especially in ICT, development of special tools/moulds and commercialization of inventions/research findings. They could equally be attached to Universities;
- Given the fact that Local Governments may not have the level of funding, expertise and experience required to effectively run these Incubators, State Government's are in a better position to establish them. Venture Capital Companies could also be attracted to provide risk capital.

Role of Government

Establishing Clusters is a capital intensive venture, which in the long run is usually very rewarding. The major role of government would be infrastructural support power/energy, road, technical training, etc. Once a model is created, it then becomes possible to attract the private sector to invest especially by offering generous terms on interest rate and long term funding through the creation of special funds, which financial institutions can access (indirect funding mechanism). Major turnkey developers can also be encouraged to establish Clusters in different parts of the Country.

Expectations from the Private Sector

For the Cluster Concept to succeed it requires active buy-in and support of the private sector though the role of government is key. In fact, the over -all success of the concept is hinged on a workable Public Private Partnership (PPP) arrangement. The role of government has already been stated, the private sector on its part will be expected to

- Establish businesses in Free Trade Zones, Industrial Parks, Clusters and Enterprise Zones once they are set (commitment/interest has already been demonstrated by the Organized Private Sector (OPS)

- Invite their business partners across the globe to also set up businesses in these Cluster (easiest way to create joint ventures);
- Nigeria's banks especially could participate in the Cluster Concept by devoting part of the SMIEIS or funds to the establishment of Industrial Clusters, Enterprise Zones and Incubators.
- Bank could also target part of the International Finance Corporation (IFC) funds currently with some banks to businesses in the Clusters,
- Private Sector will reciprocate government gesture by helping it to recoup investments made in the Clusters. In fact, government interest in such Cluster real estate can be sold off once success is established.

Funding option

Government will provide long term, single digit interest fund dedicated to Cluster development but managed by designated bank(s);

- Select, through a process, private sector property developers to build and manage the Cluster
- Selected developers should be able to access funds from designated banks on terms.

CHAPTER FIFTEEN
POLICY IMPLEMENTATION FRAMEWORK AND STRATEGIES

15.1 Institutional framework for implementation

A successful plan will require a sound institutional framework for proper implementation. The current structure today involves the following: a) Federal Government; b) State Governments; c) Local Government Councils; d) The National Council on Commerce and Industry (NCCI); and e) Private Industrial Establishments (Private Sector)

Effective formulation and implementation of the sector-specific implementation plan requires systematic liaison and collaboration among the relevant ministries and agencies and continuous dialogue and consultation with key stakeholders. For this purpose, a participatory framework that involves all stakeholders has been evolved for the implementation of the plan. In this regard, relevant institutions identified as principal components of the implementation Plan shall be established, while existing institutions shall be strengthened. The federal Ministry of Commerce and Industry, which is the lead agency in charge of overall responsibility for coordination of the Trade and Industrial Policy framework and shall anchor the implementation of this plan.

15.2 Roles of key stakeholders

15.2.1 Public Sector

The role of the Public Sector in the new industrial dispensation will be to facilitate the operations of micro, small, medium, and large scale industrial enterprises. Thus, the public sector will create the enabling environment for industries to thrive.

15.2.1.1 Federal Government

The Federal Government is responsible for the: a) provision of a stable macro-economic and social environment where industrial activities will function unhindered without violence, unrest, acrimony and destruction of structures and properties;

- b) provision of the enabling environment within which industry will thrive as well as providing guidance to States, Local .Governments and other supporting institutions;
- co-ordination of data on industries arid facilitation of research and development of all facets of industrial activities;
- introduction of incentives, tariff and pricing policy for all classes of industrial products and representation in appropriate policy formulation committees;
- promotion of the sale of exportable industrial products both within and outside the country;
- maintenance of a reasonable flow of resources into industrial development by way of providing infrastructural requirements to create conditions that will facilitate resource flows from other sources;
- training of manpower for industrial development (inspectors, technologists, researchers, export developers and input management experts);
- promotion of appropriate technology in preservation, processing, packaging, quality control, standardization, storage, financing, risk-bearing, market intelligence, transportation and market structures, through the development of prototypes and pilot projects as a follow-up to research inventions.
- promotion of primary production of all items of export-oriented industrial products by providing focus and encouragement for access to the ECOWAS, Sub-Saharan Africa, Continental and global markets; and
- striving towards a politically united and stable, socially just, cohesive and violence and corruption free society.

