NATIONAL STRATEGY FOR COMPETITIVENESS IN RAW MATERIALS AND PRODUCTS DEVELOPMENT IN NIGERIA

RAW MATERIALS RESEARCH AND DEVELOPMENT COUNCIL
FEDERAL MINISTRY OF SCIENCE AND TECHNOLOGY

July 2016

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ISBN - 978-978-8525-39-4

National Strategy for Competitiveness in Raw Materials and Products Development in Nigeria is a publication of the Raw Materials Research and Development Council (RMRDC), Abuja; an agency under the Federal Ministry of Science and Technology (FMST).

About **RMRDC**

The RMRDC was established by Decree (now Act) 39 of 1987 to promote, support and expedite industrial development and self-reliance through optimal utilization of local raw materials as inputs to the nation's industries.

THE VISION **STATEMENT**

To be an indispensable catalyst for industrial growth and development in Nigeria.

THE MISSION **STATEMENT**

To promote the development and optimal utilization of Nigeria's natural resources for industrial growth.

THE **MANDATE**

- To draw up policy guidelines and action programmes on raw materials acquisition, exploitation and development.
- To review from time to time, raw material resource availability and utilization, with a view to advising the Federal Government on the strategic implications of depletion, conservation or stock-piling of such resources.
- To advise on adaptation of machinery and processes for raw materials utilization.
- To encourage publicity of research findings and other information relevant to local sourcing of industries.
- To encourage the growth of implant research and development capabilities.
- To advise on and devise awards or systems for industries that achieve any break-through or make innovations and inventions.
- To organize workshops, symposia and seminars designed to enlighten people on new developments and solutions discovered from time to time.
- To consider and advise on special research grants for specific objectives and any other issues capable of enhancing the objectives of the Council.

CONTENTS

ABBREVIATIONS AND ACRONYMS

ALSCON	Aluminium Smelter Company Nigerias
ARCN	Agricultural Research Council of Nigeria
CIF	Cost Insurance and Freight
CSPro	Census and Survey Processing System
CODRI	Committee of Directors of Research Institutes
CRIN	Cocoa Research Institute of Nigeria
ECN	Energy Commission of Nigeria
FEC	Federal Executive Council
FIIRO	Federal Institute of Industrial Research, Oshodi
FRIN	Forestry Research Institute of Nigeria
FMARD	Federal Ministry of Agriculture and Rural Development
FMB&NP	Federal Ministry of Budget and National Planning
FMEnv	Federal Ministry of Environment
FMOH	Federal Ministry of Health
MMSD	Ministry of Mines and Steel Development
FMST	Federal Ministry of Science and Technology
Ha	Hectare
HS Code	Harmonized System Code
ICT	Information and Communications Technology
IAR	Institute for Agricultural Research
IAR&T	Institute of Agricultural Research and Training
ISO	International Organization for Standardization
Kg	Kilogramme
KPI	Key Performance Indices
LCRI	Lake Chad Research Institute
MAN	Manufacturers' Association of Nigeria
MDAs	Ministries, Departments and Agencies
M&E	Monitoring and Evaluation
M.Sc.	Master of Science

MSMEs	Micro, Small and Medium Enterprises
NABDA	National Biotechnology Development Agency
NACETEM	National Centre for Technology Management
NACCIMA	Nigerian Association of Chambers of Commerce, Industry, Mines and Agriculture
NAERLS	National Agricultural Extension and Research Liaison Services
NAFDAC	National Agency for Food and Drug Administration and Control
NAPRI	National Animal Production Research Institute
NARIs	National Agricultural Research Institutes
NARICT	National Research Institute for Chemical Technology
NASC	National Agricultural Seeds Council
NASC	National Agricultural Sample Census
NASENI	National Agency for Science and Engineering Infrastructure
NASME	Nigerian Association of Small and Medium Enterprises
NASRDA	National Space Research and Development Agency
NASSI	National Association of Small-Scale Industries
NBS	National Bureau of Statistics
NBRRI	Nigerian Building and Road Research Institute
NBTI	National Board for Technology Incubation
NCAM	National Centre for Agricultural Mechanization
NCS	Nigeria Customs Service
NCIB	National Census of Industries and Businesses
NCRI	National Cereals Research Institute
NIFFR	National Institute of Freshwater Fisheries Research
NIFOR	Nigerian Institute for Oil Palm Research
NIHORT	National Horticultural Research Institute
NIOMR	Nigerian Institute for Oceanography and Marine Research
NIPRD	National Institute for Pharmaceutical Research and Development
NILEST	Nigerian Institute of Leather and Science Technology

NIMR	Nigerian Institute of Medical Research
NISER	Nigerian Institute for Social and Economic Research
NISLT	National Institute of Science Laboratory Technology
NITR	Nigerian Institute for Trypanosomiasis Research
NMDC	National Metallurgical Development Centre
NNMDA	Nigerian Natural Medicine Development Agency
NOTAP	National Office for Technology Acquisition and Promotion
NRCRI	National Root Crops Research Institute
NRIC	National Research Innovation Council
NSPRI	Nigerian Stored Products Research Institute
NVRI	National Veterinary Research Institute
POS	Point of Sale
PPPs	Public-Private Partnerships
PRODA	Projects Development Agency
R&D	Research and Development
RMLF	Results-based Management Logical Framework
RMRDC	Raw Materials Research and Development Council
RRIN	Rubber Research Institute of Nigeria
SAS	System of Administrative Statistics
SHESTCO	Sheda Science and Technology Complex
SITC	Standard International Trade Classification
SON	Standards Organization of Nigeria
SPI	Strategic Planning Infrastructure
SSPS	Statistical Services Processing System
S&T	Science and Technology
STI	Science, Technology and Innovation
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization

PREFACE

This report on National Strategy for Competitiveness in Raw Materials and Products Development in Nigeria was prepared sequel to the briefing and subsequent directive of the Honourable Minister of Science and Technology (HMST), Dr. Ogbonnaya Onu on the need to take a critical look at the level of importation of raw materials and products, some of which the country has the capacity and capability to produce locally. Consequently, the Minister inaugurated a Committee on April 29, 2016 and directed that evidence-based data and information should be collected to determine the extent of imports and the national capacity to reduce and save the government the huge foreign exchange expended on these items over a specified time-frame.

A survey of Industries, Businesses and Research Institutions was carried out to secure data and other information that will enable the country design appropriate strategies to drive Nigeria's competitiveness in raw materials and products development.

A Compendium of Imported Raw Materials and Products was developed which provides information based on the United Nations Commodity Description of the Harmonised System (HS) Code within the Standard International Trade Classifications (SITC). Adopting the HS code is to ensure international best practices that provide a universal platform for comparability with other nations and standardisation of systems and indicators used in further analyses, monitoring and informed evaluation. The items covered include Raw Materials and Products at primary, intermediate and secondary stages.

Each commodity/item identified under imports is to be considered for domestic capacity enhancement towards competiveness in production. A time-series data set spanning 2010-2015 was compiled to provide numerical information about the quantity and value of each item. The value of every item in Naira was based on Cost, Insurance and Freight (CIF), while quantity is measured as the net weight expressed in kilogrammes.

The Compendium is a veritable Strategic Planning Infrastructure (SPI) that could meet the needs of industrialists, entrepreneurs, investors, researchers, government policy makers and decision-makers for informed intervention. Efforts and resources could be properly channelled toward domestic production of the identified items by harnessing domestic potentials for

successful adoption of appropriate standards, conformity assessment and metrology parameters within the frameworks of business and societal concerns.

The Strategy for Nigeria's Competitiveness in Raw Materials and Products Development will help government to focus and target appropriate items that could be produced in Nigeria in the short, medium and long terms. Such domestic production and utilization will reflect in declining levels of imports over time.

The strategic document is recommended to all stakeholders involved in enhancing Nigeria's competitiveness in industrial production as a means of reducing our inherent high-propensity for consumption of imported raw materials and products. Given dwindling oil revenues, Nigeria's ambition is to look inward and commence domestic production of essential Raw Materials and Products, particularly where the country has the comparative advantages.

The report comprises seven chapters:

- Chapter 1 is the introduction which gives the context of the study.
- Chapter 2 outlines the objectives and methodology used in carrying out the study as well as limitations encountered during the field exercise and in preparing the report.
- Chapter 3 describes in detail the level of import of raw materials and products, huge amounts spent in the last six years (2010-2015) and a projection for 2016-2020. It highlights the raw materials and products with potentials for local production and capacities of industries to meet national demand. It also explains the designed model to drive Nigeria's competitiveness in raw materials and products development and mapping linkages between R&D institutions, industrial sectors and raw materials.
- Chapter 4 provides elaborate information on major findings covering industries and businesses, sectoral recommendations on local sourcing of raw materials, quality infrastructure, standardisation and conformity assessment. It also addresses the constraints and enhancing factors to industrial production as well as issues relating to support to R&D in terms of infrastructure, commercialization of viable R&D findings and funding of R&D.
- Chapter 5 focuses on the requirements to drive competiveness in raw materials and products development, including competitiveness advocacy, institutional and organisational considerations, human resources, infrastructure, R&D and management, promotion of quality infrastructure and culture, financing, commercialization of R&D findings and frameworks.
- Chapter 6 deals with the way forward, results-based logical frameworks, implementation schedule and review mechanisms needed to drive the strategy.
- Chapter 7 rounds off with recommendations and conclusion.

The Raw Materials Research and Development Council (RMRDC) appreciates esteemed stakeholders in industries, businesses, research institutions and MDAs for their valuable cooperation and support in carrying out this onerous national assignment. It believes that the strategy will enable the government to reduce, significantly, the magnitude of imports of raw materials and products in the next 5 years and beyond thereby conserving the much-needed foreign exchange for the country.

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July 2016

ACKNOWLEDGEMENTS

The RMRDC is very appreciative of the Honourable Minister of Science and Technology, His Excellency, Dr. Ogbonnaya Onu for challenging the Raw Materials Research and Development Council to develop an implementable strategy that will, over time, help the country reduce significantly, over-dependence on import of raw materials and products.

The Council is grateful to the Organised Private Sector (OPS) -- including the Manufacturers Association of Nigeria (MAN), Nigerian Association of Chambers of Commerce, Industry, Mines & Agriculture (NACCIMA), Nigerian Association of Small and Medium Enterprises (NASME) & Nigerian Association of Small-Scale Industrialists (NASSI), MDAs, especially the National Bureau of Statistics (NBS), Nigeria Customs Service (NCS) and Research Institutions for their cooperation towards the success of the field study to generate evidence-based data and other information for the development of the strategy document.

The Council also recognizes the wider group of stakeholders, including Development Partners like the European Union (EU), which participated during the validation process. Noteworthy of mention are the Management and Staff of RMRDC for their solidarity and sustained support throughout the exercise.

The Council also appreciates the resource persons for their commitment and positive contributions in conceptualizing the design of the model for competitiveness of raw materials and products development and in mobilizing the Organised Private Sector groups to participate in the survey.

It is our belief that the recommendations emanating from this exercise, when fully implemented, will enable the country diversify the economy and reduce significantly, the dependence on imports of raw materials and products.

Once again, we want to thank everyone or group who in one way or the other contributed to the realization of this strategy document.

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CHAPTER ONE

INTRODUCTION

1.1 Context

Nigeria, with over 170 million people, operates a resource-based economy driven by the exploitation of natural resources, especially oil and gas. The country is also endowed with solid minerals, water and forest resources as well as rich soil and enabling climate for commercial agriculture. The large domestic market is a further incentive for the emergence of a strong industrial base. Although natural resources play a significant role in the development of the Nigerian economy, this role alone is diminishing as the world economy becomes increasingly internationalized, knowledge-intensive and technology-driven.

Value-addition to natural resources through the application of technology is imperative for a competitive economy and attainment of sustainable development. Thus, the ability of Nigeria to compete and prosper depends to a significant extent, more on the deployment of technological capacities and innovations than on exploitation of natural resources. In essence, to exploit the resources, technologies have to be developed which requires research and development (R&D). Despite efforts made over the years to exploit the natural resources, very limited progress has been recorded in value-added manufacturing, including processing of agricultural resources, improvement of mineral resources, refining of petroleum, development of petrochemicals, and production of industrial machinery and equipment, among others.

The Nigerian economy has grown substantially over the years with huge foreign exchange earnings from oil and increased agricultural output. In recent times, the services sector has over-taken the industrial sector in terms of contribution to Gross Domestic Product (GDP). In 2014, services accounted for close to 60 per cent of Nigeria's GDP, from about 53 per cent in 2011. This figure is comparable to those of other large economies in Africa such as Tunisia, but lower than that of South Africa, where the sector accounts for close to 70 per cent of GDP (African Economic Outlook, 2016).

Over the period, 2010-2014, the economy grew by 7 per cent on the average; before a decline from 2015 and first quarter of 2016 when a contraction was recorded at nearly minus-half percentage point. During this period, contributions of Agriculture and Industry to Nigeria's GDP

were on the decline from 22.3 per cent to 20.2 per cent for agriculture, and 24.8 per cent to 20.7 per cent for industry.

A consideration of specific sub-sectors reveals that, even as all sectors have registered growth generally, Education, Construction and Other Services increased by over 100 per cent in the period, 2010-2014. Transport increased by 72 per cent, ICT by 61 per cent and Financial Services (Banking & Insurance) by 46 per cent.

Despite the growth recorded from 2010 to 2014, the country, by the end of 2015, had experienced sluggish economic growth with the rate dropping to an estimated 3.0 per cent (African Economic Outlook, 2016). This development led the government to adopt an expansionary budget in 2016 to stimulate the economy. The sluggish growth is attributed mainly to a slow-down in economic activity, adversely impacted by inadequate supply of foreign exchange and restrictions targeted at some imports, some of which are inputs for manufacturing and agro-industry. Among the effects are cuts in production and lay-off of labour in some sectors, including financial services.

Nigerian enterprises are currently facing challenges in relation to the emerging developments in the economy which they perceive to be affecting the industrial sector and businesses negatively. In addition, the manufacturing sector is facing -- and will continue to face -- increasing competition as trade liberalization and globalization intensify and progressively transform the world economy into a vast free-trading zone. At the regional and continental levels, they are facing growing competition as free trade agreements and economic partnership agreements are steadily being implemented. At the national level, increased competition is being experienced not only from industrialized countries, but from such large industrializing countries & emerging economies as China, India and Brazil.

It is important to reiterate that competitiveness evolved as a ***"market mechanism which forces enterprises to measure up with each other in the production and distribution of goods and services at the best possible price and quality"***. Hence, it is believed that market mechanisms foster competition and efficiency in resource allocation, promote 'survival of the fittest' enterprises and eliminate the less-efficient ones. In essence, competitiveness can be enhanced by strengthening market mechanisms, building comparative advantages, fostering appropriate value systems and boosting innovation (RMRDC, 2009).

Though some impressive performance of the economy occurred despite a poor environment for competitiveness, a comparison of the country's global competitiveness in 2010 and 2015 shows that the levels of competitiveness remained largely unchanged. After five years, issues identified as most problematic were the same as those in 2010; and they include: inadequate infrastructure, corruption, lack of access to financing, policy instability, inefficient government bureaucracy, and poor work ethics among the national labour force.

All over the world, no economy is complete without consideration to foreign trade; and available data on Nigeria show a structure that portrays overall net positive balance in the past

two decades. However, foreign trade and available data on Nigeria reveal that commodity sections except crude oil and gas are in the negative trade balance. Indeed, oil and gas exports constitute over 95% of total merchandise export earnings from the 1980s till date. While the huge foreign exchange earned was used to propel the general development of the country, it paid less attention to such other critical items as agricultural products, solid mineral products and even services. Critical external factors beyond the control of Nigeria in addition to some domestic ones affected the economy negatively to the extent that earnings from oil and gas exports significantly declined and subsequently, impacted negatively on overall GDP growth rate contraction for the first time in recent past. By 2016 first quarter (Q1), the GDP growth declined to –0.37 per cent. The impact of this new development was felt by Government, Industries, Businesses and indeed, the citizenry.

Industries and businesses as well as governments have been traumatised since legitimate demand for resources cannot be met as governments, especially at the State level, cannot pay salaries, for contracts and even debt servicing. There is insufficient foreign exchange for industries and businesses to import essential raw materials; hence, the impending threat to retrenchment of staff and reduction in operating and productive capacities. As the unemployment rate surged to double-digits -- above 18 per cent generally and almost 25 per cent for the youths -- government is concerned because of upsurge in acts of criminality such as kidnapping, terrorism, armed robbery and vandalism.

It is imperative that government embarks on strategies that will stabilize the situation and chart the path to recovery in an orderly manner. Efforts of government will not be premised on fiat, but guided by facts-based decision-making with impacts that address set goals and vision. Based on government desire to put in place a revolutionary action plan to resuscitate the national economy and jump-start sustainable development, a strategy is proposed to move the nation towards competitiveness in raw materials and products development. This strategy will also inspire the vital elements of innovation and productivity.

1.2 Organization of the Report

This report is a product of inputs from identified stakeholders ranging from the Federal Ministry of Science and Technology and the Raw Materials Research and Development Council (RMRDC) to the Manufacturers' Association of Nigeria (MAN), Investors/Entrepreneurs, Research and Development Institutions, MDAs and Development Partners, among others.

The report presents an overview of the main objective of government and the use of appropriate methodology for generating data and other relevant facts to inform assumptions, analyses and inferences. The raw materials and products of interest were identified and the magnitude of imports in terms of quantities and net values in Naira, established. Potentials for domestic production and consumption patterns were solicited from appropriate stakeholders, including the Manufacturers Association of Nigeria (MAN), Nigerian Association of Chambers of Commerce, Industry, Mines and Agriculture (NACCIMA), Nigerian Association of Small-Scale Industries (NASSI), Nigerian Association of Small and Medium Scale Enterprises (NASME),

MDAs, especially Federal Ministries of Agriculture and Rural Development (FMARD), Industry, Trade and Investment, Finance, Mines and Steel Development, and Justice, National Bureau of Statistics (NBS), Tertiary Education Trust Fund (TETFund), Nigeria Customs Services (NCS) and Research and Development Institutes for their cooperation towards the success of the field study to generate evidence-based data and other information for the development of the strategy document.

Major findings from identified stakeholders were captured using structured questionnaires that were processed and analysed. Vital information of interest includes: identification and classification of industries and businesses, the research and development institutions, and the raw materials and products of interest. Other key parameters of importance considered include: production, quality infrastructure, constraints and enhancing factors, funding, and linkages between Research, Industry/Business and Government. The report also enumerated the various requirements to drive competitiveness in raw materials and products development. Notable among these are: Advocacy, Institutional/Organisational Arrangements, Human Resources, Infrastructural Development, Quality Infrastructure and Culture. Others are: Financing, Commercialization of R&D, and various frameworks to drive competitiveness -- legal, policy, institutional, scientific, and technological & innovation.

Recommendations on the way forward are premised on the principles of institutionalizing a Results-based Management Logical Framework (RMLF) that would provide the path-ways and mile-stones for achieving set goals which impact on the desire for competitiveness. The critical elements, ranging from advocacy to financing, are subject to strategic factors, including appropriate activity inputs, outputs, outcomes and impacts on competitiveness drive.

Following the Conclusions are supporting Appendices among which are an abridged version of raw materials and products import values between 2010 and 2015, stakeholders' questionnaires, participants in the field survey and validation meeting, and Reports of the 10 industrial sectors (Volume 2) of this Report.

CHAPTER TWO

OBJECTIVES AND METHODOLOGY

2.1 Broad Objectives

The issues of Nigeria's competitiveness, innovativeness and productivity enhancements at this auspicious time cannot be over-emphasized. The country is at the lowest depth of her economic cycle and requires stabilization and quick but orderly recovery. The days of excess foreign exchange earnings and huge foreign exchange reserves with positive balance of payments position and strong currency exchange rates, are over.

Since 2015, the key economic indicators have shown an economy that is highly distressed and traumatised to the extent that some social dislocations threatening national survival are evident. Inflation has inched up to double digits; industries and businesses are closing down factories and laying-off workers thereby worsening unemployment rates. Even government institutions, especially at the State and Local Government levels, are defaulting in staff salary payments and cannot meet up with legitimate requirements to maintain the bureaucracy and critical institutions of governance like schools, hospitals, waste disposal and security.

However, government decided that despite obvious scarcity of funds to finance increasing demand from various sections of the society, a well-developed and implementable strategy to re-establish Nigeria towards greatness and sustainable development must not be wished away. Hence, the need to adopt a very inclusive option of developing a strategy for Nigeria's drive towards competiveness in raw materials and products development. This way, the nation will become, not just competitive in production but also highly-innovative with associated improved levels of productivity.

Through this strategy, Nigeria's objective of minimizing over- dependence on foreign products even when she possesses potentials to produce locally will be realized. The impact would lead to significant drop in foreign exchange demand for import of non-essential raw materials and products. The strategy will be premised on international best practices in ensuring output of high-quality products that can match similar items elsewhere.

Government's desire is to build bridges linking successful and relevant research & development outcomes to meet industry and business needs; hence, the objective of ensuring cordial,

business-driven collaboration between the Academia/R&D institutions and the Industrial and Business Community. The strategy is tailored towards opening-up the activities of the various Research and Development Institutes, and granting every establishment access to others' on-going efforts, progress and breakthroughs.

Competitiveness strategy will not only expand domestic capacity utilisation, but also produce enough for export and diversification of foreign exchange earnings from over-dependence on earnings away from crude oil and gas. Consequently, quality jobs would be created and unemployment drastically reduced with attendant moderation in the incidence of criminality.

Specifically, this exercise was to:

- Develop a model to drive Nigeria's competitiveness in raw materials and products development.
- Carry out mapping of the various sectors' competitiveness in raw materials and products development, including production and consumption patterns, R&D institutions and their linkages with industries and businesses.
- Articulate a Results-based Management and Logical Framework for implementation of the strategy to be adopted in the short, medium and long terms.
- Make recommendations arising from the needs of the stakeholders.

2.2 Statement of the Challenges

In the event of radical changes towards negation of past behaviours and attitudes, especially in these trying times, resistance is inevitable. The challenges of resistance to change are likely to come from institutions, organisations, industries and businesses; but with strong and persistent advocacy, buy-in and adaptability would subsist.

A major challenge is observed in the area of data poverty whereby required critical data and other information are not available. Even where such data exist, accessibility and adequacy create integrity problems for their use. In fact, the general attitudes of some data suppliers to completion of questionnaires, even when the survey is to further their interests, are dogmatically negative leading to incidence of high non-response. The inability to conduct National Census of Industries and Businesses (NCIB) and the National Agricultural Sample Census (NASC) in the past 30 years in Nigeria has exacerbated data problems on platforms to make informed estimates of production, demand and consumption of raw materials and products.

The obvious disconnect between various stakeholders has created problems of disharmony in the drive towards competitiveness, and the current chaotic situation calls for effective co-ordination by the Raw Materials Research and Development Council (RMRDC). Effective coordination of linkages between researchers and entrepreneurs and industries/businesses is critical towards Nigeria's improved productivity.

Weak infrastructure and lack of quality culture also constitute major challenges towards creating a competitive environment. Issues of standardization, metrology and conformity assessment are crucial elements required to institutionalize a culture of enabling the development of quality infrastructure in the country.

Shortcomings in existing frameworks in support of enhancing Nigeria's competitiveness need to be revisited to strengthen and, where necessary, establish new ones. Such frameworks are in legal, policy, infrastructural, organizational and technical and technological forms. This is a challenge to governments if an enabling environment for competitiveness is to be created in Nigeria. Assistance from Development Partners and Non-Governmental Organisations would also boost the process.

The inability to commercialize successful research and development breakthroughs is about the most challenging issue in Nigeria as scientific research outcomes remain on the shelves of libraries of research institutes and universities. Nigeria is weak in reaping the benefits of scientific inputs towards competitiveness and innovation; and therefore, remains a net importer of virtually every commodity.

How to reverse Nigerians' attitude and high taste for foreign products against anything made-in-Nigeria is among the key challenges as their propensity for consumption of foreign products is extremely high. To reverse this trend, local products must be in adherence to standardization and be focused on quality that conforms to user-specifications and overall requirements.

2.3 Nigeria's Competitiveness in Raw Materials and Products Development

It is worrying and indeed pathetic, considering Nigeria's competitiveness country-ranking in the world at 127 out of 139 in 2010/2011 and 127 out of 144 in 2014/2015 by the World Economic Forum - Global Competitive Report for those periods. The study was based on distinct strategic factors - Basic Requirements, Efficiency Enhancers, and Innovation & Sophistication Factors. Unfortunately, the lowest ranking is observed in Infrastructure and Innovation. Innovation dropped from 2.9 to 2.8 in 2010/2011 & 2014/2015 respectively and Infrastructure from 2.0 (2010/2011) to 2.1 (2014/2015). *Competitive score is ranked: 1 – Lowest and 7 - Highest.*

TABLE 1.0
NIGERIA'S COMPETIVENESS IN 2010/2011 AND 2014/2015

Basic Requirements	**2010/2011**	**2014/2015**
a.1 Institution	3.2	3.0
a.2 Infrastructure	2.0	2.1
a.3 Macro-economic environment	4.3	4.6
a.4 Health and primary education	3.0	3.0
Efficiency Enhancers		
b.1 Higher education and training	3.0	2.9
b.2 Goods market efficiency	4.0	4.2
b.3 Labour market efficiency	4.3	4.5
b.4 Financial market efficiency	4.0	4.1
b.5 Technological readiness	3.0	3.0
b.6 Market size	4.6	4.7
Innovation and Sophistication		
c.1 Business sophistication	3.8	3.8
c.2 Innovation	2.9	2.8
Country Ranking (world)	127 out of 133	127 out of 144

Source: World Economic Forum -- Global Countries Report, 2010/11 and 2014/15

Nigeria's competitiveness situation appears to remain constant or slightly diminished when 2014/2015 is compared to the 2010/2011 ranking. Some major challenges identified by the study include; ***inadequate infrastructure, corruption, limited access to financing, policy instability, inefficient government bureaucracy, poor work ethics among the national labour force, etc.***

This unacceptable situation is a reflection of how inefficiently the Nigerian economy manages the totality of its resources and competences to increase the prosperity of her population.

2.4 Methodology

The methodology adopted in this exercise is in tandem with international best practices whereby inclusiveness and adherence to UN standard classifications are used in describing raw materials and products of interest. Facts-based inferences and use of adequate statistics in situation analysis -- rather than speculations and guess-work -- were the guiding principles.

2.4.1 Overview of Data Collection Method

The intention was to collect primary data from identified stakeholders, including Manufacturers, Research and Development Institutions, Universities and Entrepreneurs/Industries/Businesses. The study also focused on MDAs engaged in the collection of secondary data, especially on the state of the economy, foreign trade statistics and existing records on policy issues. An abridged version of extracted values for raw materials and

products imported between 2010 and 2015 (Annex 1) gives an insight on the need for this study.

At the planning stage, the team interacted with the stakeholders and sensitized them on the need to design a strategy document that informs the way forward for Nigeria's competitiveness drive in raw materials and products development. Technical workshops were organized by RMRDC and working sessions held at the Federal Ministry of Science and Technology during which the Honourable Minister [HMST] elaborated on the strategy and solicited stakeholders' cooperation with RMRDC in providing adequate data for the project.

In response to HMST's directive, a Coordination Committee was set up; comprising representatives from FMST, Ministry of Budget and National Planning, Nigeria Customs Service [NCS], National Bureau of Statistics [NBS], Manufacturers Association of Nigeria [MAN] and RMRDC which provided the Secretariat. Membership of the Coordination Committee and the Secretariat are presented in Annex 3.

Structured and pre-coded questionnaires were produced for the survey of industries and businesses and R&D institutions (Annexes 2A and 2B respectively). Schedules for capturing imported raw materials and products were designed and deployed at the NBS and NCS. The RMRDC formed twelve sectoral Committees in line with the 10 industrial sectors of MAN; a group devoted to the Research Institutions and another devoted to NASSI, NACCIMA and NASME (Annex 4 gives the list of the Sectoral Committees that participated in the field study).

A database was developed from completed questionnaires using Census and Survey Processing System (CSPro) for data processing and Statistical Package for Social Sciences (SPSS) for analysis. Members of MAN, Research & Development Institutions in Nigeria, NACCIMA, NASME and NASSI were targeted and contacted. Based on the opinions of industries in the sectors of MAN, information on the constraints and enhancing factors were compiled and summarized [See Annex 6].

Furthermore, the Coordination Committee facilitated the production of the Strategy Document. The draft report was subjected to a validation process involving stakeholders from the Organised Private Sector (OPS), Research Institutions and MDAs. The validation meeting was held in Abuja on the 27th July, 2016 and was chaired by Alhaji Sanusi Mai'jama, Vice-President of NACCIMA. (Annex 5 shows the names of delegates at the validation meeting).

Thereafter, the coordinating group synthesized the activities and outcomes of the 12 groups into a unified report outline, including the list of commercializable R&D technologies emanating for agencies under the Federal Ministry of Science and Technology (Annex 8).

2.4.2 Limitations

Limitations to fact-finding and applications for addressing critical aspects of the strategy abound, but are not significant enough to constrain the objectives and efforts. While the

response rate for the survey of Research & Development Institutions was impressive, that recorded for Industries and Businesses was low, as some of the retrieved questionnaires were either returned blank or with gaps.

At this phase, the universities were not covered in the survey as the study was limited to R&D institutions which are engage in applied scientific research. Definitely, the universities, regarded as critical stakeholders, would be engaged for current situation assessment, perceptions and opinions on the way forward towards Nigeria's competitiveness.

Time constraints placed enormous pressure at all stages, especially for data collection, analysis and report writing.

CHAPTER THREE

RAW MATERIALS AND PRODUCTS IMPORTATION, POTENTIALS FOR PRODUCTION, AND CONSUMPTION PATTERNS

3.1 Context

As indicated previously, the study experienced limited access to data. The non-availability of some data, particularly on production, demand and consumption, is attributed to the fact that Nigeria has not conducted in the past thirty years, the National Census of Industries & Businesses (NCIB) and the National Agricultural Sample Census (NASC). These two national statistical exercises provide adequate and reliable official records on quantities and values of the raw materials and products identified under the Harmonized System (HS) Code of the United Nations. However, available statistics on raw materials and products importation are considered a perfect measure in approximating national gap for domestic requirements to meet demand shortfalls. If domestic production is adequate in terms of production and quality, there will be less resort to importation of such items; hence, government's concern over importation will not arise.

3.2 Imports of Raw Materials and Products

A Compendium of imported raw materials and products was compiled and the magnitude in terms of value in Naira is colossal and not sustainable; given current national economic realities. Imports covered 97 broad categories of UN double-digit commodity classification (SITC) and were based on Cost, Insurance & Freight (CIF) for a period spanning 2010-2015. Detailed components of the broad categories, including four and ten digit classifications, were also compiled. A graphic expression of the raw materials and products import in order of magnitude is presented for the period, 2010-2015 (See Figures 3.1, 3.2, and 3.3).The value of the first 12 of 97 commodity groups in order of magnitude of imports ranged from approximately N1,058.2 billion to over N9,042.5 billion from 2010 to 2015. This level of import is not sustainable; and if it continues -- with the dwindling foreign exchange earnings -- Nigeria will run into more economic crisis by 2020.

FIGURE 3.1
IMPORTS OF RAW MATERIALS AND PRODUCTS (ITEMS ABOVE ₦1 TRILLION) CATEGORIZED, 2010-2015

DESCRIPTION	N TRNS
Nuclear Reactors, Boilers	9.043
Vehicles O/T Railw/Tranw Rool-Stock, Plts & Accessories	8.217
Electrical Machy Equip Parts Thereof; Sound Recordesr, etc.	7.364
Mineral Fuels, Oils & Product of Their Distillation; Etc;	3.421
Cereals	1.934
Plastics And Articles Thereof	1.906
Prep of Cereal, Flour, Starch/ Milk; Pastry Cooks' Prod	1.852
Organic Chemicals	1.501
Dairy Prod; Birds' Eggs; Nat. Honey; Edible Prod Nes	1.377
Fish & Crustacean, Mollusc & Other Aquatic Invertebrate	1.277
Rubber & Articles Thereof	1.062
Articles of Iron And Steel	1.058

Source: NBS and Nigerian Customs Data Bases

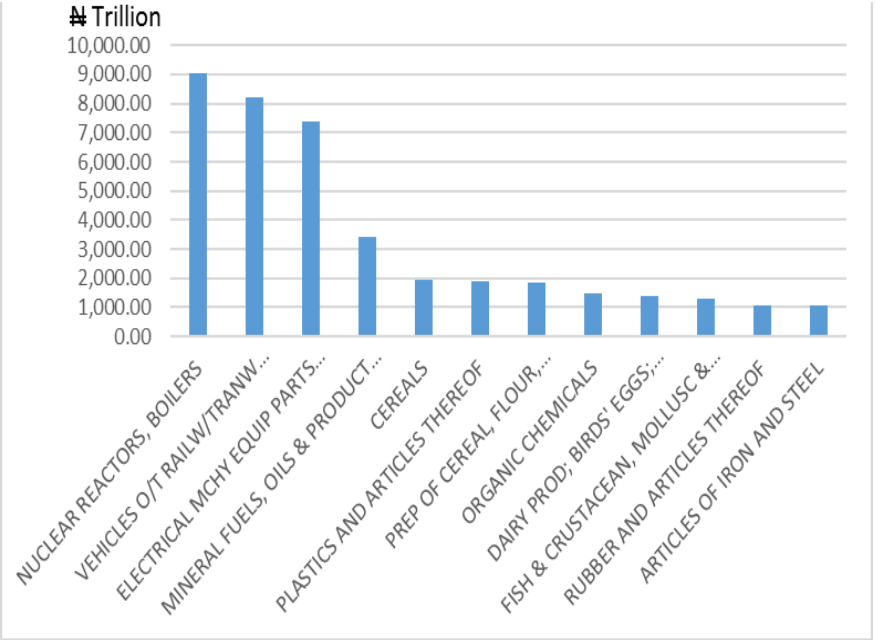


FIGURE 3.2
IMPORTS OF RAW MATERIALS AND PRODUCTS (ITEMS BELOW N1 TRILLION) CATEGORISED, 2010-2015

Commodity Description	N BILLIONS
Sugars And Sugar Confectionery	894.0
Coin of Legal Tender	745.1
Paper & Paperboard; Art of Paper Pulp, paper/Paperboard	658.1
Miscellaneous Chemical Products	451.1
Aluminium and Articles Thereof	397.7
Cocoa and Cocoa Preparations	310.4
Inorgn Chem; Compds of Prec Met, Radioact Elements Etc	305.7
Miscellaneous Edible Preparations	302.2
Pharmaceutical Products	286.6
Beverages, Spirits And Vinegar	276.1
Animal/Veg Fats & Oil & Their Cleavage Products; Etc	259.9
Essential Oils & Resinoids; Perf, Cosmetic/Toilet Prep	245.6
Ceramic Products	239.2
Salt; Sulphur; Earth & Stone; Plastering Mat; Lime & Cem	232.4
Oil Seed, Oleagi Fruits; Miscell Grain, Seed,	209.5
Fertilisers	184.3
Optical, Photo, Cine, Meas, Checking, Precision	169.1
Tanning/Dyeing Extract; Tannins & Derivs; Pigm Etc	164.4
Ships, Boats And Floating Structures	154.9
Tobacco And Manufactured Tobacco Substitutes	154.9
Wadding, Felt & Nonwoven; Yarns; Twine, Cordage,	141.2
Printed Books, Newspapers, Pictures & Other Product Etc	140.8
Glass And Glassware	135.6
Live Tree & Other Plant; Bulb, Root; Cut Flowers	129.9
Impregnated, Coated, Cover/Laminated Textile Fabric Etc	122.3
Prod Mill Indust; Malt; Starches; Insulin; Wheat Gluten	116.9
Wood and Articles of Wood; Wood Charcoal	115.2
Furniture; Bedding, Mattress, Matt Support, Cushion Etc	109.9
Man-Made Staple Fibres	108.5
Tool, Implement, Cutlery, Spoon & Fork, Of Base Met Etc	103.6
Prep of Vegetable, Fruit, Nuts or other Parts of Plants	103.3

Sources: NBS and Nigerian Customs Data Bases

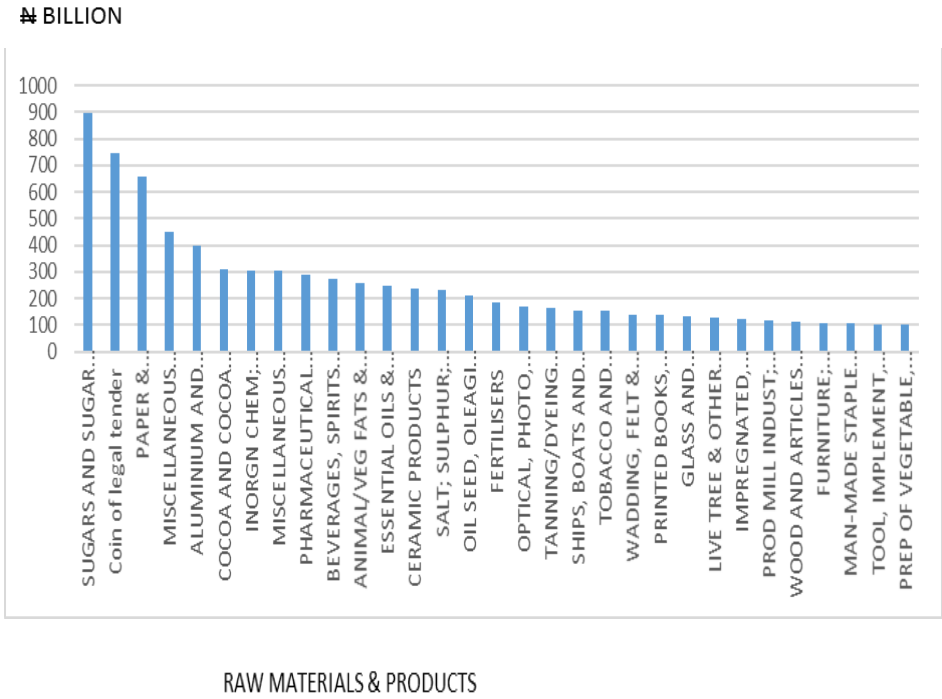
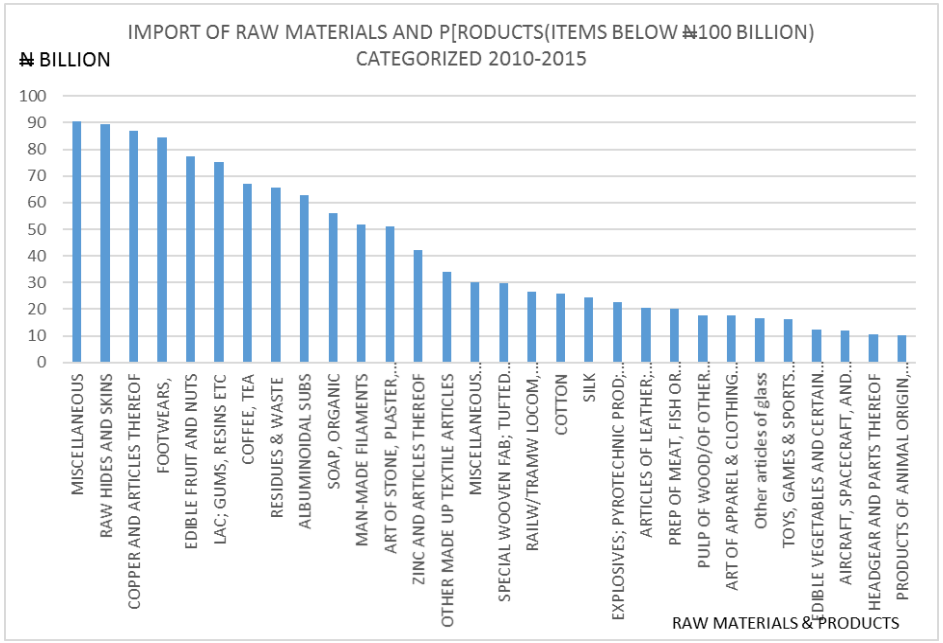


FIGURE 3.3
IMPORTS OF RAW MATERIALS AND PRODUCTS (ITEMS BELOW N100 BILLION) CATEGORISED, 2010-2015

COMMODITY DESCRIPTION	N BILLIONS
Miscellaneous	90.7
Raw Hides And Skins	89.4
Copper And Articles Thereof	87.1
Footwears,	84.4
Edible Fruit And Nuts	77.2
Lac; Gums, Resins Etc	75.4
Coffee, Tea	67.1
Residues & Waste	65.7
Albuminoidal Subs	62.9
Soap, Organic	56.2
Man-Made Filaments	51.6
Art Of Stone, Plaster, Cement, Asbestos,	51.1
Zinc And Articles Thereof	42.3
Other Made Up Textile Articles	34.1
Miscellaneous Manufactured Articles	30.1
Special Wooven Fab; Tufted Tex Fab; Lace; Tapestries etc	29.9
Railw/Tramw Locom, Rolling-Stock & Parts Thereof; etc	26.5
Cotton	25.8
Silk	24.5
Explosives; Pyrotechnic Prod; Matches; Pyro Alloy; Etc	22.7
Articles of Leather; Saddlery/Harness; Travel Goods etc	20.4
Prep of Meat, Fish or Crustaceans	20.3
Pulp of Wood/of Other Fibrous Cellulosic	17.8
Art of Apparel and Clothing Access,	17.6
Other Articles of Glass	16.6
Toys, Games & Sports Requisites; Parts & Access Thereof	16.3
Edible Vegetables And Certain Roots and Tubers	12.2
Aircraft, Spacecraft, And Parts of	12.1
Headgear And Parts Thereof	10.6
Products of Animal Origin, Nes or Included	10.1

Sources: Compiled from NBS and Nigerian Customs Data Bases



3.2.1. Nigeria's Foreign Trade (Imports: 2010-2015) and Projections to 2020

According to the National Bureau of Statistics (2016), Nigeria's import trade as at the end of the first quarter (Q1) of 2016 stood at N1,454.0 billion. On products and raw materials, the structure of Nigeria's import trade was dominated by the imports of 'Machinery and Transport Equipment', 'Mineral Fuel', and 'Chemicals & Related Products', which accounted for 34.7 per cent, 17.4 per cent and 14.7 per cent respectively. Furthermore, it was reported that 'Boilers, Equipment, Machinery & Appliances' accounted for N378.4 billion or 26 per cent of the total value of import trade in Q1 2016. Other commodities that contributed significantly to the value of import trade within this period were 'Mineral Products' at N263.0 billion (18.1 per cent), 'Products of the Chemical & Allied Industries' at N137.0 billion (9.4 per cent), 'Vehicles, Aircraft & Parts Thereof, Vessels, etc.' at N127.8 billion (8.8 per cent), and 'Base Metals and Articles of Base Metals' at N105.1 billion (7.2 per cent).

Between 2010 and 2015, the country's highest import was on nuclear reactors, boilers, equipment, machinery and appliances, etc.; amounting to N9,042.5 billion (See Figure 3.1). Based on the level of imports, it was projected that in the next five years (2016-2020), Nigeria would expend about N36,045 trillion to import raw materials and products (See Table 3.1).

TABLE 3.1
NIGERIA'S FOREIGN TRADE (IMPORTS), 2010--2015

YEAR	IMPORT =N= (BILLIONS)	PROJECTION N(BILLIONS), 2016-2020
2010	6,649	
2011	9,893	
2012	5,625	
2013	7,016	
2014	7,374	
2015	6,698	**Total** (2010-2015) = 43,254
2016-2020		**Projection** (5 years) = 36,045

Source: NBS Data Base

The implications of this level of dependence on import of raw materials and products to sustain industries, businesses and human requirements, cannot be over-emphasised. If Nigeria is allowed to continue along this path, between 2016 and 2020 the nation will be required to contend with funding raw materials and products import bill of N36,045 billion. This projection is based on a simple mean model of annualized estimate of N7.209 trillion per annum from 2010 to 2015.

Between 2016 and 2020, it is projected that Nigeria would expend N36, 045.2 billion on imports. It is obvious that the country cannot sustain this level of import if urgent steps are not taken to reduce over-dependence on imports of raw materials to sustain industrial production; hence, the need to develop an evidence-based strategy for government's intervention.

3.3 Raw Materials and Products with Potentials for Local Production

Nigeria's capacity for production of identified raw materials and products need revitalisation with appropriate stimulus targeted at commodity groups where the country has potentials and endowments. The country's potentials include: natural resource endowments like good climatic condition suitable for agricultural practices required to produce agro raw materials and products. It is also blessed with abundant solid mineral deposits awaiting exploitation, in addition to a large population and situation in the West African sub-region and Africa at large.

Higher potentials apply to agro-raw materials, while lower potentials are associated with solid mineral raw materials and products. The least potentials are linked to products of sophisticated industries. Overall, the country's potentials for local production of raw materials and products irrespective of commodity category will fit into the measures of capacities of industries and businesses to meet national demand. Potentials to meet national demand irrespective of items will lead to import reduction (See Table 3.2). Existing potentials are constrained due to inadequate business infrastructure, especially poor power supply, weak bureaucratic institutions and corruption, among others.

Though Nigerian human capital is yet to reach limits within the country, it ranks among the best, when challenged in most advanced and competitive nations. Enabling circumstances and logistics required to inspire citizens to optimally perform and produce locally, are lacking. Efforts at restoring confidence, recognition, reward for excellence, and promotion & protection of intellectual property, should be institutionalized.

Scientists in universities and R&D institutions must be encouraged by funding the various tertiary institutions adequately and challenging them on targeted areas/items of national interest. The current situation in some of these institutions reflects a country in slumber when issues of competitiveness, innovation and productivity are considered. The human resource potentials of any nation are the most priceless factors in production, which should be deemed critical in our local production efforts.

The present industrial base of Nigeria cannot guarantee optimal utilization of existing potentials to competitively produce those items currently imported locally until several heavy industries neglected into inactivity, are revitalized. They include: Iron & Steel Industry at Ajaokuta; Paper Mill at Oku-Iboku; Aluminium Smelting Plant at Ikot-Abasi; Refineries in Kaduna, Port Harcourt and Warri; several Textile Mills, Ceramic/Glass Factories and Automobile Assembly Plants, among others.

As classified by HS code broad categories, the raw materials and products with potentials for domestic production can be stratified in the order of short, medium and long terms efforts. Given appropriate government intervention and collaborative efforts of all stakeholders (research & development institutions, entrepreneurs, industries & businesses) in the faithful implementation of the strategy towards Nigeria's competitiveness in raw materials and products development, current potential levels could be significantly enhanced.

Raw materials and products with potentials for local production in the short, medium and long terms are considered in terms of percentage levels of import reduction over time. All things being equal, potentials for local production could be harnessed within the context of the strategy to reduce levels of imports.

TABLE 3.2
POTENTIALS FOR LOCAL RAW MATERIALS PRODUCTION IN THE SHORT-, MEDIUM- AND LONG- TERMS

HS CODES	BROAD CATEGORY OF RAW MATERIALS & PRODUCTS	% Reduction in Imports		
		Short Term 0 to 5Years	Medium Term 5 to 10years	Long Term 10 years & Over
01	Live animals	25	40	80
02	Meat and edible meat offal	30	50	85
03	Fish & crustacean, mollusc & other aquatic invertebrate	15	45	75
04	Dairy prod; birds' eggs; natural honey; edible prod nes	10	30	50
05	Products of animal origin, nes or included	15	35	60
06	Live tree & other plant; bulb, root; cut flowers	15	40	70
07	Edible vegetables and certain roots and tubers	20	45	75
08	Edible fruit and nuts; peel of citrus fruit or melons	15	50	80
09	Coffee, tea, mate and spices	15	45	75
10	Cereals	30	65	85
11	Prod mill indust; malt; starches; insulin; wheat gluten	25	50	75
12	Oil seed, oleagi fruits; miscell grain, seed, fruit etc	15	45	75
13	Lac; gums, resins & other vegetable saps & extracts	10	40	65
14	Vegetable plaiting materials; vegetable products nes	15	55	80
15	Animal/veg fats & oil & their cleavage products; etc	15	50	70
16	Prep of meat, fish or crustaceans, molluscs etc	10	45	60
17	Sugars and sugar confectionery	20	60	80
18	Cocoa and cocoa preparations	25	65	85
19	Prep of cereal, flour, starch/milk; pastrycooks' prod	20	65	80
20	Prep of vegetable, fruit, nuts or other parts of plants	30	60	80
21	Miscellaneous edible preparations	20	50	70

22	Beverages, spirits and vinegar	10	30	50
23	Residues & waste from the food industry; prepared ani mal fodder	10	40	60
24	Tobacco and manufactured tobacco substitutes	10	30	45
25	Salt; sulphur; earth & stone; plastering mat; lime & cement	20	65	80
26	Ores, slag and ash	25	60	75
27	Mineral fuels, oils & product of their distillation; etc	25	55	80
28	Inorgn chem; comp'ds of prec met, radioact elements etc	10	30	50
29	Organic chemicals	10	25	45
30	Pharmaceutical products	15	40	60
31	Fertilisers	32	65	87
32	Tanning/dyeing extract; tannins & derivatives; pigment etc	15	35	55
33	Essential oils & resinoids; perfumery , cosmetic/toilet prep	20	45	65
34	Soap, organic surface-active agents, washing prep, etc	30	50	75
35	Albuminoidal subs; modified starches; glues; enzymes	10	45	60
36	Explosives; pyrotechnic prod; matches; pyro alloy	5	20	40
37	Photographic or cinematographic goods	5	15	35
38	Miscellaneous chemical products	5	10	25
39	Plastics and articles thereof	10	30	50
40	Rubber and articles thereof	5	35	60
41	Raw hides and skins (other than furskins) and leather	25	50	65
42	Articles of leather; saddlery/harness; travel goods etc	20	45	60
43	Furskins and artificial fur; manufactures thereof	15	35	60
44	Wood and articles of wood; wood charcoal	10	40	75
45	Cork and articles of cork	5	25	40
46	Manufactures os straw, esparto/other plaiting mat; etc	5	35	45
47	Pulp of wood/of other fibrous cellulosic mat; waste etc	5	25	40
48	Paper & paperboard; art of paper pulp, paper/paperboard	5	30	50

49	Printed books, newspapers, pictures & other product etc	10	35	65
50	Silk	10	20	35
51	Wool, fine/coarse animal hair, horsehair yarn & woven fabric	5	20	30
52	Cotton	30	65	85
53	Other vegetable textile fibres; paper yarn & woven fab	15	35	55
54	Man-made filaments	10	30	50
55	Man-made staple fibres	10	30	45
56	Wadding, felt & nonwoven; yarns; twine, cordage, etc	5	25	65
57	Carpets and other textile floor coverings	10	30	50
58	Special wooven fab; tufted textile fabric; lace; tapestries etc	5	25	45
59	Impregnated, coated, cover/laminated textile fabric etc	5	20	50
60	Knitted or crocheted fabrics	10	25	50
61	Art of apparel & clothing access, knitted or crocheted	5	25	50
62	Art of apparel & clothing access, not knitted/crocheted	10	30	65
63	Other made up textile articles; sets; worn clothing etc	10	35	60
64	Footwear, gaiters and the like; parts of such articles	15	40	70
65	Headgear and parts thereof	10	30	60
66	Umbrellas/sun-umbrellas,walking/seat sticks,whips,riding crop	10	40	60
67	Prepr feathers & down; arti flower; articles human hair	5	25	40
68	Art of stone, plaster, cement, asbestos, mica/sim mat	5	30	60
69	Ceramic products	15	55	70
70	Glass and glassware	5	25	40
71	Other articles of glass	10	30	45
72	Coin of legal tender	5	25	30
73	Articles of iron and steel	5	10	25
74	Copper and articles thereof	5	10	20
75	Nickel and articles thereof	5	10	15
76	Aluminium and articles thereof	10	25	45
78	Lead and articles thereof	5	10	15
79	Zinc and articles thereof	5	20	30
80	Tin and articles thereof	10	15	20
81	Other base metals; cermets; articles thereof	10	30	40

82	Tool, implement, cutlery, spoon & fork, of base met etc	10	25	40
83	Miscellaneous articles of basee metal	5	25	40
84	Nuclear reactors, boilers, mchy & mech appliance; parts	5	15	25
85	Electrical mchy equip parts thereof; sound recorder etc	5	10	20
86	Railw/tramw locom, rolling-stock & parts thereof; etc	2.5	5	10
87	Vehicles o/t railw/tranw rool-stock, pts & accessories	2.5	5	7.5
88	Aircraft, spacecraft, and parts of	0	2.5	2.5
89	Ships, boats and floating structures	0	2.5	5
90	Optical, photo, cine, meas, checking, precision, etc	0	2.5	5
91	Clocks and watches and parts thereof	0	2.5	5
92	Musical instruments; parts and access of such articles	2.5	5	10
93	Arms and amunition; parts and accessories thereof	0	2.5	5
94	Furniture; bedding, mattress, matt support, cushion etc	5	20	45
95	Toys, games & sports requisites; parts & access thereof	5	15	40
96	Miscellaneous manufactured articles	5	10	30
97	Works of art, collectors' pieces and antiques	10	15	20
	Total	**1037.5**	**2952.5**	**4710**
	Mean = capacity to meet national demand (%) in import reduction	**10.8**	**30.8**	**49**

The major factors determining the potentials for local production, as presented on Table 3.2, include:

- The Nigerian economy operating on a private sector-driven strategy.
- Expansion of existing strategic industries and introduction of new ones, especially in Refineries, Petrochemicals, Iron & Steel, Aluminium Smelting, Motor Vehicle Assembly & Manufacturing, etc.
- Investment in large-scale mining, commercial agriculture and agro-allied industries.
- Massive investment in infrastructure, especially power plants, railways systems, waterways, roads, and telecommunications.
- Growing future demand in every sector.
- Emergence of new technologies in production.
- Increasing supply of raw materials from local sources.
- Attractive government incentives to industries and businesses.

Some of the negative factors capable of hindering attainment of the simulated potentials include: unfair trade practices, inadequate infrastructure, unfavourable business environment, and policy inconsistencies. There are also challenges of:

- ❖ Political instability whereby national democratic system is derailed through suspension of the Constitution by coup or war.
- ❖ Policy changes without cogent and informed reasons create doubts and put critical stakeholders off from trusting governments.
- ❖ Policy summersaults also scare potential investors away and delay effective mobilization of Foreign Direct Investments. Changes in government must not negate existing policy frameworks of palliatives for cushioning fall-outs and shocks to stakeholders.
- ❖ Insecurity manifesting in terrorism, kidnapping and other forms of criminality threatens efforts at building internal capacities and enhancing potentials for local production. Currently, disturbances in the North-East and Niger Delta regions have taken a lot from Nigeria and challenged the country's potentials extensively.
- ❖ Global warming, natural disasters, cyclical occurrences beyond the control of human authority wipe off large areas of farmlands, damage mines, and destroy industrial infrastructure. Their impacts could disrupt production activities and lower potentials to meet local demand.
- ❖ War could be internal or external and the consequences include destruction of assets and displacement of people.
- ❖ Global economic melt-down affects demand and supply chains.

3.4 Patterns of Production and Consumption of Raw Materials and Products

A mapping exercise was carried out to determine the patterns of production and consumption of raw materials and products by Nigerian industries and businesses. The mapping exercises focused on mapping the ten (10) sectors of MAN and the 97 broad categories of raw materials and products according to UN-HS Code with respect to:

- Production/Output.
- Consumption/Use.

From the mapping outcomes, each sector's engagements in production of raw materials and products and the consumption/use of raw materials and products were derived (See Table 3.3). In terms of the patterns of production, the Textile Sector is involved in the highest number of distinct broad categories of raw materials and products at 23 commodity classification. These include: HS Codes 41-44, 50-67 and 95. The least in terms of the number of HS Codes at only 3 is the Pulp & Paper Sector under HS Codes 47-49 (See Figure 3.4).

Similarly, mapping the 10 industrial sectors of MAN and 97 broad categories of raw materials and products with respect to consumption/use placed the Food, Beverages and Tobacco Sector as the highest consumer -- recording 24 broad categories of raw materials and products, including HS Codes 01-12, 14-24, 96 (See Table 3.4). The least remains the

Pulp & Paper Sector at 3 broad categories, 48-49 and 96 (See Figure 3.5). All other sectors' engagements in production and consumption are shown on Table 3.5.

In terms of the patterns of consumption of raw materials and products, the Food, Beverage and Tobacco Sector is involved as the highest consumer of raw materials at 24 broad categories, while the Pulp & Paper Sector recorded the least.

TABLE 3.3
MAPPING PRODUCTION PATTERNS OF RAW MATERIALS AND PRODUCTS BY INDUSTRIAL SECTOR

HS CODES	Broad Category Of Raw Materials & Products	SECTORS OF MANUFACTURERS ASSOCIATION OF NIGERIA (MAN)									
		Food Beverages & Tobacco	Chemicals & Pharmaceuticals	Domestic And Industrial Plastic, Rubber & Foam	Basic Metals, Iron & Steel & Fabricated Metals Products	Pulp, Paper Products, Printing & Publishing	Electrical & Electronics	Textile, Wearing Apparel, Carpets, Leather Footwear	Wood & Wood Products Including Furniture	Non-Metallic Mineral Products	Motor Vehicle & Misc. Products
01	Live Animals	X									
02	Meat And Edible Meat Offal	x									
03	Fish & Crustacean, Mollusc & Other Aquatic Invertebrate	x									
04	Dairy Prod; Birds' Eggs; Natural Honey; Edible Prod Nes	x									
05	Products Of Animal Origin, Nes Or Included	x									
06	Live Tree & Other Plant; Bulb, Root; Cut Flowers	x									
07	Edible Vegetables And Certain Roots And Tubers	x									
08	Edible Fruit And Nuts; Peel Of Citrus Fruit Or Melons	x									
09	Coffee, Tea, Mate And Spices	x									
10	Cereals	x									

11	Prod Mill Indust; Malt; Starches; Insulin; Wheat Gluten	x									
12	Oil Seed, Oleagi Fruits; Miscell Grain, Seed, Fruit Etc	x									
13	Lac; Gums, Resins & Other Vegetable Saps & Extracts		x								
14	Vegetable Plaiting Materials; Vegetable Products Nes	x									
15	Animal/Veg Fats & Oil & Their Cleavage Products; Etc	x									
16	Prep Of Meat, Fish Or Crustaceans, Molluscs Etc	x									
17	Sugars And Sugar Confectionery	x									
18	Cocoa And Cocoa Preparations	x									
19	Prep Of Cereal, Flour, Starch/Milk; Pastrycooks' Prod	x									
20	Prep Of Vegetable, Fruit, Nuts Or Other Parts Of Plants	x									
21	Miscellaneous Edible Preparations	x									
22	Beverages, Spirits And Vinegar	x									
23	Residues & Waste From The Food Indust; Prepr Ani Fodder	x									

24	Tobacco And Manufactured Tobacco Substitutes	x									
25	Salt; Sulphur; Earth & Stone; Plastering Mat; Lime & Cem		x								
26	Ores, Slag And Ash		x		x					x	
27	Mineral Fuels, Oils & Product Of Their Distillation; Etc		x								
28	Inorgn Chem; Compds Of Prec Met, Radioact Elements Etc		x								
29	Organic Chemicals		x								
30	Pharmaceutical Products		x								
31	Fertilisers		x								
32	Tanning/Dyeing Extract; Tannins & Derivs; Pigm Etc		x								
33	Essential Oils & Resinoids; Perf, Cosmetic/Toilet Prep		x								
34	Soap, Organic Surface-Active Agents, Washing Prep, Etc		x								
35	Albuminoidal Subs; Modified Starches; Glues; Enzymes		x								
36	Explosives; Pyrotechnic Prod; Matches; Pyro Alloy		x								
37	Photographic Or Cinematographic Goods		x								
38	Miscellaneous Chemical Products		x								

39	Plastics And Articles Thereof			x							
40	Rubber And Articles Thereof			x							
41	Raw Hides And Skins (Other Than Furskins) And Leather							x			
42	Articles Of Leather; Saddlery/Harness; Travel Goods Etc							x			
43	Furskins And Artificial Fur; Manufactures Thereof							x			
44	Wood And Articles Of Wood; Wood Charcoal								x		
45	Cork And Articles Of Cork			x							
46	Manufactures Os Straw, Esparto/Other Plaiting Mat; Etc			x							
47	Pulp Of Wood/Of Other Fibrous Cellulosic Mat; Waste Etc					x					
48	Paper & Paperboard; Art Of Paper Pulp, Paper/Paperboard					x					
49	Printed Books, Newspapers, Pictures & Other Product Etc					x					
50	Silk							x			
51	Wool, Fine/Coarse Animal Hair, Horsehair Yarn & Woven Fabric							x			
52	Cotton							x			
53	Other Vegetable Textile Fibres; Paper Yarn & Woven Fab							x			

54	Man-Made Filaments							x			
55	Man-Made Staple Fibres							x			
56	Wadding, Felt & Nonwoven; Yarns; Twine, Cordage, Etc							x			
57	Carpets And Other Textile Floor Coverings							x			
58	Special Wooven Fab; Tufted Tex Fab; Lace; Tapestries Etc							x			
59	Impregnated, Coated, Cover/Laminated Textile Fabric Etc							x			
60	Knitted Or Crocheted Fabrics							x			
61	Art Of Apparel & Clothing Access, Knitted Or Crocheted							x			
62	Art Of Apparel & Clothing Access, Not Knitted/Crocheted							x			
63	Other Made Up Textile Articles; Sets; Worn Clothing Etc							x			
64	Footwear, Gaiters And The Like; Parts Of Such Articles							x			
65	Headgear And Parts Thereof			x				x			
66	Umbrellas/Sun-Umbrellas,Walking/Seat Sticks,Whips,Riding Crop							x	x		
67	Prepr Feathers & Down; Arti Flower; Articles Human Hair			x				x			

68	Art Of Stone, Plaster, Cement, Asbestos, Mica/Sim Mat									x	
69	Ceramic Products									x	
70	Glass And Glassware									x	
71	Other Articles Of Glass									x	
72	Coin Of Legal Tender				x						
73	Articles Of Iron And Steel				x						
74	Copper And Articles Thereof				x						
75	Nickel And Articles Thereof				x						
76	Aluminium And Articles Thereof				x						
78	Lead And Articles Thereof				x						
79	Zinc And Articles Thereof				x						
80	Tin And Articles Thereof				x						
81	Other Base Metals; Cermets; Articles Thereof				x						
82	Tool, Implement, Cutlery, Spoon & Fork, Of Base Met Etc				x						
83	Miscellaneous Articles Of Basee Metal				x						
84	Nuclear Reactors, Boilers, Mchy & Mech Appliance; Parts				x		x				x
85	Electrical Mchy Equip Parts Thereof; Sound Recorder Etc						x				
86	Railw/Tramw Locom, Rolling-Stock & Parts Thereof; Etc										x

87	Vehicles O/T Railw/Tranw Rool-Stock, Pts & Accessories										x
88	Aircraft, Spacecraft, And Parts Of										x
89	Ships, Boats And Floating Structures										x
90	Optical, Photo, Cine, Meas, Checking, Precision, Etc						x				
91	Clocks And Watches And Parts Thereof			x	x		x				
92	Musical Instruments; Parts And Access Of Such Articles						x				
93	Arms And Amunition; Parts And Accessories Thereof				x						
94	Furniture; Bedding, Mattress, Matt Support, Cushion Etc			x	x			x	x		
95	Toys, Games & Sports Requisites; Parts & Access Thereof			x			x	x			
96	Miscellaneous Manufactured Articles			x							x
97	Works Of Art, Collectors' Pieces And Antiques								x		

TABLE 3.4
MAPPING CONSUMPTION PATTERNS OF RAW MATERIALS AND PRODUCTS BY INDUSTRIAL SECTOR

HS CODES	BROAD CATEGORY OF RAW MATERIALS & PRODUCTS.	SECTORS OF MANUFACTURERS ASSOCIATION OF NIGERIA (MAN)									
		Food Beverages & Tobacco Sectoral Group	Chemicals & Pharmaceu-ticals	Domestic And Industrial Plastic, Rubber & Foam	Basic Metals, Iron & Steel & Fabricated Metals Products	Pulp, Paper Products, Printing & Publishing	Electrical & Electronic	Textile, Wearing Apparel, Carpets, Leather Footwear	Wood & Wood Products Including Furniture	Non-Metallic Mineral Products	Motor Vehicle & Miscella-neous Assembly
01	Live animals	x									
02	Meat and edible meat offal	x									
03	Fish & crustacean, mollusc & other aquatic invertebrate	x									
04	Dairy prod; birds' eggs; natural honey; edible prod nes	x									
05	Products of animal origin, nes or included	x									
06	Live tree & other plant; bulb, root; cut flowers	x									
07	Edible vegetables and certain roots and tubers	x									
08	Edible fruit and nuts; peel of citrus fruit or melons	x									
09	Coffee, tea, mate and spices	x									
10	Cereals	x									

11	Prod mill indust; malt; starches; insulin; wheat gluten	x									
12	Oil seed, oleagi fruits; miscell grain, seed, fruit etc	x									
13	Lac; gums, resins & other vegetable saps & extracts		x								
14	Vegetable plaiting materials; vegetable products nes	x									
15	Animal/veg fats & oil & their cleavage products; etc	x									
16	Prep of meat, fish or crustaceans, molluscs etc	x									
17	Sugars and sugar confectionery	x									
18	Cocoa and cocoa preparations	x									
19	Prep of cereal, flour, starch/milk; pastrycooks' prod	x									
20	Prep of vegetable, fruit, nuts or other parts of plants	x									
21	Miscellaneous edible preparations	x									
22	Beverages, spirits and vinegar	x									
23	Residues & waste from the food indust; prepr ani fodder	x									

24	Tobacco and manufactured tobacco substitutes	x									
25	Salt; sulphur; earth & stone; plastering mat; lime & cem		x								
26	Ores, slag and ash		x								
27	Mineral fuels, oils & product of their distillation; etc		xx								
28	Inorgn chem; compds of prec met, radioact elements etc		x								
29	Organic chemicals		x								
30	Pharmaceutical products		x								
31	Fertilisers		x								
32	Tanning/dyeing extract; tannins & derivs; pigm etc		x								
33	Essential oils & resinoids; perf, cosmetic/toilet prep		x								
34	Soap, organic surface-active agents, washing prep, etc		x								
35	Albuminoidal subs; modified starches; glues; enzymes		x								
36	Explosives; pyrotechnic prod; matches; pyro alloy		x								
37	Photographic or cinematographic goods		x								

38	Miscellaneous chemical products		x								
39	Plastics and articles thereof			x							
40	Rubber and articles thereof			x							
41	Raw hides and skins (other than furskins) and leather							x			
42	Articles of leather; saddlery/harness; travel goods etc							x			
43	Furskins and artificial fur; manufactures thereof							x			
44	Wood and articles of wood; wood charcoal								X		
45	Cork and articles of cork								X		
46	Manufactures os straw, esparto/other plaiting mat; etc								X		
47	Pulp of wood/of other fibrous cellulosic mat; waste etc								X		
48	Paper & paperboard; art of paper pulp, paper/paperboard					X					
49	Printed books, newspapers, pictures & other product etc					X					
50	Silk							X			
51	Wool, fine/coarse animal hair, horsehair yarn &							X			

	woven fabric										
52	Cotton							X			
53	Other vegetable textile fibres; paper yarn & woven fab							X			
54	Man-made filaments							X			
55	Man-made staple fibres							X			
56	Wadding, felt & nonwoven; yarns; twine, cordage, etc							X			
57	Carpets and other textile floor coverings							X			
58	Special wooven fab; tufted tex fab; lace; tapestries etc							X			
59	Impregnated, coated, cover/laminated textile fabric etc							X			
60	Knitted or crocheted fabrics							X			
61	Art of apparel & clothing access, knitted or crocheted							X			
62	Art of apparel & clothing access, not knitted/crocheted							X			
63	Other made up textile articles; sets; worn clothing etc							X			
64	Footwear, gaiters and the like; parts of such articles							X			

65	Headgear and parts thereof							X			
66	Umbrellas/sun-umbrellas,walking/ seat sticks ,whips, riding crop							X			
67	Prepr feathers & down; arti flower; articles human hair							X			
68	Art of stone, plaster, cement, asbestos, mica/sim mat									X	
69	Ceramic products									X	
70	Glass and glassware									X	
71	Other articles of glass									X	
72	Coin of legal tender				X						
73	Articles of iron and steel				X						
74	Copper and articles thereof				X						
75	Nickel and articles thereof				X						
76	Aluminium and articles thereof				X						
78	Lead and articles thereof				X						
79	Zinc and articles thereof				X						
80	Tin and articles thereof				X						
81	Other base metals; cermets; articles thereof				X						
82	Tool, implement, cutlery, spoon & fork, of base met etc				X						

83	Miscellaneous articles of basee metal				X						
84	Nuclear reactors, boilers, mchy & mech appliance; parts						X				
85	Electrical mchy equip parts thereof; sound recorder etc						X				
86	Railw/tramw locom, rolling-stock & parts thereof; etc										X
87	Vehicles o/t railw/tranw rool-stock, pts & accessories										X
88	Aircraft, spacecraft, and parts of										X
89	Ships, boats and floating structures										X
90	Optical, Photo, Cine, Meas, Checking, Precision, Etc						X				
91	Clocks and watches and parts thereof						X				
92	Musical instruments; parts and access of such articles						X				
93	Arms and ammunition; parts and accessories thereof				X						
94	Furniture; bedding, mattress, matt support, cushion etc			X							

95	Toys, games & sports requisites; parts & access thereof			X							
96	Miscellaneous manufactured articles	X	X	X	X	X	X	X	X	X	X
97	Works of art, collectors' pieces and antiques								X		

Further analyses of production and consumption patterns of raw materials and products by industrial sectors, based on the HS codes and the industrial mapping carried out, it was apparent that production patterns in the Textile and Wearing Apparel Sector (See Figure 3.4) provided the highest production output; followed by Food, Beverage and Tobacco, and Chemicals and Pharmaceutical sectors respectively (See Table 3.5). This scenario could be attributed to the cross-linkages and inter-dependence of inputs to the Textile and Wearing Apparel sector on the one hand and chemicals raw materials from the Chemicals sector on the other. This pressure has significant effect on the productive capacity of the chemicals sector, as it also serves other manufacturing sectors for their inputs. The Food, Beverage and Tobacco sector consumes inputs mainly from agro- and agro-allied resources for which production is mainly sourced locally; hence, maintains a high production and consumption pattern (See Figure 3.5).

The mapping also brought to the fore, the critical importance of the Chemicals sector to other manufacturing sectors in providing their raw material inputs. To ensure that this sector keeps pace with consumption of other strategic sectors, the Petrochemical Industry should as a matter of utmost national urgency be developed to service the needs of the chemicals and related sectors.

TABLE 3.5
PATTERN OF PRODUCTION AND CONSUMPTION
BY INDUSTRIAL SECTOR

S/N	Sector	Production/Output	Consumption/ Use
1	Textile, Wearing Apparels, Carpet, Leather/Leather Foot Wear	23	22
2	Food, Beverages and Tobacco	22	24
3	Chemical and Pharmaceuticals	15	16
4	Base Metal, Iron and Steel and Fabricated Metal Product	14	16
5	Domestic and Industrial Plastic, Rubber and Foam	5	5
6	Electric and Electronics	5	6
7	Motor Vehicle & Miscellaneous Assembly	5	5
8	Wood and Wood Products including Furniture	4	6
9	Non-Metallic Mineral Products	4	5
10	Pulp, Paper and Products, Printing and Publishing	3	3
	Total	**100**	**108**
	% Distribution Pattern	**48.1**	**51.9**

FIGURE 3.4
PATTERNS OF PRODUCTION OF RAW MATERIALS AND PRODUCTS BY INDUSTRIAL SECTOR

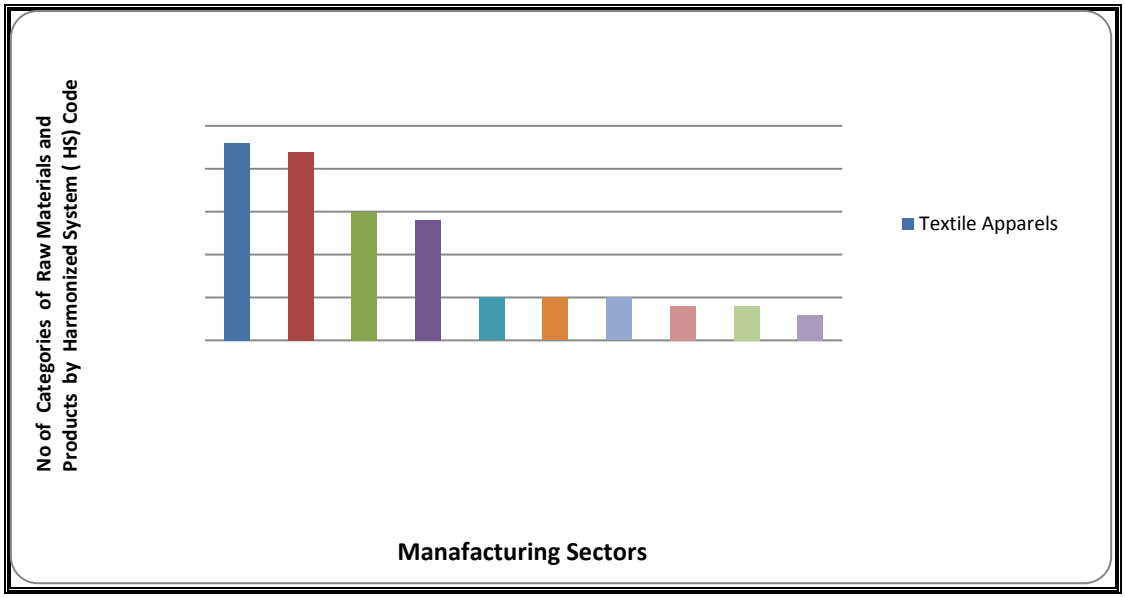
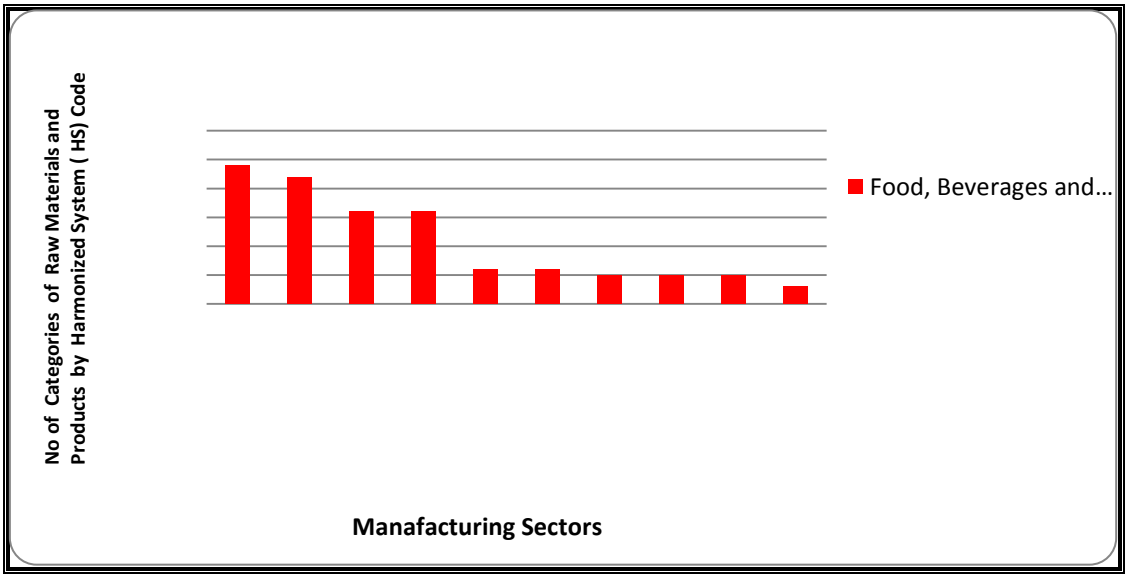


FIGURE 3.5
PATTERNS OF CONSUMPTION OF RAW MATERIALS AND PRODUCTS BY INDUSTRIAL SECTOR



3.5 Capacities of Industries to Meet National Demand

The results show capacity of industries to meet national demand in the short- medium- and long- terms, and estimates show 4, 12, 20, per cent respectively of import reduction (See Table 3.2). Data mapping of the manufacturing sectors (i.e., Ten Industrial Sectors of MAN) and broad categories of raw materials and products (production and output) above show the commodity/commodities each industrial sector has capacity to produce.

The break-down of these raw materials and products proposed by MAN to be sourced locally without Government extension of foreign exchange (Forex) and for future import are categorised by sectors of MAN and HS Codes. The recommendation on MAN's proposal, after due consideration, is that withdrawal of 100% Forex provision should be extended for the next five years. Only those items that are products of strategic industries that do not currently exist in Nigeria would be reviewed in the mid-term (5-10 years).

In response to comments on restrictions to accessing foreign exchange to import raw materials and products, MAN provided a list of some raw materials which they considered that can be sourced locally (See Table 3.6). Though they could not provide the data on quantity, they contend that these products are available locally with capacity to meet national demand.

No nation can produce all the raw materials and products required in manufacturing due to several factors, ranging from diversity in natural and human endowments and variations in industrial development, innovation and the attributes of competitiveness ranking. It is, therefore, inevitable that a nation trades to procure items required but not those in sufficient supply locally.

The capacity of domestic industries to meet national demand is a function of capacity to reduce volume of imports over time. Cumulative impact over the short-, medium- and long-terms -- either for a specific commodity group or overall commodity combination -- is a reflection of local capacity to meet domestic demand.

TABLE 3.6
MAN'S PROPOSED RAW MATERIALS AND PRODUCTS TO BE SOURCED LOCALLY (WITHOUT FOREX)

CHEMICALS AND PHARMACEUTICALS SECTOR			
S/N	**HS CODES**	**ITEMS**	**2010-2015 IMPORT(N Million)**
1	2839.1100/1900	Sodium Silicate	1,112.9
2	2807.00.00.00	Sulphuric Acid	732.5
3	2833.22.00.00	Aluminium Sulphate	6,166.1
4	2833.30.00.00	Alum	145.2
5	3401.20.00.00	Soap Noodles	8,014.3
ALL ITEMS			**16,171.00**

BASIC METALS, IRON & STEEL SECTOR			
S/N	**HS CODES**	**ITEMS**	**2010-2015 IMPORT(N Million)**
1	7209.18.00.00	Flat Iron of thickness of less than 0.5mm	234,700.1
2	8309.10.10.00 – 8309.90.90.00	Crown Corks & Caps	41,549.4
3	6905.10.00.00	Roofing Tiles	2,668.1
4	6905.90.00.00	Others	666.4
5	7207.1100.00	Semi-finished products of iron or Non Alloy Steel 0.25%, containing by weights 0.25% or more of carbon	18,560.2
6	7210.11.00.00	… of a thickness of 0.5mm or more	4323.4
7	7210.20.00.00	…plated or coated with lead, including term-plate	993.5
8	7210.30.00.00	… Electrolytically plated or coated with zinc	275.3
		… Otherwise plated or coated with zinc	
9	7210.41.00.00	Corrugated	406.0
		… Other	
10	7210.49.10.00	… In Coils	31.5
11	7210.49.90.00	… Other	15.3
12	7210.50.00.00	Plated or coated with Chrominum oxides or with chromium and chromium oxides	31,961.4
		… Plated or coated with aluminium zinc alloys	
13	7210.61.10.00	… In coils	15.1
14	7210.61.90.00	… Other	37.0
		… Other	
15	7210.69.10.00	… In Coils	1.2
16	7210.69.90.00	… Other	3.1
		… Other	
17	7210.70.90.00	**Other** Painted, varnished or coated with plastics	18.0
18	7210.90.10.00	… Plated or coated with other materials	1,193.1
19	7210.90.90.00	… Other	19.5
		Flat-rolled products of iron or non-alloy steel of a width of less than 600 mm, clad, plated or coated	
		… **Not further worked than hot-rolled**	
20	7211.19.00.00	… Other	5655.2
21	7211.29.00.00	…Other	4759.3
22	7211.90.00.00	…Other	2,413.3
		Flat-rolled products of iron or non -alloy steel, of a width of less than600 mm, clad, plated or coated	
23	7212.10.00.00	…Plated or coated with tin	1,380.4
24	7212.20.00.00	Electrolytically plated or coated with zinc	3,147.3
25	7314.20.00	Wire, iron/steel grill, fencing welded @ intersection	2,273.1
26	7314.31.00.00	Iron/steel grill, netting & fencing welded @ intersection	943.9
27	7314.39.00.00	Iron/steel grill, netting & fencing welded @ intersection	1,683.3

28	7314.41.00.00	Iron/steel cloth, grill, netting &fencing, plated or coated with zinc	873.4
29	7314.42.00.00	Iron/steel cloth, grill, nelting& fencing, nes, coated with plastic	437.3
30	7314.49.00.00	Iron/steel cloth, grill, netting & fencing nes	2,811.2
31	7313.00.00.00	Barbed wire and other fencing materials of iron or steel	6,574.1
32	7508.10.00.00	Cloth, grill and netting of nickel wire	29.0
33	7604.21.00.00	Hollow profiles of aluminium alloys	41,642.1
34	7606.1110.00	Corrugated	1,429.0
35	7606.1210.00	Corrugated	2,613.9
36	7606.9110.00	Corrugated	593.2
37	7606.9191.00	Plated, coated or vanished	509.8
38	7606.9291.00	Other	37.7
39	7606.9299.00	Plated, coated or vanished	513.3
40	7606.9210.00	Corrugated	787.6
41	7606.9191.00	Plated, coated or vanished	509.8
42	7606.9291.00	Plated, coated or vanished	37.7
43	7606.91.91.00	Aluminium plates not alloyed sheets >0.2mm rect/sq, Painted, coated or vanished	509.8
44	7606.92.91.00	Aluminium plates, alloyed sheets >0.2mm rect/sq, Painted, coated or vanished	37.7
45	7608.10.00.00	Aluminium tubes and pipes of aluminium not alloyed	623.5
46	7608.20.00.00	Aluminium tubes and pipes of aluminium alloyed	594.9
47	7609.00.00.00	Aluminium tube or pipe fittings (for example, coupling, elbows sleeves)	835.0
48	7610.10.00.00	Doors, windows and there frames and thresholds for doors	14,911.8
49	7610.90.00.00	Aluminium structures (excluding prefabricated buildings of heading 94.06)	14,678.5
50	7616.91.00.00	Cloth, grill netting and fencing of aluminium wire	154.3
51	8311.10.00.00	Coated electrode	10,762.3
52	8311.20.00.00	Cored wire of basic metal	4,458.9
53	3923.29.00.00	Articles for the Conveyance or packing of plastics	1,710.3
54	5509.3100.00	Single Yarn	366.5
55	5509.4100.00	Single Yarn	162.4
ALL ITEMS			**468,898**

PULP, PAPER AND PAPER PRODUCTS, PRINTING, PUBLISHING AND PACKAGING SECTOR			
S/N	**HS CODES**	**ITEMS**	**2010-2015 IMPORT(N Million)**
1	3920.20.20.00	Other plates, sheets, film, foil and strip, of polymers of propylene Printed	3,002.6
2	3920.10.20.00	Other plates, sheets, film, foil and strip, of polymers of ethylene Printed	403.6
3	3920.30.20.00	Other plates, sheets, film, foil and strip, of polymers of styrene Printed	255.4
4	4821.1000.00	Printed Paper Beer Labels	12,879.6
5	4819.1000.00	Printed Light Cartons	277.1
6	7607.19.10.00	Aluminium foil, not backed, Rolled, Printed	1,490.4
7	4817.1000	Envelopes	366.2
8	4820.2000	Exercise Books	190.5
9	4820.1000	Registers, Account books, Note Books	536.3
10	4808.1000.00	Corrugated paper and paperboard, whether or not perforated	262.4
11	4818.9000.00	Other	2,163.5
12	4818.4000.41	incontinence pad for adult use	13,905.0
13	3917.3200.00	Flexible Tubes (Straws)	1,907.1
14	3923.3000.00	Carboys, bottles, flasks and similar articles, Spoils, cops, bobbins and similar supports	10,063.5
15	3923.5000.00	Stoppers, lids, caps and other closures	18,573.2
ALL ITEMS			**66,276**

NON-METALLIC AND MINERAL PRODUCTS SECTOR			
S/N	**HS CODES**	**ITEMS**	**2010-2015 IMPORT (N Million)**
1	7003.1200.00	Coloured throughout the mass (body tinted), opacified, flashed or having an absorbent, reflecting or non-reflecting layer	393.8
2	7003.1900.00	Other (Glass, rough cast)	232.7
3	7003.2000.00	Wired Sheet	41.7
4	7007.2900.00	Other laminated safety glass	812.5
5	7008.0000.00	Multiple-walled insulating units of glass	796.6
6	6802.1000.00	Tiles, cubes and similar articles, whether or not rectangular (including square), the largest surface area of which is capable of being enclosed in a square the side of which is less than 7 cm; artificially coloured granules, chippings and powder	1,001.2
7	6802.2100.00	Marble, travertine and alabaster	4,534.2
8	6802.2300.00	Granite	9,155.1
9	6802.9100.00	Marble, travertine and alabaster	3,057.1

10	6802.9200.00	Other calcareous stone	308.6
11	6802.9300.00	Granite	21,831.2
12	6802.9910.00	Steatite	7.6
13	6802.9990.00	Other	1,477.5
14	6907.1000.00	Glazed tiles, cubes and similar articles, for mosaics	13,371.1
15	6907.9000.00	Unglazed ceramic flags and paving, hearth or wall tiles, etc, nes	183,952.5
16	6908.1000.00	Tiles, cubes and similar articles, whether or not rectangular, the largest surface area of which is capable of being enclosed in a square the side of which is less than 7 cm	2,630.6
17	6908.9000.00	Unglazed ceramic flags and paving, hearth or wall tiles, etc, nes	114,370.1
ALL ITEMS			**357,974**

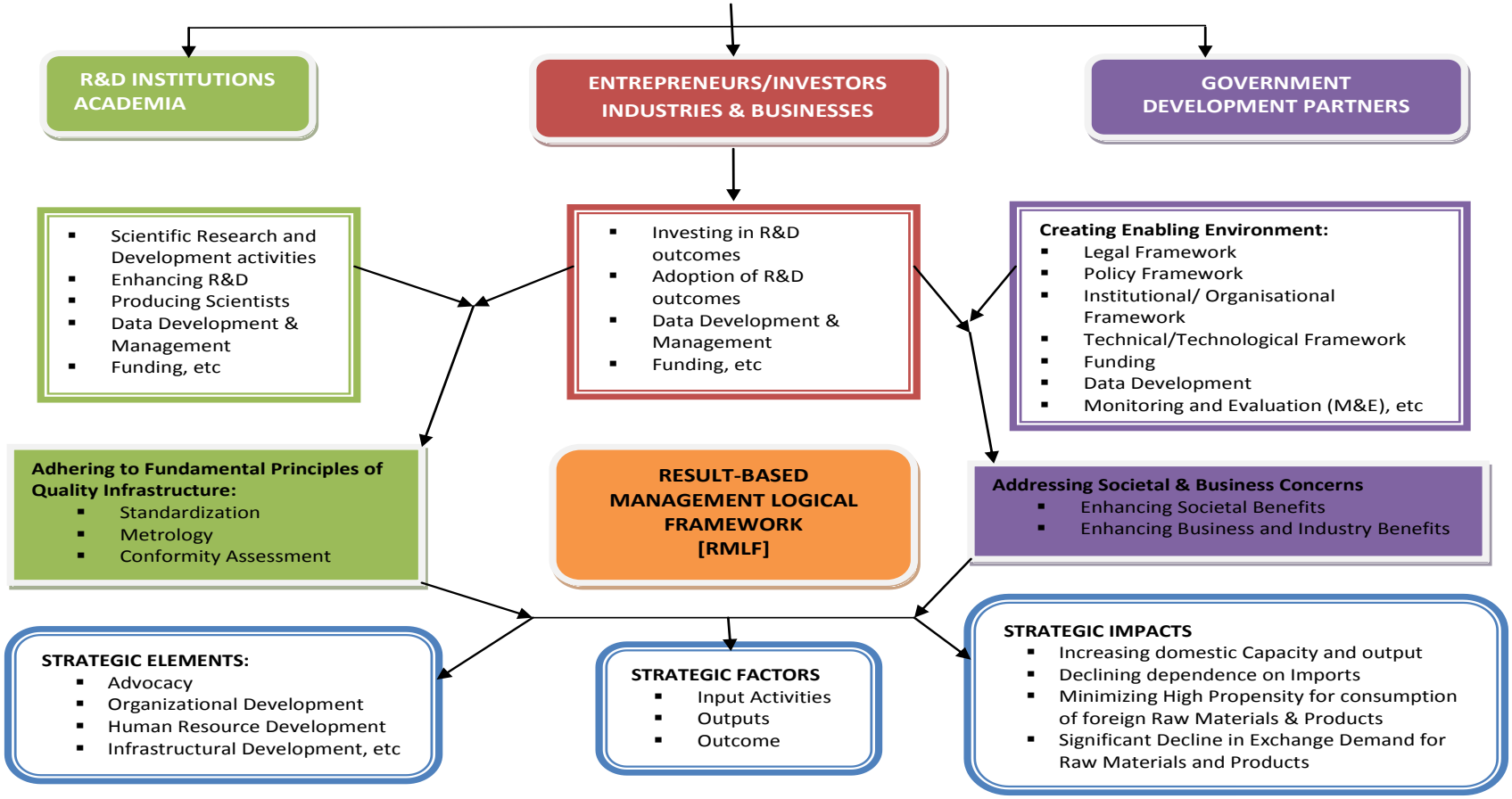
Sources: MAN's Submission to CBN, 2015 and RMRDC Data Base, 2016.

3.6 Model to Drive Nigeria's Competitiveness in Raw Materials and Products Development

The strategy to reduce imports of raw materials and products over time requires a model to drive Nigeria's competitiveness in a sustainable manner. The proposed Model is designed to encapsulate all the critical stakeholders that would be responsible for a variety of assignments in Nigeria's drive towards competitiveness that is backed by innovativeness and enhanced productivity (See Figure 3.6).

In addition to identifying the critical stakeholders (including R&D Institutions/Universities, Entrepreneurs/Businesses/Industries, Government and Development Partners), the Model assigned broad areas of responsibilities, and also emphasized the need for links between R&D Institutions, the Academia and Industries/Businesses.

FIGURE 3.6
MODEL TO DRIVE NIGERIA'S COMPETITIVENESS IN RAW MATERIALS AND PRODUCTS DEVELOPMENT



A vital component of the model is the highlight on Institutionalisation of Quality Infrastructure resulting from collaboration and cooperation between research efforts and industries/businesses. The Quality Infrastructure is characterised by strict adherence to Standardization, Conformity Assessment and Metrology.

In the same vein, the Model directs the need for strict adherence to a Results-based Management Logical Framework (RMLF) in the implementation of the various recommendations of this strategy. RMLF is a matrix that places every strategic element – Advocacy, Institutional/Organisational Arrangements, Infrastructural
Development, Human Resource Development, Data Development and Management, ICT and Technological issues.

The Model lays emphasis on the need for government to provide an enabling environment, especially by ensuring the inputs of appropriate Legal, Policy, Institutional and other frameworks. These frameworks must be subjected to RMLF in their formulation.

3.7 Mapping Linkages between Research Institutions, Industrial Sectors and Raw Materials and Products

The absence of linkages between R&D Institutions and Industries & Businesses is the crux of Nigeria's slow pace of industrialization and development. Without R&D activities targeted at industrial demand, national quality infrastructure will be on a weak foundation. If indeed Nigeria must attain competitiveness, it must ensure adequate and strong research-industry nexus. Consequently, R&D Institutions were mapped with the manufacturing sectors and broad categories of raw materials and products (See Tables 3.7 A, B, C and 3.8 A, B, C respectively). Based on the model, linkages between Research Institutions, and Industrial & Businesses were mapped. These Research Institutions were also mapped with respective raw materials and products in tandem with their mandates.

3.7.1 Mapping R&D Institutions and Industrial Sectors

Mapping R&D Institutions and Industrial Sectors is a pre-requisite to linking them. The mapping provides empirical basis for the R&D institutions to identify which industrial sectors they should be aligning efforts with via cooperation, collaboration and coordination towards competitiveness in raw materials and products development. For the first time in Nigeria's development efforts, this strategy has provided stakeholders the much-needed link for orderly, effective and sustainable national competitiveness.