15.2.1.2 Federal Ministry of Commerce and Industry (FMCI)

The Ministry formulates broad industrial policy. Among its specific functions are:

- Proposing policy options and recommending to Government such measures as legislation, fiscal incentives, etc.
- Monitoring and evaluating the implementation and performance of government policies.
- Establishing policies for promoting industrial growth as set out in this policy;
- Representing Government on matters pertaining to industry in regional and international fora.

15.2.1.3 State Governments

The State Governments are primarily responsible for the following activities:

- The maintenance of virile and effective Industrial Development Centres (IDCs) and extension services which can deal with problems of production, preservation, storage, processing, financing, risk-bearing, standardization, quality control and other marketing functions;
- The training of manpower for trade and industrial growth and development.
- The establishment of appropriate institutions for the provision of advisory and counseling services.
- Investments in roads, water and electricity in the localities where the required material inputs and industrial products are available.

15.2.1.4 Local Government Councils

The Local Government Councils provide assistance in the provision of:

- an effective industrial production support service;
- site infrastructure
- mobilization of consumers for accelerated development of finished products through co-operative organizations and community associations;
- assistance in data collection at the primary level; and construction, management and maintenance of local markets to enhance trade and industry.
- National Council on Commerce and Industry (NCCI)
- The National Council on Commerce & Industry (NCCI) is the highest policy making body on industrial matters in the country. It provides a forum where the Honorable Minister of Commerce and Industry meets with the Commissioners responsible for trade and industrial matters in the States of the Federation as well as other stakeholders in the public and private sectors to rub minds on issues relating to trade and industrial development of the country.

15.2.2 Private Sector

The private sector is expected to assume the leading role in Nigeria's industrialization process following the current Government Policy reform measures. Through the privatization programme, government has substantially sold its shareholding in public enterprises. Thus, after providing a level playing field by dismantling the state monopoly of enterprises as part of the reform agenda, Government is ensuring good business practices, and preventing the emergence of private sector monopolies. The opportunities which the private sector should take advantage of are spelt out in subsequent chapters.

15.3 Management framework for Policy Implementation

Effective formulation and implementation of the industrial Master Plan requires systematic liaison and collaboration among the relevant ministries and agencies and continuous dialogue and consultation with key stakeholders. For this purpose, a participatory framework that involves all stakeholders has been evolved for the implementation of the plan. In this regard, relevant institutions identified as principal components of the Master Plan shall be established, while existing institutions shall be strengthened. The Federal Ministry of Commerce and Industry is the lead agency in charge of overall responsibility for coordination of the Trade and Industrial Policy framework.

The overall framework would have at its apex the President of the Federal Republic of Nigeria to give the needed push and guidance to the overall industrialization process in the country. Since a number of ministries and agencies at all tiers of government are involved in the process it is necessary for the President to take a leading role in this plan. The President will be assisted by a Presidential committee (taskforce) on industrialization which will draw on various stakeholders at both the federal and state levels and involving the OPS and labour.

Other organs that would have direct involvement in the process would include; Economic Management Team, Minister of Commerce and Industry, Trade and Industrial Promotion Institutions, National Council on Commerce and Industry, Executive Secretariat,

15.3.1 The Economic Management Team (EMT)

With the introduction of the various economic reform measures in 2003, it became imperative to give a sense of direction and focus to the management of the economy. This was achieved through the formation of the Economic Management Team (EMT) under the leadership of the President and the Economic Team under the chairmanship of the Minister of Finance. The EMT provides broad policy guidance and general direction to the economic reform programme of Government, monitors and coordinates the implementation of the various reform measures, ensures that various quantitative targets and structural benchmarks under the Policy Support Instrument (PSI) are met and serves as a forum for reaching consensus on proposed policy measures before the issues are referred to the Federal Executive Council (FEC). Membership of the EMT comprises the Minister of Finance, Minister of Commerce and Industry as well as the Chief Executives of the MDAs that are the major drivers of growth of the economy. .