Out of the 17 R&D Institutions in Agriculture & Rural Development research, 15 are engaged in scientific R&D activities tangential to the Food, Beverages & Tobacco Sector. The Rubber Research Institute of Nigeria [RRIN] is for Domestic & Industrial Plastics, Rubber & Foam Sector researches, while the National Centre for Agricultural Mechanisation (NCAM) will be linking up with the Motor Vehicle & Miscellaneous Assembly Sector. Apart from the Food, Beverages & Tobacco Sector, the Institute of Agricultural Research (IAR) is also engaged in Textile-related research, while the Agricultural Research Council of Nigeria (ARCN) is engaged in Wood and Wood Products research (See Table 3.7A).

For the Science and Technology-related R&D Institutions (16 of them) itemised on Table 3.7 B, 9 (NITR, NBTI, NABDA, FIIRO, NOTAP, RMRDC, NACETEM, NACGRAB, NISLT) are engaged in Food, Beverages & Tobacco-related R&D activities; 8 in Chemicals & Pharmaceuticals; 4 in Domestic & Industrial Plastics, Rubber & Foam; and 5 in Basic Metals, Iron & Steel and Fabricated Metal Products (NASENI, NBTI, NOTAP, RMRDC, NACETEM). Others include: 4 R&D Institutions into Pulp, Paper, Printing & Publishing (NBTI, NOTAP, RMRDC, NACETEM); 5 into Electricals & Electronics (NBTI, SHESTCO, NOTAP, RMRDC, NACETEM); 6 into Textiles, Wearing Apparel, Carpets, Leather/Footwear (NILEST, NBTI, NOTAP, RMRDC, NACETEM, NARICT; 4 into Wood & Wood Products (NBTI, NOTAP, RMRDC, NACETEM); 5 into Non-Metallic Mineral Products (NBTI, NOTAP, RMRDC, NACETEM, NARICT); and 4 into Motor Vehicle & Miscellaneous Assembly-related research (NBTI, NOTAP, RMRDC, NACETEM). Whilst NACETEM is involved with technology policy and management, NOTAP is involved with technology acquisition and promotion, and through these they play a central role in all the industrial sectors.

Other R&D institutions in the areas of Health, Environment, Budget & National Planning, Solid Minerals, and Industry, Trade & Investment are mapped with the manufacturing sectors (See Table 3.7 C). The Nigerian Institute for Social & Economic Research (NISER) cuts across all the ten manufacturing sectors, while 3 R&D institutions are engaged in chemical & pharmaceutical-related research activities (NIPRD, NIMR, NISER). The National Automotive Council (NAC) is the only institution which focuses on Motor Vehicle & Miscellaneous Assembly, while the Forest Research Institute of Nigeria (FRIN) is involved with Pulp & Paper Products and Wood & Wood Products. On its part, the National Metallurgical Development Centre (NMDC) is engaged in Basic Metals, Iron & Steel and Fabricated Metal Products as well as the Non-metallic Mineral Product sectors.

Findings from the mapping exercise of R&D Institutions and the industrial Sectors and raw materials and products reveal the need for government to review the mandates of the R&D Institutions towards addressing the broad categories of raw materials and products imported into the country (HS Codes 1-97). It is strongly believed that this will create the linkages between R&D Institutions and Industries & Businesses, and invariably lead to the evolution of market-oriented and demand-driven R&D. It is also contended that this will be the quickest way to make research market-driven and shorten the process of commercialization of R&D outputs. From the mapping, industries will also identify which R&D Institutions to engage to address their needs.

TABLE 3.7A
MAPPING RESEARCH & DEVELOPMENT INSTITUTIONS AND MANUFACTURING SECTORS

HS CODES	MANUFCTURING SECTOR	FEDERAL MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT																
		IAR Kaduna	NAPRI Kaduna	NIFFR Niger	IAR&T Oyo	NAERLS Kaduna	NIOMR Lagos	CRIN Oyo	NIHORT Oyo	RRIN Edo	NIFOR Edo	NRCRI Abia	NSPRI Kwara	NCRI Niger	NCAM Ilorin	LCRI Abuja	ARCN Abuja	NVRI JOS
01	Food beverages & tobacco sectoral group	x	x	x	x	x	x	x	x		x	x	x	X		x	x	x
02	Chemicals & pharmaceuticals					X											X	
03	Domestic and industrial plastic, rubber & foam					X				x							X	
04	Basic metals, iron & steel & fabricated metals products	X		X			X				X				X		X	
05	Pulp, paper products, printing & publishing																	

06	Electrical &electronic																	
07	Textile, wearing apparel , carpets, leather/bather footwear	X				X											X	
08	Wood & wood products including furniture																X	
09	Non-metalic mineral products																	
10	Motor vehicle & miscellaneous assembly					X									X			
	R&D focus on manufacturing sector																	
		2	**1**	**1**	**1**	**5**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**5**	**1**

TABLE 3.7B
MAPPING RESEARCH & DEVELOPMENT INSTITUTIONS AND MANUFACTURING SECTORS

HS CODES	MANUFACTURING SECTORS	FEDERAL MINISTRY OF SCIENCE AND TECHNOLOGY															
		NBRRI Abuja	NASENI Abuja	NITR Kaduna	NILEST Kaduna	NBTI Abuja	ECN Abuja	NABDA Abuja	FIIRO Lagos	NNMA Lagos	SHESTCO Abuja	NOTAP Abuja	RMRDC Abuja	NACETEM Osun	NARICT Kaduna	NACGRAB Oyo	NISLT
01	Food beverages & tobacco			X		x		x	x			x	x	x		x	x
02	Chemicals & pharmaceuticals				x	x				x	x	x	x	x	x		
03	Domestic and industial plastic, rubber & foam					x						x	x	x			
04	Basic metals, iron & steel & fabricated metals products		x			x						x	x	x			
05	Pulp, paper products, printing & publishing					x						x	x	x			
06	Electrical & electronic		X			x					x	x	x	x			
07	Textile, wearing apparel , carpets, leather/bather footwear				x	x						x	x	x	x		
08	Wood & wood products including furniture					x						x	x	x			
09	Non-metalic mineral products					x						x	x	x	x		
10	Motor vehicle & miscellaneous assembly		X			x						x	x	x			
R&D focus on manufacturing sector		0	3	1	2	10	0	1	1	1	2	10	10	10	3	1	1

TABLE 3.7C
MAPPING OTHER RESEARCH & DEVELOPMENT INSTITUTIONS AND MAUFACTURING SECTORS

HS CODES	MANUFACTURING SECTOR	FEDERAL MINISTRY OF HEALTH		FEDERAL MINISTRY OF ENVIRONMENT	FEDERAL MINISTRY OF BUDGET & PLANNING	MINISTRY OF SOLID MINERALS DEVELOPMENT	FEDERAL MINISTRY OF INDUSTRY, TRADE & INVESTMENT
		NIPRID Abuja	NIMR Abuja	FRIN Ibadan, Oyo	NISER Ibadan, Oyo	NMDC, Jos	NAC
01	Food beverages & tobacco sectoral group				X		
02	Chemicals & pharmaceuticals	X	X		X		
03	Domestic and industial plastic, rubber & foam				X		
04	Basic metals, iron & steel & fabricated metals products				X	X	
05	Pulp, paper products, printing & publishing			X	X		
06	Electrical & electronics				X		
07	Textile, wearing apparel , carpets, leather/bather footwear				X		
08	Wood & wood products including furniture			X	X		
09	Non-metallic mineral products				X	X	
10	Motor vehicle & miscellaneous assembly				X		X
R&D focus on manufacturing sector		1	1	2	10	2	1

3.7.2. Mapping R&D Institutions and Raw Materials and Products

Mapping R&D Institutions and the 97 broad categories of Raw Materials and Products provides a clearer understanding of what raw materials and products drive the demand for R&D activities. In addition, the mapping has identified which R&D Institution should focus on which raw materials and products towards Nigeria's competitiveness drive efforts (See Tables 3.8A, 3.8B and 3.8C).

Nigerian Stored Products Research Institute (NSPRI) cuts across the 12 agro-based categories of raw materials and products, while Agricultural Research Council of Nigeria impacts on 25 agro-based broad categories of raw materials and products due to the nature of its mandate in the area of policy and capacity building (See Table 3.8 A). Other R&D Institutes in the areas of raw materials and products range from 6 broad categories to one.

Sixteen Science and Technology-related R&D Institutions were mapped with the 97 broad categories of raw materials and products (See Table 3.8B). RMRDC is involved in 20 of the 97 commodity broad areas, while NBTI, FIIRO and NARICT are respectively involved in 12. NASENI is involved in 14 broad categories of 97 HS-Code classification of commodities and products. Others are as shown on Table (3.8 B).

Mapping the other 6 R&D Institutions in the areas of Health, Environment, Budget & National Planning, and Solid Minerals Development with the 97 broad categories of raw materials and products reveals that NMDC and National Steel Raw Materials Exploration Agency (NSRMEA) are to focus on 9 HS-Code classifications respectively, while FRIN is to engage in 8 areas. NPRID and NIMR are involved in 5 broad categories of raw materials and products classification, respectively. Due to the peculiar mandate of NISER, its undertakings cut across all categories of the 97 classifications.

TABLE 3.8A
MAPPING RESEARCH AND DEVELOPMENT INSTITUTIONS AND BROAD CATEGORY OF RAW MATERIALS AND PRODUCTS

HS CODES	BROAD CATEGORY OF RAW MATERIALS & PRODUCTS.	FEDERAL MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT															
		IAR Kaduna	NAPRI Kaduna	NIFFR Niger	IAR&T Oyo	NAERLS Kaduna	NIOMR Lagos	CRIN Oyo	NIHORT Oyo	RRIN Edo	NIFOR Edo	NRCRI Abia	NSPRI Kwara	NCRI Niger	NCAM Ilorin	LCRI M'guri	ARCN Abuja
01	Live animals		x			X											x
02	Meat and edible meat offal		x			X											x
03	Fish & crustacean, mollusc & other aquatic invertebrate			X		X	x										x
04	Dairy prod; birds' eggs; natural honey; edible prod nes		x			X											x
05	Products of animal origin, nes or included		x			X											x
06	Live tree & other plant; bulb, root; cut flowers				x	X			x				X				x
07	Edible vegetables and certain roots and tubers					X						x	X				x
08	Edible fruit and nuts; peel of citrus fruit or melons	x				X			x				X				x
09	Coffee, tea, mate and spices					X		x					X				x
10	Cereals												X	x		x	x
11	Prod mill indust; malt; starches; insulin; wheat gluten	x				x						x	X				x

12	Oil seed, oleagi fruits; miscell grain, seed, fruit etc	x				X					x		X				x
13	Lac; gums, resins & other vegetable saps & extracts					X				x							x
14	Vegetable plaiting materials; vegetable products nes				x	X											x
15	Animal/veg fats & oil & their cleavage products; etc		x			X											x
16	Prep of meat, fish or crustaceans, molluscs etc		x	x		X	x										x
17	Sugars and sugar confectionery					X											x
18	Cocoa and cocoa preparations					X		x					X				x
19	Prep of cereal, flour, starch/milk; pastrycooks' prod					X							X	x			x
20	Prep of vegetable, fruit, nuts or other parts of plants				x	X		x					X				x
21	Miscellaneous edible preparations				x	X							X				x
22	Beverages, spirits and vinegar					X											x
23	Residues & waste from the food indust; prepr ani fodder					X											x
24	Tobacco and manufactured tobacco substitutes					X		x						x			x

25	Salt; sulphur; earth & stone; plastering mat; lime & cem																
26	Ores, slag and ash																
27	Mineral fuels, oils & product of their distillation; etc																
28	Inorgn chem; compds of prec met, radioact elements etc																
29	Organic chemicals																
30	Pharmaceutical products																
31	Fertilisers																
32	Tanning/dyeing extract; tannins & derivs; pigm etc																
33	Essential oils & resinoids; perf, cosmetic/toilet prep	x				X											X
34	Soap, organic surface-active agents, washing prep, etc																
35	Albuminoidal subs; modified starches; glues; enzymes																
36	Explosives; pyrotechnic prod; matches; pyro alloy																
37	Photographic or cinematographic goods																
38	Miscellaneous chemical products																
39	Plastics and articles thereof																

40	Rubber and articles thereof									x							
41	Raw hides and skins (other than furskins) and leather																
42	Articles of leather; saddlery/harness; travel goods etc																
43	Furskins and artificial fur; manufactures thereof																
44	Wood and articles of wood; wood charcoal																
45	Cork and articles of cork																
46	Manufactures os straw, esparto/other plaiting mat; etc																
47	Pulp of wood/of other fibrous cellulosic mat; waste etc																x
48	Paper & paperboard; art of paper pulp, paper/paperboard																
49	Printed books, newspapers, pictures & other product etc																
50	Silk																
51	Wool, fine/coarse animal hair, horsehair yarn & woven fabric																
52	Cotton	x				X											X
53	Other vegetable textile fibres; paper yarn & woven fab																

54	Man-made filaments																
55	Man-made staple fibres																
56	Wadding, felt & nonwoven; yarns; twine, cordage, etc																
57	Carpets and other textile floor coverings																
58	Special wooven fab; tufted tex fab; lace; tapestries etc																
59	Impregnated, coated, cover/laminated textile fabric etc																
60	Knitted or crocheted fabrics																
61	Art of apparel & clothing access, knitted or crocheted																
62	Art of apparel & clothing access, not knitted/crocheted																
63	Other made up textile articles; sets; worn clothing etc																
64	Footwear, gaiters and the like; parts of such articles																
65	Headgear and parts thereof																
66	Umbrellas/sun-umbrellas,walking/seat sticks,whips,riding crop																
67	Prepr feathers & down; arti flower; articles human hair																

68	Art of stone, plaster, cement, asbestos, mica/sim mat																
69	Ceramic products																
70	Glass and glassware																
71	Other articles of glass																
72	Coin of legal tender																
73	Articles of iron and steel																
74	Copper and articles thereof																
75	Nickel and articles thereof																
76	Aluminium and articles thereof																
78	Lead and articles thereof																
79	Zinc and articles thereof																
80	Tin and articles thereof																
81	Other base metals; cermets; articles thereof																
82	Tool, implement, cutlery, spoon & fork, of base met etc	X			X										x		
83	Miscellaneous articles of basee metal																
84	Nuclear reactors, boilers, mchy & mech appliance; parts																
85	Electrical mchy equip parts thereof; sound recorder etc																
86	Railw/tramw locom, rolling-stock & parts thereof; etc																
87	Vehicles o/t railw/ tranw rool-stock, pts & accessories																

88	Aircraft, spacecraft, and parts of																
89	Ships, boats and floating structures																
90	Optical, Photo, Cine, Meas, Checking, Precision, Etc																
91	Clocks and watches and parts thereof																
92	Musical instruments; parts and access of such articles																
93	Arms and amunition; parts and accessories thereof																
94	Furniture; bedding, mattress, matt support, cushion etc																
95	Toys, games & sports requisites; parts & access thereof																
96	Miscellaneous manufactured articles														x		
97	Works of art, collectors' pieces and antiques																
Total R&D focus on raw materials		**5**	**6**	**2**	**4**	**1**	**2**	**4**	**2**	**2**	**1**	**2**	**12**	**2**	**2**	**1**	**25**

TABLE 3.8B
MAPPING RESEARCH & DEVELOPMENT INSTITUTIONS AND BROAD CATEGORY OF RAW MATERIALS & PRODUCTS

HS CODES	BROAD CATEGORY OF RAW MATERIALS & PRODUCTS.	FEDERAL MINISTRY OF SCIENCE AND TECHNOLOGY															
		NBRRI Abj	NASENI Abj	NITR Kad	NILEST Kad	NBTI Abj	ECN Abj	NABDA Abj	FIIRO Lagos	NNMA Lagos	SHESTCO Abuja	NOTAP Abuja	RMRDC Abuja	NACETEM Osun	NARICT Kaduna	NACGRAB Oyo	NISLT
01	Live animals			X									X				
02	Meat and edible meat offal												X				X
03	Fish & crustacean, mollusc & other aquatic invertebrate												X				X
04	Dairy prod; birds' eggs; natural honey; edible prod nes												X				X
05	Products of animal origin, nes or included			X													
06	Live tree & other plant; bulb, root; cut flowers							X								X	
07	Edible vegetables and certain roots and tubers							X					X			X	
08	Edible fruit and nuts; peel of citrus fruit or melons												X				
09	Coffee, tea, mate and spices																
10	Cereals												X				
11	Prod mill indust; malt; starches; insulin; wheat gluten					X			X				X				X
12	Oil seed, oleagi fruits; miscell grain, seed, fruit etc					X			X				X				

13	Lac; gums, resins & other vegetable saps & extracts												X		X	
14	Vegetable plaiting materials; vegetable products nes														X	
15	Animal/veg fats & oil & their cleavage products; etc															
16	Prep of meat, fish or crustaceans, molluscs etc															X
17	Sugars and sugar confectionery												X			X
18	Cocoa and cocoa preparations					X			X				X			X
19	Prep of cereal, flour, starch/ milk; astrycooks' prod					X			X							X
20	Prep of vegetable, fruit, nuts or other parts of plants					X										X
21	Miscellaneous edible preparations					X			X							X
22	Beverages, spirits and vinegar					X			X							X
23	Residues & waste from the food indust; prepr ani fodder					X			X							
24	Tobacco and manufactured tobacco substitutes															
25	Salt; sulphur; earth & stone; plastering mat; lime & cem	X														
26	Ores, slag and ash															

27	Mineral fuels, oils & product of their distillation; etc														x		
28	Inorgn chem; compds of prec met, radioact elements etc														X		
29	Organic chemicals														X		
30	Pharmaceutical products																
31	Fertilisers														X		
32	Tanning/dyeing extract; tannins & derivs; pigm etc				X										X		
33	Essential oils & resinoids; perf, cosmetic/toilet prep					X				X					X		
34	Soap, organic surface-active agents, washing prep, etc					X			X						X		
35	Albuminoidal subs; modified starches; glues; enzymes					X			X								
36	Explosives; pyrotechnic prod; matches; pyro alloy																
37	Photographic or cinematographic goods																
38	Miscellaneous chemical products														X		
39	Plastics and articles thereof					X							X		X		
40	Rubber and articles thereof												X				

41	Raw hides and skins (other than furskins) and leather				X								X				
42	Articles of leather; saddler /harness; travel goods etc				X										X		
43	Furskins and artificial fur; manufactures thereof				X										X		
44	Wood and articles of wood; wood charcoal																
45	Cork and articles of cork																
46	Manufactures os straw, esparto/ other plaiting mat; etc																
47	Pulp of wood/of other fibrous cellulosic mat; waste etc								X				X				
48	Paper & paper-board; art of paper pulp, paper/ paperboard								X				X				
49	Printed books, newspapers, pictures & other product etc																
50	Silk																
51	Wool, fine/ coarse animal hair, horsehair yarn & woven fabric																
52	Cotton												X				

53	Other vegetable textile fibres; paper yarn & woven fab																
54	Man-made filaments																
55	Man-made staple fibres																
56	Wadding, felt & nonwoven; yarns; twine, cordage, etc																
57	Carpets and other textile floor coverings												X				
58	Special wooven fab; tufted tex fab; lace; tapestries etc																
59	Impregnated, coated, cover/laminated textile fabric etc																
60	Knitted or crocheted fabrics																
61	Art of apparel & clothing access, knitted or crocheted																
62	Art of apparel & clothing access, not knitted/ crocheted																
63	Other made up textile articles; sets; worn clothing etc																
64	Footwear, gaiters and the like; parts of such articles				X												
65	Headgear and parts thereof																

66	Umbrellas/ sun-umbrellas, walking/seat sticks, whips,riding crop																
67	Prepr feathers & down; arti flower; articles human hair																
68	Art of stone, plaster, cement, asbestos, mica/sim mat	X															
69	Ceramic products		X						X				X				
70	Glass and Glassware		X														
71	Other Articles of Glass																
72	Coin of Legal Tender																
73	Articles of Iron And Steel		X														
74	Copper and Articles Thereof		X														
75	Nickel and Articles Thereof		X														
76	Aluminium and Articles Thereof		X														
78	Lead and Articles Thereof		X														
79	Zinc and Articles Thereof		X														
80	Tin and Articles Thereof		X														
81	Other base metals; cermets; articles thereof		X														
82	Tool, mplement, cutlery, spoon & fork, of base met etc		X														

83	Miscellaneous Articles of Basee Metal		X														
84	Nuclear reactors, boilers, mchy & mech appliance; parts										X						
85	Electrical mchy equip parts thereof; sound recorder etc		X				X										
86	Railw/tramw locom, rolling-stock & parts thereof; etc																
87	Vehicles o/t railw/tranw rool-stock, pts & accessories		x														
88	Aircraft, Spacecraft, And Parts of																
89	Ships, boats and floating structures																
90	Optical, photo, cine, meas, checking, precision, etc																
91	Clocks and watches and parts thereof																
92	Musical instruments; parts and access of such articles																
93	Arms and amunition; parts and accessories thereof																
94	Furniture; bedding, mattress, matt support, cushion etc		x														

95	Toys, games & sports requisites; parts & access thereof																
96	Miscellaneous manufactured articles																
97	Works of art, collectors' pieces and antiques																
Total R&D focus on raw materials		**2**	**14**	**2**	**5**	**12**	**1**	**2**	**12**	**1**	**1**	**0**	**20**	**0**	**12**	**3**	**11**

TABLE 3.8C

MAPPING OTHER RESEARCH & DEVELOPMENT INSTITUTIONS AND BROAD CATEGORY OF RAW MATERIALS & PRODUCTS

HS CODES	BROAD CATEGORY OF RAW MATERIALS & PRODUCTS.	FEDERAL MINISTRY OF HEALTH	FEDERAL MINISTRY OF ENVIRONMENT	FEDERAL MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT	FEDERAL MINISTRY OF BUDGET & PLANNING	FEDERAL MINISTRY OF SOLID MINERALS DEVELOPMENT		
		NPRID Abuja	NIMR Lagos	FRIN Ibadan, Oyo		NISER Ibadan, Oyo	SS	NSRMEA, Kaduna
01	Live animals							
02	Meat and edible meat offal							
03	Fish & crustacean, mollusc & other aquatic invertebrate							
04	Dairy prod; birds' eggs; natural honey; edible prod nes							
05	Products of animal origin, nes or included							
06	Live tree & other plant; bulb, root; cut flowers		X					
07	Edible vegetables and certain roots and tubers							
08	Edible fruit and nuts; peel of citrus fruit or melons		X					
09	Coffee, tea, mate and spices							
10	Cereals							
11	Prod mill indust; malt; starches; insulin; wheat gluten							
12	Oil seed, oleagi fruits; miscell grain, seed, fruit etc							
13	Lac; gums, resins & other vegetable saps & extracts		X					
14	Vegetable plaiting materials; vegetable products nes							

15	Animal/veg fats & oil & their cleavage products; etc							
16	Prep of meat, fish or crustaceans, molluscs etc							
17	Sugars and sugar confectionery							
18	Cocoa and cocoa preparations							
19	Prep of cereal, flour, starch/milk; pastrycooks' prod							
20	Prep of vegetable, fruit, nuts or other parts of plants							
21	Miscellaneous edible preparations							
22	Beverages, spirits and vinegar							
23	Residues & waste from the food indust; prepr ani fodder							
24	Tobacco and manufactured tobacco substitutes							
25	Salt; sulphur; earth & stone; plastering mat; lime & cem							
26	Ores, slag and ash							
27	Mineral fuels, oils & product of their distillation; etc							
28	Inorgn chem; compds of prec met, radioact elements etc							
29	Organic chemicals	X						
30	Pharmaceutical products	X	X					
31	Fertilisers							
32	Tanning/dyeing extract; tannins & derivs; pigm etc							
33	Essential oils & resinoids; perf, cosmetic/toilet prep	X	X					
34	Soap, organic surface-active agents, washing prep, etc							

35	Albuminoidal subs; modified starches; glues; enzymes	X						
36	Explosives; pyrotechnic prod; matches; pyro alloy							
37	Photographic or cinematographic goods							
38	Miscellaneous chemical products	X						
39	Plastics and articles thereof							
40	Rubber and articles thereof							
41	Raw hides and skins (other than furskins) and leather							
42	Articles of leather; saddlery/ harness; travel goods etc							
43	Furskins and artificial fur; manufactures thereof							
44	Wood and articles of wood; wood charcoal			X				
45	Cork and articles of cork			X				
46	Manufactures os straw, esparto/other plaiting mat; etc			X				
47	Pulp of wood/of other fibrous cellulosic mat; waste etc			X				
48	Paper & paperboard; art of paper pulp, paper/paperboard			X				
49	Printed books, newspapers, pictures & other product etc			X				
50	Silk							
51	Wool, fine/coarse animal hair, horsehair yarn & woven fabric							
52	Cotton							
53	Other vegetable textile fibres; paper yarn & woven fab							

54	Man-made filaments							
55	Man-made staple fibres							
56	Wadding, felt & nonwoven; yarns; twine, cordage, etc							
57	Carpets and other textile floor coverings							
58	Special wooven fab; tufted tex fab; lace; tapestries etc							
59	Impregnated, coated, cover/ laminated textile fabric etc							
60	Knitted or crocheted fabrics							
61	Art of apparel & clothing access, knitted or crocheted							
62	Art of apparel & clothing access, not knitted/crocheted							
63	Other made up textile articles; sets; worn clothing etc							
64	Footwear, gaiters and the like; parts of such articles							
65	Headgear and parts thereof							
66	Umbrellas/sun-umbrellas,walking/seat sticks,whips,riding crop							
67	Prepr feathers & down; arti flower; articles human hair							
68	Art of stone, plaster, cement, asbestos, mica/sim mat							
69	Ceramic products							
70	Glass and glassware							
71	Other articles of glass							
72	Coin of legal tender							
73	Articles of iron and steel						x	x

74	Copper and articles thereof							x
75	Nickel and articles thereof						x	x
76	Aluminium and articles thereof							
78	Lead and articles thereof						x	x
79	Zinc and articles thereof							x
80	Tin and articles thereof						x	x
81	Other base metals; cermets; articles thereof						x	x
82	Tool, implement, cutlery, spoon & fork, of base met etc						x	x
83	Miscellaneous articles of base metal						x	x
84	Nuclear reactors, boilers, mchy & mech appliance; parts							
85	Electrical mchy equip parts thereof; sound recorder etc							
86	Railw/tramw locom, rolling-stock & parts thereof; etc						x	
87	Vehicles o/t railw/tranw rool-stock, pts & accessories						x	
88	Aircraft, spacecraft, and parts of							
89	Ships, boats and floating structures							
90	Optical, photo, cine, meas, checking, precision, etc							
91	Clocks and watches and parts thereof							
92	Musical instruments; parts and access of such articles							
93	Arms and amunition; parts and accessories thereof							
94	Furniture; bedding, mattress, matt support, cushion etc			x				

95	Toys, games & sports requisites; parts & access thereof							
96	Miscellaneous manufactured articles							
97	Works of art, collectors' pieces and antiques			x				
Total R&D focus on raw materials		**5**	**5**		**8**	**0**	**9**	**9**

CHAPTER FOUR

MAJOR FINDINGS FROM STAKEHOLDERS

Different stakeholders participated in the field study that enabled the preparation of the report, ranging from industries and businesses to research and development institutions and government agencies. Thus, differences exist in sectoral emphases, motivations and recommendations. Consequently, findings from the study are analysed in two broad categories of industries & businesses and R&D institutions to account for the differences observed.

Members of the Manufacturers Association of Nigeria (MAN), Nigerian Association of Chambers of Commerce, Industry, Mines & Agriculture (NACCIMA), Nigerian Association of Small- and Medium- Scale Enterprises (NASME) and Nigerian Association of Small-Scale industrialists (NASSI) were targeted in the survey. The detailed report of the various sectors of MAN/NACCIMA/NASME/NASSI as well as R&D Institutions is presented in Volume 2 of this report.

4.1 Industries and Businesses

The changing nature of manufacturing activities is increasingly being recognized by industries and businesses. The stakeholders generally observed that considering the current economic situation in the country, it is imperative that government undertakes forecasting and planning studies as inputs for the design of national manufacturing strategies and policies.

The industries and businesses noted that while it is impossible to predict precisely what the future would look like, prospective studies and innovative forecasting can provide insights into potentials for local sourcing of raw materials and products. This will set the tone and context to reduce considerably, over-dependence on imports and associated demand for foreign exchange.

Without such forward-looking analyses and proactive industrial development strategy design, the country runs the risk of continued underdevelopment.

The question that emerged from the interactions with stakeholders in industries and businesses is: ***'have we considered placing emphases on the future role of technology development for manufacturing, creation of new industries, poverty reduction, job and wealth creation and national security?'*** In essence, there is need to pay attention to the role of manufacturing as driver of future economic recovery of Nigeria and in capturing economic value in the form of production-related jobs.

The stakeholders also acknowledge the need to place emphases on linkages between the production base and research activities and the role of this interaction for future innovation in manufacturing. Going by their reflections, this report argues that long-term industrial competitiveness may depend on the country's ability to build and upgrade production-related industrial capabilities and to address technological gaps in specific industries. Such technological gaps could be found in value chains of commodity-based and consumer industries as well as with capital equipment-based/factory suppliers.

Stakeholders further agree that quality is critical for driving Nigeria's competitiveness in raw materials and products development. In the same vein, conceptual frameworks that account for the diverse elements of manufacturing systems are crucial for understanding how economies can increase manufacturing competitiveness, close technological gaps and improve strategies to reap benefits from modern value chains.

4.1.1 Sectoral Recommendations on Local Sourcing of Raw Materials

The perceptions of industries and businesses of what should be done to enhance competitiveness in raw materials and products development are summarised on Table 4.1 as sectoral recommendations. They explain why change will occur in the manufacturing sector, what manufacturing industries need to do differently, which R&D and technological break-through could become relevant, what the future might look like if Nigeria continues on the path of import-dependence [as a result of inaction or progress], and the level of economic recovery we can achieve if positive and committed steps are taken to implement the proposed strategy for driving her competitiveness in raw materials and products development.

TABLE 4.1A
SECTORAL RECOMMENDATIONS TO LOCAL SOURCING OF RAW MATERIALS

S/N	SECTORS	RECOMMENDATIONS
1	**FOOD, BEVERAGE & TOBACCO**	1. Need for periodic engagement of Stakeholders (MAN, NACCIMA, NASSI, NASME, etc.) on policy issues of manufacturing for Consistency in Government policies 2. Allow Crude Palm Olein (CPO) importation but to be restricted to refiners with credible and verifiable backward integration programme and to consider excluding Crude Palm Oil (CPO) HS Code 1511.10.00 from the list of items not valid for foreign exchange because of long gestation period (3-5 years). 3. Need to tighten control on smuggling and improve standards and quality of local raw materials through improved varieties and capacity adopting best global practices. 4. Reform of the land tenure system to encourage large scale Agriculture and Consistency within the production value chain. 5. Government to provide enabling environment in terms of security, basic and manufacturing infrastructure and improved transportation system and reduce cost of doing business in manufacturing. 6. Priority should be given to funding of research & development institutions for targeted raw materials and products 7. Government should initiate agricultural reforms with specific focus on improved yield by providing improved seedlings,

		especially with encouragement of backward integration for most of the manufacturing companies 8. Encourage local contents development including recognition and support for companies patronising local raw materials vis-a-vis periodic incentives. 9. Change in school curriculum to embrace entrepreneurship in agro- value chain development and consistent capacity building in specialised and intricate skills areas.
2	**CHEMICALS AND PHARMACEUTICALS**	1. There should be lower interest rate (2-5%) on long-terms funds. 2. Incentives, taxations and regulations should be streamlined. Encourage pioneer status on tax matters. 3. Adequate infrastructure and security should be improved to facilitate manufacturing. 4. Enabling environment for quality research should be provided to researchers to conduct research relevant to industries. 5. Encourage more linkages with development partners and collaboration amongst the Academia/R&D Institution, Manufacturing, Entrepreneurs/ Investors and the Government in the area of raw materials/products development in order to reduce import. 6. Government and the Manufacturing Sector should support for R&D Programmes and projects and pursue research work that will lead to new product development and commercialisation. Proper funding of research institutions and research 7. Government should create more free trade zones and duty on raw materials/products not manufactured in Nigeria should be reduced and duty on raw materials/products manufactured in Nigeria should be increased. 8. Multinationals should be encouraged to invest 70% of the profit in Nigeria and 20% of this should be in critical sector research (CSR). 9. Industries should regularly provide funding and guidance for capacity building/skill acquisition in the area of raw materials development 10. There should be policy to enforce patronage of made in Nigeria goods with short-term, medium-term and long-term development plan. Industries should explore the maximum possibilities of import/export within ECOWAS. 11. Monopolisation of sectors should be discouraged by providing level playing field to all stakeholders. 12. Industries with research capability should actively participate in local production of needed materials 13. Government to set-up petrochemical industries, encourage downstream investment and build capacity 14. There should be an affordable facility for testing quality raw materials so developed. R & D centres to research into quality improvement methods, new raw materials, new uses of existing raw materials, methods of refining/testing raw materials for

		industry use and methods of packaging and storage. 15. Industries to ensure that standard of locally produced materials match with international standard and re-orient the people's mind-set that anything made in Nigeria is inferior. 16. Operating cost in Nigeria should be reduced by creating enabling environment for business to thrive, provide loan at single digit interest rate, reduce cost of electricity and gas and provide good transportation network.
3	**DOMESTIC & INDUSTRIAL PLASTIC, RUBBER & FOAM**	1. Increase gas supply to Indorama EPCL to enable it increase its raw materials/products output and also set up new product lines for other currently imported critical raw materials. 2. Petrochemical plants should be resuscitated as a matter of urgency and new ones established in order to enable the production of a wide range of petrochemical-based raw materials and products in the country to feed both the plastics, packaging and foam industries. 3. Encourage Indorama to commence continuous production of Polypropylene (PP) and Polyethylene (PE) with increased gas supply, to meet local demand. 4. Encourage large scale production of plastic recycling to produce raw materials and products for some companies. 5. Embrace simple technology from China in setting up production lines for raw materials locally. 6. Encourage the setting up of plants to produce raw materials where the country has comparative advantage. 7. Develop the solid minerals sector as this is the basis for the establishment of some production plants- e.g. mineral-based raw materials. 8. FOREX should be made available for the foam and plastics manufacturers to be able to source raw materials that are not available in the country to prevent them from closing shop. 9. Woo back tyre manufacturers – Dunlop and Michelin, to set up plants in the country for maximum utilisation of the nation's natural rubber in product development. 10. Resuscitate old and ageing rubber plantations for increased rubber output. 11. Government should equip the R&D centres to undertake proper research in product based research. There should also be close collaboration between researchers and foreign technical partners. 12. Interested entrepreneurs should be encouraged by the government by sourcing cheap equipment for them. 13. Basic infrastructure should be provided by the government in order to reduce overhead cost and ultimately, cost of raw materials and products. For example the completion of the rail projects in the country will reduce cost of haulage of raw materials and products across the country. 14. Government should institute incentives in form of grants for

		companies that utilize locally produced raw materials for a minimum of four (4) years to encourage them. 15. More free-trade zones should be established to promote the export of locally produced raw materials.
4	**BASIC METALS**	**Steel** • Need to urgently resolve the problem of Ajaokuta Steel Company and revitalised the company and boldly resolve all its legal impediments; • Ajaokuta should be urged to produce molten metal which is the basis for production of steel products anywhere in the world; • The activities of Ajaokuta if allowed to take off, will resolve the much needed production of Billet and Hot Roll Coils which will be used for wide ranges of steel products; • Alternatively, members are ready to invest in another company along with foreign investors to provide alternative in place of the problem with Ajaokuta; • Government Policies should be made to grow the sub-sector; • The need for the government to prioritise the steel sub-sector in the next 2 years, as it is the back-bone of industrialisation; **Aluminium** • All issues surrounding the ownership issue, both physical and legal, on ALSCON must be settled by the Government; • The route for the transfer of raw materials (Bauxite) through Imo River needs to be attended to through necessary investments by Government on the dredging of the river ; • Government should encourage RMRDC in conjunction with Federal Ministry of Solid Minerals and other relevant Agencies to explore/exploit Bauxite deposit in Nigeria. • The fact that ALSCON was wrongly located cannot be overemphasised, but consideration should be given to an alternative company that will be located closer to the secondary users for the necessity of economy of scale; • Government should put into process, the floating of another smelter company which will be jointly owned by the stakeholders and foreign / local investors that maybe promoted by the Government with shared equity holdings; • The proposed new company if agreed, should be guided to strategize its capacity in modules (say about 50,000MT per annum for a start) with periodic review of its capacity to gradually meet the national requirement as well as for export; • Timeline for establishing such smelter plant will take about 3 years; • Revenue could also be earned from export earnings of the smelter products; • Government should give some level of priority consideration to

		the allocation of forex to investors in the Aluminium and Steel businesses; • The issue of ECOWAS Liberalisation Scheme (ETLS) must be properly monitored and supervised to curb trans-shipment from third party countries to West Africa and Nigeria in particular; • Strong emphasis must be placed on patronage of local industries with attendant effects on local capacity development and growth of manufacturing businesses; **Other Recommendations** • The law on exportation of scrap metals must be strictly enforced to curb abuses and the envisaged dearth of needed raw materials to the Basic Metal Sector. • As a nation of over 170 million people, to earn our respect in the committee of nations, we must take urgent steps to produce our own aluminium raw materials • Users of the annealed cold rolled coils should be allowed to import at prevailing duty rate for the next one year after which the duty should be increased. This is to give the producers time to stabilise on their local production and improve relationship with the users; • For the production of wire rods, Government should allow the importation of billets into Nigeria for the next one year after which the Government should disallow continued importation. It is assumed that during this period, local producers should be able to produce at maximum capacity while the users that wish to set up their own plants should use the opportunity to do so, and where that is not possible they should begin to patronise local producers. • Government should also approve the earlier recommended duty rate of 5% on billet at the expiration of the moratorium period of one year, as earlier recommended by MAN.
5	**PULP, PAPER PRODUCTS, PRINTING**	1. Effort should be made for the development of local raw materials as industrial input in the sector for self-sufficiency, e.g. establish plantations of *Gmelina arborea,* Pines and Eucalyptus species to service the existing primary paper mills. Plantation of raphia plants and bamboo which are potential sources of long and medium fibres should be established and investigation to exploit their full potentials should be continued. 2. Participation of the private companies that bought these paper mills is highly needed to solve problems of long fibre shortage in the country. 3. Short term measures should involve the use of non-wood fibrous plants that are abundant in Nigeria for pulp production. 4. Many agricultural residues can be harvested and used in combination with materials like kenaf, miraculous berry and other bast fibre producing plants. Also, the use of secondary

		fibres should be promoted and plants to produce pulp from such materials set up. 5. The high demand of products of the sector is attributed to the expansion of educational sector. The Universal Basic Education scheme operated in the country, meant to increase the literacy level of Nigeria, has resulted in a high demand for educational books such as notebooks, textbooks, etc. 6. The low level of research and development in the universities and research institutes is as result of inadequate facilities, necessary support to research institutes and tertiary institutions by the government for carrying out research and development especially in the area of sound policy formulation. 7. Funding of market oriented R&D and industrial development. These are necessary to meet the challenges of globalisation.
6	**ELECTRICAL & ELECTRONICS**	1. Government to encourage increased investment in the Electrical – Electronic sector of the economy by expanding our production lines and attracting new investments into the sector, so as to to improve our present capacity utilisation from the present average of 35% to 100% within the next twenty-four months if possible. 2. To channel a reasonable portion of our profit into research and development with a view to maintaining set standards and developing new product lines in line with our contemporaries worldwide. 3. To work with SON and other relevant government agencies to develop and maintain improved quality products in accordance with international practices. 4. To work with RMRDC and other relevant agencies to locally source and develop raw materials for industrial use. 5. To create more employment for Nigerians by moving from our present 12,500 employees to over 25,000 within the next two years. 6. Government should grant incentives for the production of essential raw materials. 7. Government should increase the import duty on some selected finished electronics products. These products are to be agreed upon and should be such that there must be sufficient production capacity to meet the local needs within a very short period. This is to serve as an incentive to the local industries in this sector currently operating as well government should grant incentives (e.g. income tax concessions) to manufacturers to ensure reduction in production cost and encourage investment and expansion in the sub-sector. 8. Government should put in place policies to encourage the patronage of locally manufactured lightings fittings, accessories and lamps/bulbs. 9. Government should increase the import duty of finished electrical fittings and accessories that have local production

		capacity e.g. light fittings, switches and sockets, from the current 40% to 100% and above as a way to protect the local industries. 10. Manufacturers should be encouraged by Government to obtain financial facilities at reasonable interest rate to make new investment and expansion feasible. 11. Government Patronage: As a matter of urgency, Government should come up with a policy that will require TCN, FMP, NDDC and REBs to remove locally available materials from their off-shore list. Government at all levels and their agencies should be made to source all locally available materials direct from the domestic manufacturers up to 75%. The balance of the 25% may be given to local contractors/suppliers who should be required to purchase from domestic manufacturers (with evidence). 12. Government should increase import duty on finished Refrigerators, Air-conditioners, and Fans etc. that local manufacturers have capacity to meet local demands to go up by 100% or be banned completely. 13. Government should introduce more stringent measures to be applied to importers of second hand Refrigerators, air-conditioners and other domestic appliances that are currently banned and still in our market. Raids to be carried on these dealers and products confiscated. 14. Government should put in place enabling environment to be created by improving the basic infrastructures and reduction of Bank lending rates to enable borrowing by Industries.
7	**TEXTILES, WEARING APPAREL**	1. Nigeria should set up Cotton Corporation as recommended by Federal Ministry of Agriculture and Rural Development to ensure effective monitoring, control and distribution of quality cotton seeds and lint. 2. Full implementation of Cotton, Garment and Textile policy plan by the Presidential Committee on cotton to encourage cotton Farmers for Intense multiplication of the different varieties of long staple cotton with relatively higher yields by giving loans to them without Collateral. 3. The Commodity Exchange should be made Functional for price control possibly by re-establishment of commodity board. 4. Maintain high quality cotton seeds and cotton lint through strict adherence to zoning of the different cotton varieties and encourage improved varieties, adopt best farming, processing and packaging practices so that high quality fibre will be achieved 5. Intensified research efforts on the development of long staple cotton by promoting /encourage massive production by farmers, as well as research efforts on the development

		of synthetic Fibre of Acrylic and Industrial Lubricants for treatment of Textile machines 6. Government should encourage patronage of made in Nigeria goods through local content policies. 7. Promote the establishment of more petrochemical plants: For example, Government should franchise and license other companies to break monopoly of some companies e.g. petro chemicals companies that produce polyester or polypropylene. **Short-Term: 0--3years** • Review of the laws guiding importation by raising tariffs for imported textiles and others that can be produced locally, while banning/discouraging of importation of second hand clothing and allied products by attaching very high tariffs (minimum of 30%). • Set up training institutions and immediately review the curriculum of the colleges of technology offering textile and industrial design courses. • Regulate and standardise private training institutions currently engaged in the industry through National Board for Technical Education (NBTE) and the Federal Ministry of Education. • Periodically showcase Made-in-Nigeria products through exhibitions and trade fairs in order to create awareness and encourage patronage of locally products. • The Standards Organization of Nigeria (SON) should be mandated to check the quality of accessories currently imported as a lot of these items are sub-standard and most do not meet international standards thereby affecting quality of locally produced finished garments. This should be in collaboration with industry practitioners. **Medium-Term: 3--5years** • Organise the cottage industries to harness the potentials of the various indigenous fabrics and crafts. Give incentives and Tax rebate to starter/existing companies/industry machinery imports and foreign exchange priority should be available with little bureaucracy of processing. • Encourage PPP in setting up major factories with government incentives in providing free land and zero tariffs on equipment including scholarships for specialised training in the sector. • The textile/apparel sector is long overdue for an Act of Parliament to protect and ensure continuity of government

		policies. • Textile Council is needed urgently to ensure that an industry that provided over 80% of employment and 60% of GDP in the 70s and early 80s does not continue to suffer marginalisation and inconsistent government policies. The Council will include industry experts from the various apparel sub-sector value chain and would be responsible (among general industry matters) for intellectual property rights, regulations, policy formulations, interface with other relevant government agencies and play advocacy role with government. • Upscale the Leather Research Institute and build capacity through training and re-training in key mass production skills areas such as pattern production, software usage, production engineering, machine operations, designing and merchandising, retail and marketing. • The garment factories, traditional and other textile producers should be given space within the free trade zones and provided with infrastructure, especially power. • Better incentives than what is currently being given should be available for start-ups and already existing practitioners in form of grants and infrastructure in common facilities available for use at little or no cost. • The issue of multiple taxes should be addressed urgently as this had made necessary investment unattractive and unprofitable. • Government should be the major consumer of made-in Nigeria goods. All official clothing and government agencies uniforms in its entirety should be made in Nigeria. • Re-introduction of hides and skins section in the Ministry of Agriculture and Natural Resources both at State and Federal levels to help check the quality and quantity of skins produced by reducing wastage and pre- and post-mortem defects. • All tanning industries should construct effluent treatment plant to treat pollution and effluent as obtained anywhere in Europe and Asia. • Formulate a deliberate policy with attractive incentives for the Sector backed by Legislation and Executive Fiat that is difficult to change and create a road map that successive Governments will have to follow. Inform the general populace of the goals of the policies so that they will ensure that successive governments do not derail.

		• Create a Garment and Leather Council that has a Governing Board that includes Manufacturers, Entrepreneurs and Designers who can implement the policies. Such Council should be backed up with Legislation that requires the highest majority before it can be overturned. • Government should encourage consumption of locally produced materials through legislation and policy instruments and discourage importation where local raw materials and products are available • Research and development efforts on raw materials should be intensified, while R&D institutions and Universities should analyse and collate results from success stories on the specific raw materials and see how they can be integrated into the Nigeria's system considering factors like weather, climate, temperature and humidity • Technical know-how should be improved in ginning, spinning and other process technologies in the sector in Nigeria to discourage importation of yarn. • Establishment of dyes and chemicals industries in Nigeria should be encouraged. • Establishment of other fibre industries like Polyester, Viscose, Wool, and Polyamide should be encouraged so that textile sector will not be import dependent to enhance profitability of the sector and employment opportunities. • Government should evolve and implement policies that will deter dumping of goods and encourage local patronage (due to low product quality in some cases). • Increased financial support to the sector with single digit financial loan as well as funding R&D activities. Access to finance for local manufacturers in order to enhance their quality and level of their production. In addition, SMEs need access to finance for retooling. • Necessary facilities for improved quality control systems must be provided to ensure production of high quality products to meet international standards. • Provision of adequate infrastructural facilities especially in the utility sector as well as investment friendly environment/business infrastructure. • Improved Technical Expertise of researchers and Academicians through appropriate mechanisms. • Introduction of price control regulatory framework to force down the prices of goods. • Review of the Nigerian Gas Master Plan and Gas Pricing

		Policy: To make available cheaper and well running Liquefied Natural Gas (LNG) price.
8	**WOOD & WOOD PRODUCTS**	1. Premium should be placed on home grown intelligence, in a bit to encourage and sustain our local production and building of our local technology capacities. 2. Afforestation plan should be taken seriously with emphasis on tree planting policies. A minimum of 60,000 ha is required to be planted for sustainability till 2030. 3. Bank of Industry (BoI) should also intervene on working capital apart from machineries. 4. More support should be giving to RMRDC in order to propel research findings, innovations, and latest technologies among research institutes, universities and local manufacturers. 5. Intervention fund should be provided for this sector of economy with adequate payback plan for the fund. 6. Bamboo should be developed as alternative raw material to wood. Substitution of wood with bamboo will significantly reduce deforestation; enhance performance and efficiency and productivity in the sector. Development of bamboo should be enhanced by policy as it was achieved in Sri-Lanka.
9	**NON-METALIC MINERAL PRODUCTS**	**CEMENT: Findings and Recommendations** 1. There is need for more research by RMRDC/CEMAN with a view to overcoming the inadequacy of locally available gypsum in commercial quantity. MT 2. There is no need to import cement to Nigeria any longer except specific types not available locally 3. Government should specify quantity of gypsum to import. ST 4. There is need for more investment in gypsum. MT 5. There is need for separate investment in mines for quality of gypsum. 6. It has become imperative that the large deposits of gypsum in the country should be beneficiated and processed to meet the requirements of crayon, chalk and pop production ST. **GLASS: Findings and Recommendations** 1. There is the need to find out the specific problems of local glass industries, in particular, availability of raw materials, funding as well as technical know-how in terms of new technology. ST 2. The sector is of the view that more investors are needed for the production of different types of glass products locally if

		encouraged and supported with incentive policies and funding. ST 3. Studies (R&D) need to be carried out on how to use local soda ash, Nigerian coal and exploring sand deposits of required specification in Nigeria. 4. Rapid development of petrochemical infrastructure to be able to produce HDPE on sustainable basis. 5. Government should create enabling and conducive environment for research and development by promulgating workable laws and regulations, providing adequate funding and encouragement for scientific community. 6. Research and development institutions are to play a role of working and identifying area for raw materials development for use in the industry and develop a sustainable, cheaper method for production of such material. 7. Investors and entrepreneurs are to work with any research/development institutions who can provide them with workable model of required raw materials and products at viable economies of scale. 8. Industries and businesses are to adopt locally available raw materials and products developed locally. This will reduce the cost of input and ready availability of material for their final product manufacturing. This will also reduce the need for scarce foreign exchange and difficulty in importations. 9. Development partner and Donor community to provide adequate funding and required research and technical equipment, instant availability of product data and materials from relevant world bodies and institutions. 10. Government should, give adequate protection from cheaper imported products, provide bank loans at single digit interest rate, reduce the cost of electricity and gas as they are major cost of production of any industry. Better and secured road and rail network for cheaper transportation of products for the masses. **CERAMICS: Findings and Recommendations** 1. Nigeria will welcome more investors in the sector especially production of sanitary wares (Medium term). 2. Need to protect investment in this sector against imported substandard products (Short term). 3. Consensus opinion was that there is no need to import ceramic tiles to Nigeria except those identified not available locally (banning) [Short term]. 4. Locally produced ceramic tiles must strive to meet

		international standards in order to be competitive in the global market as there is room for export starting with ECOWAS as well as East/Central African countries (Short term). 5. Need to promote investment in production of specialized cement products that are not produced locally currently (Long term). 6. Need for production of refractory bricks in Nigeria beginning with pilot plants and then full commercialization (Short-Medium term). **FIBRE CEMENT: Findings and Recommendations** 1. There is need to meet with the stakeholders on the issue of reducing and eventual total elimination of the health hazards of the products and make it more environmentally friendly with a view to meeting global standard acceptable to WHO. MT 2. RMRDC/manufacturers in the sub-sector to research and find alternative environmentally friendly raw materials in addition to cellulose. MT 3. Recommended enhancing factors towards sustainable competiveness in raw materials and product development. - Government should make a policy that will mandate producers to source for 90% of their raw materials locally. - They should also fund research institutions to enable them function properly. 4. They should provide RMRDC with constant information update on areas where research is needed in sourcing of materials locally 5. Encourage local companies to participate in raw materials processing as a business venture so that the production chain can be fully integrated end to end locally sourcing for materials to be processed and produced in Nigeria. 6. Government should commit huge resources (materials, financial and human) in conducting research on semi processed raw materials for manufacturing companies. **SCHOOL CHALK, CRAYON & PENCIL: Findings and Recommendations** 1. For crayon and pencil, there is need to attract investor to produce locally through new and existing investment policies. ST 2. Quantification process and mining of graphite deposit should commence. MT

		General Recommendations • Full value chain development of locally available raw materials should be encouraged. • Increasing effort to build local capacity of technological know-how in other to increase local content more sufficiently. • Exploration of Nigerian coal should be reviewed and beneficiation of the coal to reduce its volatility as well as meet other specification for glass industry • Forex should be made available. • Functional rail system needs to be put in place. • Power challenge is fundamental and should be fixed. • Government to create an institutional structure for market competition in the country. • Government to initiate and sustain micro economic reform. • Government to enact and implement policies that support private enterprises development. • Continuous intensified effort for foreign direct investment [FDI] in Nigeria, in order to create jobs.
10	**MOTOR VEHICLE & MISCELLA-NEOUS ASSEMBLY**	1. Government should select few out of the assembly plants that are willing to transfer technology to us and will produce acceptable and affordable vehicles for the country. 2. Standards Organisation of Nigeria (SON) should work with OEM for the local approval of standards. 3. Government should encourage patronage of locally produced vehicles, motorcycles, bicycles and parts by starting with the compulsory use of locally produced automobiles by government agencies. 4. Government should increase tariff with the CET window for fairly used imported vehicles and motorcycles to discourage importation. 5. Government should discourage double taxation, encourage reasonable tax regime, and give tax holiday for any breakthroughs and innovation by the industry. 6. RMRDC and NADDC should collaborate in demand driven R&D, collect information on successful R&D in the tertiary institutions and research institutes and publish them for industrial awareness and usage by the Automotive Assembly Companies. 7. Government should insist on the use of only CKD only as SKD is being abused. 8. NADDC should expedite action on the introduction of loan scheme for the purchase of motor vehicle, motorcycle and

		bicycle to stimulate local production and create employment. 9. Government should speed up the implementation of the national automotive Policy in order to encourage motor vehicle assembly companies that have been given licenses to establish their plants and start production. 10. Signing into law and expeditious implementation of the automotive policy

TABLE 4.1B
RECOMMENDED TIME FRAME FOR IMPORT (SHORT-, MEDIUM- AND LONG- TERMS) FOR SELECTED RAW MATERIALS

S/N	Items	Time-Frame	Strategies	Remarks
PAINT SUB-SECTOR				
1	Extenders such as: Calcium carbonate	0-3years to achieve 80% substitution and 3-6 years to achieve full substitution	Promoting investment in newer mineral processing technologies. BOI to assist mineral processors with loan facilities for expansion	Presently about 60% is sourced locally and 40% is imported.
	Kaolin		Same as above	100% sourced locally but colour needs improvement
	Mica		Sensitising investors on the profitability of investing in mining/processing of Mica	Presently it is imported as there are no miners/ processors
	Talc		Commercialisation of R&D work undertaken by RMRDC/SHETSCO on beneficiation of Talc	Imported but can be sourced locally. Because the ore is coloured, beneficiation is required
	Barite		Same as above	Barite for paint sector is sourced locally
	Petrochemical-based raw materials such as Resins, Organic solvent,		Encourage investment in Petrochemical plants to produce these chemicals.	90% of Petrochemical-based raw material inputs in

	binders , Pigment/dyes		Meanwhile, RMRDC should commercialise its work on resins and natural rubber latex. Resins producers to partner with RMRDC on the project.	paint are imported because of lack of plants to produce them.
PHARMACEUTICALS SUB-SECTOR				
	None at the moment except Glycerine	3-4 years	A roadmap for development of raw materials to be prepared by Pharmaceutical group of MAN, RMRDC and NIPRD. For glycerin, large scale soap producers should be encouraged to invest in refining of glycerol (their by-products) to glycerin.	All raw materials are 100% imported. 75% are petrochemical based while 25 % are agro/mineral based. Presently, the glycerol produced is exported, refined and imported as glycerin. If refined locally, this will meet about 80 90 % of national demand
SOAP & DETERGENT SUB-SECTOR				
	Crude palm oil and palm kernel oil, tallow	50% substitution in 2-3 years and full substitution in 5 years	Promote investment in oil palm plantation and processing. Upgrade/modernize processing facilities to increase production	Can be locally sourced
	Tallow			100% imported
	Linear alkyl benzene (LAB) and petroleum jelly		De-regularise downstream of the petroleum sector to encourage investment in petrochemical plants	Petrochemical based.
	Bleaching earth		Promote R&D and investment in production from local	Can be sourced locally

			clays. RMRDC and NARICT to refine earlier effort.	
	Caustic soda	5-10 years	RMRDC and NARICT are building a small scale plant. Promote investment in production, particularly as by-product of PVC production which is petrochemical based. Eleme –Indorama to be supported in their plan to establish a PVC plant which is an initiative of RMRDC.	100 % imported. National demand is about 200,000MT.
TOILETRIES & COSMETICS SUB-SECTOR				
	Linear alkyl benzene sulphonate (LABSA)	1-2 years	By end of 2016, there will be adequate sulphonating plant to produce LABSA locally to meet local demand and export.	Until petrochemical plants become fully operational in Nigeria, the primary raw material (LAB) will continue to be imported 100 %.
	Sodium Lauryl ether sulphate(SLES)	Dependent on petrochemical plant		Imported
	Emulsifying wax			100 % sourced locally
	Mineral oil/silicon oil	Dependent on oleochemical plant	Promote investment in fatty alcohol plant that can also produce glycerine	100 % imported, can be sourced localy
	Essential oil	1-2 years	RMRDC to commercialise its completed R&D work	Imported but can be sourced locally.
PETROLEUM PRODUCTS MANUFACTURING SUB-SECTOR				
	Base oil	Dependent on petrochemical plant	Effort should be sustainable to make Kaduna refinery fully functional to enable it produce base oil	Imported but can be sourced locally

BASIC CHEMICALS SUB-SECTOR				
	Caustic soda	5-10y years	Promote investment	Imported but can be sourced locally
	Soda ash	5-10 years	Promote investment	Imported but can be source locally
	Sodium silicate		Promote investment	Sourced locally

TEXTILES SUB-SECTOR				
1.	Cotton	0-5 years (short term) 6-10 years (medium term) 60% substitution in the short term 100% substitution in the medium term	• Promote mechanized farming and boosting of the crops. • Provide high quality farming inputs. • Re-introduce Commodity Boards/Marketing system to control • pricing of commodities. • Develop more extra-long staple cotton varieties suitable for • cultivation in cotton producing zones of the country.	Low production. Can be locally sourced
2.	Silk Yarn	20% substitution for short term	• Resuscitate the sericulture development project in Ekiti State in collaboration with the relevant stakeholders. • Promote establishment of small and cottage industries for the • production of the raw materials.	Silk can be sourced locally
3.	Kenaf Fibre	50% substitution for short term	• Boost the production of Kenaf. • Promote processing Kenaf plant into fibres.	Very low production. Kenaf can be locally sourced.
4.	Corn Starch	20% substitution for short term	Promote the local production and processing of corn.	Can be locally sourced
5.	Dyestuff	10% substitution for short term	Reduce tariffs on imported inputs especially chemicals, machineries and spare parts.	Dyestuff can be sourced locally

WEARING APPAREL SUB-SECTOR				
1.	Cotton	0-5 years (short term) 60% substitution (short term) 100% substitution (medium term)	• Full implementation of the National Cotton, Textile and Garment • Enterprise Policy as part of the Nigerian Industrial Revolution • Plan • Boost local production. • Develop more extra-long staple cotton.	Cotton is a major raw material for the whole sector and 100% substitution is possible.
2.	Buttons	50% substitution in the medium term 80% substitution in the long term	• Promote more investments in the petroleum downstream sector. • Reduce duties on equipment/machinery and accessories.	Petrochemical based. Can be sourced locally.
CARPETS AND RUGS SUB-SECTOR				
1.	Jute Yarn	0-5 years (short term) 70% substitution in the short term	• Promote development of Kenaf as an alternative to Jute • Promote Boosting of Kenaf among farmers • Promote investments in Kenaf Processing	Can be 100% locally sourced
2.	Calcium Carbonate	0-5 years 100% substitution	Increase local production by Investment Promotion	Locally Sourced
3.	Short paper tube	0-5 years 100% substitution	Increase local production by Investment Promotion	Locally Sourced
4.	Long paper tube	0-5 years 100% substitution	Increase local production by Investment Promotion	Locally Sourced
5.	Nylon Fishing yarn	0-5 years 100% substitution	Increase local production by Investment Promotion	Locally Sourced
6.	Nylon for rugs wrapping	0-5 years 100% substitution	Increase local production by Investment Promotion	Locally Sourced
7.	Cello Tape Big	0-5 years 100% substitution	Increase local production by Investment Promotion	Locally Sourced
8.	Nobel label	0-5 years 100% substitution	Increase local production by Investment Promotion	Locally Sourced

LEATHER SUB-SECTOR				
1.	Hides and Skins	0-5 years (short term) 80% substitution 5-10 years (long term) 100% substitution	Increase Livestock production and improve hides and skins quality	Locally produced high percentage also imported.
2.	Fat Liquor	0-5 years (short term) 60% substitution	• Promote investments in downstream petrochemical industry. • Promote investments in oil seeds production	Can be locally sourced
3.	Vegetable Tanning Materials (i) "Bagaruwa" (ii) Mimosa	20% substitution for short term	Intensify research efforts and commercialize research result on vegetable tanning materials	Can be locally sourced
4.	Salt	0-5 years (short term) 60% substitution	• Promote investments in salt production and processing. • Promote investments in downstream petrochemical industry.	Can be locally sourced
5.	Sulphuric Acid	0-5 short-term 70% substitution in the short term	Promote investments in sulphuric acid production and processing.	Can be sourced locally.
6.	Dyestuff	Locally produced, but raw materials are imported	Promote investments in the petro-chemical industries	Can be locally sourced
7.	Hydrated lime	20% substitution (short term)	RMRDC & NARICT working on a pilot plant	Can be locally sourced
8.	Detergents	100% import substitution in short term	Promote investments in the petrochemical industries	Can be locally sourced
FOOT-WEAR AND LEATHER GOODS SUB-SECTOR				
1.	Leather (Processed Hides & Skins)	0-5 years 100% Substitution	Increase local production in terms of quality and quantity through the following: • Improve breed stock and animal husbandry practices to improve quality of raw skins • Provision of grazing reserves with adequate infrastructure • Reactivate non-	Locally sourced but high percentage is also imported.

			functional abattoirs and slaughter slabs and construct new ones with required facilities • Build capacity in proper hides and skins flaying, preservation and tanning skills	
2.	Natural Rubber Latex	0-5 years 60% substitution	Boost local production of rubber.	Can be locally sourced
3.	White pigments (Titanium dioxide)	0-5 years 30% substitution	Promote investment in local production	Can be locally sourced
4.	Adhesives	0-5 years (short term) 30% substitution	Promote investment in local production	Can be locally sourced
5.	Insole boards (major raw materials - sawdust, rice husk and grass)	0-5 years (short term) 20% substitution	Promote investment in local production	Can be locally sourced
6.	Bafting fabric	0-5 years (short term) 30% substitution	Promote investment in local production	Can be locally sourced

4.1.2 Quality Infrastructure, Standardization and Conformity Assessment

Findings from the survey revealed that industries and businesses recognised the importance of quality infrastructure to enhance their operations and attainment of competitiveness. They reported that they collaborate with international and national standard bodies and called for the establishment of national quality infrastructure or the strengthening of existing national standard bodies, including regulatory agencies such as SON and NAFDAC to ensure compliance to standards and achievement of quality in local raw materials and products development.

Furthermore, industries and businesses opined that standards and conformity assessment are desirable to products, process and system development, which are also critical for competitiveness and access to markets.

Industries Standard Certifications

Overall, 61 per cent of manufacturing industries in Nigeria associate with specific Certification agencies. Figure 4.1 shows the overall Industry Certification in collaboration with Standard Certification agencies. Distribution of Industries and Businesses along the Certification agencies shows that 8.8 per cent are associated with the International Organization for Standardization (ISO), 4.1 per cent with UNIDO and 20.5 per cent with SON. While 16.9 per cent are associated with NAFDAC, about 10.8 per cent are certified by others. This situation shows that of all those who associate with quality certification agencies, 45 per cent of them deal with global

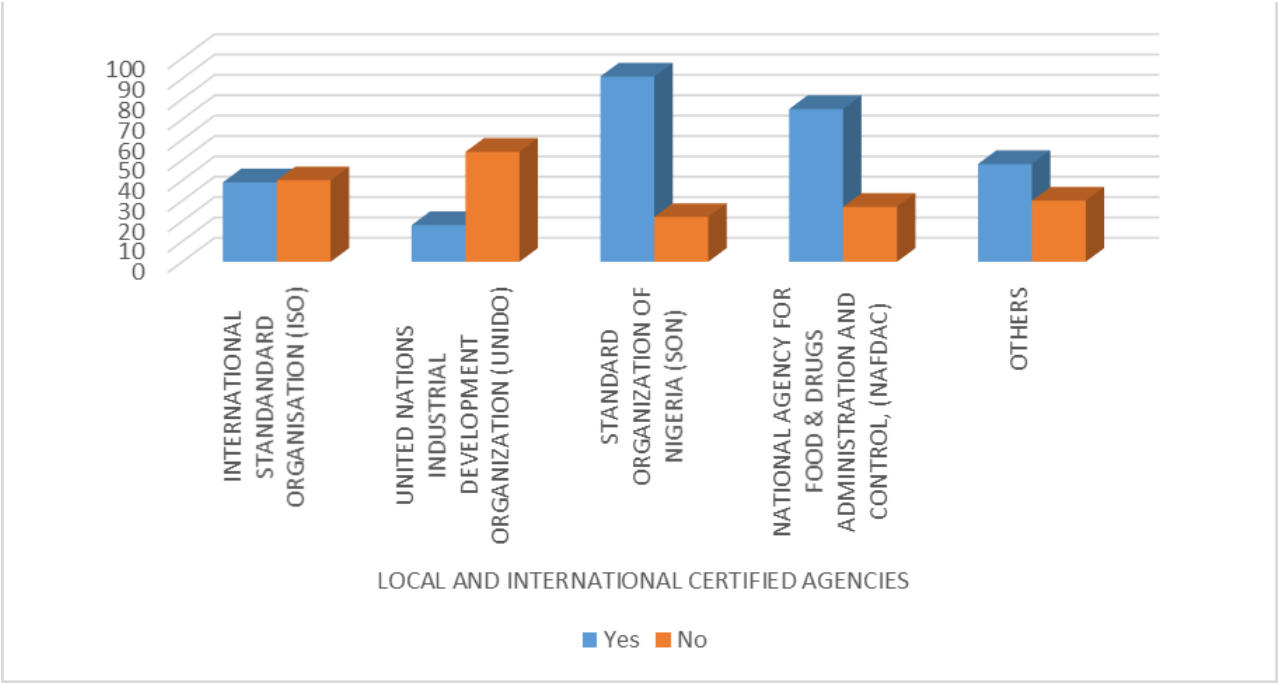
certification bodies. Distribution of industries and businesses which acknowledge they relate with ISO include Food, Beverages and Tobacco Sector (28%) and Chemicals and Pharmaceuticals (25%). Similarly, 25% report that they collaborate with the United Nations Industrial Development Organization (UNIDO) out of which 56% are from the Food, Beverages and Tobacco sector. This is followed by the Domestic and Industrial Plastics, Rubber and Foam sector at 16%. The Standards Organization of Nigeria (SON) records the highest proportion of certified industries and businesses at 80%, with 32% of those in the Food, Beverages and Tobacco sector certified. Domestic and Industrial Plastics, Rubber and Foam Sector accounts for 29% of industries certified by SON. The National Agency for Food and Drugs Administration and Control (NAFDAC) certified about 74% of industries out of which 37%, being the highest, are from the Food, Beverages and Tobacco sector. This is followed by the Domestic and Industrial Plastics, Rubber and Foam sector at 32%. Figure 4.2 shows sector-specific Standard Certification profile.

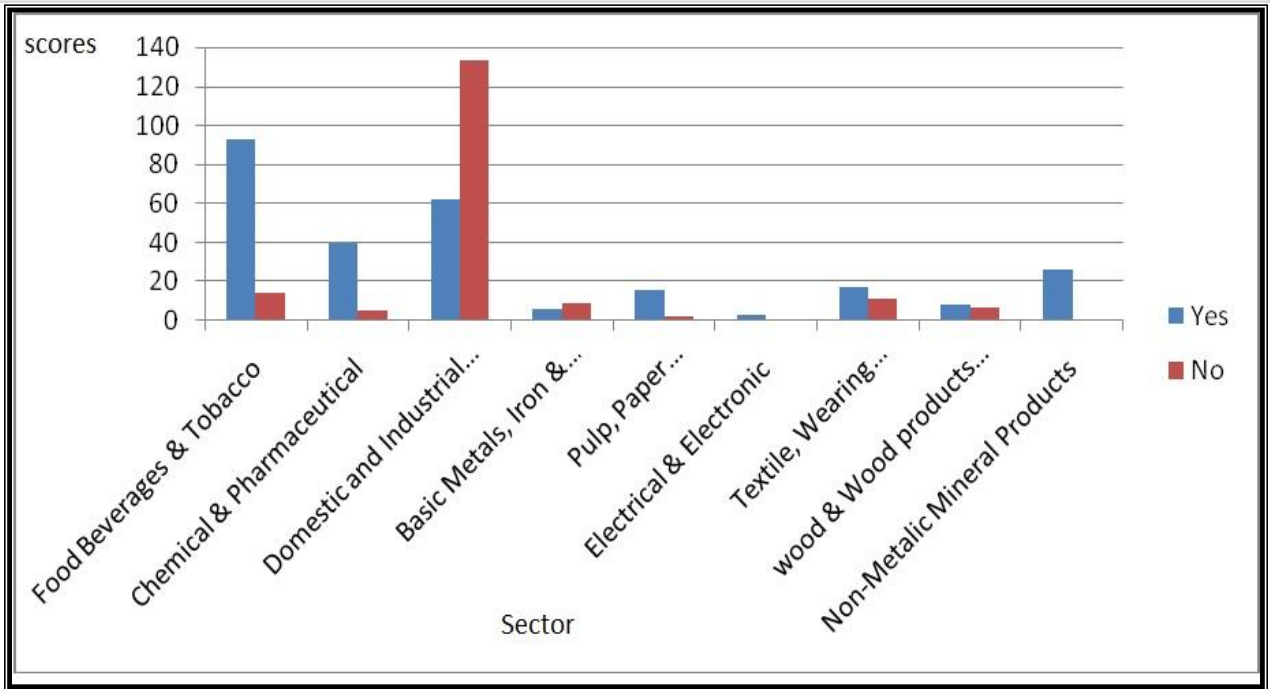
Towards achieving competitiveness in raw materials and products development, more efforts would be targeted at global agencies' certification so the proportion of industries certified by ISO would not go below 75 per cent in the short- and medium- terms. Attention should also focus on reversing the certification profile of Domestic & Industrial Plastics, Rubber & Foam, Wood, and Textile sectors.

Table 4.2
NIGERIAN INDUSTRIES' STANDARD CERTIFICATIONS

Industrial Sector	RESPONSE	CERTIFICATION AGENCIES					
		INTERNATIONAL ORGANISATION for STANDARDISATION(ISO)	UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION (UNIDO)	STANDARDS ORGANIZATION OF NIGERIA (SON)	NATIONAL AGENCY FOR FOOD & DRUGS ADMINISTRATION AND CONTROL, (NAFDAC)	OTHERS	SECTOR SPECIFIC
Food Beverages & Tobacco	Yes	11	10	29	28	15	93
	No	4	5	0	1	4	14
Chemical & Pharmaceutical	Yes	10	1	14	12	3	40
	No	1	2	0	0	2	5
Domestic and Industrial Plastic, Rubber & Foam	Yes	7	3	26	24	2	62
	No	37	38	22	22	14	133
Basic Metals, Iron & Steel/Steel & Fabricated Metals	Yes	1	0	3	2	0	6
	No	2	3	0	1	3	9
Pulp, Paper Products, Printing & Publishing	Yes	3	2	7	3	1	16
	No	0	1	0	0	1	2
Electrical & Electronic	Yes	1	0	1	0	1	3
	No	0	0	0	0	0	0
Textile, Wearing Apparel, Carpet, Leather/Bather Footwear	Yes	3	1	6	5	2	17
	No	3	3	0	1	4	11
Wood & Wood products including Furniture	Yes	2	1	4	1	0	8
	No	1	2	0	2	2	7
Non-Metalic Mineral Products	Yes	1	0	1	0	24	26
	No	0	0	0	0	0	0
Overall	Yes	39	18	91	75	48	271
	No	40	54	22	27	30	173
Percentage%	YES	8.8	4.1	20.5	16.9	10.8	61.1

FIGURE 4.1
OVERALL INDUSTRY CERTIFICATION IN COLLABORATION WITH STANDARD CERTIFICATION AGENCIES





Conformity Assessment Methods

Conformity assessment methods are premised on four specific and other unspecified methods, including Testing, Inspection, Supplier's Declaration, Customer's Declaration and Others. These methods are stratified as **Highly, Just** and **Not Appropriate** for the ten manufacturing industry sectors of the Manufacturers Association of Nigeria (MAN.)

Findings show that, for all sectors combined, the method of Testing is the most highly appropriate, with 73 points score; followed by Inspection at 65 points, while Supplier's Declaration recorded 53 points. Customer's Declaration indicated 48 points score and Other unspecified methods recorded 62 points. Specific manufacturing industry sector ratings are presented on Table 4.3, while Figure 4.3 shows Nigerian Industries Conformity Assessment Methods.

The implication of this report points is that manufacturing in Nigeria pays less attention to customers' desires, tastes and certification. This relates to negation of quality principles whereby conformity to customer's specifications and certification are crucial to sustain patronage of the potential customer within the domestic economy. Since customer's certification is ranked lowest among Conformity Assessment Methods, it could be responsible for the high propensity of citizens' demand for foreign products.

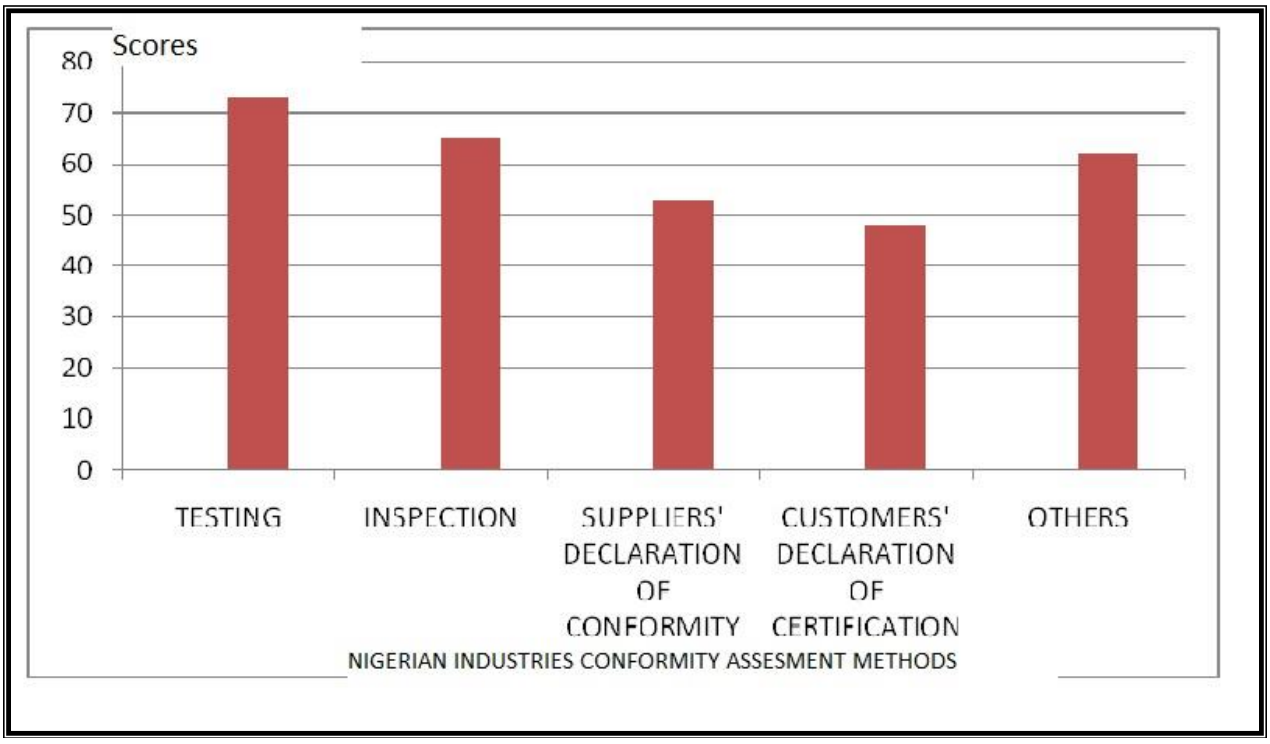
It is, therefore, imperative that industries and businesses in Nigeria should direct efforts at ensuring that more emphases on customers' desires, tastes, requirements and certification are built into their product-modelling. One of the goals of Advocacy in this strategy would be to redirect customers' demand for made-in-Nigeria products against imported foreign products arising from quality improvement that incorporates customers' certification.

TABLE 4.3
NIGERIAN INDUSTRIES' CONFORMITY ASSESSMENT METHODS

INDUSTRIAL SECTOR	TESTING			INSPECTION			SUPPLIERS' DECLARATION OF CONFORMITY			CUSTOMERS' DECLARATION OF CERTIFICATION			OTHERS		
	Highly	Just	Not	Highly	Just	Not	Highly	Just	Not	Highl	Just	Not	Highl	Just	Not
Food Beverages &Tobacco	26	14	1	27	13	1	19	16	6	24	13	4	5	2	0
Chemical & Pharmaceutical	10	3	1	7	4	3	5	8	0	4	9	1	4	0	0

Domestic and Industrial Plastic, Rubber & Foam	**16**	**4**	**31**	**13**	**8**	**32**	**16**	**4**	**32**	**10**	**8**	**34**	**12**	**0**	**0**
Basic Metals, Iron & Steel/Steel & Fabricated Metals	**3**	**0**	**0**	**2**	**1**	**0**	**0**	**2**	**1**	**0**	**1**	**2**	**2**	**0**	**0**
Pulp, Paper Products, Printing & Publishing	**7**	**1**	**0**	**6**	**1**	**0**	**6**	**2**	**0**	**4**	**4**	**0**	**4**	**0**	**0**
Electrical & Electronic	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**4**	**0**	**0**
Textile, Wearing Apparel, Carpet, Leather/Bather Footwear	**5**	**1**	**0**	**5**	**1**	**0**	**3**	**3**	**0**	**4**	**2**	**0**	**31**	**2**	**0**
wood & Wood products including Furniture	**4**	**1**	**0**	**4**	**1**	**0**	**3**	**2**	**0**	**1**	**4**	**0**	**0**	**0**	**0**
Non-Metalic Mineral Products	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
Motor Vehicle & Miscellaneous Assembly	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
All Sectors	**73**	**24**	**33**	**65**	**30**	**36**	**53**	**38**	**39**	**48**	**42**	**41**	**62**	**4**	**0**

FIGURE 4.3
NIGERIAN INDUSTRIES' CONFORMITY ASSESSMENT METHODS



Ranking Standard Requirements by Industrial Sector

Industries and Businesses ranked specified standard requirements in quality infrastructure by order of importance. Overall, Government-regulated Standards with 57 points is ranked highest; followed by International Standards - 51 points, National Standards - 42 points, Supplier's or Purchaser's Standards - 39 points, and Regional Standards - 28 points. Other Standards not specified elsewhere recorded 30 points - above regional standards. Details of industry sector specifics are presented on Table 4.3.

There is need to pay more attention on how to enhance ranking of the Supplier's and Purchaser's Standard specifications from the fourth position to the fore-front of standard requirements by considering their desires and tastes. The result confirms exactly the opposite of what had been established in consideration of Conformity Assessment Methods whereby Customer's Declaration of Certification ought to rank higher in the quality environment. Figure 4.4 ranks standard requirements by order of importance.

FIGURE 4.4
RANKING STANDARD REQUIREMENTS
BY ORDER OF IMPORTANCE

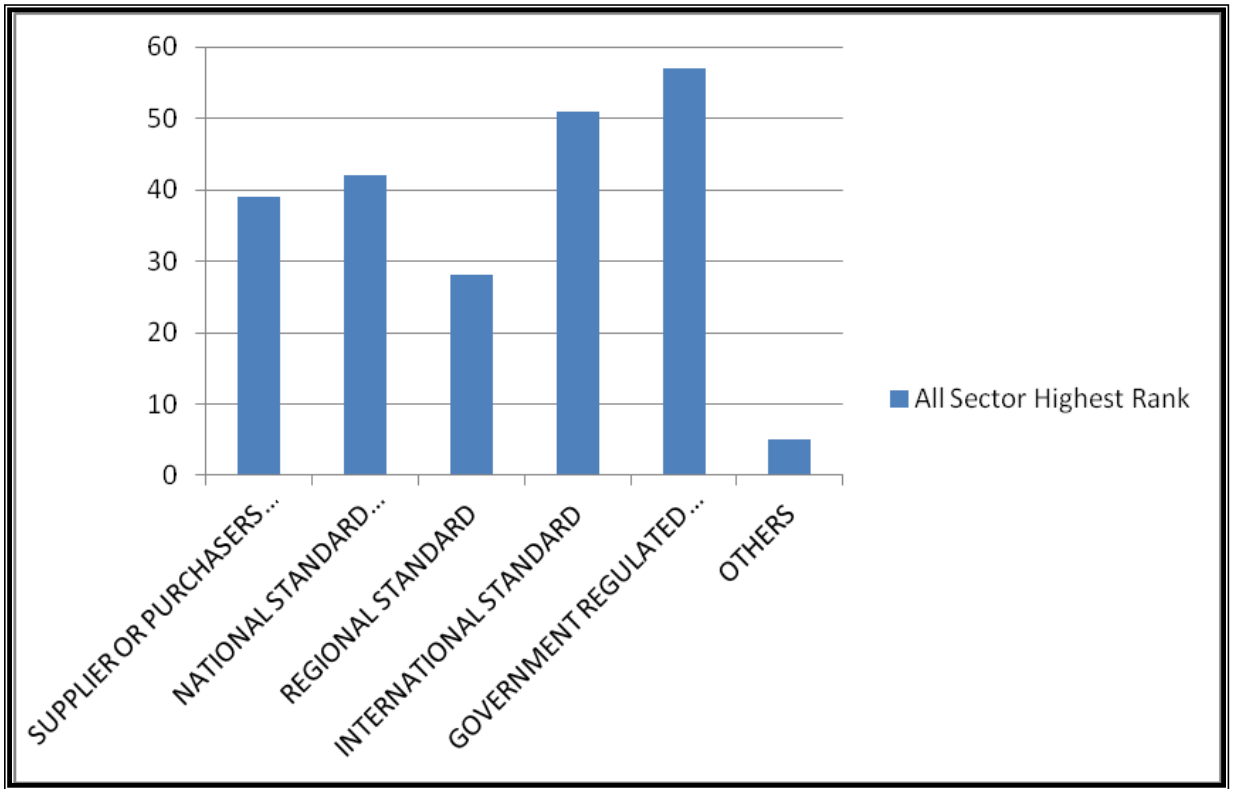


TABLE 4.4
RANKING STANDARD REQUIREMENTS BY ORDER OF IMPORTANCE

STANDARDS REQUIREMENT	RANK (1 Highest to 6 Lowest)	SECTOR										
		Food Beverages & Tobacco	Chemical & Pharmaceutical	Domestic and Industrial Plastic, Rubber & Foam	Basic Metals, Iron & Steel/Steel & Fabricated Metals	Pulp, Paper Products, Printing & Publishing	Electrical & Electronic	Textile, Wearing Apparel, Carpet, Leather/ Footwear	Wood & Wood products including Furniture	Non-Metallic Mineral Products	Motor Vehicle & Miscellaneous Assembly	All Sectors
SUPPLIER OR PURCHASERS STANDARD S	1	12	7	12	1	4	0	3	0	0	0	39
	2	9	2	2	0	1	1	2	5	1	0	23
	3	0	1	7	1	1	0	0	0	0	0	10
	4	4	2	1	0	0	0	0	0	0	0	7
	5	7	2	2	1	2	0	0	0	0	0	14
	6	1	0	27	0	1	0	0	0	0	0	29
NATIONAL STANDARD	1	14	6	12	2	2	0	4	2	0	0	42
	2	6	3	7	1	3	1	1	3	1	0	26
	3	5	3	0	0	3	0	0	0	0	0	11
	4	2	0	2	0	0	0	0	0	0	0	4
	5	2	0	0	0	0	0	0	0	0	0	2
	6	1	2	29	0	1	0	0	0	0	0	33
REGIONAL STANDARDS	1	12	2	7	1	1	2	3	0	0	0	28
	2	0	1	3	1	0	2	0	0	0	0	7
	3	3	2	3	1	2	0	0	0	0	0	11
	4	8	3	1	0	1	0	2	0	0	0	15
	5	3	3	6	0	2	0	0	0	0	0	14
	6	4	3	30	0	2	1	0	0	0	0	40
INTERNATIONAL STANDARD	1	13	10	15	3	3	1	3	2	1	0	51
	2	3	4	6	0	2	0	1	1	0	0	17
	3	4	0	0	0	0	0	0	2	0	0	6

	4	4	0	1	0	2	0	0	0	0	0	7
	5	3	0	0	0	1	0	0	0	0	0	4
	6	2	0	29	0	1	0	1	0	0	0	33
GOVERNMENT REGULATED STANDARDS	1	19	7	18	2	5	0	4	2	0	0	57
	2	6	2	2	0	1	1	1	3	0	0	16
	3	2	4	1	0	1	0	0	0	0	0	8
	4	2	1	3	1	2	0	0	0	0	0	9
	5	2	0	0	0	0	0	0	0	0	0	2
	6	2	0	28	0	0	0	0	0	0	0	30
OTHERS	1	4	1	0	0	0	0	0	0	0	0	5
	2	2	0	0	0	1	0	0	0	0	0	3
	3	1	0	0	0	0	0	0	0	0	0	1
	4	0	0	0	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0	0	0	0
	6	2	0	2	1	0	0	0	0	0	0	5

Objects of Standards and Conformity Assessment in Order of Appropriateness

Industries and Businesses considered the appropriateness of objects of Standards, Conformity Assessment in order of "**Highly", "Just" and "Not"** ranking. Irrespective of the industrial sector, objects of Conformity Assessment, including Products, Process, Systems, Person or Body and Others were ranked according to whether they are "**Highly", "Just"** or "**Not"** appropriate.

All industrial sectors combined indicate that the most highly appropriate object of conformity assessment occurred in Products with 85 Points score, followed by Process at 75 points, Systems at 64 points and Person/Body with 57 points. The unspecified object of conformity assessment recorded 23 points.

In the bid to enhance competitiveness, policy efforts should be directed to boost Person/Body as a critical object of Conformity Assessment. When Person/Body over-takes Process and System Objects, the desire of domestic consumers to keep high taste of preferring foreign products would diminish naturally. This result goes to confirm findings in Standard Requirements, Conformity Assessment Methods and Standard Certification.

TABLE 4.5
OBJECTS OF STANDARDS AND CONFORMITY ASSESSMENT

SECTOR	Products			Process			System			Person or body			Others		
	Highly	Just	Not	Highly	Just	Not	Highly	Just	Not	Highly	Just	Not	Highly	Just	Not
Food Beverages & Tobacco	30	14	2	23	17	2	16	23	4	14	15	7	3	2	
Chemical & Pharmaceutical	8	3	2	9	3	1	8	3	2	6	2	2	0	1	0
Domestic and Industrial Plastic, Rubber & Foam	25	10	19	25	8	20	25	9	18	26	4	20	12	0	0
Basic Metals, Iron & Steel/Steel & Fabricated Metals	3	0	0	3	0	0	2	1	0	1	1	1	3	0	0
Pulp, Paper Products, Printing & Publishing	9	0	0	8	0	0	7	1	0	4	2	0	3	0	0
Electrical & Electronic	1	0	0	1	0	0	1	0	0	1	0	0	1	1	0

Textile, Wearing Apparel, Carpet, Leather/Bather Footwear	**3**	**2**	**0**	**2**	**3**	**0**	**2**	**3**	**0**	**2**	**2**	**0**	**1**	**0**	**0**
wood & Wood products including Furniture	**5**	**0**	**0**	**3**	**2**	**0**	**2**	**3**	**0**	**2**	**0**	**2**	**0**	**0**	**0**
Non-Metallic Mineral Products	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
Motor Vehicle & Miscellaneous Assembly	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
All Sectors	**85**	**29**	**23**	**75**	**33**	**23**	**64**	**43**	**24**	**57**	**26**	**32**	**23**	**4**	**0**

4.1.3 Business Concerns Ranked in Order of Importance

Nigerian industries and businesses ranked business concerns in order of importance by considering the following: Trading, Quality, Profitability, Manufacturing, Distribution, Purchasing, Use, Specification, Contracts and Others.

Business concerns with the highest level of importance is Manufacturing at 91 points score, followed by Quality (87 points), Specification (66 points), Distribution (62 points) and Purchasing (59 points). The rest include Profitability (57 points), Use (56 points), Trading (48 points), Contracting (47 points) and Others (4 points). Industrial sector-specific rankings are expressed on Table 4.6, while Figure 4.6 shows specific business concerns ranking.