15.3.2 Industrial Policy Advisory Council

Aims

- Co-ordinate industrial policy formulation and negotiations among relevant government and ministries and agencies.
- Monitor implementation of industrial Master Plan
- Establish industrial desks, for proper functioning of industrial promotion

Strategies

- Reviewing industrial policy in line with national needs and global challenges.
- Periodic meeting of ministries and agencies may be necessary for review of changing global environment.
- Ensuring the comprehensive incorporation of Nigeria's interest into the formulation of international agreements and strict compliance of all parties to reciprocal provisions of any treaty as regards industrial policy matters.

Structure

- Ministries of Foreign Affairs, Agriculture, Information & Communications, Finance, Commerce and Industry and other trade and industrial related ministries. - Chaired by Mr. President.

15.3.3 National Council on Commerce and Industry

This Council, made up of all Ministries responsible for commerce and industry at both the Federal and State levels, Organized Private Sector, international organizations and other stakeholders meets regularly to review matters relating to trade and industry, with a view to ensuring efficient performance of the trade and industrial sector.

15.3.4 National Focal Point (NFP) on Multi-Lateral Trade and Industrial Matters

The Focal Point is to serve as a forum for systematic consultation, and collaboration among relevant Government Ministries, Agencies, Academia and the Private Sector, for effective management industrial Matters.

Strategies

- Providing policy advice on matters relating to trade and investment negotiations, agreements and other trade relations.

- Identifying and discussing major concerns bearing on commercial policy.
- according priority to the country's participation in the various projects aimed at rapid development of a virile African commercial and industrial network;
- ensuring effective participation of Nigeria in the activities of various international organizations, and abiding by their relevant multilateral agreements.
- encouraging National Council on Commerce and Industry and all trade and industrial related institutions to take advantage of the opportunities available at international levels to attain their set goals.
- supporting the efforts of the Economic Community of West African States (ECOWAS) in harmonizing industrial development in the sub-region for member countries to benefit from the attendant linkages.
- encouraging and supporting the export of locally produced arid manufactured goods and services to other African countries.
- encouraging and supporting other African regional integration initiatives in industrial development, harmonization of the regulatory policies and promotion of direct trade and industrial links.

Structure

The structure of the National Focal Point comprises of the Committee on Goods, Committee on Services and Committee On Trade-Related Intellectual Property Rights (TRIPS), with their fifteen Sub-Committees as approved by the Federal Executive Council. An important feature of the National Focal Point is the provision for establishment of 'trade and investment desks' in relevant member ministries, for effective handling of commercial and industrial activities.

15.3.5 Executive Secretariat

The Executive Secretariat shall be the technical aide mechanism for coordinating and harmonizing the activities of the National Focal Point, National council on Commerce and Industry and the Trade and Industrial Policy Advisory Council.

The ***aim*** is to advise the Minister of Commerce and Industry on policies and initiatives relating to trade and commercial policy.

- Provide technical support for international trade negotiations and exchanges.

- Facilitate and co-ordinate the activities of the other principal components of the framework for trade and commercial policy, including maintenance of the records of the National Focal Point.

Strategies

- Monitor and advise on pertinent domestic, regional and international development and on implementation of approved policies.
- Conduct studies bearing on key policy issues. Draft policy statements and documents.