FIGURE 4.5
MOST APPROPRIATE OBJECTS OF CONFORMITY ASSESSMENT

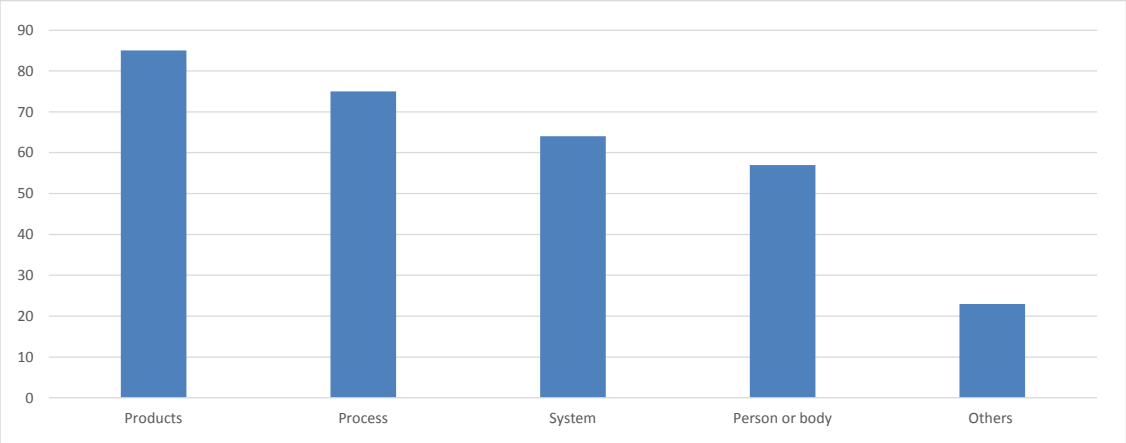


TABLE 4.6
RANKING OF BUSINESS CONCERNS

BUSINESS CONCERNS	RANK (1 highest to 10 lowest)	MANUFACTURING SECTOR										
		Food Beverages & Tobacco	Chemical & Pharma-ceutical	Domestic and Industrial Plastic, Rubber & Foam	Basic Metals, Iron & Steel/ Steel & Fabricated Metals	Pulp, Paper Products, Printing & Publishing	Electrical & Electronic	Textile, Wearing Apparel, Carpet, Leather/ Footwear	Wood & Wood products including Furniture	Non-Metallic Mineral Products	Motor Vehicle & Miscellaneous Assembly	Specific Business Concern
TRADING	1	10	0	31	2	1	0	1	3	0	0	48
	2	9	0	4	0	1	1	2	0	0	0	17
	3	5	0	2	0	0	0	0	0	0	0	7
	4	3	1	1	0	0	0	0	0	0	0	5
	5	7	3	0	0	4	0	1	2	1	0	18
	6	1	4	4	0	0	0	0	0	0	0	9
	7	1	2	2	0	1	0	0	0	0	0	6
	8	1	1	2	1	2	0	1	0	0	0	8
	9	1	0	2	0	0	0	0	0	0	0	3
	10	0	2	1	0	1	0	0	0	0	0	4
QUALITY	1	23	10	39	2	3	1	4	4	1	0	87
	2	14	3	7	1	5	0	0	0	0	0	30
	3	4	1	4	0	0	0	0	1	0	0	10
	4	3	0	0	0	0	0	0	0	0	0	3

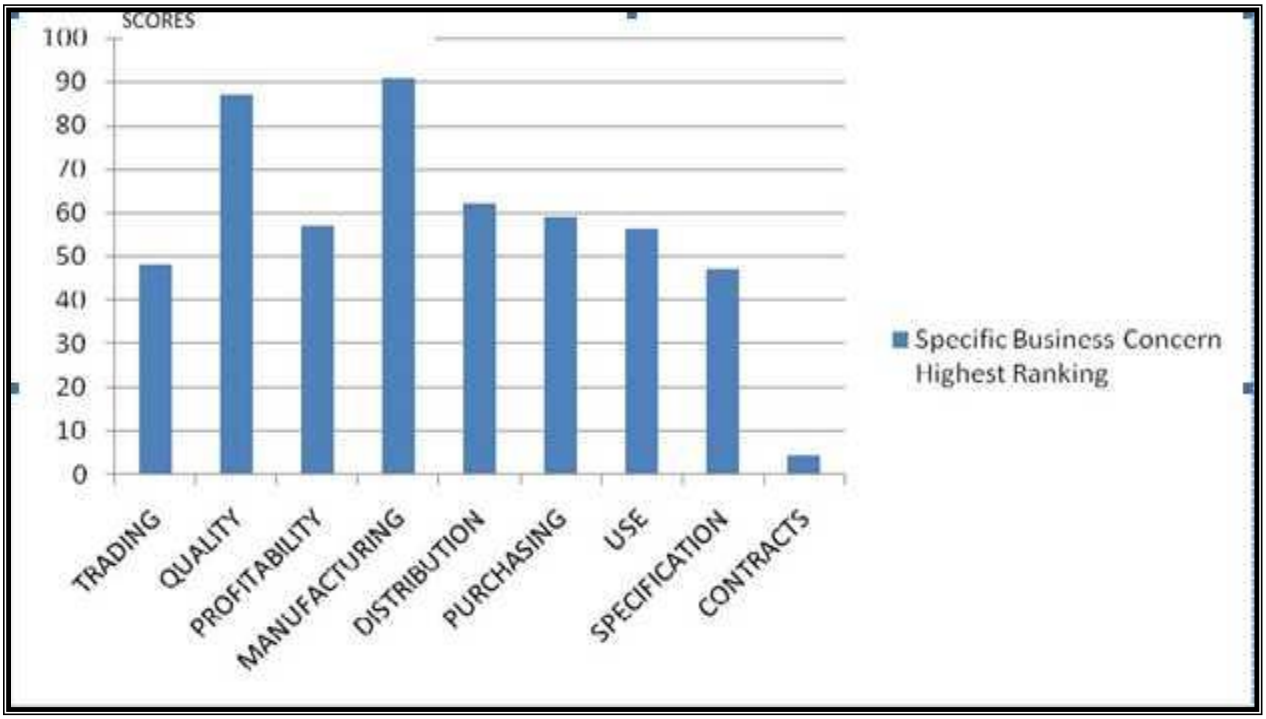
	5	0	0	1	0	0	0	0	0	0	0	1
	6	2	0	0	0	1	0	0	0	0	0	3
	7	0	0	1	0	0	0	1	0	0	0	2
	8	0	0	0	0	0	0	0	0	0	0	0
	9	0	0	0	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0	0	0	0
PROFITABILITY	1	13	3	37	1	0	0	1	2	0	0	57
	2	3	7	4	0	1	1	1	1	1	0	19
	3	7	0	3	1	1	0	1	2	0	0	15
	4	11	1	0	0	5	0	0	0	0	0	17
	5	4	2	4	0	0	0	2	0	0	0	12
	6	2	0	1	1	1	0	0	0	0	0	5
	7	0	0	2	0	1	0	0	0	0	0	3
	8	2	1	1	0	0	0	0	0	0	0	4
	9	1	0	0	0	0	0	0	0	0	0	1
	10										0	0
MANUFACTU-RING	1	24	10	45	2	3	1	1	4	1	0	91
	2	8	1	3	1	2	0	1	0	0	0	16
	3	3	2	3	0	3	0	1	0	0	0	12
	4	4	0	1	0	1	0	0	1	0	0	7
	5	4	1	0	0	0	0	0	0	0	0	5

	6	2	0	0	0	0	0	1	0	0	0	3
	7	0	0	0	0	1	0	0	0	0	0	1
	8	0	0	1	0	0	0	1	0	0	0	2
	9	1	0	0	0	0	0	0	0	0	0	1
	10										0	0
DISTRIBUTION	1	14	2	38	0	1	0	3	4	0	0	62
	2	4	2	1	1	2	1	0	0	0	0	11
	3	7	5	4	1	2	0	0	0	0	0	19
	4	8	3	5	0	0	0	0	0	0	0	16
	5	5	1	1	1	1	0	1	1	0	0	11
	6	3	0	3	0	0	0	0	0	0	0	6
	7	0	0	0	0	1	0	1	0	1	0	3
	8	2	0	1	0	1	0	0	0	0	0	4
	9	1	1	0	0	1	0	0	0	0	0	3
	10	1	0	0	0	0	0	0	0	0	0	1
PURCHASING	1	15	0	41	0	1	0	2	0	0	0	59
	2	1	3	1	1	1	1	0	2	0	0	10
	3	5	4	3	1	2	0	1	2	1	0	19
	4	6	2	0	1	1	0	0	0	0	0	10
	5	5	1	1	0	2	0	1	0	0	0	10
	6	3	2	3	0	2	0	0	0	0	0	10
	7	3	1	4	0	1	0	0	0	0	0	9
	8	4	0	0	0	0	0	1	0	0	0	5

	9	2	1	0	0	0	0	0	0	0	0	3
	10	1	0	0	0	0	0	0	0	0	0	1
USE	1	15	3	34	1	3	0	0	0	0	0	56
	2	3	7	3	0	2	1	3	2	0	0	21
	3	7	1	1	0	1	0	1	0	0	0	11
	4	4	1	5	0	2	0	0	1	0	0	13
	5	7	1	1	0	0	0	1	0	0	0	10
	6	1	0	3	0	1	0	0	0	1	0	6
	7	5	0	4	1	0	0	0	0	0	0	10
	8	0	1	0	0	1	0	0	0	0	0	2
	9	1	0	0	0	0	0	0	0	0	0	1
	10										0	0
SPECIFICA-TION	1	18	5	36	0	3	1	3	0	0	0	66
	2	6	5	4	1	2	0	0	3	1	0	22
	3	3	3	4	1	2	0	1	0	0	0	14
	4	0	0	2	0	0	0	0	0	0	0	2
	5	1	0	2	0	0	0	1	0	0	0	4
	6	4	0	0	0	0	0	0	0	0	0	4
	7	6	0	0	0	0	0	0	0	0	0	6
	8	3	0	0	0	2	0	0	0	0	0	5
	9	1	0	3	0	0	0	0	0	0	0	4
	10										0	0
CONTRACTS	1	11	1	33	0	0	1	1	0	0	0	47

	2	4	2	3	0	1	0	1	2	0	0	13
	3	4	1	2	0	2	0	0	0	1	0	10
	4	6	3	2	0	0	0	1	0	0	0	12
	5	0	0	2	1	0	0	0	0	0	0	3
	6	3	2	1	0	1	0	1	0	0	0	8
	7	2	0	0	0	1	0	0	0	0	0	3
	8	4	1	5	0	0	0	0	0	0	0	10
	9	3	3	2	1	3	0	0	0	0	0	12
	10	2	0	0	0	0	0	0	0	0	0	2
OTHERS	1	2	0	0	2	0	0	0	0	0	0	4
	2	0	0	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0	0	0	0
	6	0	0	0	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0	0	0	0
	9	0	0	0	0	0	0	0	0	0	0	0
	10	1	0	0	1		0	0	0	0	0	2
Overall Highest Ranking		**145**	**34**	**334**	**10**	**15**	**4**	**16**	**17**	**2**	**0**	**577**

FIGURE 4.6: SPECIFIC BUSINESS CONCERNS RANKINGS



4.1.4 Societal Concerns Ranked in Order of Importance

Societal concerns ranking in order of importance considers such elements as health, safety, environment, economic well-being, fair trade, consumer protection, government laws, government regulations and others not specified.

Fair Trade with 40 points is considered the most important societal concern; followed by Economic Well-Being with 38 points, Environment and Government Laws/Regulations at 31 points respectively. Others in order of importance include Consumer Protection - 29 points, Safety - 26 points, Health - 25 points and Others Not Specified Elsewhere -- 2 points. Table 4.7 and Figure 4.6 provide greater details on industry-specific rankings. Figure 4.7 depicts the highest ranking of societal concerns.

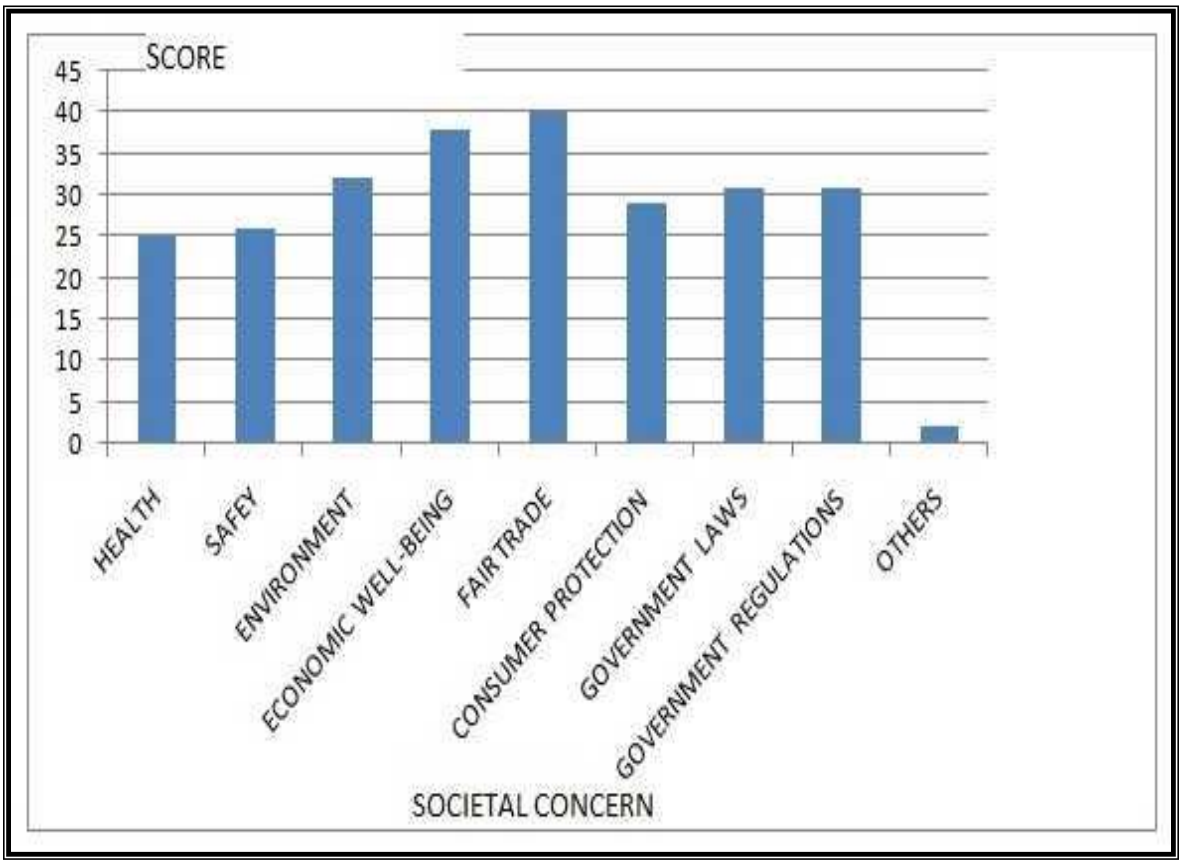
TABLE 4.7
SOCIETAL CONCERNS RANKED BY ORDER OF IMPORTANCE

SOCIETAL CONCERNS	RANK (1 Highest to 10 lowest)	SECTOR										All Industries & Business (Highest)
		Food Beverages & Tobacco	Chemical & Pharmaceutical	Domestic and Industrial Plastic, Rubber & Foam	Basic Metals, Iron & Steel/Steel & Fabricated Metals	Pulp, Paper Products, Printing & Publishing	Electrical & Electronic	Textile, Wearing Apparel, Carpet, Leather/Bather Footwear	wood & Wood products including Furniture	Non-Metalic Mineral Products	Motor Vehicle & Miscellaneous Assembly	
HEALTH	1	12	4	2	1	2	1	2	1	0	0	25
	2	2	0	0	1	0	0	0	0	0	0	3
	3	2	1	0	2	0	1	0	0	0	0	6
	4	1	1	0	0	0	0	0	0	0	0	2
	5	4	0	2	2	0	0	0	0	0	0	8
	6	0	0	0	0	0	0	0	0	0	0	0
	7	1	1	1	0	0	0	0	1	0	0	4
	8	2	0	0	0	0	0	0	0	0	0	2
	9	0	0	0	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0	0	0	0
SAFEY	1	10	5	5	3	0	0	2	1	0	0	26
	2	7	0	1	0	0	0	0	0	0	0	8
	3	7	1	1	1	0	1	0	0	0	0	11
	4	0	1	1	0	0	0	0	0	0	0	2
	5	3	2	1	1	1	0	0	0	0	0	8
	6	0	0	0	0	0	0	0	0	0	0	0
	7	1	2	0	0	0	1	0	0	0	0	4
	8	3	0	0	0	0	0	0	0	0	0	3
	9	0	0	0	0	0	0	0	0	0	0	0
	10									0	0	0
ENVIRONMENT	1	8	12	4	2	1	4	1		0	0	32
	2	2	6	0	1	1	0	0		0	0	10
	3	3	2	3	1	1	1	0		0	0	11
	4	0	0	2	0	0	0	0		0	0	2
	5	5	2	0	0	0	1	0		0	0	8
	6	0	0	0	0	0	0	0		0	0	0
	7	0	2	1	0	0	0	0		0	0	3

	8	4	1	0	0	0	0	0		0	0	5
	9	0	0	1	0	0	0	0		0	0	1
	10									0	0	0
ECONOMIC WELL-BEING	1	13	13	4	3	2	2	1	0	0	0	38
	2	2	1	4	0	2	0	1	0	0	0	10
	3	8	5	4	1	0	0	1	0	0	0	19
	4	0	0	1	0	0	0	1	0	0	0	2
	5	3	1	3	1	0	0	0	1	0	0	9
	6	0	0	0	0	0	0	0	0	0	0	0
	7	2	1	0	0	0	0	0	1	0	0	4
	8	2	1	2	0	0	0	0	0	0	0	5
	9	0	0	0	1	0	0	0	0	0	0	1
	10									0	0	0
FAIR TRADE	1	9	10	5	5	5	1	5	0	0	0	40
	2	3	4	0	3	0	1	1	0	0	0	12
	3	9	3	1	2	2	1	0	1	0	0	19
	4	0	1	0	0	1	0	0	1	0	0	3
	5	2	0	1	0	1	2	1	1	0	0	8
	6	1	0	0	0	0	0	0	0	0	0	1
	7	2	0	1	0	0	0	1	0	0	0	4
	8	2	3	0	0	0	0	0	0	0	0	5
	9	0	0	0	1	0	0	0	0	0	0	1
	10	28	21	8	11	9	5	8	3	0	0	93
CONSUMER PROTECTION	1	7	6	4	3	5	3	1	0	0	0	29
	2	2	1	1	3	0	2	1	0	0	0	10
	3	6	1	1	1	4	1	0	0	0	0	14
	4	0	0	0	0	1	1	0	0	0	0	2
	5	3	1	2	0	0	0	2	1	0	0	9
	6	0	0	0	0	0	0	0	0	0	0	0
	7	1	1	1	0	0	0	1	0	0	0	4
	8	0	1	0	0	0	0	0	0	0	0	1
	9	0	1	0	0	0	0	0	0	0	0	1
	10									0	0	0
GOVERNMENT LAWS	1	11	5	3	4	0	3	3	2	0	0	31
	2	6	3	1	1	2	1	0	0	0	0	14
	3	7	0	2	0	0	1	1	0	0	0	11
	4	0	1	0	1	1	0	0	0	0	0	3

	5	2	1	0	2	2	1	0	0	0	0	8
	6	0	0	0	0	0	0	0	0	0	0	0
	7	1	1	0	0	1	0	0	0	0	0	3
	8	0	2	1	0	0	0	0	0	0	0	3
	9	0	1	0	0	0	0	0	0	0	0	1
	10									0	0	0
GOVERNMENT REGULATIONS	1	6	7	4	3	5	0	1	5	0	0	31
	2	7	1	1	0	3	0	1	0	1	0	14
	3	5	2	1	1	0	2	0	0	0	0	11
	4	1	0	0	0	1	0	0	0	0	0	2
	5	2	1	1	1	2	1	1	0	0	0	9
	6	1	0	0	0	0	0	0	0	0	0	1
	7	0	1	0	0	1	0	0	0	0	0	2
	8	0	2	1	0	0	0	0	0	0	0	3
	9	0	1	0	0	0	0	0	0	0	0	1
	10	0	0	0	0	0	0	0	0	0	0	0
OTHERS	1	1	0	0	1	0	0	0	0	0	0	2
	2	0	1	1	0	0	0	0	0	0	0	2
	3	0	0	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0	0	0	0
	6	0	0	0	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0	0	0	0
	9	1	1	1	1	0	0	0	0	0	0	4
	10	0	0	0	0	0	0	0	0	0	0	0

FIGURE 4.7
HIGHEST RANKING ON SOCIETAL CONCERNS



4.1.5 Industries and Businesses in Collaboration with Research and Development Institutions

One major problem militating against Nigeria's competitiveness borders on the disconnect between the industrial sector and the research & development institutions in the country. This situation impacts negatively on innovation and competitiveness, thereby constraining national quality infrastructure.

Over 82% of industries and businesses in Nigeria reported no collaboration with any research institution (See Table 4.8). 29% of these are from the Food, Beverages and Tobacco Sector. About 44% of industries which do not effectively collaborate with R&D institutions are in the Domestic and Industrial Plastics, Rubber and Foam Sector.

Table 4.8
DISTRIBUTION OF INDUSTRIES IN COLLABORATION WITH R&D INSTITUTIONS

Manufacturing Sectors	Collaboration with R&D Institutions		Total
	Yes	No	
Food Beverages & Tobacco	16	33	49
Chemical & Pharmaceutical	2	13	15
Domestic and Industrial Plastic, Rubber & Foam	3	50	53
Basic Metals, Iron & Steel/Steel & Fabricated Metals	1	2	3
Pulp, Paper Products, Printing & Publishing	2	5	7
Electrical & Electronic	0	1	1
Textile, Wearing Apparel, Carpet, Leather/Bather Footwear	1	4	5
wood & Wood products including Furniture	0	5	5
Non-Metallic Mineral Products	0	1	1
Motor Vehicle & Miscellaneous Assembly	n/a	n/a-	n/a
Total All Sectors	25	114	139
Percentage Distribution (%)	18	82	100

Note: n/a – Not Available

4.1.6 Industries' and Businesses' Opinions on Funding R&D

The perceptions of industries and businesses for R&D funding burden on funders (Government, Businesses, R&D institutions, Development Partners, Entrepreneurs and others not specified) place the highest proportion of cost of Research and Development on Governments; followed closely by Industries and Businesses at 22.2% and 20.1%, respectively (See Table 4.9).

Other allocations are for the Development Partners at 19.8%, Entrepreneurs, 19.3% and 15.3% to R&D Institutions/Universities. Other funders not classified were expected to contribute about 3.3% (See Figure 4.8).

Research and Development institutions' opinions on R&D funding arrangement place the highest burden on government as the key funder - with 66.7% of respondents preferring that government should contribute 80-100%, while 20% want government to provide 61-80% and only 6% recommending 41-60% and 21-40% funding respectively. Other categories of funders by the opinions of R&D institutions should contribute 0-20%.

On the issue of funding adequacy and how R&D should be adequately funded, the R&D institutions expressed their views as follows:

A. FUNDING ADEQUACY FOR RESEARCH AND DEVELOPMENT (R&D)

- Budgetary allocations have been grossly inadequate via-a-vis the mandates of R&D institutions.
- Untimely release of funds which results in poor outcomes.
- Inadequacy of allocations renders many product development efforts inconclusive.
- Often, allocations to research are not released in full which hinders serious research efforts.

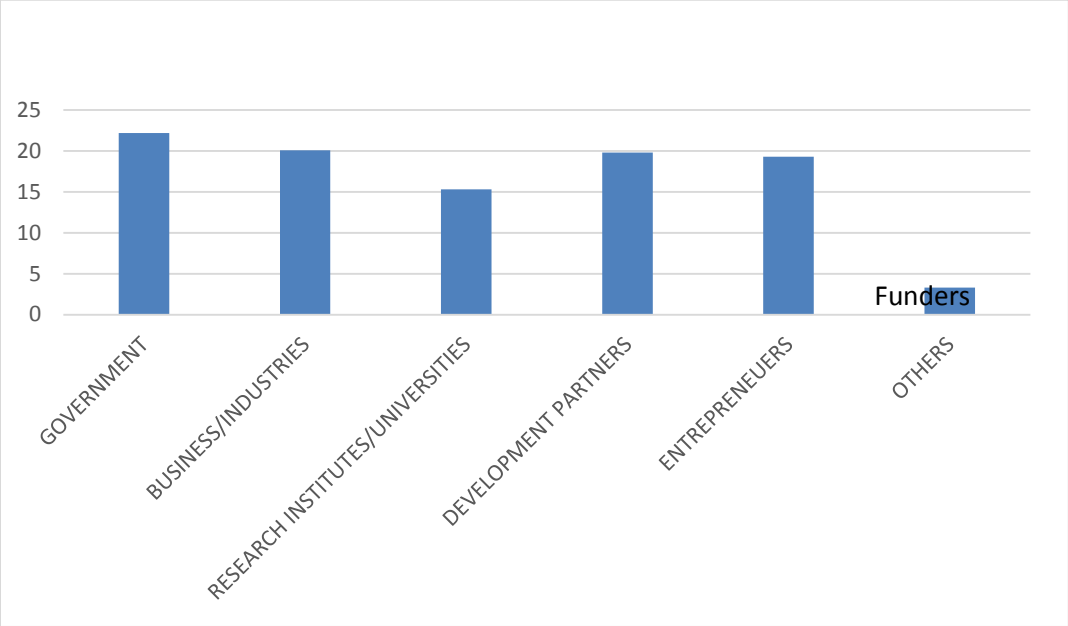
B. HOW R&D SHOULD BE ADEQUATELY FUNDED

- Increase Government budgetary allocation to enable fulfilment of R&D mandates.
- Provide special tax incentives to motivate Industries and Businesses to fund R&D and ensure implementation
- Elicit increased support from Development Partners in funding R&D.
- Elicit the cooperation and collaboration of investors and entrepreneurs through incentive system to support and fund R&D.
- Set up a dedicated Special Research Fund (venture capital, risk fund, etc.).
- Extend the scope of the Tertiary Education Trust Fund (TETFund) to embrace research institutions.
- Operationalise the Research and Innovative Fund as defined in the National Policy for Science, Technology and Innovation.
- Sustained commercialization of research findings to raise funds for further R&D efforts.

Table 4.9
INDUSTRIES' AND BUSINESSES' OPINIONS
ON R&D FUNDING ARRANGEMENTS

Funding (%)	Government	Industries & Businesses	R&D Institutions	Develop-ment Partners	Entrepreneurs	Others
0 – 20	14	101	81	106	98	16
21 – 40	16	10	6	4	4	2
41-- 60	52	1	2	4	2	0
61 – 80	43	2	0	0	6	0
81 – 100	4	3	0	1	2	1
Total	**129**	**117**	**89**	**115**	**112**	**19**
Funding Burden %	**22.2**	**20.1**	**15.3**	**19.8**	**19.3**	**3.3**

FIGURE 4.8
OPINIONS OF INDUSTRIES AND BUSINESSES ON R&D FUNDING



4.1.7 Rewarding Research Activities

Respondents were asked their opinions on how R&D activities should be rewarded. Perceptions of industries and businesses on allocation of R&D benefits are expressed on Table 4.10. They

are of the view that 20.3 per cent should go to R&D institutions, 20 per cent to Scientists, 19 per cent to Industries & Businesses, 18.2 per cent to Entrepreneurs/Investors, and 18 per cent to Government (See Figure 4.9).

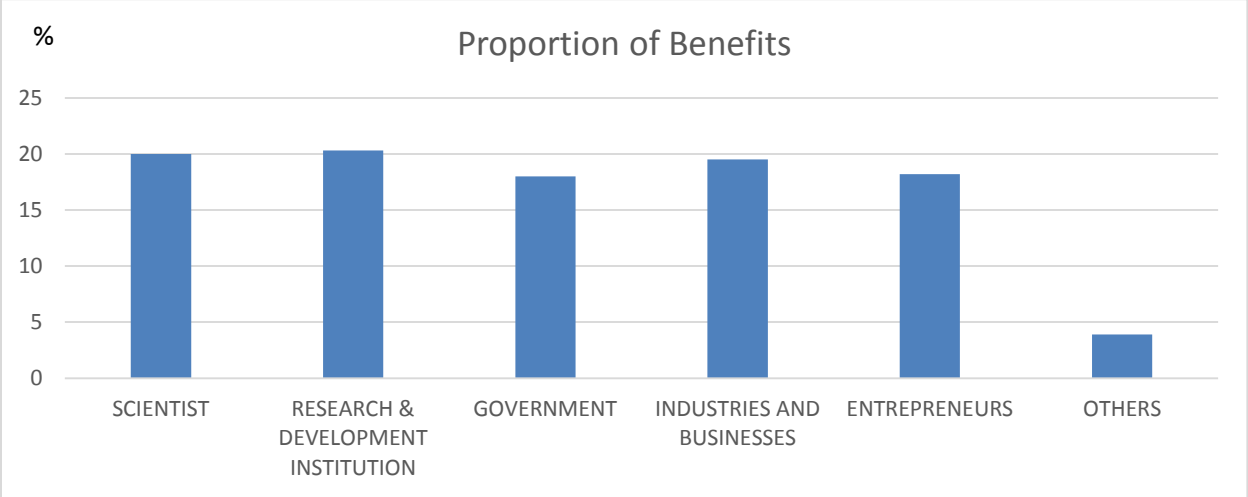
It is, therefore, imperative to apply effective advocacy towards refocusing opinions about government solely funding R&D. The private sector should support R&D by driving the demand for R&D inputs to production and development of raw materials and products - at the least, through Public-Private Partnerships (PPPs) and distribution of R&D benefits. In more developed economies, R&D activities are driven by industry requirements rather than desires of governments. However, considering the country's level of development, government's substantial funding of R&D activities cannot be over-stated.

Industries & Businesses are also of the opinion that government should lead in funding R&D (22.2% of respondents) and they (Industries & Businesses - 20.1% of respondents) will complement government efforts. This view is a reflection of the current situation in the country where the private sector feels that R&D is the sole responsibility of government and has not availed itself the benefits of linking industrial manufacturing activities to the Research Institutions.

TABLE 4.10
INDUSTRIES' AND BUSINESSES' OPINIONS ON
DISTRIBUTION OF R&D BENEFITS

	Beneficiaries of R & D Income					
Proportion of Benefits%	**SCIENTISTS**	**RESEARCH & DEVELOPMENT INSTITUTIONS**	**GOVERNMENT**	**INDUSTRIES AND BUSINESSES**	**ENTREPRENEURS**	**OTHERS**
0-20	67	88	78	87	98	22
21-40	23	29	24	27	4	1
41-60	23	8	8	2	2	0
61-80	10	0	1	1	6	0
81-100	0	0	0	3	2	1
Total	123	125	111	120	112	24
% Returns on R&D Outcomes	20	20.3	18	19.5	18.2	3.9

FIGURE 4.9
PATTERNS OF DISTRIBUTION OF R&D BENEFITS



4.1.8 Opinions of Industries and Businesses on Roles of Stakeholders

Four specific categories of stakeholders were identified by Industries & Businesses on what roles they are expected to play to promote Nigeria's competitiveness in Raw Materials and Products Development. The expected roles as proposed by industries & businesses are summarised as follows:

FOOD, BEVERAGE AND TOBACCO

(1) Roles of Government

(a) Provide an enabling environment for investors, industries, businesses and raw materials producers, researchers, legal protection, policy framework, infrastructure, funding research, credit facilities, agro-inputs, etc.

(b) Initiate measures for harnessing and conservation of raw materials.

(c) Actively support commercialization of research findings and expand access to markets for producers.

(d) Strengthen regulatory frameworks and institutions to boost research, development, production and consumption in line with global best practices.

(e) Promote concrete investments in the growth and development of MSMEs across the country.

(f) Organize and actively participate in relevant stakeholders' fora on a regular basis, and support follow-ups on proceedings and resolutions.

(g) Pursue Public-Private Partnership (PPP) initiatives to boost local content development and utilization.

(h) Explore and exploit collaboration with relevant Development Partners to support research and local production.

(2) Roles of Research Institutions

(a) Constantly develop research competences.
(b) Sustain research efforts and publicities on their outcomes.
(c) Pursue and nurture collaboration with relevant International Institutions to boost Nigerian capacities.
(d) Develop mutually-beneficial relationships with local manufacturers and entrepreneurs.
(e) Explore cost-effective research strategies to enable affordability of the products in the market and international competitiveness.

(3) Roles of Investors and Entrepreneurs

(a) Increasingly utilize local raw materials.
(b) Closely liaise and collaborate with R&D institutions. Invest in R&D.
(c) Strictly adopt best practices in use of raw materials and in product development.
(d) Invest in capacity development regularly both locally and abroad.
(e) Invest in local raw materials production.

(4) Roles of Industries and Businesses

(a) Engage competent personnel for optimum output and returns.
(b) Invest in capacity building and best practices, including quality control.
(c) Increase utilization of local raw materials and other inputs. Invest in R&D.
(d) Increasingly encourage industrial attachment for students and trainees to promote skills transfer to Nigerians.
(e) Support and promote local content in manufacturing production.

CHEMICALS AND PHARMACEUTICALS

(1) Roles of Government

(a) Invest in and encourage research into local raw materials.
(b) Provide an enabling environment for local production in line with best practices and at affordable prices:

- Infrastructure, soft credit, tax reliefs, level playing field, legal and regulatory frameworks, etc.

(2) Roles of Research Institutions

(a) Sustain research into use of local raw materials.
(b) Collaborate with Government, Investors, Entrepreneurs, Industries and Businesses on commercialization of research

findings.

(3) Roles of Investors and Entrepreneurs

(a) Develop mutually-beneficial relations with research institutions.
Invest in R&D and increasingly support utilization of local raw materials.

(b) Participate in the development of petrochemical and downstream chemical industries.

(4) Roles of Industries and Businesses

(a) Increase focus on production of finished goods from local raw materials at affordable rates and to meet best practices.

(b) Support government in the promotion of establishment of downstream chemical industries from petrochemical raw materials.

DOMESTIC AND INDUSTRIAL PLASTIC, RUBBER AND FOAM

(1) Roles of Government

(a) Invest in and encourage research into local raw materials.

(b) Provide an enabling environment for local production in line with best practices and at affordable prices: infrastructure, soft credit, tax reliefs, level playing field, legal and regulatory frameworks, etc.

(2) Roles of Research Institutions

(a) Sustain research into use of local raw materials.

(b) Collaborate with Government, Investors, Entrepreneurs, Industries and Businesses on commercialisation of research findings.

(3) Roles of Investors and Entrepreneurs

(a) Develop mutually-beneficial relations with research institutions.
Invest in R&D and increasingly support utilisation of local raw materials.

(b) Participate in the development of petrochemical and down-stream chemical industries.

(4) Roles of Industries and Businesses

(a) Increase focus on production of finished goods from local raw materials at affordable rates and to meet best practices.

(b) Support government in the promotion of establishment of downstream chemical industries from petrochemical raw materials.

BASIC METALS

(1) Roles of Government

(a) Develop a comprehensive programme for the exploration and exploitation of local raw materials, including skills development and funding of R&D.

(2) Roles of Research Institutions

(a) Liaise and collaborate with industries on the status of local raw materials in domestic production of goods.

(3) Roles of Industries and Businesses

(a) Support R&D in local raw materials.

PULP AND PAPER PRINTING PRODUCTS

(1) Roles of Government

(a) Provide decent funding for research in the sub-sector.

(b) Provide an enabling environment for the sub-sector to thrive locally.

(2) Roles of Research Institutions

(a) Sustain research into local raw materials and improve competences and capacities.

(3) Roles of Investors and Entrepreneurs

(a) Invest in R&D and explore utilization of findings/results for local production.

(4) Roles of Industries and Businesses

(a) Increasingly explore utilization of local raw materials.

ELECTRICALS AND ELECTRONICS

(1) Roles of Businesses and Industries

(a) Increasingly source and utilize local raw materials.

TEXTILES AND WEARING APPARELS

(1) Roles of Government

(a) Provide an enabling environment for the sub-sector to thrive locally.

(b) Adequately fund R&D.

(c) Review the Industrial Policy to protect and grow local industries.

(2) Roles of Research Institutions

(a) Intensify research into local raw materials for the sub-sector.

(b) Invest in competencies.

(c) Adequately publicize R&D findings to attract interest in their local utilisation.

(3) Roles of Investor and Entrepreneurs

(a) Invest in R&D towards increased utilisation of local raw materials.

(4) Roles of Industries and Businesses

(a) Invest in capacity building, quality control and utilization of local raw materials.

WOOD AND WOOD PRODUCTS

(1) Roles of Government

(a) Invest in R&D for local raw materials for the sub-sector.

(b) Strengthen the relevant infrastructure, including power.

(c) Develop a definite policy on local raw materials.

(2) Roles of Research Institutions

(a) Sustain research efforts and capacity building.

(3) Roles of Investors and Entrepreneurs

(a) Sustain support for R&D in the sub-sector.

(4) Roles of Industries and Businesses

(a) Invest in R&D and utilisation of findings/results.

NON-METALLIC MINERAL PRODUCTS

1) Roles of Government

(a) Encourage the development of non-metallic minerals in the country by creating enabling environment and appropriate policy for mining.

(b) Give adequate protection from cheaper imported products, facilitate bank loans at single digit interest rate.

(c) Construct road and rail networks for cheaper bulk transportation of mineral materials.

(d) Promote local content and provide incentives in mineral exploration and processing in order to build local capacity and ensure technological transfer.

(e) Give attention to the development of the country's abundant non-metallic minerals reserve as areas of huge investment potentials for production of varieties of cement, glass and ceramics, etc., in the country

2) Roles of Research Institutions

(a) Conduct research in specialised areas in the non-metallic sector, especially on mineral beneficiation.

(b) Collaborate with industries to address their areas of need in non-metallic minerals.

3) Roles of Investors and Entrepreneurs

(a) Develop effective working collaboration to ensure that their needs are addressed locally.

4) Roles of Industries and Businesses

(a) Encouraged to adopt locally-available raw materials and products developed locally to reduce input costs and save foreign exchange.

5) Roles of Development Partners

(a) Assist in building capacity and ensuring international best practices to secure and sustain the environment.

MOTOR VECHICLE AND MISCELLANEOUS ASSEMBLY

(1) Roles of Government

(a) Promote local content and import substitution, and protect local manufacturers.

(b) Fund research and development activities in the sector.

(2) Role of Research Institutions

(a) Intensify efforts in the development of raw materials, prototypes and models that can facilitate economic activities in the sector.

(3) Role of Entrepreneurs and Investors

(a) Patronize local industries on spare parts and components and encourage local contents in manufacturing by collaborating with R&D Institutions.
(b) Assist in funding R&D in their area of interest.

Detailed recommendations of each sector are presented in Volume 2 of the Sector Report

4.1.9. Constraints and Enhancing Factors to Competitiveness in Industrial Raw Materials and Products Development

Industries and Businesses in Nigeria indicated their various constraints and enhancing factors by critical indicators. Each manufacturing industry and business sector identified peculiar constraints and enhancing factors for each sector as shown in Annex 6.

4.2 Research & Development Institutions

Research & Development Institutions are pivotal to Nigeria's drive towards competitiveness in raw materials and products development. Structured questionnaires were administered to these institutions while returns were critically analysed.
The structure of scientific institutes in Nigeria shows the distribution of institutions by areas of research responsibility and concentration of research activities. The distribution of R&D institutions by activity sector is expressed by the supervisory Federal Ministry.

4.2.1 Research Efforts, Specialization and Commercialization of Research Findings

The efforts of R&D institutions are captured and expressed with respect to on-going research and development, including commercially-viable breakthroughs, and future endeavours if empowered and challenged adequately (See Table 4.12).

TABLE 4.12
ON-GOING RESEARCH AND DEVELOPMENT ACTIVITIES BY HS CODE AND STANDARD INTERNATIONAL TRADE CLASSIFICATION (SITC)

A) AGRICULTURE AND RURAL DEVELOPMENT RESEARCH INSTITUTION

HS CODES	SITC DESCRIPTION
1801 (Cocoa)	Cocoa beans, whole or broken, other quality raw cocoa beans
1802 (Cocoa)	Cocoa powder not containing added sugar/sweetening matter
1806200000 (Cocoa)	Chocolate, etc., containing cocoa in blocks, slabs or bars > 2kg
0902100000 (Tea)	Green Tea, whether or not flavoured
0902200000 (Tea)	Green Tea*(Quality improvement on Green Tea production has been completed)*
0902300000 (Tea)	Black Tea, ferm/partially ferm *(Quality improvement on Black Tea*

	production completed)
0103	Live swine (Artificial Insemination)
0104	Live sheep and goat (Ruminant Nutrition)
0105	Live poultry (Artificial Insemination)
1201	Soya bean (Varietal development)
55	Kenaffibre (Varietal and product development)
1901100000	Preparation of infact use for retail sale of flour, etc.
1901200000	Mixes and dough for preparation of bakers wares of 19.05
0101 (Equine and Camel)	Multiplication and conservation of equine and camel species
0102 (Bovine)	Generation of crossbreds dairy cattle through artificial insemination Fattening trials for beef production
0103 (Swine)	Generation of crossbreds from four pure lines of pigs (Large, White, Landrace, Duroc and Pietrain) for farmers.
0104 (Sheep and Goats)	Selection, breeding trials for sheep and goats. Fattening of rams for festive periods.
0105 (Poultry)	Upgrading of the Shika Brown. Development of the new broiler bird for meat production.
0301	Live fish – Mass Production
0305	Smoked fish meal for human consumption
0301990000	Other Live Fish
03012	Live fish-fingerlings and broods stock
0301990000	Other live fish – Aquarium fish
0302340000	Fresh fish
0303190000	Fresh fish
0303490000	Frozen tuna
0303490000	Herrings
0303610000	Frozen Sardine
0303740000	Frozen Mackerel
0304290000	Other Frozen Fish Fillets
0305100000	Fish Meal
0305490000	Smoked Fish (Stock fish)
0305510052	Dried Cod Head (Stock fish)
0306130000	Frozen Shrimps and Prawns
0306140000	Frozen Crabs
1603000000	Fish Oil
1604131000	Canned Sardine
1604139000	Other Canned Fish
1604140000	Canned Tuna
1604150000	Canned Mackerel (Titus)
40	Rubber and articles thereof
4001100000	Natural rubber latex, in primary forms/in plates, sheets/strips

4001210000	Smoked sheets of natural rubber
3909	Amino-resins, phenolic resins and polyurethanes, in primary forms
13	Lac; gums, resins and other vegetable saps and extracts
0106191900	Other animals of a kind used for human food
09	Coffee, tea, mate and spices
1516200021	Animal or vegetable fats and oils and their fractions

B) FEDERAL MINISTRY OF SCIENCE AND TECHNOLOGY

HS CODES	SITC DESCRIPTION
84-85	Machineries specialized for particular industry
68-71	Non-metallic mineral manufacturers; Not elsewhere specified (NES)
25-27	Coal, Coke and Briquettes
25-27	Non-metallic Mineral Manufacturers (NES)
84-85	Power Generating Machinery and Equipment
84-85	Electrical Machinery, Apparatus and Appliances (NES) Electrical parts thereof (including non-electrical counterparts, NES, of electrical household type equipment)
1211	Herbal medicine R&D (Product and Development) Production of standardized medicinal plant extracts and galenicals
1211	Production of standardized medicinal plant extracts and galenicals.
1211	Development of Naturemed anti-arthritis lotion
1211	Development of Naturemed anti-infective tea
1211	Development of Naturemed herb combination therapy for malaria.
31	Fertilizers
3102100000	Urea
3105900000	Other Fertilizers; Not Elsewhere Specified (NES)

C) FEDERAL MINISTRY OF HEALTH

HS CODES	SITC DESCRIPTION
1302	Vegetable saps and extracts derived from vegetable products
1108140017	Starches inulin, manioc (cassava) starch (starches)
1211	Plants and parts of plants, of a kind used in perfumery, pharmaceutical industries, etc.
30	Pharmaceutical products

Table 4.13 provides an overview of raw materials and products for future R&D endeavours if R&D institutions are empowered and challenged adequately.

TABLE 4.13

FUTURE ENDEAVOURS IN RESEARCH AND DEVELOPMENT IF IMPOWERED/CHALLENGED ADEQUATELY

A) AGRICULTURAL SECTOR

RAW MATERIALS AND PRODUCTS	HS CODES	SITC DESCRIPTION
Cocoa	1806909000	Other food preparations containing cocoa and chocolate
	1806901000	Other confectionaries containing cocoa
Tea	09	Fabrication of local equipment for local production of green tea for small and medium enterprises
Tea	09	Coffee, tea mate and spices
Kenaf	55	Kenaf fibre product for packaging of agricultural products
Soyabean	1201	Soya bean for oil production
Cereals (Wheat)	1001	Development and release of heat tolerant high yielding variety of wheat with potential yields of 6-8t/ha for self-sufficiency in wheat production in Nigeria.
Cereals (Barley)	1901	Malt extract from barley for industrial use and development of good quality wheat flour for baking and confectionaries
Live animal	0101 (Equine and Camel)	Molecular characterization of equine and camel species conservation of these breeds.
Live animal	0102 (Bovine)	New breeds development through the Open Nucleus Breeding System (ONBS) and recombinant DNA techniques.
Live Animal	0103 (Swine)	New breeds development through the Open Nucleus Breeding System (ONBS) and recombinant DNA techniques.
Live Animal	0104 (Sheep and Goats)	New breeds development through the Open Nucleus Breeding System (ONBS) and recombinant DNA techniques.
Live Animal	0105 (Poultry)	Development of new breeds of chickens for eggs and meat from exotic pure lines
Fish, Crustaceans, etc.	03	Fish and crustaceans, molluscs and other aquatic in vertebrates
Fish, Crustaceans, etc.	0306130000	Frozen shrimps and prawns
Fish, Crustaceans, etc.	0301	Live fish
Fish, Crustaceans, etc.	03012	Live fish – fingerlings and brood-stock
Fish, Crustaceans, etc.	0301990000	Other live fish – aquarium fish
Fish, Crustaceans, etc.	0302340000	Fresh fish
Fish, Crustaceans, etc.	0303190000	Fresh fish

Fish, Crustaceans, etc.	0303490000	Frozen Tuna
Fish, Crustaceans, etc.	0303490000	Herrings
Fish, Crustaceans, etc.	0305100000	Fish Meal
Fish, Crustaceans, etc.	0306130000	Frozen Shrimps and Prawns
Fish, Crustaceans, etc.	0306140000	Frozen Crabs
Fish, Crustaceans, etc.	1603000000	Fish Oil
Fish, Crustaceans, etc.	1604131000	Canned Sardine
Fish, Crustaceans, etc.	1604139000	Other Canned Fish
Fish, Crustaceans, etc.	1604140000	Canned Tuna
Fish, Crustaceans, etc.	1604150000	Canned Mackerel (Titus)
Pharmaceuticals	3002	Development of new vaccines against diseases of economic importance
Pharmaceutical	3002	Development of multivalent vaccines
Pharmaceutical	3002	Development of diagnostic kits, sera and biologics
Pharmaceutical	3002	Development of ethno-veterinary drugs
Rubber, Plastic and Foam	40	Rubber and articles thereof
Rubber, Plastic and Foam	3506910000	Adhesives based on rubber or plastic (including artificial resins)
Rubber, Plastic and Foam	3812	Rubber accelerators; plasticisers; Not Elsewhere Specified; anti-oxidising preparations
Rubber, Plastic and Foam	3907	Polyether and epoxide resins; polyesters, in primary forms
Pulp, Paper and Printing	47	Pulp of wood/of other fibrous cellulosic mat; waste, etc.
Rubber and Plastics	13	Lac, gums, resins and other vegetable saps and extracts
Animal	0106191900	Other animals of a kind used for human food
Animal Products	1516200021	Animal or vegetable fats and oils and their factions

SCIENCE, TECHNOLOGY AND INNOVATION SECTOR

RAW MATERIALS AND PRODUCTS	HS CODES	SITC DESCRIPTION

Transportation	86-89	Other Transportation Equipment (Air Craft)
Transportation	86-89	Road vehicle (including Air Cushion Vehicles) e.g. Electric Car and Low Cost Vehicle
Electrical Electronics	84-85	Power Generating Machinery and Equipment (Small Hydro Turbine, Gas, Turbine Engine Project Research (Six Cylinder)
Non-Metallic Mineral	25-27	School Pencil Development – Non-metallic mineral manufacturers
New and Advanced Materials	NA*	Nanotechnological improvements on soils
Building & Construction Materials	NA	Energy Efficient Studies in Buildings
Building & Construction Materials	NA	Skills Development Schemes and Pilot Models in Nigeria
Building & Construction Materials	NA	Erosion Control in Road Infrastructural Sites
Building & Construction Materials	NA	Engineering Solutions on Problem Soils
Building & Construction Materials	NA	NBRRI Architectural Innovations for IDP camps
Building & Construction Materials	9826	Refractory bricks technology Incubation in Nigeria.
Chemicals	121190	Development of Insecticide treated nets (using Pesticidal Plants
Pharmaceutical	121190	Development of herbal medicines for the management of diabetes, cancer and livestock diseases
Pharmaceuticals	121190	Development of natural preservatives from plants
Pharmaceuticals	121190	Development of natural sweetness from plants
Pharmaceuticals	121190	Development of crude plant extract as raw materials for herbal drug production
Oleochemicals	1511	Palm Oil and its fractions
Oleochemicals	1511101000	Crude palm kernel oil: for soap manufacture
Chemicals	2207	Ethyl alcohol, undenatured of > = 80% alcohol denatured spirits
Minerals	2508100000	Bentonite
Pharmaceuticals	1302	Vegetable saps and extracts derived from vegetable

		products
Pharmaceuticals	1108140017	Starches; inulin, manioc (cassava) starch (starches)
Pharmaceuticals/ Cosmetics	1211	Plants and parts of plants of a kind used in perfumery, pharmaceuticals, etc.
Pharmaceuticals	30	Pharmaceutical products
Chemicals	38	Miscellaneous chemical products

N/A -- Not Applicable

Table 4.14 provides a summary of commercially-viable research and development break-through of raw materials and products that request attention of government, investors and entrepreneurs.