Structure

Headed by the Permanent Secretary, the Executive Secretariat shall be responsible for:

- Advising the Minister of Commerce and Industry on trade and industrial related issues;
- Directing the Secretariat's activities;
- Technical direction of the commercial and industrial
- Officer Service;
- Ministry dialogue with stakeholders on trade and industrial issues;
- Membership will include Directors of relevant Ministries
- Staffing by commercial and industrial officers and contracted professionals.
- Commercial & Industrial Officer Service

15.4 Agencies for Promoting Competition

Due to the tendency of a free market enterprise economy to encounter the challenges of monopoly, misplaced fiscal and monetary policy priorities and unfair exposure of the local industry to imports from developed economies, specific agencies shall be established to join the efforts of the Consumer Protection Council for the promotion of competitiveness in the trade and industrial sector of the economy.

Government has put in place measures to encourage a level playing field for enterprises in the domestic and foreign markets through the establishment of the Nigerian Trade and Competition Commission.

15.4.1 Federal Competition Commission

Aims

• Ensure fair competition and consumer protection in domestic markets through efficient and fair enforcement of antidumping, anti-trust, consumer protection and weights and measures legislations.

• Advise government on changes in policy consistent with bilateral, regional and international trade agreements.

• Prosecute and adjudicate allegations of breach of any of the four legislations.

Strategies

• Review and administer. relevant laws, practices, standards and procedures relating to consumer protection, anti-dumping, competition and weights and measures.

• Recommend measures and legislation that conform with international practice and undertakings.

• Develop methods, standards and procedures for investigating, prosecuting and adjudicating allegations of dumping and other unfair trade practices by exporters and importers.

Structure

• Nigerian Trade and Competition Commission comprises of the following five related bodies, each of which shall be governed by its specific legislation:

- Anti-dumping Authority;
- Anti-Trust Competition Authority;
- Consumer Protection Council;
- Weights and Measures; and
- Standards Organization of Nigeria (SON).

15.4.2 Bankruptcy Commission

The structure and functions of the Bankruptcy Commission shall be as approved by the enabling legislation and grounded by the Bankruptcy Act of 1979 and any subsequent amendments.

15.4.3 Stakeholders Consultations

Aims

• Effective systematic and well informed consultation with key stakeholders on trade and commercial policy concerns.

• Development of an informed constituency within the general public, generally supportive of the principal aims of government trade and industrial policy.

Strategies

- Appropriate periodic consultations with the Executive
- Secretariat, National Focal Point, National Council on Commerce and Industry, Trade and Industrial Policy Council, Intellectual Property Rights Commission, and the Nigerian Trade and Competition Commission.
- Dissemination of information, on Trade and Industrial matters.
- Continuing feedback on Trade and Industrial matters.
- Organization of periodic stakeholders forum on Trade and Industrial matters.

Structure

- Overall co-ordination of consultations by the Executive Secretariat.
- Support by the Trade and Investment Information System, including database and website.
- Implementation and Monitoring of Trade And Industrial Policy
- Previous policies failed to fully achieve their set objectives owing to the absence of effective implementation and monitoring mechanisms. The present policy document therefore recognizes policy implementation and monitoring as crucial to the achievement of the set aims and strategies.

Aim

- Ensure that set objectives are met, policies implemented and monitored.

Strategies

- providing adequate incentives to local and foreign entrepreneurs for the establishment of commercial and industrial enterprises;
- organizing awareness programmes for potential and existing entrepreneurs on the need to use local resources, promote exports of made-in-Nigeria goods, as well as the adoption of standards and quality assurance measures in commercial and industrial production for efficiency and competitiveness;
- evolving appropriate legal framework to ensure productivity and competitiveness of commercial and industrial products in the international market.
- negotiating and maintaining bilateral Investment Promotion and Protection Agreement (IPPA) with interested countries,

- maintaining liaison and collaboration with all agencies that play key roles in the realization of the objectives of the Trade and Industrial Policy;
- collecting, .collating, analyzing and storing data of relevance to the achievement of the trade and industrial Policy objectives;
- promoting capacity development for the commercial and industrial sector;
- liaising with relevant agencies to ensure that appropriate technologies are employed in the commercial and industrial enterprises;
- maintaining liaison with all Government agencies that provide infrastructural facilities to ensure adequate and functional infrastructure,
- setting up a National Commercial & Industrial Forum (NCIF) with the participation of relevant organizations and stakeholders;
- preparing and publishing the Annual Report of the Federal Ministry of Commerce & Industry on trade and industrial development in Nigeria; and
- Reviewing the Trade and Industrial Policy of Nigeria from time to time through the collaboration of Government with other stakeholders.