TABLE 4.14
COMMERCIALLY-VIABLE RESEARCH
AND DEVELOPMENT BREAK-THROUGHS

A. AGRICULTURAL AND RURAL DEVELOPMENT ACTIVITY SECTOR	
ITEMS	**MAJOR R&D BREAK-THROUGHSS**
Cocoa	• Early bearing cocoa varieties which combine high (2000kg/ha compared with 500kg/ha on farmers' farm) insect pests and disease tolerance and other quality parameters were developed. Twelve (12) hybrids of cocoa from these categories were released in 2011)
Coffee	• A socio-economically acceptable method of rehabilitating old coffee plantation with overgrown trees has been developed through cropping at 30cm above ground level to rejuvenate the old plants
Cashew	• Seeds and seedlings of 25 superior genotypes, high yielding (10-13kg/tree/year) medium size nuts with superior flavor and apple skin/flesh colour selections have been supplied to farmers nationwide.
Tea	• Currently, twenty-four (24) highland clonal tea genotype introduced from Kenya are kept in • Germplasm on Mambilla Plateau. Six (6) of these have been recommended for commercial cultivation clones. They are 35, 143, 318, 236, 68 and 357.
Crop Processing and Utilization	• There has been a major break-throughss by Agricultural Research Institutes in the aspect of value addition on sixty (60) products from different crops, of which 22 have been patented with the former Ministry of Commerce and Industry.
Farming Systems and Extension	• CRIN has established Cocoa Seed Garden in all the 14 cocoa producing States (Ondo, Cross River, Osun, Edo, Oyo, Ogun, Ekiti, Kwara, Kogi, Akwa Ibom, Delta, Abia, Taraba and Adamawa States) in Nigeria. This will assist CRIN in providing extra-early cocoa variety to all farmers.

	• To meet European Union (EU) Regulation/Standard in Cocoa production, CRIN embarked on sensitization and awareness creation at Owena (Idanre Local Government Area of Ondo State) on the particular recommended for farmers' use to ensure good cocoa bean quality.
Statistics, Socio-economic and Techno-economic Research on Cocoa	• Through the use of Geographical Information System (GIS), the total current hectares under cocoa cultivation in Nigeria has been estimated to be 639, 348 ha. The contribution of each of the 14 cocoa-producing states are as follows: Ondo – 149, 687ha; Cross River – 123,747ha; Osun – 106,111ha; Oyo – 41, 447ha; Kogi – 10,200ha; Abia 4, 230ha:Kwara – 3,578ha; Akwa Ibom – 1,892ha; Taraba – 200ha' Delta – 150ha and Adamawa – 6ha;
Biotechnology	• Cocoa plantlets have been successfully regenerated from the flora part (staminode) of cocoa. • Somatic embryos of cocoa have been developed from staminode explants of tea and cocoa using locally sourced growth enhancement substitutes like lagoon water, trona and earthworm casts. • Genetic transformation of staminode explants of cocoa was achieved using *Agrobacterium tumafisien*
Improved Farm Inputs and Practices	• Varietal development of maize, cowpea, soya bean and kenaf • Comprehensive soil mapping for some food basket states • Organic/rock phosphate fertilizer development • Appropriate and improved farming systems developed for South-west, Nigeria
Wheat	• Development and release of 6 irrigated and rain fed wheat with potential yields of 5-6t/ha and 3.5t/ha respectively as against wheat land races with low yields of 1.0t/ha • Five open pollination millet varieties and one hybrid millet with potential yields of 3.5-4.0t/ha as against land races of 0.8t/ha. • Value-addition to sorghum, wheat stores as livestock feeds for ruminants in North-West Zone • Production of adequate and quality breeder and foundation seeds of wheat and millet for seed companies and farmers. • Dissemination of agricultural technologies through demonstrations, workshops, publications and field days that enhance adoption of wheat and millet technologies to about 30-40% by farm.
Livestock	• Improved milk and meat off-take from our indigenous cattle through artificial insemination technology. • Livestock feed formulations using industrial food wastes • Use of indigenous natural resource for ethno vetinary treatment of livestock

	• Animal food product development from cereals and legumes.
Poultry	• Shika Brown layer chicken developed • Development of meat type (broiler) chicken • Feeding packages • Animal packages
Fish	• Fish Genetic and Engineering: Genetic improvement of cultured fish spices • Mass production of fast growing fingerlings • Improved Technology for induced breeding of catfishes • Development of hand pelletizer (fish feed formulation, feed mixer and grinder) • Development of standard sampling techniques for catch assessment of inland water fisheries. • Development of NIFFR fish cake • Techniques in Zooplankton mass production (Live fish food) • Design and fabrication of solar tent for fish drying • Fabrication of tanks and Polythene bags for live fish transportation.
Animal Vaccines & Disease Control	• Development of viral vaccines • Development of bacterial vaccines • Rinderpest eradication • Surveillance, diagnosis and control of major animal diseases of economic importance • Veterinary outreach to livestock farmers • Prompt diagnosis of diseases (e.g. rabies, Avian influenza, etc.) • Establishment of Biosafety level 3 laboratory for the identification of highly pathogenic organisms • Recognized as FAO Regional Laboratory for Avian influenza and other trans- boundary animal diseases.
B. SCIENCE, TECHNOLOGY & INNOVATION ACTIVITY SECTOR	
Laboratory Equipment and Processes	• Science and Technology Laboratory Standards for Post-Basic Education Institutions and Research Institutions • NISLT/Step-B workshop on effective maintenance and management of laboratory equipment in Post-Basic educational Institutions (PBEIs) • National Inventory of Science Equipment Programme (NISEP) • Assessment of the effect of lead poisoning in humans and animals in mining locations in south-west of Nigeria. • Production of BI Aflatoxin antibody in detection of agricultural products
Products and Process Development	• Neem-based organic fertilizer • Essential oil extraction technology • Biodiesel from Jatropha seeds

	• Moringa bio-products • Tomato paste technology
Building Materials and Equipment Development	• Development of Roller Compactor with Vibratory Element • Development of interlocking block-making machine • Development of Manual Brick-making machine • Production of digitalized sub-grade Soil Maps of States in Nigeria • Setting up of Pozzolana Pilot Plants in Nigeria at Ota (Ogun State) and Bokkos (Plateau State)
Pharmaceuticals	• Development of an effective anti-sickling phyto-medicine • Development of a process for production of pharmaceutical grade starch • Development of a process for the production of microcrystalline cellulose for use in drug formulation • Development of an effective anti-malaria phyto-medicine • Development of an effective anti-diabetic phytomedicine • Development of an effective anti-fungal phyto-medicine • Extraction of essential oils from local plants • Extraction of pharmaceutical grade Artemisinin from *Artemisia* plant grown in Nigeria
Others	• Slow release nitrogen fertilizer based on area (sponsored by RMRDC) • Phyto drug for treatment of epilepsy • Integrated Technologies for scientific processing of *Moringa oleifera* for production of some nutritional, medicinal, agricultural and industrial inputs • Production of Prodigiosin: an anti-cancer drug • Technologies for rapid production of food and other economic tree crop seedlings by systems • Vehicle-Speed Limiter (VSL) • Ultra-cheap Indoor Energy Harvesting Units using Dye-sanitized solar cell array • Direct Write Fabrication of Light and Humidity sensor • Reversed Engineered Spray Pyrolysis Machine • Production of Chemical Vapour Deposition Machine • Production of Medical Diagnostic Blood genotype determination machines and bacteria incubators with digital temperature controls and displays • Production of Chassis for Point-of-Sales (POS) and Vending machines as import substitute (produced for a local company on demand).

4.2.2 Current State of Infrastructure in R&D Institutions in Nigeria

Assessment of infrastructure for research in R&D in Nigeria was carried out based on adequacy and accessibility covering the following:

i. Buildings.
ii. Road access to the Institute.
iii. Water (Potable).
iv. Access to Electricity.
v. Supply of Electricity.
vi. Connection to modern communications network.
vii. Adequacy of library.
viii. Conduciveness of Laboratories.
ix. Data Centre and Data Base adequacy.

While access to R&D Institutes is about 71%, the least categories of infrastructure in terms of adequacy are lack of conducive laboratory facilities at 5.9% and supply of electricity at 6.3%. Overall adequacy of all infrastructural facilities aggregated to adequacy (See Table 4.15). Sector-specific infrastructure adequacy placed the Health sector at 25 %, Science & Technology sector at 48% and Agriculture & Rural Development sector at 35%.

TABLE 4.15
CURRENT STATE OF INFRASTRUCTURE IN R&D INSTITUTIONS IN NIGERIA

S/N	Activity Sectors	Physical Condition Of Building		Access To Institution		Access To Potable Water		Access To Electricity For R&D		Adequacy Of Supply Of Electricity		Connection To Modern Communication Network		Adequate Library		Conducive Laboratory.		Functional Data Centre & Data Bases		Total		Sector Specific Adequacy (%)
		YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	
1	AGRIC	3	6	6	3	4	5	2	7	1	8	4	5	4	5	1	8	3	5	28	52	35
2	SC&TECH	4	3	5	2	2	4	0	7	0	6	2	4	3	3	0	7	5	2	35	38	48
3	HEALTH	0	1	1	0	1	0	0	1	0	1	0	1	0	1	0	1	0	0	2	6	25
4	TOTAL R&D	7	10	12	5	7	9	2	15	1	15	6	10	7	9	1	16	8	7	65	96	
5	(%) ADEQUECY	41.2		70.6		43.8		11.8		6.3		37.5		43.8		5.9		53.3		40.4		

4.3 Research & Development Institutions' SWOT Analysis for Competitiveness in Raw Materials & Products Development

Some Research & Development institutions in Nigeria enumerated their key areas of **Strengths, Weaknesses, Opportunities and Threats (SWOT).** Findings from these institutions are expressed below to include:

COCOA RESEARCH INSTITUTE OF NIGERIA [CRIN]

Strengths

- The Institute has established a reputation as the main source of genetic materials of its mandate crops.
- Part of its land in each location has been developed into plantation office & residential buildings and access roads.
- It enjoys the goodwill and support of government and is the only Institute with research mandate on its crops in Nigeria.
- Demand and marketability of its mandate crops and their products continue to increase since its inception.
- The Institute has capable personnel that carry out research and extension on all aspects of the mandate crops.
- ICT and GIS facilities are available.
- It has a vantage position of easy access by farmers and proximity to higher institutions of learning & research, including UI, OAU, FRIN, IAR&T, NIHORT and IITA in Ibadan axis alone.
- It is involved in capacity building for farmers and collaboration with tertiary institutions.
- CRIN is now the technical arm of the National Cocoa Development Committee and Cocoa Action Plan of the Federal Government.
- It has developed linkages with other stakeholders.

Weaknesses

- Funding has been reduced over the years such that ageing equipment and infrastructure cannot be replaced.
- It is confronted with epileptic power supply, poor road network, insufficient water supply, inadequate ICT facilities, dilapidated office & residential accommodation and inadequate vehicles for field-work.
- The laboratories need rehabilitation and re-equipping with more up-to-date equipment and reagents.
- This situation has adversely affected output, adoption of its research findings & technologies and linkages with major stakeholders, especially industry.
- Research staff morale is low leading to high turn-over to the universities and shortage of manpower.
- No department for the training of technologists.
- Internal revenue base is weak.

- Development Plan is inadequate.

Opportunities

- Rising need for further genetic improvement of planting materials and development of new products from the mandate crops by CRIN.
- Federal Government should establish Cocoa Marketing Company to enhance production & marketing and expand production and use of cocoa and other mandate crops.
- Advanced research methodologies and tools are now available backed by a wide knowledge base in sister institutions that can be tapped by CRIN.
- Need for greater network with Faculties of Agriculture in Nigerian Universities producing graduates for CRIN'S employment as well as a large young labour force that the nation can harness in production and processing of CRIN's mandate crops.
- CRIN'S mandate crops are most suitable to stimulate the establishment of SMEs to provide employment, reduce poverty and enhance food security.
- The Agricultural Development Project (ADP) system is in place in all States of the Federation to provide a robust extension support to disseminate CRIN's research findings nationwide.
- Communications facilities will facilitate collaboration with other Institutions and boost interaction with stakeholders, especially farmers.
- Additional funding can come from 25% of cocoa export levy for R&D.
- Potentials for more External Collaboration Enhanced Access to Global Agricultural Information.
- Huge potential for PPPs locally and internationally.

Threats

- Turn-over of research staff at CRIN has been high without any replacement – creating a succession vacuum in many disciplines.
- Poor funding has adversely affected infrastructure and laboratories which are required to qualify for research funding by donor agencies.
- Untimely release of funds harmful to time-bound R&D activities.
- Promotion of the production and export drive of other tree crops products (such as palm oil), competition for land use for plantation of other crops and urban development will affect the expansion programme of CRIN mandate crops.
- Policy inconsistencies.
- Use of non-research personnel to direct the affairs of the Institute, creating disaffection among career officers.
- Unreliable public utilities (electricity, water, etc.) affect cost and results of R&D.

PROJECT DEVELOPMENT INSTITUTE [PRODA], ENUGU

Strengths

- PRODA has experienced and qualified personnel drawn from all parts of the country.

- Several machines and equipment processing lines have been researched and developed for SMEs.
- Provides support for industrial growth, especially in the agricultural sector.

Weaknesses

- Mandate does not permit it to commercialize its products.
- Inadequate manpower development & staff welfare.
- Inadequate funding and delays in budget implementation.
- Multiplicity of agencies researching into same area.

Opportunities

- Low funding has compelled the Institute to look beyond its mandate to generate revenue.

Threats

- Poor funding and inadequate budgetary provisions for the Institute's activities.
- Poor road network from Abakaliki expressway to headquarters.
- Epileptic power supply.

RUBBER RESEARCH INSTITUTE OF NIGERIA [RRIN]

Strengths

- Favourable soil and climatic conditions for rubber and gum Arabic production. They are of climatic and socio-economic importance.
- Good high-yielding clones available.
- Farmers have acquired knowledge and skills to grow crops over the years.
- Available land for expansion; availability of clonal seed gardens; and good natural rubber and gum Arabic genetic base.
- RRIN is the only government institution in Nigeria mandated to carry out R&D on rubber, gum Arabic and other latex-producing plants of economic importance. It is a centre for information on rubber and gum Arabic.
- Favourable government policy and political will.
- Ready market for rubber and gum Arabic with insignificant export restrictions.
- Proximity to other research institutes and universities.
- Goodwill and co-operation of stakeholders and international organizations.
- Committed and trained scientists; good training facilities for field research and extension.
- No known viable substitute for natural rubber and gum Arabic in such applications as tyre manufacture and food additive.

Weaknesses

- Poor rehabilitation and management of rubber estates.
- Low labour supply from high rural-urban migration.
- Farmer-based organizations have weak operational and financial capacities.
- Low level of adherence to quality standards.
- Unfair & weak marketing arrangements for producers and

buyers.
- Facilities, funding and infrastructure are inadequate.
- Lack of skilled personnel in some critical areas of need.
- Absence of modern research equipment.
- High cost of training personnel in specialized disciplines.

Opportunities
- Low funding and foreign exchange shortage has compelled the Institute to look beyond its mandate to generate revenue for its activities.
- Increase government commitment to agriculture as in the Agricultural Transformation Agenda (ATA).
- Growth of organic and Fair Trade market globally. Continuous rise in prices of rubber and gum Arabic in the world market.
- Improved climate for private sector development and PPPs.
- Enhanced R&D in value addition to the mandate crops and huge potential for commercialization of some of the institute's developed technologies.
- RRIN is the only Reference Centre for natural rubber and gum Arabic production in Nigeria, and accredited government agency to provide rubber quality certification for relevant organizations before export. .

Threats
- Volatility of world prices of rubber, climate change, high incidence of diseases and pests.
- Advanced technology especially from the Asian world.
- Competing use of land supporting rubber in the cultivation of other plantation crops such as oil palm.
- Instability in Government policies.
- Rubber is cultivated in the volatile Niger Delta region.
- Rubber production is labour-intensive and cost of labour is increasing.
- Deforestation and increasing urbanization.
- Brain-drain of specialized scientists.

NATIONAL AGENCY FOR SCIENCE & ENGINEERING INFRASTRUCTURE (NASENI)

Strengths
- Highly-skilled personnel.
- Government support.
- Research and consultancy.

Weaknesses
- Government policies on R&D.
- Inadequate collaboration with SMEs to transfer product technology.
- Non-availability of state-of-the-art laboratory and workshop

equipment.
- Non-access to licensed professional software.
- Lack of publicity and awareness.
- Inadequate funds.

Opportunities
- World Bank Science and Technology Education Post-Basic (STEP-B).
- African University of Science and Technology (AUST).
- Abubakar Tafawa Balewa University (ATBU).
- China Great Wall.
- Nigerian-Turkish Nile University (NTNU).
- Japan International Cooperation Agency (JICA).
- The Trade Mission of the ROC (Taiwan).
- University of Maiduguri (UNIMAID).
- Marmara University, Istanbul Turkey and TIAD (Machine Tools Industrialists) Bayrampasa, Istanbul, Turkey.
- Smart Hydro Power Nigeria Limited.
- Niger Delta Development Commission.
- Federal University of Technology, Owerri (FUTO).
- National Physical Laboratory, United Kingdom.
- Obafemi Awolowo University (OAU), Ile-Ife.
- Nigerian Army.

Threats
- Importation of products such as solar panels, inverters, voltage regulators, tricycle, motor-cycle spare parts.
- Government interference in the Agency's mandate and operations.

INSTITUTE FOR AGRICULTURAL RESEARCH [IAR]

Strengths
- Highly-skilled personnel.
- Government support.
- Research and consultancy.

Weaknesses
- Inadequate and unstable funding.
- Distorted staff structure, poor motivation and low morale.
- Cumbersome management structure.
- Obsolete equipment and facilities.
- Poor data base and information retrieval system.

- Inadequate infrastructure.
- Weak Institute-Industry linkage.

Opportunities

- Linkage and collaboration potentials within and outside Nigeria.
- Research funding potential from Government, Agencies and Organisations (NAOS).
- Benefits from Global Information and Communications Technology.
- Mobilization of support from institutions and other bodies within and beyond the Catchment Area.
- Staff capacity building through linkages & collaborations.
- High external demand for released crop varieties, services and machines.
- Openness to change in R&D and Technology.

Threats

- Emergence of Universities and Research Institutes competing for high-calibre staff.
- Political instability and general insecurity.
- Inadequate funding.
- Poor patronage of research findings by industries.
- Epileptic power supply.
- Low level of private sector involvement.

LAKE CHAD RESEARCH INSTITUTE [LCRI]

Strengths

- The only research Institute in the North-East zone.
- Skilled manpower in research and support services.
- Adequate supply of power and water supply.
- Acquisition of about 100ha and 50ha of land for irrigated and rain-fed research activities respectively.
- Moderately-equipped laboratory for soil testing and product development. Promotion of mechanized farming.
- Establishment of research stations and networks.
- Strong collaboration with international and national research centres.

Weaknesses

- Inadequate manpower, particularly high-calibre scientists.
- Inadequate research facilities.
- Low capacity building of scientists and administrators.

- Inadequate office equipment.

Opportunities
- Strategic location of the Institute – the only one in the North-East.
- Strategic mandate crops: millet, wheat and barley.
- Diverse farming systems in the mandate area

Threats
- Vulnerability of the environment (weather & security).
- Inconsistent government policies in agriculture.
- High turn-over of skilled staff.

NATIONAL AGRICULTURAL EXTENSION & RESEARCH LIAISON SERVICES (NAERLS)

Strengths
- Linkage with extension, research and media organizations.
- Availability of facilities for research and extension work, including ICT and GIS.
- Long continuous involvement in Agricultural Research & Extension.
- Part of a Dynamic University.
- High-esteem audiences and clients.
- Involvement in training and re-training of grassroots extension personnel.

Weaknesses
- Inadequate Manpower Development Plan, low staff motivation and morale.
- Weak linkages to relevant Research Institutions and other Partners.
- Weak internal revenue base.
- Inadequate vehicles for field-work.

Opportunities
- Potentials for IGR.
- Potentials for more external collaboration and funding; linkages with national & international organizations.
- Enhanced access to Global Agricultural Information.
- Improved use of ICT and GIS in agricultural research & information dissemination.
- Potentials for improve PPPs across the globe.

Threats
- Policy inconsistencies.

- Uncertain funding regimes and untimely release of funds.
- Unreliable public utilities.
- High cost of provision of alternative power and communications.
- High cost of disseminating research findings.

NATIONAL ANIMAL PRODUCTION RESEARCH INSTITUTE [NAPRI]

Strengths

- Highly-skilled human resources.
- Large hectarage of land for future development.
- Wide diversity of animal genetic resources (AnGR) and high-quality animal products and by-products.
- Proven technologies and services to communities.
- Strong linkage with world-class agricultural organizations.

Weaknesses

- Inadequate and inconsistent funding.
- Sub-standard and insufficient staff offices, ill-equipped laboratories, and poor infrastructure for research.
- Lack of continuity in policy and project implementation, and lack of transparency in administration.
- Lack of training opportunities for staff, low staff motivation and poor attitude to work.
- Poor documentation and dissemination of research findings.

Opportunities

- Linkage and collaboration potentials with farmers and other related institutions.
- Attracting local and international grants and scholarships.
- The only research Institute charged with the responsibility of animal production research in Nigeria.

Threats

- Land encroachment from poor boundary demarcation; trespassing on NAPRI land by surrounding villages and livestock rustling.
- Insecurity issues and political instability.
- Lack of continuity in execution of activities and programmes.
- Duplication of research functions in sister Institutes.
- In-house union issues.
- Exclusiveness in style of administration.

NATIONAL INSTITUTE OF PHARMACEUTICAL RESEARCH & DEVELOPMENT [NIPRD]

Strengths

- The National Strategic Health Development Plan developed by the FMOH and the compact signed by the States.
- Well-trained manpower in the field of Pharmaceutical, Medical and Biomedical research.
- Effective and successful collaborations with local and international R&D organizations.
- International recognition, including as a Centre for the Research & Development of Phyto-medicines in Africa.
- Well-established in basic research with the right mix of human resources.
- Manages to retain and attract some of the best scientists within the country – helping to strengthen its drug development research capacity.

Weaknesses

- Research is poorly-funded; late and incomplete release of approved allocations.
- Poor R&D perception and ownership.
- R&D funding is largely the responsibility of government in most countries especially developing countries, with spending in Nigeria in the order of 0.001% of GDP.
- Over-dependence on fiscal budgetary allocations is a major gap.
- Insufficient R&D infrastructure.

Opportunities

- Recently acquired a synthetic plant for the production of Active Pharmaceutical Ingredients (APIs).
- Inherent social values associated with the use of traditional herbal medicines which can be exploited as incentives along with scientifically-valid studies towards the conservation and economic empowerment of grassroots/local communities.
- Medicinal plants and traditional knowledge of their use can be an important component of a national economic development strategy for the promotion of general health and reduction of poverty.
- Ethno-botanical and ethno-medical surveys should be carried out to identify and classify the folkloric herbs used in the treatment of diseases.

Threats

- Unstable government policies and economic instability.
- Most of the information used for decision-making are international aggregates or from other countries leading to generalized rather than country-specific interventions.

- Operational research is hardly built into project plans.
- Low up-take of research results by pharmaceutical industries leading to accumulation of research results without commercialization.
- Epileptic power supply has compelled huge expenditures on self-power generation.
- The strongest argument against traditional medicine today is the lack of scientific proof of efficacy.
- Increasing scarcity of medicinal plant species represents a trend that should be addressed immediately. The loss of the medicinal plant resource-base and bio-diversity will have negative long-term impacts for the poor and mankind at large.
- Inadequate opportunities, equipment and work environment has led to significant brain-drain of R&D personnel.
- Almost all the solvents, reagents, standards and equipment used in the R&D process are petrochemicals, which has led to major importation of otherwise locally-available raw materials, capital flight, high cost of R&D and R&D products.

CHAPTER FIVE

REQUIREMENTS TO DRIVE COMPETITIVENESS IN RAW MATERIALS & PRODUCTS DEVELOPMENT

The requirements to drive competitiveness in raw materials and products development are focused on known strategic elements, including Advocacy, Institutional and Organisational Arrangements, Human Resource Development, Infrastructural Development, Funding and Frameworks Development.

5.1 Competitiveness Advocacy

Several reports on the Nigerian economy and manufacturing have noted the declining level of productivity and competitiveness in the country. One of the comparative advantages that the country has - apart from its resource endowments - is its large domestic market. Despite this advantage, only a small portion of producers have been able to develop into sizeable businesses and compete globally. Both the agricultural and manufacturing sectors have suffered limitations arising from low productivity. For instance, productivity has declined for industrial products and food crops over the past two decades. The severe reduction in agricultural exports is a further indication of the weak competitiveness of Nigerian agriculture.

Nigerian industries are currently facing increasing competition as trade liberalization and globalization intensify and progressively transform the international economy into a vast free-trading zone. At the regional and continental levels, Nigerian industries are also confronted with growing competition as free-trade areas are being developed and relevant agreements & economic partnership agreements implemented. At the national level, increased competition is being experienced not only from industrialised economies, but from large industrialising countries such as China, India and Brazil. These countries compete with Nigerian enterprises with the advantage of low labour costs, developed infrastructure and higher technological capabilities.

Competitiveness evolved as a ***"market mechanism which forces enterprises to measure up with each other in the production and distribution of goods and services at the best possible price and quality"***. It is believed that market mechanisms foster competition and efficiency in resource allocation, promote survival-of-the-fittest enterprises and eliminate less efficient ones.

Competitiveness, therefore, can be enhanced by strengthening market mechanisms, building comparative advantages, fostering appropriate value systems and boosting innovation. It is imperative for government to promote market-friendly policies that would stimulate competition as comparative advantages are much more beneficial than mere dependence on natural resource endowments. Government should make strategic choices to identify niches where enterprises can compete and put in place a wide range of supportive policies and incentives to enhance competitiveness of local industries.

Furthermore, there is the need to promote application of science, technology and innovation, upgrade the industrial sector, and improve access to information & knowledge for enterprises to gain and sustain competitive advantage.

Competitiveness advocacy should be predicated on "competition policy" and enabling laws. The goal of the policy is to maintain a liberal competitive order that maximizes national comparative advantages, encourages the free flow of products and services at affordable cost, promotes innovation and strengthens production capacities in the country. Policies, such as investment protection and liberalisation, are necessary but not sufficient. A national competitive strategy should aim at attracting activities with high added value and providing incentives to firms to locate more elements of their value- chain in the country.

The Strategy proposes approaches to competitiveness and sustainable economic development in understanding the relationship between government, research institutions/higher education, and industries/businesses and subsequently evaluate the country's capacity and capability to foster development through Science, Technology and Innovation (STI) or what could be called the **National Innovation System (NIS).**

5.2 Institutional and Organizational Arrangements

There is enough institutional capacity in terms of the number and types of R&D institutions and Industrial/Business outfits. What is required mostly include how to leverage existing institutions by strengthening them through adequate funding, enabling environment, protection of scientists and industrialists, appropriate policy and legal frameworks, and also to challenge these institutions to the limits. There are very few imported commodities without any R&D institution that has mandate to conduct research activity on them. However, there is need to establish new R&D institutions in the medium- and long- terms, especially in sophisticated science and technology-related industries. The policies should also encourage Public-Private Partnership (PPP) arrangements between stakeholders.

Organizational arrangements need a re-think that would build bridges linking Industries and Businesses with scientific R&D institutes. Even in the R&D community, what is going on in one institute is hardly known among the rest. Coordination arrangements must be established and strengthened by policy or legal frameworks.

Existing marketing-driven R&D outcomes should be encouraged to perform outside the confines of the R&D apparatus or under the auspices of neither industries nor government agencies. Mechanisms for promoting R&D activities must be left to experts intellectually endowed to track and promote commercially-viable research findings.

5.3 Human Resources

Human capital is a major driver of competitiveness in any country; hence, efforts must not be spared in developing, actualizing, managing and challenging human capacities. Apart from formal education at tertiary levels, efforts at content management training should ensure continuous upgrading of skills and avoidance of generational skill- gaps. Training, technical workshops/seminars, professional association memberships and participation in study tours should be promoted by R&D institutions and in industry sectors. Institutional and industrial attachments should be encouraged on a routine basis as a deliberate policy of R&D institutions and manufacturers. Such attachment programmes must not be localized, but extended to advanced economies with superior levels of competitiveness, innovation and productivity.

5.4 Infrastructure

Findings show that the infrastructural environment is extremely weak, especially in power supply and laboratory facilities. Modern transportation facilities are in a sorry state, particularly the roads and railways. Most water-ways and airports require upgrading and modernization. Access to communications infrastructure should also be further expanded and modernized. Statistical and ICT infrastructure are weak and attention should be paid to ensure data availability for decision-making. In the same vein, ICT inputs into scientific R&D and industries/businesses should be encouraged. Efforts of Government to improve infrastructure should be sustained.

5.5 Research & Production Development and Management

The selection of areas of research priority that target production of specific commodities require well-focused management techniques by agencies with mandates to manage research and development and raw materials and products. The most appropriate agency of government for this is the **Raw Materials Research and Development Council (RMRDC)**. Other research councils are narrow in terms of mandate but must be coordinated to inform effective legal and policy interventions.

Professional and regulatory bodies should make informed inputs in the selection of research and production of commodities. Relevant MDAs' opinions should be required on choice of research and production areas of intervention. Such MDAs will include the Federal Ministry of Agriculture & Rural Development, Federal Ministry of Science & Technology, Ministry of Solid Minerals Development, Federal Ministry of Health, Ministry of Budget & National Planning, Federal Ministry of Environment, National Bureau of Statistics, Nigeria Customs Service, among

others. The RMRDC, under the auspices of the Federal Ministry of Science & Technology, should coordinate and manage the processes and systems of driving national competitiveness in raw materials and products development.

5.6 Promotion of Quality Infrastructure and Culture

One of the requirements to drive competitiveness in raw materials and products development is quality. The development, production and utilisation of local raw materials demand the consideration of quality to ensure market access and consumer acceptability. Industries can only patronize and utilize local raw materials when their quality is guaranteed and meet industrial standards and specifications. Standardization and technical regulation systems are components of an enabling business environment.

For production and effective trade in goods to take place, compliance with standards and technical regulations is imperative. There is a need to establish a National Quality Infrastructure which provides evidence that products thus produced locally meet quality requirements and will be acceptable to the market and regulatory authorities. Inability to show that products meet the acceptable standards implies that suppliers will not gain market access or be able to participate in global value-chains.

Suppliers are increasingly challenged to provide products and services that demonstrably meet the requirements, specifications or standards at price levels that the market is prepared to pay. The demonstration may consist of inspection, testing, certification or any combination thereof by the supplier or an independent party chosen by the supplier and purchaser.

Quality Infrastructure Reform

The National Quality Infrastructure is taken as the totality of the institutional frameworks (public and private) that require establishment and implementation of standardization, metrology (scientific, industrial and legal), accreditation and conformity assessment (inspection, testing and product and system certifications) necessary to provide acceptable evidence that products and services meet defined requirements, be it demanded by authorities (technical regulation) or the market place (contractual or inferred).

Quality infrastructure establishment is a core responsibility of government, especially as it relates to standards, conformity assessment and accreditation. The private sector also has an important role to play but this is subject to government creating the enabling infrastructure. Fundamental are the formulation of a “National Quality Policy” and the enactment of the enabling laws which will support the establishment of the national quality infrastructure. The Quality Policy coordinates standards and technical regulation issues and is inter-linked with the Science, Technology and Innovation Policy and Industrial Policy, Agricultural and Environmental Policies, Food Safety Policy and Consumer Protection Policy. The national quality policy should be a pre-requisite for a technical support programme and be developed within the context of industrial development strategy, export promotion, trade promotion and related government

policies and strategies. A well-developed quality policy can have positive impacts on industrial development and consequently, tremendous effects on trade. The National Quality Infrastructure needs to be strengthened through legal and institutional arrangements.

To make Quality Infrastructure (QI) contribute positively to raw materials and products development, there is the need to put in place effective legislative instruments to ensure that current donor support to national QI can be transformed into an effective support service provider to industries in particular, and other productive sectors of the economy in general. Metrology, standards and accreditation are activities that are rarely self-financing and as such, commitment by government -- for adequate and long-term funding through the national budget -- is an absolute necessity.

5.7 Financing Product Development/Commercialization of R&D

Financing product development or commercialisation of R&D should be a mix of funds from stakeholders of which government should take the lion's share. Results of survey of industries and businesses and the R&D institutions indicate the desire to compel government into being the major funder.

It should be noted that in the short-run and even in the medium-term, government bears the main burden of funding products development and commercialization but the proportion ought to vary against commercialisation. In the medium- and long- runs, government funding and involvement will decline as private sector participation and funding appreciate.

There have been recent efforts by the present administration to diversify the economy based on the recognition of their enormous human and natural endowments of the country and on the concept of deploying science, technology and innovation to agricultural, health, manufacturing, energy, industrial sectors, etc.

The main economic driver of all the sectors is to deploy Science, Technology & Innovation (STI) platforms to facilitate Research & Development and the commercialization of R&D outputs. For this reason, the Federal Ministry of Science & Technology is uniquely positioned to discharge its mandates through the operation of seventeen agencies/parastatals that have cross-cutting but concise responsibilities, specialized skills and technologies to enhance various sectors of the economy. The common focus of these agencies/parastatals is the development of indigenous capabilities in the use of science, technology & innovation knowledge and products, and their domestication for sustainable industrial and economic development.

Commercializing R&D results is a process involving various technical and economic considerations. It must satisfy a need that will trigger demand and make a difference which would generate market success. Furthermore, the process will ensure that commercialization would lead to understanding the size and growth forecasts of the market for the products and be profitable when manufactured.

Commercialization has not been a priority in the nation's Research Institutes due to government policy which is affecting their activities and invariably industrial and manufacturing sectors, which have been depending largely on technologies from abroad. This policy limits their mandates to pilot plants or proto-types of the R&D outputs.

Commercialization of research outcomes is a major contribution of technology advancement and one that can bring financial autonomy to the government research agencies and generate strong public research-industry linkages and revenue. The linkages would in turn result in focused research engagement, based on market needs and core competence.

The FMST believes that through its agencies it can fast-track the realization of the priority policies and programmes of the nation's socio economic development Agenda through the commercialization of R&D results, especially in the areas of infrastructural development, agriculture, health, solid minerals, manufacturing, transportation, education, security, information & communications technology, human capacity development, water resources, environment, energy and power.

The FMST also coordinates R&D activities in Nigeria by developing raw materials for use in industries and developing appropriate technologies for their exploitation to a level of proto-types and pilot plants. Due to the dwindling funding of research over the years, some of the agencies out of necessity have extended their efforts to commercializing their R&D products to meet economic challenges.

While the FMST will need to focus on the development of indigenous capabilities in the use of STI knowledge and products, and their domestication for sustainable industrial and economic development, it is also important for the Ministry to work towards substituting local commercializable technologies/products of the Research Institutes for imported goods to impact positively on the economy.

In doing this, the FMST will also have to intimately work with relevant stakeholders like relevant MDAs, State & Local Governments and the Organized Private Sector to identify specific commercializable technologies/products of its agencies which qualify for import substitution.

Thus, the results of the findings of this competitiveness study for raw materials and products development will help the FMST in:

a. Identifying commercializable local technologies/products of its agencies which qualify for import substitution.
b. Reviewing the Ministry's mandate to incorporate commercialization of R&D outputs of its Research Institutes.
c. Expanding the mandate of the Ministry to include monitoring and coordination of all commercializable R&D outputs of all Research Institutes in Nigeria.
d. Encouraging Government to patronize locally-made goods and services.

e. Improving funding to ST&I (National Research and Innovation Fund (NRIF), Risk Funds).

Investments in local technologies/products listed for import substitution need to be vigorously promoted and industries producing such items banned from sourcing foreign exchange officially for their importation.

A number of policies need to be in place to allow agencies involved in R&D to engage in the commercialization of their outputs Regular reviews of the sector's research policies, intellectual property management, industrial, trade and tax policies, etc., are also imperative.

A continuous development of the commercialization process, for example; monitoring and evaluation and institution building are very necessary. Consistent and appropriate government policies must be put in place to encourage investors to commit resources for long-term projects and programmes.

In line with the FMST's priority programmes, the following R&D outputs/services developed by FMST Agencies (See Figure 5.1) have been identified based on their potentials for viable socio-economic development, impact on the citizenry, industrial linkages, commercialization and qualification for import-substitution.

TABLE 5.1
SOME R&D OUTPUTS/SERVICES DEVELOPED
BY FMST AGENCIES

S/N	Commercializable R&D Products	Brief Description	Potentials for Commerciali-zation	Patent Status	Agency
1	CARGO TRICYCLE	Tricycle for carrying goods and products (70% local content)	Very high potential.	Secured	NASENI
2	PASSENGER TRICYCLE	Tricycle for carrying passenger (65% local content)	Very high potential	Secured	NASENI
3	PRIMARY SCIENCE KITS (PSK)	Have high international rating and are being used all over the country to enthuse young scholars to study science.	Very high potential	Secured	NASENI
4	JUNIOR SCIENCE KITS (JIT)	Have high international rating and are been used all over the country to enthuse young scholars to study science	Very high potential	Secured	NASENI
5	PRODIGIOSIN	Anti-cancer drug produced domestically by application of principles of biotechnology	Commercialization in process	Held on for the moment as a trade secret	SHESTCO
6	WATER-BORNE PLANT FROM BLENDS OF NATURAL RUBBER LATEX & POLY VINYL ACETATE	An acrylic binder and emulsion paints	Accepted by Paint manufacturing Group of MAN. Favourably compared with commercial paints available in Nigeria. Pilot Plant being developed	Patented	RMRDC
7	TOMATO PASTE TECHNOLOGY	A proven technology domesticated from Vietnam with capacity for 1- 5 tonnes per day of paste	3 plants at NARICT, Kudan (KDS) and Ajiwa (KTS)	In process based on modifications introduced	NARICT
8	JATROPHA OIL	Training for	Training and	Registered no.	NARICT

	COOKING STOVES	technology transfer to local artisans	confirmed	NGP/2014/102	
9	FOOTBALL PRODUCTION	Foot balling	Domesticated from Pakistan	Not registered NFA accredited	NARICT
10	HIGH QUALITY CASSAVA FLOUR PRODUCTION		Technology already adopted by local entrepreneurs/cassava processors	Patented	FIIRO
11	CASSAVA STARCH PRODUCTION		Technology already adopted by local entrepreneurs/cassava processors	Patented	FIIRO
12	MECHANIZED GARI PRODUCTION		Technology already adoted by local entrepreneur/cassava processors	Patented	FIIRO
13	INSTANT POUNDED YAM FLOUR PRODUCTION		Technology already adopted and proliferated	Patented	FIIRO
14	SOY GARI PRODUCTION		Gradual adoption of technology	Patented	FIIRO
15	SOY-OGI PRODUCTION PRODUCT		Discussion in progress with local & international companies for adoption	Patented	FIIRO
16	SORGHUM MALT PRODUCTION		Technology already adopted by most breweries	Patented	FIIRO
17	PALM WINE BOTTLING AND PRESERVATION		Technology already adopted by local entrepreneurs	Patented	FIIRO
18	GROUNDNUT PASTE PRODUCTION		Gradual adoption of technology by local entrepreneurs	Patented	FIIRO
19	BODY LOTION PRODUCTION		Technology is already adopted by many local entrepreneurs	Patented	FIIRO

A detailed list of proven commercializable technologies/products from the FMST Agencies, and is shown as Annex 8**.**

It also reveals that some of the challenges of commercialization of R&D include: inadequate funding; weak collaboration and linkages; poor synergy among FMST

Agencies, weak coordination, monitoring & evaluation; poor patronage and inadequate information on locally- developed products. However, the FMST is currently working towards the establishment of a National Research and Innovation Fund (NRIF), Risk Funds and budgetary allocations for commercialization of R&D results.

5.8 Frameworks for Driving Competitiveness

Appropriate frameworks for driving Nigeria's competitiveness will focus primarily on government, after due consultations, providing legal, policy, institutional and science, technology and innovation platforms.

5.8.1 Legal Framework

Existing legal instruments tangential to strategic elements may be repealed or revised depending on findings by appropriate authorities. Such laws may include issues related to land use, mining activities, indigenization, citizenship, etc. Apart from existing laws, new ones may be enacted to either free-up or lighten areas of looseness or undue gaps detrimental to competiveness.

5.8.2 Policy Frameworks

New policy frameworks will be developed and existing ones which are deemed inadequate after thorough evaluation by experts, should be revised. Policy areas where revision efforts should be directed would include development plans, structure of the national economy, education policy, agricultural policy, credit policy, and industrial policy, etc.

5.8.3 Institutional and Organizational Frameworks

Within the institutional and organisational frameworks, there is the need to revisit the public service reform to enhance the capacity of government institutions. Other frameworks would focus on data generation agencies like the National Bureau of Statistics (NBS) and Nigeria Customs Service (Nigerian Integrated Customs Information System -- NICIS) to enhance adequate provision of appropriate production and trade records.

The RMRDC Strategic Plan should be taken into consideration in order to address the issue of competitiveness in raw materials and products development. All stakeholder-institutions should be encouraged to accommodate competitiveness, innovation and productive ideals as fundamental principles in their master plans for development.

5.8.4 Science, Technology and Innovation Frameworks

Government in collaboration with relevant ICT associations and agencies should be encouraged to provide the country with enabling science, technology and innovation

frameworks to facilitate enhancement of Nigeria's competiveness drive. Such frameworks which will cut across all sectors of the economy -- Education, Industry, Health, Agriculture, Mining, etc. -- must be premised on intensive ICT applications.

CHAPTER
SIX

WAY FORWARD, LOGICAL FRAMEWORK, IMPLEMENTATION SCHEDULE, REVIEW MECHANISMS & RAW MATERIALS DEVELOPMENT MASTER PLAN

6.1 Way Forward and Logical Framework

The best way forward is to subject all activities premised on the strategic element to the Results-based Management Logical Framework (RMLF). The matrix to be adopted will subject the strategic elements to the strategic factors. The Strategic elements include:

- Competitiveness Advocacy.
- Institutional/Organizational Arrangements.
- Human Resource Development.
- Infrastructural Development.
- R&D.
- Financing.
- Monitoring & Evaluation [M&E].

The strategic factors to which the elements would be subjected include:

- Inputs/Activities.
- Outputs Derivables.
- Outcomes Associated.
- Impacts on Goals & the Strategy.

The Results-based Management Logical Framework (RMLF) is presented in a matrix (See Table 6.1).

TABLE 6.1
RESULTS-BASED MANAGEMENT LOGICAL FRAMEWORK (RMLF)

S/N	STRATEGIC ELEMENTS	INPUTS	OUTPUTS	OUTCOMES	IMPACTS
1	**COMPETITIVENESS ADVOCACY**	(i) Awareness programmes involving the use of electronic, print & social media to engage both the critical stakeholders and the general public on issues of; a. Competitiveness & innovation b. Promotion of R&D in Industries & Businesses c. Promotion of made- in-Nigeria raw materials & products (ii) Orientation programmes towards indigenous scientific and industrial risk bearing	• Number of Radio, TV, etc. placements on Competiveness and Innovation • Workshops, Seminars and Conferences on Competitiveness Innovation and productivity • Recognition of outstanding breakthroughs in R&D • Number of posters bill boards, etc on R&D and Industrial & Business successes. • * Number of orientation programmes targeted at the Youths, Scientist and Entrepreneurs.	• Appropriate foundation for collective responsibility on competitiveness laid. • Stakeholders buy-in guaranteed • Younger generation's interest and commitment to innovation and competitiveness belief achieved • Industries & businesses encouraged to collaborate with R&D institutes. • - A culture of patriotism in support of made in Nigeria raw materials & products institutionalised.	• Conducive competitiveness environment enhanced. • Prospects for improved demand for made in Nigeria raw materials & products improved • - More Nigerians are better educated on the benefits of linking R&D to industries & businesses

2	**INSTITUTIONAL/ ORGANIZATIONAL ARRANGEMENTS**	• Constitute a functional consultative interest group on competitiveness in raw materials and products development with members drawn from critical stakeholders as delineated in the competitiveness model. • Strengthen RMRDC to provide professional leadership in the coordination efforts by providing secretariat of the consultative committee on competitiveness in raw materials and products development. • Strengthen existing R&D institutions and the academia on challenges of industries and businesses. • Enable appropriate MDAs of government to perform the role of providing enabling environment for enhancing Nigeria's' competitiveness. • Attract Development Partners to provide technical & funding back-ups	• Inaugural meeting of Consultative Committee at national level involving all stakeholders. • Interest sector groups on competiveness in raw materials and products development • Under the auspices of the FMS&T, a strengthened RMRDC is achieved. • Policy or legal frameworks to strengthen RMRDC is introduced to ensure effective coordination and collaboration of stakeholders • Number of MDAs and Development Partners engaged to support Nigeria's competitiveness drive.	• Coordinating agency on Nigeria's' competitiveness drive should be RMRDC. • Competitiveness on raw materials and products is strengthened. • All stakeholders including MDAs and Development Partners support secured.	• Enhance organisational and institutional arrangement achieved. • Effective coordination of Nigeria's competiveness in raw materials and product development upgraded. • Enhanced linkages between R&D institutions and industries in raw materials and products development.
3	**HUMAN RESOURCE DEVELOPMENT**	• No of programmes for training scientists within and outside the country • Attachments for industry workers within and outside the university and Polytechnic curriculums. • * Strengthening tertiary	• No of scientists who received R&D training. • Number of industry workers who received training. • University and polytechnic curricula reviewed. • * Variety and number of	• Capacity of scientists in R&D institutions enhanced • Basis for transition to sophisticated industries established	• Generation gaps in R&D activities reduced. • Improved chances and innovation and competitiveness in raw materials. • * Enhanced competiveness and innovation sustainability

		student's industrial attachment programmes.	students benefiting from Industrial attachment programmes.	• - Basis for graduates of universities and polytechnics improved chances of employment in R&D and in industries established.	achieved.
4	**INFRASTRUCTURAL DEVELOPMENT**	• Construction of new power plants: a. Thermal b. Hydro c. Solar d. Nuclear e. Others • Expansion of existing railway networks to link heavy industries • Introduction of electric speed trains with modernised tracks. • Dredging important inland & costal water way to facilitate raw materials supply & evacuation of final products from heavy industrial estates. • Expansion of existing ICT infrastructure: i. Optic fibre ii. Broadband etc • Building new communication infrastructure • Build & maintain road networks • Develop Scientific R&D pilot	• Number of new power plants established. • Number of existing power plants modernised and expanded. • Number of new rail lines developed and old ones modernised. • Number of new rail lines linking heavy industries or industrial estates. • Length of water way dredged. • Broad band expansion capacity & length of new optic fibre, etc. • Number and length of new road networks established. • Number of R&D pilot parks established	• Enabling environment for competitiveness in raw materials & product development created. • Enabling environment for R&D activities guaranteed • Ability to expand industrial capacity and activities established • Strong foundation for competitiveness innovation and productivity guaranteed • Cost of manufacturing and services is significantly reduced • Basis for up-scaling R&D breakthroughs	• Enhanced competitiveness environment for sophisticated industries. • Enhanced competitiveness in cost of industries' production. • Improvement in overall growth of the industrial sector's contribution to economic development. • Enhanced R&D sensitive scientific activities • Enhanced innovation and productivity in support of competitiveness.

		plants		to commercialisable outcomes established.	
5	**R&D**	• R&D projects in agro-based raw materials and products. • R&D projects in science and technology-based raw materials and products • R&D projects in solid mineral raw and products • R&D projects in Health, Environment, Forestry and others based raw materials and products • Development and refurbishing R&D libraries laboratories, etc	• Number of projects on agro- based R&D projects completed or in progress. • Number of Science and Technology based raw materials and products projects completed • Number of R&D projects in solid minerals based projects completed or in progress. • Other R&D projects in Health, Environment etc completed or in progress.	• Commercialisable projects ready for upgrade and adoption by Industries and Businesses. • Modern support systems for R&D Activities towards enhance competitiveness in raw materials and products development. • Quality infrastructure development as R&D support to industries and businesses.	• Enhanced Nigeria's competiveness in raw materials and products development achieved • Improved quantity of commercialisable R&D breakthroughs achieved. • Enhanced conformity Assessment, standardisation and metrology method achieved. • Quality culture institutionalised to support competitiveness
6	**INDUSTRIAL & BUSINESS DEVELOPMENT**	• Projects to link industries & businesses to R&D for promotion of fundamental principles of quality Infrastructure • Develop Ultra-modern industrial parks that provides for sophisticated industries conforming to climate change. • Projects on large scale modern holdings in Agriculture.	• Number of modern industrial parks developed. • No of modern sophisticated industries developed. • The degree of R&D linkages to industries businesses. • No of modern large scale agricultural projects completed. • No of large scale solid	• Modernised industrial environment established. • R&D activities driven by industries and business demand. • Large scale sophisticated industries increase sector share to national economy	• Increase in innovation anc productivity arising from enhanced Competitiveness ranking • Improved contribution of industries to GDP growth in Nigeria and reduction on over dependence on imported raw materials and Products. • Quality of locally made raw materials and products improved considerably.