CHAPTER SIXTEEN
CONCLUSION

The global industrial scene is undergoing rapid transformation as technology continues to grow and change the structure of production. The priority focus of the third industrial revolution experienced in the 21st century is on promoting fast-growing, job-creating green industries. It is imperative that developing countries intensify efforts to stimulate economic recovery by focusing on R&D and innovation. Knowledge as a source and innovation as a force are emerging as effective factors of production in fostering economically efficient, ecologically friendly and socially desirable pattern of industrial development. Nigeria's aim of becoming one of the 20 leading economies in the world by 2020 requires particular attention to the challenges of industrialization of the country. A socially inclusive growth that is pro-poor would require the private sector to take advantage of domestic resources and the public sector to ensure an enabling environment for the private sector to drive economic growth.

The Nigerian manufacturing has experienced some setback for some time now and has been afflicted by weaknesses arising from inefficiencies in the provision of public utilities and exacerbated by energy crisis, import dependence and poor sectoral linkages. These afflictions have manifested in low capacity utilization, depleted financial base, high production costs, unemployment and general economic decline in the country. The strategies set out in this plan to redress the stagnation in the manufacturing sector are as stated earlier. It is expected that the implementation of the strategies for addressing the challenges in the manufacturing sector as contained in this Plan would promote rapid economic and social development of the country as well as move the country closer to achieving NV20:2020.

Manufacturing and Micro, Small, Medium Enterprises hold the key to Nigeria's sustainable development. Trade and Investment are the centre piece of economic development and the country must produce quality goods to leverage the enormous opportunities that abound in globalization. The Industrial Sector Specific Implementation Plan presents, Inter-alia, the policy objectives of the Federal Government of Nigeria. The historical development and the present status of industries are briefly described. The various industrial components, the comparative edge and the competitive advantages, and the broad economic framework that

are required for effective implementation of the policy are highlighted. The guidelines and the strategies for the achievement of the objectives of the policy are also clearly described. The Federal Government of Nigeria is confident that as the policy is implemented, citizens will reap the benefit of high quality goods and improved service delivery at affordable cost. These would serve as engine for economic growth/development, employment generation and poverty alleviation. Doubtless, with firm cooperation and partnering amongst stake holders in the harmonious and faithful implementation of the reviewed policy the National vision of becoming Africa's leading economy and being among the first twenty economies of the world in the year 2020 will surely become a reality.

Attention will be focused on the five sub-sector groups classified as high priority in the NV20:2020 perspective plan for the country. They are chemicals and pharmaceuticals (including hydro-carbon based); basic metal, iron and steel and fabricated metal; food, beverages and tobacco; textiles, wearing apparel and leather/leather footwear; and non-metallic mineral products. They represent the foremost segments of the manufacturing sector where Nigeria has or can easily develop comparative advantage. They are being developed in the short to medium term to enable the nation attain its Vision 2020 for the sector as they have the highest potential to provide raw materials for other key industries in the longer term. These industries will require particular public and private sector focus to attain high growth rates, increase MVA and quickly propel manufacturing contribution to GDP to more significant levels within the medium term.

Currently, these industries are fairly primed for immediate and significant upgrade. When all is considered, they have great economic potential and are positioned to attract funding and achieve higher return on investment. Every effort will be made to expand capacity, enlarge production and expand the market in these competitive sub-sectors. To quickly optimize the potential of the sub-sectors, targeted incentives will be made available and specific strategies will be developed to quickly transform and execute the capacities and capabilities of these sub-sectors in the effort to leapfrog their contributions to the GDP.