		• Resuscitate moribund heavy industries like Aluminium, Paper, Textiles, Iron and Steel, etc • Establish more refineries, petrochemical and gas, power plants, etc. • * Encourage projects on large scale mining & quarrying activities.	minerals mining and processing plants established. • No of moribund industries resuscitated	• Industries and businesses creating quality job and reducing unemployment	
7	**M & E**	• Production of M&E frameworks • Establish M&E task team • Conduct M&E activities • Report M&E funding	• Framework for M&E activities established. • Organisational arrangements to administer M&E activities established. • Number of spot-checks and routine scheduled checks conducted. • Number of reports made	• Basis for quality project performance established. • Alert systems for early warning established. • Guideline to monitor performance on strategy implementation institutionalised.	• Chances of project failure minimised . • Enhanced strategy success guaranteed. • Value for money principles assured.

8	**POLICY & LEGAL FRAMEWORKS**	• Develop appropriate policy frameworks. • Develop appropriate legal frameworks. • Strengthen existing policy and legal frameworks.	• Number of new policy frameworks developed and adopted. • Number of existing policy frameworks reviewed. • Number of existing legal framework reviewed and new ones developed.	• Industrial policy required to support competitiveness established. • Favourable fiscal policy and monetary policy to support the strategy established. • Appropriate Land Use Act adopted. • New national policy and Act on large scale farming and animal husbandry developed	• Enhanced enabling environment towards competitiveness is achieved • Compelling instrument for protection of scientist, investors and industries interest • Societal and businesses' concerns are by law guaranteed by law
9	**FINANCING**	• Activities at sourcing for funds to facilitate strategy implementation • Funding and procurement of; a. Goods and Materials b. Trainings, Workshops, Seminars, Conferences and study tours. c. Data Development d. Construction e. R & D Activities f. M & E Activities g. Coordination Bodies h. Ad-hoc and Miscellaneous i. Activities j. Consultancy Services	• No of Agencies Institutions Solicited to fund & offer Technical assistance towards strategy implementation • Amount of funds realised and released to fund strategy implementation. • * Number and types of Consultancy Services executed.	• Adequate funding of competitiveness projects • Specialist engaged to provide professional advice on key arrears of project implementation • Monitoring and evaluation of project implementation performance realised.	• Orderly and guided competitiveness project implantation guaranteed. • * Funding constraint factors minimized or eliminated.

6.2 Implementation Schedule and Review Mechanisms

The proposed strategy for Nigeria's' drive towards competitiveness in raw materials and products development is predicted on a 5-year implementation policy thrust subject to review at the end of 2020 as it commences from 2016. Unavoidably, some of the key projects associated with achieving strategic elements will roll over the medium- and long- terms.

For the purpose of implementation modalities, the short-term is for the period one year to less than 5 years; medium-term -- 5 to below 10 years; and long-term -- 10 years to 15 years. The review after the first 5 years, 2016-2020, will be informed by M&E reports that are to be synthesised finally in 2021.

A summary of the implementation time-frame is scheduled to highlight take-off and end periods of most projects associated with the strategic elements (See Table 6.2). It gives a synopsis with which a more detailed schedule would be developed with approved projects under each strategic element.

The projects that would commence in Year 1 include those in Competitiveness Advocacy, Institutional/Organizational Arrangements and Financing. Advocacy and funding run through the period, while institutional and organisational arrangements could be concluded in the short-term. Details of other activities are as expressed in the implementation schedule.

While institutional/organizational arrangements would be achieved in the short-term, policy/legal frameworks would terminate in the mid-term. Projects that would continue in the long-term would include those related to Advocacy, Human Resource Development, R&D, Industrial and Business Development, Monitoring and Evaluation, (M&E), and Financing.

TABLE 6.2
IMPLEMENTATION SCHEDULE (SHORT-, MEDIUM- & LONG- TERMS) AND REVIEW MECHANISMS

S/N	Project Area	Short-Term 1 ≤ 5 Years Y1 Y2 Y3 Y4 Y5	Medium-Term 5 ≤ 10 Years Y6 Y7 Y8 Y9 Y10	Long-Term 10 to 15 Yrs Y11 Y12 Y13 Y14 Y15
1	Competitiveness Advocacy	Y1 ←	→	Y15
2	Institutional/Organizational Arrangement	Y1 ← Y2.5 →		
3	Human Resource Development	← Y1.5	→	Y13 →
4	Infrastructural Development	← Y2.0	→ Y9	
5	R&D	← Y1.5	→	Y14
6	Industrial & Business Development	← Y2	→	Y12 →
7	M&E	← Y1.5	→	Y15
8	Policy & Legal Frameworks	← Y2	Y7 →	
9	Financing	← Y1	→	Y15

In driving the mechanism for the implementation schedule, it is necessary to adopt a clear road-map that will guide the process of ensuring each of the strategic elements is focused on attaining competitiveness of the nation's raw materials and products within the context of global best practices. This can be achieved through the adoption of the Raw Materials Development Master Plan – a publication of the Raw Materials Research and Development Council (RMRDC) – See Annex 7.

6.3 Raw Materials Development Master Plan [RMDMAP]

Within the framework of the way forward, the report considered as appropriate, the adoption and implementation of the Raw Materials Development Master Plan as a complementary strategy towards driving Nigeria's competitiveness in raw materials and products development.

The RMDMAP articulates strategic issues that will help in the country's efforts toward reducing the importation of raw materials and products to save the huge foreign exchange being expended. It equally canvassed the adoption of local content in

manufacturing as a veritable strategy to achieve competitiveness. In essence, the master plan is aimed at promoting productivity and increased sourcing of raw materials by local industries to create employment opportunities, and provide the requisite platforms for diversification of the economy into resourced-based economic growth trajectory now and in the future.

The Raw Materials Development Master Plan enabling framework is summarized in Annex 7. The complete document can be obtained from the RMRDC for further reading and reflections.

CHAPTER
SEVEN

RECOMMENDATIONS AND CONCLUSION

The national drive towards competitiveness in raw materials and products development takes cognizance of the following recommendations and conclusion categorized according to responsibilities. The recommendations underscore the need for industries & businesses, research & development institutions and government to take a critical look at the issues raised, and ensure commitment towards their implementation.

7.1 Industries and Businesses

For Entrepreneurs/Investors and Industries/Businesses, the recommendations and concluding remarks that impact on the business community towards Nigeria's competitiveness in raw materials and products development include the following:

- Should collaborate with government in resuscitating and modernizing the Paper Mills, Iron & Steel Mills, Aluminium Smelting Plant, Refineries, Petrochemicals, Textile, Ceramic, Motor Vehicle Assembly Plants, Ship Building/Dock Yards, Hydro- and Thermal Power Plants, Nuclear Power Plant, Large-scale Agricultural Projects and establishment of modern grazing fields, gas plants, etc. Revitalize and ensure more commitment in harnessing already privatized Nigerian enterprises.

- Should embark on record-keeping and promote statistical culture of responding to legitimate business performance enquiries by authorised MDAs with mandate to collect and report progress of national economy.

- Should increasingly utilize local raw materials and closely liaise and collaborate with R&D institutions. They must strive to invest in R&D for raw materials and products development.
- Should create new re-orientation programmes aimed at refocusing industries and businesses in Nigeria to look inwards for local sourcing of raw materials and products as well as invest in backward-integration.

- Should effectively link up with R&D institutions for solutions to their problems while supporting R&D funding.
- Must device means of effective collaboration with government to accelerate resuscitation of moribund, heavy and sophisticated industries in the country and establish new ones.
- Should adopt the outcomes of the mapping of R&D institutions and the industrial sectors of MAN as guides to invest and adopt R&D results.
- Should maintain strict adherence to Standardization, Metrology and Conformity Assessment to accelerate attainment of improved Nigeria's competitiveness in raw materials and products development.
- Should ensure an enabling environment and more commitment (support to out-growers, farmers, mining, credit facilities, out sourcing, etc.) for participation in backward integration programmes.
- Should endeavour to adopt cost-effective strategies for effective and efficient utilization of local raw materials and industrial production in line with best practices.
- Should invest in feeder-industries in collaboration with other entrepreneurs, investors and industries.
- Should support exploration and exploitation of raw materials and other industrial inputs.
- Should provide research grant to solve specific industry problems and for the results of such research activities be taken by the industry.
- Should ensure production of quality products that could compete favourably with foreign ones.
- Should show interest in clustering for sustainability and cost effectiveness.

7.2 Research & Development Institutions

Recommendations and conclusions related to the Research & Development Institutions and the Academia in Nigeria's drive toward competitiveness in raw materials and products development include the following. They should:

- Sustain R&D into raw materials and products utilization, including periodic review of their performances and statuses across industrial sectors for further research and up-take.
- Sustain research efforts and constant upgrading of research competences and capabilities, including exploring cost-effective research strategies to enable competitiveness of the products in local and international markets.
- Strengthen and explore more areas of collaboration with relevant international institutions to boost national capacities and develop mutually-beneficial relationships with local manufacturers and entrepreneurs.
- Create strong linkages with industry for commercialization of research findings.
- Encourage periodic capacity building of research personnel in

specialized areas to encourage advanced research methodologies and tools to enhance quality of outputs.

- Be encouraged to seek and accept experts on sabbaticals to handle and develop capabilities in specific areas of their institutional mandates towards enhancing raw materials and products competitiveness.
- Motivate (reward for excellence and promotion/protection of intellectual property, etc.) and fund research on targeted areas/items of national interest.
- Sustain research into indigenous technologies to improve competitiveness, national capacity and capabilities.
- Ensure constant upgrading and maintenance of laboratories, equipment, instruments and facilities for credibility of research work and sustainability.
- Ensure R&D is demand-driven and home-grown by focusing on raw materials and products that would lead to local capacity enhancement and considerably reduce imports.
- Focus on producing graduates and scientists with skills and intellectuals to propel competitiveness and innovation.
- In collaboration with entrepreneurs/industries/businesses, adhere strictly to the fundamental principles of Quality Infrastructure in all research and manufacturing activities.
- Address issues of societal and business concerns.
- Through an umbrella association of Nigerian R&D/academic institutions in applied scientific research, be encouraged and empowered to coordinate scientific research, monitor emerging issues, protect the interests of scientists and reward excellence.
- With their regulatory bodies, periodically review academic curricular in a bid to guarantee the quality of graduates of these institutions as adequate to drive the nation's efforts towards competitiveness in innovation and productivity.
- Ensure that linkages between them be guided by the outcome of mapping R&D institutions and industrial sectors that defines which industrial sectors to be linked.
- On no account overlook Standardization, Metrology, and Conformity Assessment in the promotion of quality culture and competitiveness.
- Ensure that their activities result in enhancement of Societal and Business benefits.

7.3 Government

Recommendations and conclusions related to the Government and Development Partners toward competitiveness in raw materials and products development include the following:

- Focus more on creation of an enabling environment for the promotion of Public-Private Partnerships (PPPs) and private sector-led national development policy.

- Intensify and sustain efforts towards a private sector-driven economy devoid of bureaucratic hindrances and policy somersaults.
- Accord backward integration a national priority as part of the economic recovery plan to ensure sustainable development and competitiveness.
- Enforce increased levies on raw materials and products for which the nation has capacity to source and produce locally.
- Provide investors with more incentives to expand existing complex industries, especially refineries, petrochemicals, iron and steel, aluminum smelting, motor vehicle, and manufacturing, and to establish new ones.
- Support/promote programmes and projects that link R&D institutions/academia and industries/businesses through incentives that can to sustain the enhancement of competitiveness and innovation. Over 80 per cent of industries and businesses in Nigeria do not collaborate in any way.
- Sustain improvements and massive investments in infrastructure, especially the railway systems, water-ways, roads, power plants, telecommunications, oil and gas, etc.
- Create and strengthen a coordinating mechanism that would manage the Model designed to drive Nigeria's competitiveness in raw materials and products development.
- Develop and encourage intensive Competitiveness Advocacy strategy to elicit support of all Nigerians, especially the critical stakeholders.
- Create reliable and accessible funding mechanism for the short-, medium- and long- terms to meet the requirements of MSMEs for sustainable raw materials and products development. The funding mechanism should be a declining function of time while that of the other stakeholders would be an increasing function of time.
- Ensure the creation and availability of a data base on domestic production and consumption of raw materials and products as well as their import.
- Ensure constant monitoring and evaluation of performance towards import reduction and domestic capacity enhancement.
- Address issues of data quality in terms of narrowing existing gaps in critical statistical needs. Continuous improvement of foreign trade data and conduct of National Agriculture Sample Census (NASC), National Census of Industries and Businesses (NCIB) and strengthening the System of Administrative Statistics (SAS) are imperative.
- Ensure confidence and trust through maintenance of consistent policies.
- Ensure collaboration with network providers and Development Partners on information gathering and sharing on security issues that may affect businesses in raw materials and products development.
- Address all short-comings in the existing frameworks such as

legal, policy, infrastructural, organizational and science, technology and innovation, research funding, credit facilities, agro-inputs, etc. to harmonize and promote competitiveness.

- Support commercialization of research findings and expand access to markets for producers.
- Sustain public enlightenment and advocacy through sensitization campaigns in the print, electronic and social media on the attributes of research findings, local raw materials sourcing, domestic production as well as value-addition for made-in-Nigeria goods.
- Promote sustainable investments in the growth and development of MSMEs across the country.
- Sustain organization and active participation in relevant stakeholders' fora on raw materials development on a regular basis, and ensure the implementation of resolutions.
- Encourage inter-institutional linkages for the implementation of a comprehensive programme for the exploration and exploitation of local raw materials, including skill acquisition and funding of R&D.
- Sustain efforts at quick resolution of myriad of litigations on some of the privatized enterprises (ALSCON, ALADJA STEEL, etc.)
- Ensure periodic reviews of the nation's Policies (Industrial, Agricultural, Solid Minerals, Environmental, etc.) to protect and grow local industries.
- Sustain Public-Private Partnership (PPP) initiatives to boost local content development and utilization.
- Strengthen collaboration with relevant Development Partners (USAID, DFID, UNIDO, etc.) to support research and local production efforts.
- Effectively patrol the borders as a priority to protect the nation from being a dumping ground for smuggled products.
- Institute a Technical Aid Corps of retired industry and research workers for strengthening SMEs.
- Ensure early completion and functionality of the Free Trade Export Processing zones in the country
- Empower RMRDC under the auspices of FMST to coordinate involvement of all stakeholders (R&D Institutions/Academia, Entrepreneurs/Industries/Businesses, Government and Development Partners) in Nigeria's drive towards competitiveness in raw materials and products development.

7.4 Development Partners

Development Partners need to be involved in the drive towards competitiveness in raw materials and products development. Nigeria should solicit assistance from them in such areas as provision of:

- Technical and scientific corporation.
- Grants for scientific research.

- Credit for resuscitation and establishment of new strategic industries.
- Capacity building facilitation for R&D institutions, industries and relevant MDAs.
- Funding data base development, management and conduct of M&E on projects associated with competitiveness, innovation and productivity.
- Ensuring compliance to RMLF on every project associated with competitiveness in raw materials and products development.

7.5 Conclusion

The general remarks are cross-cutting issues that have implications for all stakeholders and encapsulated in the Model designed to drive Nigeria's competiveness in raw materials and products development. Government must realize that the Competitiveness Advocacy component of the strategic elements is important and should include orientation programmes that would promote local sourcing of raw materials and products by industries' and citizens' preferences for locally-produced goods.

There are appropriate legal and policy frameworks to enable the realization of competitiveness in raw materials and products. However, newly-integrated ones could be formulated for Government to continue to promote and enhance societal and business benefits while insisting on standardization and conformity assessment. It is important that the direct policy thrust towards rapid commercialization of R&D breakthroughs must be supported by government and the private sector with rewards for scientists and industries that partner in successful ventures that utilize local raw materials and products.

Nigeria's drive towards achieving competitiveness in raw materials and products development is most likely to take place in a changing globalized economy full of uncertainties. It must be appreciated that no nation can produce all the raw materials and products it requires. There is the need for collective efforts among all stakeholders -- industries, businesses, investors, entrepreneurs, research & development institutions -- to adopt a national strategy that will enable the country reduce over-dependence on imported raw materials and products.

The current efforts of government to redirect the country's focus from import of raw materials and products will greatly build national capacity in the development of abundant natural resources and enhance manufacturing competitiveness. It will also diversify the economy while promoting sustainable and inclusive developments, which are hallmarks of the Sustainable Development Goals (SDGs).

Government should sustain the initiative with the private sector to develop a united vision on how best to drive the diversification of the economy and achieve economic recovery in the short-to-medium terms.

In conclusion, governments, Development Partners, industries & businesses, R&D institutions & the academia and the general public are advised to embrace the thrust of this strategy towards Nigeria's competitiveness in raw materials and products development as a policy instrument capable of transforming and changing the industrial and business landscape. It is also an instrument for challenging the dormant potentials in R&D institutions of Nigeria.

*The **time is now** for Nigeria to stop being an import-dependent country, but one with a highly-competitive economy with potentials to export value-added non-oil products.*

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ANNEXES

ANNEX 1
ABRIDGED VERSION OF RAW MATERIALS AND PRODUCTS IMPORTS (2010-2015)

HS CODES	COMMODITY DESCRIPTION (SITC)	QTY(Kg)	VALUE (N)
01	Live animals	10,298,329	2,675,365,590
03	Fish & crustacean, mollusc & other aquatic invertebrate	6,457,474,401	1,276,774,444,106
04	Dairy prod; birds' eggs; natural honey; edible prod nes	2,508,697,296	692,368,021,788
05	Products of animal origin, nes or included.	196,232,854	12,166,981,553
09	Coffee, tea, mate and spices	209,956,512	50,580,648,166
10	Cereals	13,734,713,287	2,492,916,985,918
11	Prod mill indust; malt; starches; inulin; wheat gluten	1,067,147,065	116,948,418,722
12	Oil seed, oleagi fruits; miscell grain, seed, fruit, etc.	537,887,728	210,095,696,967
13	Lac; gums, resins & other vegetable saps & extracts	43,500,309	84,539,135,298
16	Prep of meat fish or crustaceans molluscs, etc.	134,031,224	16,500,289,124
17	Sugars and sugar confectionery	8,819,603,840	897,228,573,534
18	Cocoa and cocoa preparations	2,252,121,837	323,579,342,621
19	Prep of cereal, flour, starch/milk; pastry cooks' prod	1,076,806,906	1,059,874,533,164
21	Miscellaneous edible preparations	697,356,162	302,154,991,691
22	Beverages, spirits and vinegar	1,195,993,368	281,644,603,633
23	Residues & waste from the food indust; prepr ani fodder	483,583,551	88,357,338,301
24	Tobacco and manufactured tobacco substitutes	65,106,434	45,085,216,116
25	Salt; sulphur; earth & ston; plastering mat; lime & cem	10,818,566,375	309,054,190,393
28	Inorgn chem; compds of prec met, radioact elements etc	2,129,688,951	305,726,819,972
29	Organic chemicals	2,550,733,923	637,786,070,431
30	Pharmaceutical products	932,039,761	371,379,759,245
31	Fertilisers	834,735,610	237,126,242,920
32	Tanning/dyeing extract; tannins & derivs;	1,460,166,487	248,875,299,991

	pigm etc		
33	Essential oils & resinoids; perf, cosmetic/toilet prep	1,102,072,019	365,062,495,703
34	Soap, organic surface-active agents, washing prep, etc	640,417,992	89,451,990,400
35	Albuminoidal subs; modified starches; glues; enzymes	315,324,989	91,452,322,629
36	Explosives; pyrotechnic prod; matches; pyrop alloy; etc.	123,102,537	29,603,970,523
38	Miscellaneous chemical products	1,941,340,817	728,076,275,684
39	Plastics and articles thereof	7,184,990,652	1,875,794,211,899
40	Rubber and articles thereof	2,273,036,654	1,048,207,890,622
41	Raw hides and skins (other than furskins) and leather	82,042,588	94,245,354,991
42	Articles of leather; saddlery/harness; travel goods, etc.	201,245,437	23,108,821,994
44	Wood and articles of wood; wood charcoal	876,374,622	131,792,257,476
47	Pulp of wood/of other fibrous cellulosic mat; waste, etc.	143,320,691	23,003,275,166
48	Paper & paperboard; art of paper pulp, paper/paperboard	3,678,306,854	664,911,621,673
52	Cotton	120,178,080	36,926,154,469
54	Man-made filaments	314,039,988	60,283,339,366
55	Man-made staple fibres	786,754,073	137,705,739,632
56	Wadding, felt & nonwoven; yarns; twine, cordage, etc.	349,577,166	153,537,971,728
59	Impregnated, coated, cover/laminated textile fabric, etc.	457,604,290	126,229,749,075
64	Footwear, gaiters and the like; parts of such articles	243,672,131	78,515,730,611
72	Iron and steel	4,705,311,577	949,380,518,498
73	Articles of iron or steel	5,275,985,960	1,591,028,712,400
74	Copper and articles thereof	236,721,333	105,378,305,040
76	Aluminium and articles thereof	1,526,883,424	470,762,499,737
79	Zinc and articles thereof	149,444,245	52,983,761,760

ANNEX 2A
QUESTIONNAIRE DEPLOYED TO INDUSTRIES AND BUSINESSES

Federal Republic of Nigeria
April, 2016

QUESTIONNAIRE

FOR INDUSTRIES & BUSINESSES

on

The Strategy Towards Nigeria's Competitiveness in Raw Materials and Products Developments

Confidentiality Clause

All information provided will be treated with utmost confidentiality in the spirit of the Statistics Act 2007 and would be limited in use only to the extent of producing facts on current situation of Nigeria's Competitiveness in Raw Materials and Products Development. A Strategy required for orderly development of Raw Materials and Products will require data provided by identified Stakeholders in this questionnaire. This statistical instrument is for the collection of facts on current situation of the key Institutions and Establishments involved in the development of quality Raw Materials and Products towards Nigeria's competitiveness. Thank you.

Your Institute is identified as a Critical Stakeholder among the Research & Development Institutions/Academia in Nigeria to participate in this exercise of providing adequate information to enable the country design a strategy for driving Nigeria's Competitiveness in Raw Material and Products development. Your selection is premised on the understanding of your noble role in Research and Development activities in Nigeria.

We request that you respond adequately to the questions contain in this questionnaire. Thank you.

SECTION 1.0: IDENTIFICATION

1.01 Name of Institution:_____

1.02 Physical Address: _____

1.03 Postal Address:_____

1.04 Name of Head of Institution/Establishment:_____

1.05 Date of Establishment_____

1.06 Core Area of Mandate/ Specialization_____

1.07 Telephone line of Head of Institution/Establishment:_____

1.08 E-mail Address of Head of Institution/Establishment _____

1.09 Office Telephone Line_____

1.10 Institution's Website:_____

In case of a University;

1.11 Name of Faculty/Development_____

1.12 Name of the Dean of Faculty_____

1.13 Name of Head of Department_____

1.14 Contact email Address_____

1.15 Contact Phone line;_____

SECTION 2: MANDATE, FUNCTIONS AND AREA OF SPECIALIZATION

2.01: From the Act, or statute establishing your institution, state your core mandate and or functions as a Research and Development Institution.

_____

_____

_____

_____

_____

2.02: Guided by the attached United Nations Harmonized Standard (HS) code and commodity description by Standard International Trade Classification (SITC), Please indicate your key areas of specialization in Research and Development.

1	HS Code	SITC
2		
3		
4		
:		

(Use extra sheet if necessary)

2.03: Indicate areas of on-ongoing Research and Development activities by HS code and SITC

S/N	HS Code	SITC Description
1		
2		
3		
4		
:		

(Use extra sheet if necessary)

2.04: Indicate potential areas of future endeavour in Research and Development if and challenged adequately:

S/N	HS Code	SITC Description
1		
2		
3		
4		
5		
6		

(Use extra sheet if necessary).

2.05: List in order of importance your major Research and Development break through since inception:

1: _____
2: _____
3: _____
4: _____
: _____
: _____
n: _____

SECTION 3.0 HUMAN RESOURCES AND DEVELOPMENT

3.01: Please List in order of seniority the Research Scientists in your Institution

Name	Designation	Areas of R&D Specialized	Year of R&D Experience	R&D Merit Award(s) received	Membership of R&D Professional Association	Skilled Enhancement/Training Requirement	Major Challenge(s) encountered in R&D
3.011	3.012	3.013	3.014	3.015	3.016	3.017	3.018

SECTION 4.0 SWOT ANALYSES

4.01 Please list your sources of **STRENGTH** in Research and Development activities ***(you may use extra sheets if neccessary)-***

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*4.02 What are the challenging **WEAKNESSES you** are facing as a Research and Development* Institution? ***(You may use extra sheets if neccessary)-***

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4.03 Please indicate all **OPPORTUNITIES** in support of Research & Development to your Institution. ***(You may use extra sheets if neccessary)-***

_____
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4.04 Please List existing **THREATS** to Research & Development facing your Institution. ***(You may use extra sheets of paper)***_____
_____
_____
_____
_____
_____
_____
_____

SECTION 5.0 INFRASTRUCTURE

5.01 Are the Physical Condition of Building in the Institution adequate? ***(Tick √ Appropriately)***

YES	
NO	

5.02 Is Access to the Institution Adequate? ***(Tick √ Appropriately)***

YES	
NO	

5.03 Is access to portable water for Research & Development adequate ***(Tick √ appropriately)***

YES	
NO	

5.04 Is access to electric power supply adequate for Research & Development? ***(Tick √ appropriately)***

YES	

NO	

5.05 Is the supply of energy (Fuel, gas, solar etc.) adequate for Research & Development ***(Tick √ appropriately)***

YES	
NO	

5.06 Is the institute connected by modern communication network (Fiber optics) for local and wide area network ***(Tick √ appropriately)***

YES	
NO	

5.07 Is your library adequate to support Research & Development Activities? ***(Tick √ appropriately)***

YES	
NO	

5.08 Is the current state of Laboratories in the institution conducive for Research and Development activities? ***(Tick √ Appropriately)***

YES	
NO	

5.09 If NO to 5.08, please describe the inadequacies and what are require to remedy the current situation

_____
_____
_____

5.10 Describe the adequacy of supply of required specimen, materials and major consumables for Research and Development Activities

_____
_____
_____
_____
_____

5.11 Describe the current level of ICT application for Research and Development activities in your Institution

_____
_____
_____

5.12 Are there dedicated transportation equipment for Research & Development activities?

_____
_____
_____

_____

_____

5.13 Do you have a functional Data Centre and Data Bases for archiving and reporting Research & Development activities of your Institution?

(Tick √ Appropriately)

YES	
NO	

SECTION 6.0 FUNDING RESEARCH AND DEVELOPMENT

6.01 Indicate percentage distribution of R&D funding by the following potential sources between 2010-2015

Code	Funders	%
6.02	Government	
6.03	Development partners	
6.04	Industries/ Business	
6.05	Entrepreneur/Investors	
6.06	Professional Association	
6.07	NGO	
6.08	Others Specify……	

6.02 Describe the funding adequacy for Research and Development activities in your institution between 2010 to 2015.

_____

_____

_____

_____

_____

_____

_____

6.03 In support of government policy towards competitiveness in Raw Materials and Product development in Nigeria, how should R&D activities be adequately funded

_____

_____

_____

_____

_____

_____

_____

7.6 Suggest the way forward for Nigeria Competitiveness in Raw Materials & Product development._____

_____

_____

_____

_____

_____

8.0 COMPLETION OF SCHEDULE

8.01 Signature of Scientist completing this schedule: _____

8.02 Name of Scientist Completing this schedule: _____

8.03 Designation of Scientist completing the Schedule: _____

9.04 Date of Completion of this schedule:_____

THANK YOU

ANNEX 2B
QUESTIONNAIRE DEPLOYED TO R&D INSTITUTIONS

QUESTIONNAIRE

FOR RESEARCH INSTITUTES AND ACADEMIA
ON

The Strategy for Driving Nigeria Competitiveness in Industrial Raw Materials and ProductsDevelopment

Federal Republic of Nigeria
April, 2016

Confidentiality Clause

All information provided will be treated with utmost confidentiality in the spirit of the Statistics Act 2007 and would be limited in use only to the extent of producing facts on current situation of Nigeria's Competitiveness in Raw Materials and Products Development. A Strategy required for orderly development of Raw Materials and Products will require data provided by identified Stakeholders in this questionnaire. This statistical instrument is for the collection of facts on current situation of the key Institutions and Establishments involved in the development of quality Raw Materials and Products towards Nigeria's competitiveness. Thank you.
Your establishment is identified as a critical Stakeholder among Industries and Businesses in Nigeria to participate in this exercise of providing adequate information to enable the country design a strategy for driving Nigeria's Competitiveness in Raw Materials and Products development. Your selection is premised on the understanding of your noble role in productive sector of the Nigeria economy.
We request that you respond adequately to the questions contain in this questionnaire. Thank you.

SECTION 1.0: identification

1.16 Name of Establishment:_____

1.17 Physical Address: _____

1.18 Postal Address:_____

1.18.1 Name of Head of Institution/Establishment:_____

1.19 Date of Establishment_____

1.20 Core Area of Mandate/ Specialization_____

1.21 Telephone line of Head of Institution/Establishment: _____

1.21.1 E-mail Address of Head of Institution/Establishment:__

1.22 Office Telephone Line_____

1.23 Office Website:_____

SECTION 2: Use of Raw Materials and Products in your production/Manufacturing

2.01: In the period 2010 + 2015, please provide annual average use of the Raw Materials and Products as Input in your Production/Manufacturing activities.

HS Code	Commodity Description	Use of items		Of which import	
		Quantity Metric Tonnes	Value (N)	Qty Metric Tonnes	Value (N)
2.011	2.012	2.013	2.014	2.015	2.016

(Use compendium of raw materials and products attached)

2.02: List major constraint factors militating against your desire to source these items from Local/Domestic sources.

2.03: List efforts made in the past (if any) to source your raw materials and products need from within Local/Domestic sources.

SECTION 3.0 Raw Materials and Products Manufactured

3.01 In the period 2010 to 2015, please give annual average estimate of the raw materials and product manufactured as output by your industry.

HS Code	Raw Materials /Products Description	Manufactured (output)		Of which export	
		Quantity Metric Tonnes	Value (N)	Qty Metric Tonnes	Value (N)
3.011	3.012	3.013	3.014	3.015	3.016

(Please refer to attached compendium of Raw Materials and Products)

3.02: Please indicate your level of average annual capacity utilization in the manufactured of these raw materials and products in the period 2010 to 2015:

3.03: List major constraint factors militating against:

3.031: Expansion in production:

3.032: Competitiveness with foreign products:

Section 4.0: Standardization, Conformity Assessments and Competitiveness

4.01 Standards of business activities and products are certifies by which of these bodies or Agencies (Local & International)

Tick Appropriately ✔

4.011	International Standards Organization ISO	
4.012	United Nations Industrial Development Organization NSO	
4.013	Nigeria Standards Organization NSO	
4.014	National Agency for Food & Drugs Administration and Control, NAFDAC	
4.015	Others (Specify) _____ ____ _____ ____	

4.02 Please rank the following conformity Assessment methods in order of appropriate to your business establishment; (Rank: highly appropriate 0, Just appropriate 1, Not appropriate 2

Code	Specify standard Requirement	**Rank**
4.021	Testing	
4.022	Inspiration	
4.023	Suppliers' declaration of conformity	
4.024	Suppliers' declaration of certification	
4.025	Others (Please Specify) _____ _____	

4.03 In which order of importance would you rank the following specific standard requirements for your business activities and product.

Code	Specify standard Requirement	**Rank**
4.031	Suppliers or purchases standard specification	
4.032	National Standard specification	
4.033	Regional standards (e.g: ECOWAS)	
4.034	International Standards (e.g ISO)	
4.035	Government Regulated standards	
4.036	Others (Please Specify) _____ _____	

4.04 For purposes of building sustainable quantity infrastructure in production/Manufacturing rank in order of propriety the following objects of standards Conformity Assessment.
(Rank: highly appropriate 0, Just appropriate 1, Not appropriate 2

Code	Objects	**Rank**
4.041	Products	
4.042	Process	
4.043	System	
4.044	Person or Body	
4.045	Others (Please Specify) _____ _____	

4.05 To ensure Nigeria's competiveness in production of Raw Materials and products and the development of viable quality Infrastructure, please rank the following BUSINESS CONCERNS in order of importance (highest 1,2,3,4…….10) lowest.

Code	**Business Concerns**	**Rank**
4.050	Trading	
4.051	Quality	
4.052	Profitability	
4.053	Manufacturing	
4.054	Distribution	
4.055	Purchasing	
4.56	Use	
4.57	Specification	
4.58	Contracts	

4.59	Others (Please Specify) _____ _____	

4.06 To ensure Nigeria's competitiveness in production of Raw Materials and products and the development of viable quality infrastructures, please rank the following SOCIETAL CONCERNS in order of importance.
(Highest order of importance 0, 1, 2 , 3 ……..n lowest)

Code	Social Concerns	Rank
4.062	Health	
4.063	Safety	
4.064	Environment	
4.065	Economic Well-being	
4.066	Fair Trade	
4.067	Consumer protection	
4.68	Government Laws	
4.69	Government Regulations	
4.59	Others (Please Specify) _____ _____	

Section 5.0: Collaboration and Cooperation between Industries & Business and the Research & Development Institutions.

5.01 Is your business establishment in collaboration with Research & Development Institutions or the Academia (Universities/Polytechnics) on issues of Raw Materials and or Products Development.

✔ **Tick appropriately**

Yes	
No	

5.02 If yes to 5.01, identify and list the items of collaboration as listed in the compendium of Raw Materials & Products attached. ----------

5.03 In order to enhance Nigeria's competitiveness in Raw Materials and Product development, list item areas of Research and Development your business establishment would prefer to collaborate and support:

HS Code	Commodity items

(Refer to the compendium of Raw Materials & Products attached)

5.04 Please list the types of support your business establishment would proffer to offer Research & Development Institutions with capacity to provide your needs in Raw Materials and product input.

5.05 In your business opinion, who should fund resend and development activities towards Nigeria's competitiveness in Raw Materials and product Development. (Allocate Entrepreneurs (%) weight)

Code	Funders	%
5.051	Government	
5.052	Businesses/Industries	
5.053	Research Institutes/Universities	
5.054	Development Partners	
5.055	Entrepreneurs	
5.056	Others (specify)	

5.06 How do we allocate or share returns on Research & Development break through adopted by Industries and business; (Allocate % share of benefits)

Code	Beneficiaries	%
5.061	Scientist	
5.062	Research & Development Institution	
5.063	Government	
5.064	Industries & Business	
5.065	Entrepreneurs/Investors	
5.066	Others	

SECTION 6.0 Perception Indicators on Constraint and Enhancing factors towards Nigeria's competitiveness in Raw Materials & products Development.

6.01 State vividly, the roles you except Governments to play in the event of promoting Nigeria Competitions in Raw Materials product development

---

6.02 What roles do you expect Research and Development Institutions and Universities to play towards enhancing Nigeria's Competitions in Raw Materials & Product development Institutions and Universities to play towards enhancing Nigeria's competitions in Raw Materials & product development

---

6.03 State your opinion on the roles of Investors and Entrepreneurs towards Nigeria's competitiveness in Raw Material and Product development in Nigeria

---

6.04 Indicate the expected roles of industries and Businesses towards enhancing Nigeria's competitiveness in Raw Materials and Products Development.

6.05 In what ways do you expect our Development Partners and Donor community to assist Nigeria achieve enhanced levels of competitiveness in Raw Materials and Product Development:

6.06 How do Nigeria's Industries and Business substantially minimize the very high propensity for consumption and use of foreign made Raw Materials and Products.

6.7 List in your business opinion, what constitute major constraint factors to Nigeria's Competitiveness in Raw Material and Product development.

6.9 Recommend what Enhancing Factors Nigeria should consider and adopt towards sustainable competiveness in Raw Materials and Product Development.

SECTION 7: Attestation

I, ----------

Designation: ----------

Do hereby attest to the provision of facts and true reality of conditions in response to this questionnaire.

…….

Signature/Date

ANNEX 3
COORDINATING COMMITTEE MEMBERS

The three categories of under-listed stakeholders are as follows:

(1) **Ministries/Organized Private Sector (OPS):** The nominees are:

(i) Pharm. A. Oguntunde - Federal Ministry of Science and Technology.

(ii) Mr. Toyin Durowaiye- Representative, Manufacturers Association of Nigeria

(iii) Mr. H. J. Swomen – Representative, Comptroller General, Nigeria Customs Services

(iv) Mr. A. C. Chukwuka – Representative, Ministry of Budget and National Planning/Chairman, Tariff Committee

(v) Mr. Mustapha A. Daramola – Representative of The Statistician General, National Bureau of Statistics

Resource Persons:

(i) Mr. Henry Eteama

(ii) Mr. R. Adegbenro

(2) **RMRDC Staff Members and Secretariat :**

(i)	Dr. K. B. Ajoku	Chairman
(ii)	Dr. B.O. Olugbemi	Member
(iii)	Dr. (Mrs) M.S. Bassi	Member
(iv)	Dr. (Mrs) J.P.A. Bassey	Member
(v)	Mr. O.A. Bakare	Member
(vi)	Mr. J.A. Obekpa	Member
(vii)	Engr. E. Obassi	Member
(viii)	Mr. M. A. Kollere	Member
(ix)	Mr. Sule Yakubu	Member
(x)	Mr. A. A. Lemu	Member
(xi)	Mr. Tobi-Anderson	Member
(xii)	Mrs. P. Egbujo	Member

ANNEX 4
MAN SECTORAL COMMITTEE MEMBERS

1. FOOD, BEVERAGE AND TOBACCO (FBT)

- Chief Pau Gbedegun - Chairman, MAN
- Mr. F.K. Ode - Member/Secretary
- Dr. Enweruzoh - Deputy Secretary
- Mr. John Obekpa - Deputy Secretary II

2. TEXTILES, LEATHER AND LEATHER PRODUCT (TLLD)

- Alhaji Salisu Umaz - Chairman, MAN
- Dr. Hammanga - Member/Secretary
- Dr. T. Omara-Achong - Deputy Secretary

3. WOOD AND WOOD PRODUCTS (WWP)

- Mr. Ayokunle Akinyelure - Chairman, MAN
- Dr. Ogunwusi - Member/Secretary
- Mr. Mika S.R. - Deputy Secretary

4. CHEMICALS AND PHARMACEUTICALS (CP)

- Pharm. Okey Ankpe - Chairman, PMAN
- Dr. M.O.Omojola - Member/Secretary
- Dr. (Mrs) M.S. Bassi - Deputy Secretary

5. PLASTIC, RUBBER AND FOAM (PRF)

- Dr. Bashiru - Chairman, MAN
- Dr. E.A. Asanga Member/Secretary
- Dr. (Mrs) Jane Bassey - Deputy Secretary

6. MOTOR VEHICLE (MV)

- Dr. D.V.C. Obi - Chairman, MAN
- Dr. M.L. Buga - Member/Secretary
- Dr. J.O. Adekunle - Deputy Secretary

7. ELECTRICAL AND ELECTRONICS (EE)

- Engr. Onofowokan - Chairman, MAN
- Engr. T.O. Odedele - Member/Secretary
- Mrs. Ejuya - Deputy Secretary

8. NON-METALLIC (NM)

- Mr. Jide Mike - Chairman, MAN
- Mr. S.B. Olaniyan - Member/Secretary
- Dr. G.G. Awolehin - Deputy Secretary

9. BASE METAL (BM)

- Chief Oluyinka Kufile - Chairman, MAN
- Dr. B.O. Olugbemi - Member/Secretary
- Mr. S.L. Wali - Deputy Secretary

10. PULP, PAPER AND PAPER PRODUCTS (PPPP)

- Princess Layo Okeowo - MAN
- Mrs. H.Y. Tanko - Member/Secretary
- Dr. (Mrs) Omara-Achong - Deputy Secretary

11. RESEARCH INSTITUTIONS

- Prof. A.A. Voh - Research Institute
- Dr. (Mrs.) A.U.E. Uboh - Member/Secretary
- Mrs. D.O. Nwanah - Deputy Secretary

12. NASSI/NASME/NACCIMA

- Alhaji Sanusi Maijama - President, NACIMA
- Mr. B.M. Lawal - Me mber/Secretary (NASSI/NASME)
- Miss Ruth Indagawa - Deputy Secretary
- Mr. Ini Ukim - Member/Secretary (NACCIMA)
- Mrs. M. Obi - Deputy Secretary

ATTENDANCE AT MAN SECTORAL MEETING IN LAGOS

FOOD, BEVERAGES AND TOBACCO

1.	Paul Gbededo	-	Chairman FBT and GMD Flour Mills PLC.
2.	Mr Fred Chiazor	-	Vice Chairman FBT Director Coca Cola Nigeria PLC
3.	Mr Santosh Pillar	-	MD, PZ Wilmar
4.	Mr. R. Sengupta	-	GM, Conservaria Ltd
5.	Alhaji Mohammd Tahir	-	GM PZ Cusson
6.	Mrs. Ada Amogu	-	Flour Mills PLC
7.	Mrs. Sade Morgan	-	Nigeria Bottling Co. Ltd
8.	Mr. F.K. Ode	-	RMRDC

9.	Mr. John Obekpa	-	RMRDC
10.	Mrs. Uche Ojiaser	-	RMRDC
11.	Mr. Femi Gbadegun	-	MAN

CHEMICALS AND PHARMACEUTICALS

1.	Dimeji Shoji	-	Ag. Chairman
2.	Okey Akpa	-	Member
3.	Milih Pandya	-	Member
4.	Anup Asarwi	-	Member
5.	Adesoji Fagbenni	-	Member
6.	Olayuwola Seilat	-	Member
7.	Rotimi Aluko	-	Member
8.	Jude Maduke	-	Member
9.	Piku Changrani	-	Member
10.	Gabriel Akpan	-	Member
11.	Umocoft Chioma	-	Member
12.	Dr. M.O. Omojola	-	Secretary
13.	Dr. (Mrs.) Mercy S. Bassi	-	Deputy Secretary

DOMESTIC AND INDUSTRIAL PLASTIC RUBBER

1.	Dr. Bashiru	-	Chairman
2.	Dr. E.A. Asanga	-	Member/Secretary
3.	Dr. (Mrs) Jane Bassey	-	Member/Deputy Secretary

BASE METAL

1.	Chief Yinka Kufile	-	Qualitec Industries Ltd	Chairman
2.	Mr. R.P. Simgh	-	African Foundries Ltd	Member
3.	Mr. Adesoye Tunde	-	Techlum Nig. Ltd	Member
4.	Mr. Jide A. Mike	-	Wempco Group	Member
5.	Mr. Ikhile Dennis		Wahum	Member
6.	Chief (Dr.) J.C. Dugad	-	Tower Aluminum PLC	Member
7.	Mr. Anup K.R. Drolia	-	MINL	Member
8.	Mr. Adeyemi Folorunsho	-	AD (Sectoral Matters)	Member
9.	Seyi Adegbite	-	Sectoral Executive	Member
10.	Dr. B.O. Olugbemi	-	RMRDC	Secretary
11.	Mr. S.L. Wali	-	RMRDC	Deputy Secretary

PULP, PAPER AND PAPER PRODUCTS

1.	Adeliyi, D.O.	-	Hallmark Paper Production
2.	Natarajan Lakshmipathi	-	Ashngy Industries Limited

3.	Noah Babatunde	-	NICAPACO
4.	Walter Ofomi	-	Wahum Packaging Ltd.
5.	Akinyanju Akintunde	-	Melrose Books & Publishing
6.	Jha, A.N.	-	Jebba Paper Mills Ltd
7.	Princess Layo Okeowo	-	FAE
8.	Prof. Abiodun O. Oluwadare	-	Univ. of Ibadan
9.	Adeyemi Folorunsho	-	MAN
10.	Seyi Adegbite	-	MAN
11.	Mrs. H.Y. Tanko	-	RMRDC - Secretary
12.	Dr. (Mrs.) T.E. Omara-Achong	-	RMRDC - Dep. Sec.
13.	Ajayi O. Oluwaseyi	-	RMRDC

ELECTRICAL AND ELECTRONICS

1.	Mr. George O. K. Onafowokan	-	Chairman
2.	Mrs. Unachukwu Chioma	-	Member
3.	Mr. Benedict Osufiana	-	Member
4.	Mr. Samson Oyejide	-	Member
5.	Mrs C. Cynthia Simson-Anike	-	Member
6.	Engr. Timothy O. Odedele	-	Member/Secretary
7.	Engr (Mrs.) Iyabo O. Ejuya	-	Member/Dep. Secretary

TEXTILE, WEARING AND APPAREL

1.	Alh. Salisu Umar	-	Mario Jose Ent. Kano	Chairman
2.	Dr. Zainab Hammanga	-	RMRDC	Secretary
3.	Mr. Adeyemi Folorunsho	-	MAN	Member
4.	Alh. Lawan Sule Garo	-	GB Tannery Kano	Member
5.	Alh. Hamman Kwajaffa	-	NTMA, Lagos	Member
6.	Dr. Micheal Adeboyo	-	Haffar Ind. Co. Ltd, Lagos	Member
7.	Alh. Moh'd Kabir Haruna	-	FAMAD, PLC Lagos	Member
8.	Mrs. M.O. Ajibade	-	Lucky Fibres Lagos	Member
9.	Mrs. Bunmi Ajayi	-	Lusammo Apparel, Lagos	Member
10.	Monalisa A. Azeh	-	Mona Matthews, Lagos	Member
11.	Adeniyi A. Adebisi	-	Garment Factory	Member
12.	Wumi Oluwadare	-	Garment Factory	Member
13.	Mrs. O.O. Davies	-	RMRDC	Member
14.	Dr. G.G. Mustapha	-	RMRDC	Secretary

WOOD AND WOOD PRODUCTS

1.	Mr. Kunle Akinyelure	-	Chairman
2.	Tosin Amushan	-	Member

3.	Bolarinwa Akinseye	-	Member
4.	Jide A. Mike	-	Member
5.	Ajayi Oluwaseyi O.	-	Member
6.	Oluwaseyi A. Adegbite	-	Member
7.	Mr. Adeyemi Folorunsho	-	Member
8.	Dr. Ogunwusi A.A.	-	Secretary

NON-METALLIC

1.	Jide A. Mike	-	Ag. Chairman
2.	James A. Salako	-	Member
3.	Ogunsola Adetunji	-	Member
4.	Makinde Micheal	-	Member
5.	Mr. Adeyemi Folorunso	-	Member
6.	Dr. Gabriel Awolehin	-	Member/Secretary

MOTOR VEHICLE

1.	David V.C. Obi	-	Chairman
2.	Rev. Lambert Ekewuba	-	Member
3.	Mr. Adeyemi Folorunsho	-	Member
4.	Mba Nkechinyere	-	Member
5.	Dr. M.L. Buga	-	Secretary
6.	Dr. J.O. Adekunle	-	Deputy Secretary

NACCIMA, NASSI AND NASME

1.	Chris John Mamuda	-	NASME
2.	Mohammed Ghazali	-	NASSI
3.	Sanusi Maijamaá	-	NACCIMA
4.	Emeka-Okeke Ifeyinwa	-	NACCIMA
5.	B.M. Lawan	-	NACCIMA
6.	Obi M.N.	-	RMRDC
7.	Ini Ukim	-	RMRDC
8.	R. A. Indagawa	-	RMRDC

RESEARCH INSTITUTIONS

1.	Prof. A.A. Voh (Jr)	-	Chairman
2.	Prof. S.A. Thomas	-	Member
3.	Prof. O.O. Kunle	-	Member
4.	Dr. Ismaila Y. Ilu	-	Member
5.	Dr. (Mrs.) A.U.E. Uboh	-	Secretary/Member
6.	Mrs. D.O. Nwanah	-	Assist. Sec/Member
7.	Mr. Henry C. Eteama	-	Resource Person/Member

ANNEX 5
DELEGATES AT THE REPORT VALIDATION MEETING
[CHAIRED BY ALHAJI SANUSI MAIJAMA, VICE-PRESIDENT OF NACCIMA -- 27/07/2016]

S/N	NAMES	ADDRESS	GSM	E-MAIL
1	Dr. J.O. Adekunle	RMRDC	08023433381	adekunleoyebode@yahoo.com
2	Dr. (Mrs.) Mercy S. Bassi	RMRDC	08059497618	merceybassi9@gmail.com
3	Engr. T.O. Odedele	RMRDC	08032249286	odedelermrdc@yahoo.com
4	Obi M. N. (Mrs.)	RMRDC	08072047327	nwanagu2@gmail.com
5	R.A. Indagawa (Ms)	RMRDC	08037881426	ruth_indagawa@yahoo.com
6	R. Adegbenro	CVL Lagos	08033217925	radegbenro@hotmail.com
7	Chukwuka A.C.	Budget Office	08036501505	anthonychukwuka@yahoo.com
8	Opaluwa John	FMITI	08060797558	opaluwajoh@yahoo.com
9	Obienu N.I.	MSMD	08033477750	obienu4life@yahoo.com
10	Obekpa J.A.	RMRDC	08137413492	johnobekpa@gmail.com
11	Dr. R.O. Enwereuzoh	RMRDC	08033273187	queenrosen@yahoo.com
12	Dr. M. Omojola	RMRDC	08036547612	omojolamose@gmail.com
13	Olushola Bakare	RMRDC	08183620533	dudore@yahoo.com
14	Anthonia Mbagwu	RMRDC	08038829645	mbaanthonia1233@yahoo.com
15	Otuechere Uzoma	RMRDC	08032532731	Uzoma2020@yahoo.com
16	Tobi-Maduku Anderson	RMRDC	08112659328	
17	Duyilemi A.D.	RMRDC	08063332566	ayoduyin@yahoo.com
18	A.A. Lemu	RMRDC	08055509610	Katambajiya@yahoo.com
19	Dr. Zainab Hammanga	RMRDC	08033320724	zainabu1408@gmail.com
20	Ode F.K.	RMRDC	08065656040	bonk425@yahoo.com
21	Dr. E.A. Asanga	RMRDC	08065369344	eaasanga@yahoo.co.uk
22	Dr. B.O. Olugbemi	RMRDC	07033270187	drolugbemi@yahoo.com
23	Dr. (Mrs.) A.U.E. Uboh	RMRDC	08036198002	angelauboh@yahoo.com
24	Mrs. D.O. Nwanah	RMRDC	08034078181	ujayrmrdc@yahoo.com
25	Mrs. I.O. Ejuya	RMRDC	08032863710	ejuyarmrdc@yahoo.com
26	B.M. Lawan	RMRDC	08036215200	babamallamlawan@gmail.com
27	Mika S.R.	RMRDC	08035961308	mikashuaibu@yahoo.com
28	Dr. G.G. Mustapha	RMRDC	08036249032	gremagaramustapha@gmail.com
29	Dr. G.G. Awolehin	RMRDC	08033950802	arrogab2010@yahoo.com
30	Dr. T.E. Omara-Achong	RMRDC	08034524980	ebiaomara2@yahoo.com
31	Adesoji A.A.	Fed. Min. of Justice	08060686622	adefolab@yahoo.com
32	Prof. Kunle O.O.	NIPRD	08033145095	kunleoo@yahoo.com

33	Aleshe, A.N.	FME, Abuja	08065925027	olesheade@yahoo.com
34	Oguntunde A.	FMST	07039863496	yome_2a@yahoo.com
35	Abdulmumin Onigaugi	TETFUND	08056522993	aboniyy@yahoo.com
36	Toyin Durowaiye	MAN	08062409324	tdurowaiye177@yahoo.com
37	Jide A. Mike	MAN	08033028605	jobarbsa@yahoo.com
38	Austen Anyakura	NBS, Abuja	08023053559	austenec@yahoo.com
39	Mustapha A.D.	NBS	08066667697	mdazeez@nigerian.stat.gov.ng
40	Ibrahim Mudasim	NBS	08064413742	balkinmuda@gmail.com
41	K.B Ajoku (Ph.D)	RMRDC	08050360799	ajokukemi@yahoo.com
42	Onukwugha E. Osuji	SUJI VENTURES	07053771289	esinsuji@gmail.com
43	Engr. Obassi Ettu	RMRDC	08023084465	ettustic@gmail.com
44	Ogunwusi A. A	RMRDC	07034789966	Oguns59@yahoo.co.uk
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ANNEX 6
CONSTRAINTS AND ENHANCING FACTORS TO COMPETITIVENESS IN INDUSTRIAL RAW MATERIALS & PRODUCTS DEVELOPMENT

S/N	SECTOR	CONSTRAINTS FACTORS	ENHANCING FACTORS
1	**FOOD, BEVERAGE & TOBACCO**	▪ No fund to purchase and research for raw materials ▪ Distance and poor condition of road ▪ Difficulty in accessibility of raw materials ▪ Lack of capacity building for business men and women in the country ▪ Inadequate raw material production ▪ Shortage of land for location of industries/business ▪ Lack of secured environment ▪ Patent right by monopoly ▪ High cost of registration in CAC ▪ Partial issuance of licence ▪ Lack of public partnership ▪ Shortage of credit facilities ▪ Non usage of research findings ▪ Inadequate funding of research activities ▪ Unavailability of raw material inputs ▪ Standard specification ▪ Technology ▪ Certification of product ▪ High rate of exchange of foreign ▪ Low quality products ▪ Inadequate technical services ▪ Finance and materials for production ▪ Quality of long grain paddy	▪ Collaborate with other international bodies for partnership ▪ Provide improved variety of raw materials ▪ Modern machines for storage and production ▪ Increase in credit facility to small and medium scale industries ▪ Reduce cost of registration ▪ No restriction to entry into business ▪ Provide strong coordination of programme on raw materials ▪ Faith in made in Nigeria product ▪ Buy made in Nigeria goods to encourage production ▪ Keep faith in their own product ▪ Ban importation of foreign products ▪ Provide modern equipment ▪ Organised training workshops and seminars to encourage producers ▪ Maintain duty of 20% and additional levy of 30% on finished tomato in retail pack ▪ Importation of tomato paste in sachet to be prohibited ▪ Maintain duty of 5% for all dairy manufacturers for

		▪ Impurity level and lack of awareness ▪ Lack of technical know-how * poor business planning and training poor funding* no accountability on the part of stake holders of public corporation ▪ These material are not manufactured locally the petroleum wax are not available locally. ▪ All materials bought locally are still sourced above. We only buy from local stores excepts for emulsifying wax which made locally ▪ Local sources not able to meet total needs where available, others not available locally ▪ Non exploration of available natural resource in the country. Non functionality of Kaduna refinery. Other raw materials are not available in Nigeria ▪ Not available in local market due to manufacturing constraint. ▪ High cost of production, ▪ Inaccessibility of available materials, Infrastructure deficiency, insecurity. ▪ High Bank interest rate and charges. ". ▪ Multiple Government regulations by all tier of Government stifling business environment. ▪ Inadequate funding of our	dairy raw materials imported in packaging of 25% or more ▪ Market price control ▪ To provide modern equipment ▪ Provision of funding support ▪ Develop the local industry ▪ Develop the transportation facility ▪ Reliable power supply throughout the year ▪ Government should encourage mining of the Nigeria's resources ▪ Constant power supply to industries and introducing basic methods ▪ Access to electricity or power ▪ Access to telecommunication ▪ Means of transportation ▪ Market outlet ▪ Availability of services: banks, schools, hospital etc. ▪ Developing skilled and employed workers ▪ Rewinding innovation ▪ Creating funding facilities for entrepreneur ▪ Go back to plantation farming like planting of cotton, Rubber, Cocoa, etc. ▪ Regular research* proper personnel training* regular research* quality control/inspection ▪ Proper training of personnel regular research ▪ Milk and milk products being essential food items

		research and development institutions	should be exempted from VAT in line with other essential food items ▪ quality control and inspection measures funding of relevant sectors * Nigeria government should relinquish their abandon farms to Oil palm Farmers Union ▪ proper personnel training* regular research* quality control and inspection measures * govt to should relinquish all their farms to oil palm farmers union ▪ sustain the restriction of import of fruit juice in retail packs ▪ Redirection of import of fruit juice concentrates in drums to bonafide manufacturers from 10% - 5% ▪ Quality control and inspection * Regular research * Proper personnel training funding of relevant sectors ▪ Funding of relevant sectors* proper personnel training* regular research* quality control and inspection measures * govt to should relinquish all their farms to oil palm farmers union ▪ Training personnel * Proper funding* Researching* Quality control* Standardisation. ▪ Recommended factors includes:- Funding of relevant sectors* Proper

			personnel training* Regular research * Quality control and inspection services ▪ Proper personnel training * Regular research* Funding of relevant sectors* Quality control and inspection ▪ Funding of relevant sectors* Proper personnel training* Regular research * Quality control and inspection services ▪ Adequate fund should be provided as a motivating factor * Inspection should be done untimely *Provision of adequate logistics support ▪ Nigeria should provide grants and loans to research institutions and agencies *Govt should provide technical support *Government should create enabling environment by providing social amenities like access road electricity etc. ▪ Regular research proper personnel training *Quality control and inspection *Funding of relevant sectors. ▪ Proper personnel training * Regular research* Funding of relevant sectors* Quality control and inspection ▪ Using newer methods more funding for better development * Ensuring raw materials and

			products are of a high quality periodical research ▪ Training personnel's* Proper funding* Researching* Quality control* Standardization.
2	**CHEMICALS AND PHARMACEUTICALS**	▪ Non availability in the country of some chemical. Where available items are costlier than imported ones ." The Quality falls below acceptance standard ▪ Our refineries cannot produce base oil. The technology to produce additive is not yet with us in the country. o Price, o Competition, *. Availability, o Scarcity of forex, * o Quality o No local manufacturers ▪ Some of these materials are not locally manufactured here except for emulsifying wax which can be sourced locally ▪ Purification system for materials is crude, over dependence on the use of imported machineries for the manufacture of system products. ▪ Non-availability of petrochemical starting materials for the production of the raw materials ▪ Over regulation is causing stagnation in the industry	▪ There must be long term funds for development at 2-5% interest rate. o SMEs willing to invest in raw materials development should not be restricted by SON in import of machinery and spares. o Efforts to protect industries making raw materials. ▪ Promote and motivate indigenous products. ▪ Explore the maximum possibilities of import export within ECOWAS region. ▪ Promote maintenance culture and operate an open policy onresearch programme. Reduce dependency on imported raw materials ▪ Create awareness for patronising locally made goods, ▪ By creating enabling environment for business to thrive, ▪ give adequate protection from cheaper imported products, ▪ provide bank loans at single digit interest rate,

			▪ Reduce the cost of electricity and gas as they are major cost of production in any industry ▪ Adequate funding of our universities and research and development institutions. ▪ Expertise Involvement, ▪ Government political will to encourage made in Nigeria offer incentive & tax benefit to research finding. ▪ Should consider locally made in Nigeria products ahead of foreign made. ▪ Should enact policies that will support and encourage Nigerian industries andbusinesses. ▪ Greater access to Forex and loans. ▪ Find ways to reduce the high operating cost in Nigeria. ▪ Government should design policy that will improve operation of local manufacturers. ▪ Government should encourage patronage of locally made goods.* Reduce duty of imported raw materials & machineries .* Reduced interest rate to manufacturers. Better allocation of Forex to manufacturers to procure raw materials

3	**DOMESTIC & INDUSTRIAL PLASTIC, RUBER & FOAM**	▪ For cable making, there's no copper producing company in Nigeria ▪ HS code 7408.1100.00 copper: There is no copper producing in Nigeria. ▪ " HS code 3904.2200.00 polyvinylchloride for cable making: we were running our own compounding line to back up for this product but importing all components is more expensive than importing readymade PVC compound. ▪ "HS code 7217.1090.00 Galvanized steel wire cannot be sourced in Nigeria because the quality of galvanization is far below specified standards for cables. ▪ Clearing of raw materials at Nigeria ports. ▪ Power supply instability. ▪ Poor road network." ▪ High operating cost o Chemicals used in producing polyurethane products are not locally produced.* o The local vendors/suppliers that so import the chemicals in question sell at exorbitant prices. o Sometimes, these chemicals may not be available due to some inherent challenges facing the local vendors. o Availability of foreign exchange for direct importation is also a problem. o Price war among the	▪ Investment in the production of local materials. ▪ * Tax rebates to companies engaged in production of raw materials. ▪ * Government's participation in subsidies and subvention to willing raw material manufacturing investors. ▪ Nigeria should give support in developing agriculture and its downstream industries o More and New petrol chemical industries should be established. * o Government should regulate pricing of local petrol chemical industries.* CBN should allocate more forex to plastic industries for them to survive their business. ▪ Nigeria should give support to develop agriculture and its downstream industries o More and New petrochemical industries should be established. o Government should regulate local petrol chemical industries. o CBN should allocate more forex to

		competing vendors. ○ Inadequate policy control guiding the suppliers. ○ Economic and political instability within the country. ▪ Non-availability of materials locally. ▪ Non available in large quantity of production. "Insufficient petrochemical company in the country. ▪ No availability of forex in the country to import raw materials ▪ Non availability of forex in the company in the country to import raw materials ▪ Inadequate supply of LNG and quality issues with respect to ethane content.	plastic industries for them to survive their business. ▪ Encourage more petrochemical companies to open. ▪ Control the price of raw materials and do not allow monopolies to be established ▪ Research and development countries should be given security govt. *Should encourage industries/businesses ▪ Government should provide friendly investment policies for investors and also provide the enabling environment to attract the investors ▪ Constant power supply * ▪ Provide adequate infrastructures ▪ Government regulations and laws should be favourable to businesses and investors * ▪ Provide adequate support and assistance through funding and building research institutions
4	**BASIC METALS**	▪ Inability to produce one of the critical raw materials such as molten metal and Aluminum ingots in the country ▪ Inability to complete the Ajaokuta Steel Project ▪ Some of the raw materials produced locally, especially billet are not patronised by industries in the sector ▪ The Aluminum Smelter Company of Nigeria (ALSCON), Ikot Abasi, is	▪ Ajaokuta Steel Company must be completed in earnest ▪ Patronage of our local industries ▪ ALSCON must be resuscitated and functioning ▪ The Steel and Aluminum sector must be prioritised by government ▪ Access to forex to procure

		not producing and still enmeshed with plethora of litigations, thereby subjecting users of this material to importation ▪ Exportation of scrap metals resulting in the dearth of needed raw materials	the necessary raw materials
5	**PULP, PAPER PRODUCTS, PRINTING**	▪ Local paper manufacturing plants in Nigeria are not functional ▪ High prices of paper due to exchange rate problems ▪ Most of the items are not manufactured *Production capacities are very low compared to local demand ▪ Most items are available ▪ Local mills has no capacity to produce required raw materials for some of our products. ▪ Financial constraints *Severe competition from imported goods ▪ Not able to get raw materials that meet our standard ▪ Lack of basic infrastructure ▪ Lack of basic natural resources. ▪ Poor Logistics, ▪ Inferior standard compared with foreign ones, ▪ Lack of funds ▪ Importation, ▪ Lack of the raw materials locally, ▪ People orientation	▪ Increasing the level of campaign through social media the importance of going for locally made goods. ▪ Government should create enabling environment for industries to be able to produce their raw materials locally. ▪ Total synergy of RMRDC/universities/research institute with businesses/industry to develop processes/technology considering local condition and scale up to commercial viable stage. Government to provide enabling environment in improving infrastructures/development finance/rules& regulation in consultation with industries/business. ▪ Adequate funding for R&D *Patronage for local materials ▪ Reduce finance cost *Invest in technical training *Govt support for industries setup ▪ Creation of enabling environment for research products to be developed ▪ Government incentives to

			manufactures with 80% use of local raw materials for their products, ▪ There is need to be faithful in what we can produce and backed by Government laws ▪ Patronising locally produced items, ▪ Building consumer confidence ▪ The govt should wake up to is responsibility by having the political will to provide funds and other necessary modern facilities for the take off of industrial research and raw materials as well as product development ▪ The turnaround of the economy should now be both in manufacturing and all other sectors to increase our GDP.
6	**ELECTRICAL & ELECTRONICS**	▪ Due to non operation of petro chemical industry * non availability of raw materials and policy ▪ poor infrastructures and inconsistency in government policy ▪ Abandonment of factories due to economic stringency.	▪ The government should try to encourage industries on quality products by providing necessary incentives. ▪ The industries should not compromise standards and quality ▪ The citizens should patronize local industries in order to encourage them.
7	**TEXTILES, WEARING APPAREL**	▪ Poor infrastructural amenities such as bad roads, and other social amenities ▪ high cost of raw materials due to the economic situation of the country ▪ Inconsistency in govt policies	▪ Carry out research and develop quality raw materials document success story and improve on it. ▪ Improved power supply and adequate moving for

		thereby discouraging locals engaged in the provision of raw materials. ▪ No company manufacturing the specific polypropyler (pp) chips used by our machine. 2. the chips (PP) procure from eleme petrochemical did not run on the machine as the machine is too sensitive and waste generated is about 70% another raw material synthetic latex is not readily available in the country ▪ Tanneries prefer to export the 1st grade than sell to local consumers , none availability of the appropriate quality lies their locally ▪ The raw material is not available locally ▪ non availability of raw materials locally ▪ Unavailability of the grade one skins in the local/domestic market. High price of grade one skins in local domestic market. In terms of chemical from import due to scarcity of foreign exchange. Also bureaucracy in documentation for clearance at port ▪ Non availability of raw materials locally ▪ Inadequate funds ▪ Customs import duty is too high ▪ Bureaucratic procedure are too much especially at the sea port	R&D ▪ Avalaibility of forex ▪ Providing raw materials locally ▪ Establish research institutions that can provide research and development toward sourcing raw materials locally ▪ Nigeria should give support in develop agriculture and its downstream industries, as well as minerals and related industries. ▪ identify and appraise the major policy that has been used to induce local sourcing of raw material ▪ Evaluate the role of local sourcing of industrial raw material as a factor influencing industrial capacity utilisation ▪ Invest in research and development ▪ Invest heavily in sustainable energy ▪ Develop good interstate rail line ▪ Encourage stakeholders to attend high tech ▪ Continuous research as sincere approach to industries growth ▪ Consistent government policies towards core manufacturing areas ▪ Infrastructure development in power and energy sector ▪ Investment in startup ideas and small, medium

			size manufacturing ▪ Investment in research and development ▪ Government's realistic approach to fund and encourage research projects ▪ Creation of enabling environment for research product to be developed ▪ Government incentives to manufacturers with 80% use of local raw materials for their products ▪ To encourage and enforce local use of discoveries and restrict importation in such areas.
8	**WOOD & WOOD PRODUCTS**	▪ No known local manufacturers of many of the raw materials, ▪ If local manufacturers did exist, inability to ensure they are maintaining required standards ▪ The inability of government to uphold/enforce legislation to encourage/protect local manufacturing & improve confidence in locally manufactured products, ▪ Lack of financial support & lack of patronage by end-users, ▪ Lack of government focus on these issues	▪ Invest in research and development ▪ Invest heavily in sustainable energy ▪ Develop good interstate rail line ▪ Encourage stakeholders to attend high tech ▪ Consistent government policies towards core manufacturing areas ▪ Infrastructure development in power and energy sector ▪
9	**NON-METALIC MINERAL PRODUCTS**	▪ Inconsistency in govt policies on promoting industrialisation in the country ▪ Non availability of good and quality raw materials ▪ Lack of adequate support, both governmental and private to the R&D institutions and universities. ▪ Local manufacturing and investor confidence ▪ lack of infrastructure	▪ Investment in startup ideas and small, medium size manufacturing ▪ Investment in research and development ▪ Creation of enabling environment for research product to be developed ▪ Government incentives to manufacturers with 80% use of local raw materials

			for their products ▪ To encourage and enforce local use of discoveries and restrict importation in such areas
10	**MOTOR VEHICLE & MISCELLANEOUS ASSEMBLY**	▪ Apathy in patronising local products ▪ Collapse of first generation assembly companies ▪ Lack of or poor utilization of automotive funds ▪ Corruption ▪ Over craving for foreign cars ▪ Smuggling and sabotage in import of second hand vehicles	▪ * Patronage of locally manufactured or finished products, ▪ Protection of local industries from unfair competition, ▪ Rewards & concession for institutions achieving results. ▪ Revival of assembly plants in the country

ANNEX 7

RAW MATERIALS DEVELOPMENT MASTER PLANENABLING FRAMEWORK

STRATEGIC ISSUES	OBJECTIVES	ACTIVITIES	TARGETS
VALUE ADDITION	Draw up guidelines and programmes of action for strengthening competitiveness of local industries through improved manufacturing value-added (MVA). Carry out sector specific value chain analysis of key industrial crops in order to ensure local processing. Discourage the export of primary commodities and promote the export of medium-to-high technology manufactured products. Support the emergence of resource –based manufacturing enterprises. Develop processing technologies for value chain development of raw materials.	Promote export incentive schemes that will accelerate value addition to primary commodities. Support the modernization of industries to enhance competitiveness through fiscal policies. Encourage industries to invest in R&D locally through fiscal policies. Develop value chain for raw materials. Create systems for disseminating results and develop products Upgrade indigenous products. Encourage the establishment of dusters. Create processing centres for adding value to raw materials. Develop systems for linking SMI`s with market opportunities.	Regulate exportation of primary raw materials through appropriate fiscal policy.
TECHNOLOGY ACQUISITION	Access and adapt technologies which may not be available locally for adding value to raw materials. Apply cutting edge or relevant technologies to develop raw materials required by industry. Create local capacity for competitively adding value to raw materials.	Establish linkages with institutions overseas with capacity in technology development for processing raw materials. Access patents and other document systems for developed technologies. Establish systems for documenting locally developed technologies and disseminate Information on such technologies to end-users. Organize study tours to	Reinvigorate Nigerian patent office.

		relevant institutions and strengthen manpower exchange programmes to accelerate technology acquisition.	
MACHINERY AND EQUIPMENT	Create local capacity for machinery and equipment design and fabrication. Create opportunities for the development of value chains for various local raw materials.	Facilitate the establishment of engineering workshops for design and fabrication of machinery and equipment. Create a special fund for acquisition of engineering infrastructure for fabrication workshops. Establish engineering centres in the geopolitical zones, equipped with facilities which local fabricators can patronize for high capital machinery and equipment and precision engineering. Equip engineering workshops in the various universities, polytechnics and technical colleges. Re-invigorate and proliferate the trade centres for training of middle level engineering manpower. Embark on reverse engineering as a deliberate master plan strategy.	Create special funds for acquisition of engineering infrastructure for fabricating processing equipment. Establish engineering centres equipped with high capital machinery and equipment. Challenge engineering companies to copy critical machinery and equipment.
RESEARCH & DEVELOP-MENT	Develop local raw materials for optimal yield output with quality specifications desired by the industry. Develop technology upgrade for indigenous traditional processing techniques. Develop new products from local raw materials.	Determine the quality attributes desired by industry in specific raw materials. Adapt local raw materials for the production of products for which foreign raw materials are utilized. Identify institutions with competences in undertaking desired research. Create a system for linking industry with research institutions and identify	Establish active database on quality specifications for raw materials. Draw up a list of imported raw materials, with emphasis on items to be replaced with local alternatives. Empower organizations such as RMRDC to link

		sources of funds for research projects. Upgrade the capacity of identified research institutions for challenge of developing targeted raw materials. Establish science and technology (S&T) park.	research institutions with industries. Promote ten R & D projects every quarter. Establish specialized science and technology parks.
LOCAL RAW MATERIALS CONTENT DEVELOPMENT PROGRAMME	Identify and develop raw materials for which Nigeria can competitively produce. Explore policies for gradual replacement of imported raw materials with local substitutes to conserve foreign exchange.	Collate data on Nigeria`s resource endowment. Apply modern technology to boost the output of agricultural, mineral, chemical and other draw materials. Develop capacity for research and value addition to targeted raw materials.	Publish a handbook on Nigeria`s raw materials, with information on prices, quantity, quality, etc. Establish a committee to periodically review the local raw materials content development programme.
	Build up local technological capacity for adding value to raw materials.	Develop out grower schemes for souring raw materials. Develop and annually review time frame for the local raw materials content development programme Apply appropriate fiscal policies to protect raw materials which can be locally produced competitively. Conduct up-to date survey of industrial raw materials. Develop Nigeria`s capacity in the production of petrochemicals, to open a wide range of vital raw materials.	
ENVIRONMENT	Ensure sustainable development and exploitation of natural resources. Guarantee environmental safety in raw materials exploitation and utilization.	Promote cleaner production principles for sustainable industrial development. Encourage the emergence of biodegradable and environmentally friendly packaging materials.	Develop a master plan for environment-al sustainability in raw materials development and utilization.

	Establish adequate environmental standards as well as monitor and evaluate impact of industrial activities on the environment. Encourage optimization of production processes for waste reduction in industry. Establish databank for environmental management. Ensure the conduct of environmental impact assessment in raw materials development.	Develop technologies for waste management (recycling, utilization, etc.) Build technological capacity for managing environmental problems. Build capacity for awareness in environmental impact assessment and monitoring. Encourage entrepreneurs to invest in "environmental businesses" or `eco-business which are emerging new areas of enterprise development. Ensure adequate safety in industrial operations.	Incorporate environmental management in the educational curriculum at all levels. Minimize wastes generation and emissions from raw materials production and utilization by 10-20% annually. Carry out environmental health and safety audits of industrial operations. Introduce the use of biodegradable and environmentally friendly packaging materials. Liaise with the private sector to set up pilot plants on eco-business in six geo-political zones.

ANNEX 7
RAW MATERIALS DEVELOPMENT MASTER PLAN FRAMEWORK

STRATEGIES AND MEASURES	ACTIONABLE STEPS AND TASKS
Draw up guidelines and action programme on raw materials sourcing, acquisition and development	Establishing a raw materials website for inventory of raw materials, value-adding technology, critical research, development and innovation gaps and highlights of global best practices in priority raw materials for Nigeria. Periodic monitoring of local content in industry
Periodic review of raw materials resources availability and utilization and advice on the strategic implication of depletion, conservation and stock-piling	Conducting periodic techno-economic studies and surveys of industries.
Advise on adaptation of machinery and processes for raw materials utilization	Developing indigenous technological capacity. Promoting model and pilot plants for local raw materials processing. Adoption of reverse engineering method.
Promote the development of raw material needs of the various industrial sectors.	Funding of competitive R&D Develop academic curricula on raw materials R&D issues Promoting production and export of value added raw materials. Establishment of R&D units by firms Attracting Foreign Direct Investment into the raw materials development sector. Providing incentives to firms using high local raw materials content. Creation of raw materials desk in relevant government agencies such as NIPC, NEPC etc.

SECTORAL PLAN

STRATEGIES AND MEASURES	ACTIONABLE STEPS AND TASKS
BASE METALS, IRON & STEEL SECTOR	Inventory of relevant exploration and mining organizations, industries, raw materials requirement and availability Establishment of foundries, machine and fabrication shops Exploring, evaluating and developing strategic base metals Provision of infrastructure such as railway network and good waterway, etc. Encourage local manufacture through low tariff and promotion of local patronage.

	Removal of restrictions on importation of essential equipment, machinery and spares. Discouraging exportation of ferrous and non-ferrous scraps.
CHEMICALS AND PHARMACEUTICALS	Ensure sustained operation of the nation's refineries to provide needed raw materials. Periodic review of tariffs on chemical and pharmaceutical raw materials. Encourage the establishment of small-scale intermediate industries to feed larger ones.
DOMESTIC AND INDUSTRIAL PLASTICS, RUBBER AND FOAM	Investing in small-scale petrochemical industries to supply the basic raw materials. Promoting the establishment of downstream rubber, rubber plantation and controlling exportation of unprocessed rubber. Intensify R&D through funding of Rubber Research Institute by the private sector. Encouraging in-plant R&D
ELECTRICAL AND ELECTRONICS	Enforce standards and specifications for the components through a well-articulated regulation and monitoring policies. Commercialize successfully completed R&D projects and locally fabricated prototype components. Regulate importation of CKD components of electronics. Establish compulsory special tax to support the funding of electrical and electronics R&D projects.
FOOD, BEVERAGE AND TOBACCO	Boost production of tropical and temperate crops and other agro-based raw materials. Encourage local manufacturers for improved production. Funding support for agricultural production and processing. Timely supply of agro-inputs to end-users. Private sector to produce intermediate products which constitute the needed raw materials. Industry to provide logistic support to farmers to ensure availability of specified raw materials.
MOTOR VEHICLE AND MISCELLANEOUS	Establishment of industries such as specialized injection molding, blow molding, extrusion plants and auto components test centres. Acquisition of technology for auto components parts. Establishment of auto engineering course in tertiary institutions.
NON-METALLIC MINERALS	Develop processing technologies and machinery for beneficiation Investment in the training of the required manpower Establishment of Risk Fund for mineral processor Conduct survey of available solid minerals.
PULP, PAPER AND PAPER	Develop and promote mini-scale paper production technology.

PRODUCTS, PRINTING, PUBLISHING AND PACKAGING	Provide linkage between the sector and research institutions. Provide farmers with incentives to plant tree crops. Encourage local industries to utilize R&D results from mixed pulping of local long fibre from kenaf, jute wastes and bamboos.
TEXTILES, WEARING APPAREL, LEATHER AND LEATHER PRODUCTS.	Upgrade indigenous process technologies of the sector. Encourage patronage of locally made products. Promote investments. Boost the production of the local raw materials. Develop the petrochemical industry to produce synthetic fibre.
WOOD AND WOOD PRODUCTS	Encourage extensive establishment of forest plantations. Develop processes for increased utilization of wood wastes. Coordinate exploration, exploitation and management of forests.
NEW AND ADVANCED MATERIALS	Expose indigenous researchers to contemporary development in the sector. Establish specialized R&D centres for the sector Establish a database with relevant stakeholders. Adoption of advanced technology in manufacturing. Promote the development of some raw materials through tissue culture.

LEGAL, REGULATORY FRAMEWORK AND INCENTIVES TO INDUSTRY

STRATEGIES AND MEASURES	ACTIONABLE STEPS AND TASKS
Provision and enforcement of appropriate legal and regulatory framework to promote raw materials development	Acts establishing RMRDC, SON, NAFDAC, NBS should be reviewed. Technology acquisition agreement to include clauses on training of local personnel. Acquisition of data from industries. Compulsory patronage of locally produced goods Tax incentives for local production of parts, machinery and equipment Development of sanctions for erring industries. R&D spending on raw materials development should be a minimum of 0.05% Credible criteria for local raw material producers should be prepared which will include NAFDAC Certification or SON certification

INSTITUTIONAL ARRANGEMENTS FOR IMPLEMENTATION

Responsibilities of Government	Define relevant regulatory conditions for raw materials development, utilization, conservation or stockpiling. Establish or strengthen institutional framework for information generation and dissemination, policy enforcement and monitoring; regular institutional review mechanism. Promote

	linkages as well as provide basic data on raw materials availability, development and utilization. Provide investment incentives for the development of raw materials in Nigeria. Make funds available for R&D process and other necessary infrastructure like industrial parks, laboratories, equipment, etc. Provide physical infrastructure such as roads, water and electricity so as to reduce the cost of doing business in the country. Ensure proper institutionalization of the National System of Innovation (NSI) for raw materials development and utilization. Provide logistic support for the NSI and Raw Materials Information System (RMIS). Ensure that environmental concerns are integrated with the processes of raw materials development and utilization. Coordinate major environmental restitution activities. Collaborate with the private sector to conduct market surveys for raw materials demand in and outside the country. Encourage demand for local raw materials and their finished products in order to further stimulate demand for domestic raw materials. Monitor and enforce raw materials local content and deletion regulations. Conduct surveys and identify raw materials resources available in the states. Work with private sector groups to establish quantity of raw materials and resources. Organize promotional activities in order to stimulate stakeholder participation in the development and utilization of raw materials in the states. Support private sector investment in raw materials development. Provide extension services for effective agricultural and mineral raw materials development. Provide farming implement and fertilizer at subsidized rates. Supply credible data on raw materials status to the Raw Materials Information System. Ensure that environmental concerns are mainstreamed into raw materials development and utilization as well as restitution activities. Collaborate with the private sector to identify new markets and conduct demand studies for raw in and outside Nigeria. Encourage demand for local raw materials, local content and deletion regulations. Facilitate access to raw materials available in the area.

	Support acquisition of raw materials sites or agricultural land, for the development of certain raw materials. Monitor environmental impacts arising from raw materials development and report assessment to state and federal levels. Ensure effective participation of rural dwellers in raw materials development, especially in the area of agriculture. Encourage demand for local raw materials and their finished products. Provide information on known or identified raw materials in order to facilitate proper documentation and assessment of the extent of availability. Organize production and processing chains amongst primary producers of raw materials at the rural level. Invest in enterprises for the purposes of raw materials, carry out all their R&D activities in Nigeria. Participate actively as key stakeholders in both NSI and RMIS. Provide financial and other logistic support to NSI. Collaborate with the government to identify opportunities and conduct demand studies for raw materials. Ensure that environmental concerns are integrated with the processes of raw materials development and utilization. Support institutions to develop human capacity in the areas of raw materials development and utilization. Develop occupational skills and standards that allow both workers and employers to train and assess performance against industry-accepted standards. Develop linkages with local and international stakeholders and investors in order to ensure regular demand for Nigeria's raw materials and monitor the market situation. Give priority considerations to local raw materials at all times and be responsive to local content and deletion regulation. SMEs to partner with government and financial institutions for the purpose of gaining access to funds at competitive interest rates. ICT firms to facilitate equipment and software acquisition, data collection, processing and information dissemination. Provide physical infrastructure under PPP arrangement.

ANNEX 8

COMMERCIALIZABLE R&D TECHNOLOGIES AND PRODUCTS OF FMST AGENCIES

S/N	NAME OF AGENCY	TITLE OF COMMERCIALIZABLE R&D PRODUCTS	BRIEFS DESCRIPTION OF R&D	POTENTIAL FOR COMMERCIALIZA-TION	PATENT STATUS / RIGHT
1	NASENI	Cargo Tricycle	Tricycle for carrying goods and products (70% local content).	Very high potential	Secured
2	NASENI	Passenger Tricycle	Tricycle for carrying passengers (65% local content)	Very high potential	Secured
3	NASENI	NASENI Motorcycle (MI)	Motorcycle (75% local content)	Very high potential	Nil
4	NASENI	Metal permanent mould for various Motorcycle Components /parts – Brake Lever, Clutch Moon, Ball Bearing Seating and Clutch Housing	Metal permanent mould for various motorcycle components/parts. (100% domestication).	Very high potential	Nil
5	NASENI	Integrated Cassava Processing Plant	To produce cassava and yam flour from tubers (70% local content).	High potential	Not yet secured
6	NASENI	Bore Hole Hand Pump	Gives access to clean drinking water.	The product is tested and ready for commercialization	Not yet secured
7	NASENI	Manual Drilling Rig	For drilling borehole manually	The product is tested and ready commercialization	Not yet secured
8	NASENI	Solar Panels	These products are manufactured at NASENI Solar Energy Ltd. Karshi Abuja. They are used for conversion of energy from the sum into electricity. The solar panels can be used for 12V (80W &	Very high potential	Not yet secured

			175W), 24V (180W – 200W)		
9	NASENI	NASENI Solar Phone Charger (different ratings)	Converts solar energy to electricity. Charge 12- 20 phones within one hour.	High potential	Not yet secured
10	NASENI	Plug and Play Home System	Plug and play system has the capacity to supply electricity to 10 lamps, 1 TV Set, 4 Fans, 1 Decoder, 1 hr/T in a home or office	High potential	Not yet secured
11	NASENI	Digital Road Sign	It is an important road feature which depicts direction to road users when in darkness	Very high potential	Not yet secured
12	NASENI	100Kg rotary Furnace	Domesticated	Very high potential	None
13	NASENI	Interlocking Brick-Making Machine (2&8 moulds)	Domesticated	Very high potential	None
14	NASENI	Channel Grating	Domesticated	High potential	None
15	NASENI	Salting Bath	Domesticated	High potential	None
16	NASENI	Bull Gear	Domesticated	High potential	None
17	NASENI	300Kg Recuperative Rotary Furnace	Domesticated	Very high potential	None
18	NASENI	Muffle Furnace	Domesticated	Very high potential	None
19	NASENI	35 KW Small Hydropower Turbine	Domesticated	Very high potential	None
20	NASENI	Pepper Grinding Plate	Domesticated	High potential	None
21	NASENI	Water Pump Impeller	Domesticated	High potential	None
22	NASENI	Yam Pounding Machine	Domesticated	Very high potential	None
23	NASENI	Logic Gate Emulator Trainer (Tertiary Training Kits)	Logic gates emulator trainer is a micro controller-based device programmed to emulate several different logic gates	Very high potential	Not yet secured

			such as AND, OR, NOR, NAND, XOR and XNOR. Will solve the problem of non-availability of simple, affordable and easy to use logic training kits in our institutions.		
24	NASENI	Power Inverter (different ratings, 5 KVA, 10KVA, 50KVA)	Converts DC, current to AC. Capable of high speed switching between the utility power and the inverted power. For rural electrification. Will proffer solution to perennial power problem industrial application.	Very high potential	Not yet secured
25	NASENI	Public Address System (Sand Alobe)	A complete audio equipment for seminars, lecture halls, religious gathering etc. for effective communication in large gathering.	Very high potential	Not yet secured
26	NASENI	Gordian Stabilizer (Different ratings – 1KVA, 2KVA,3KVA, 5KVA)	Automatic voltage regulator; offer protection to equipment against low voltages and power surges.	Very high potential	Not yet secured
27	NASENI	Micro-Controller Development Boards with on-board Programmer (Tertiary Training Kits)	Provides template for digital simulation, design and programming. Bridging the practical deficiency in digital systems.	Very high potential	Not yet secured
28	NASENI	5KVA Automatic Change Over	Automatically detects utility power, thereby changing over and shutting down	Very high potential	Not yet Secured

			generating set and vice versa. Saving energy and time as associated with manual detection and operation. Enhances services delivery.		
29	NASENI	Multi-grain Threshers	It is a mobile power-driven agricultural machine used to beat or rub harvested plants in order to separate the seeds from the rest of the plant, It is used for threshing maize, millet, guinea corn, cowpea and groundnut. It will provide a more efficient, controlled and hygienic means of harvesting agro-based products with less post-harvest damage.	Huge potential	Yet to be initiated
30	NASENI	Cabinet Solar Food Dryers	It is a device used for drying vegetables, tomatoes, pepper, etc. It can be used by dairy industries for the production of milk powder. It uses solar power to facilitate its proper drying. It is used to reduce the cost and waste associated with post-harvest operation of maize and related cereal crops.	Huge potential	Yet to be initiated
31	NASENI	Rice Threshing Machine	It is a power driven agricultural machine which separates rice grains from rice straw after the initial manual cutting process of rice	Huge potential	Yet to be initiated

			has been carried out. It can also be used for wheat processing. It has threshing capacity of 3.8 bags/hr. It is used to reduce the cost and waste associated with post-harvest operation of rice and wheat.		
32	NASENI	Smoke House Devices	It is a device where fish, meat or other food items are cured in smoke. It is manufactured locally and utilizes small amount of charcoal to achieve great output. It has a carrying capacity of 50kg of fish. Will provide a means of controlled smoking and drying of fish and meat.	Huge potential	Yet to be initiated
33	NASENI	Automatic Load Isolating Device	Protects generators of inverter from over loading without human intervention.	High potential	Not yet secured
34	NASENI	Step-down Transformer	Designed to satisfy the power requirements of the Advanced Manufacturing Technology (AMT) equipment installed at the various development Institutes of NASENI.	Very high potential	Not yet secured
35	NASENI	Primary Science Kits (PSK)	Have high international rating and are being used all over the country to enthuse young scholars to study science	Very high potential	Secured

36	NASENI	Junior Science Kits (JSK)	Have high international rating and are being used all over the country to enthuse young scholars to study science	Very high potential	Secured
37	NASENI	Mathematical Kits		Very high potential	Not yet secured
38	NASENI	Bath Crucibles	Domesticated	High potential	Not yet secured
39	NASENI	Power Insulator	Domesticated	High potential	Not yet secured
40	NASENI	Belt Standing Machine	Domesticated	High potential	Not yet secured
41	NASENI	Spinning Machine	Domesticated	High potential	Not yet secured
42	NASENI	Glaze Mixer	Domesticated	High potential	Not yet secured
43	NASENI	Soxlet Extractor	Domesticated	High potential	Not yet secured
44	NASENI	Oil Extraction Apparatus	Domesticated	Very high potential	Not yet secured
45	NASENI	Water Distillation	Domesticated	Very high potential	Not yet secured
46	NASENI	Clevenger Class Apparatus	Domesticated	Very high potential	Not yet secured
47	NASENI	Automatic Electro-Deposition System (AES)	Domesticated	High potential	Patent process yet to be initiated
48	NASENI	3D-Printing System (PEDIBOT)	Domesticated	High potential	Patent process yet to be initiated
49	NASENI	On-Board Diagnostic Tool (PEDISCAN 1)	Domesticated	High potential	Patent process yet to be initiated
50		Vibrating Cement Brick-making Machine Single Stroke	Domesticated	High potential	Patent process yet to be initiated
51	NASENI	Laterite Brick-	Domesticated	High potential	Patent

		making Machine			process yet to be initiated
52	NASENI	Energy-saving LED Bulb (5 Watts and 15 Watts)	Energy saving led ac powered bulbs designed to be used with existing lamp holders be it pin or screw. Brightness is equal to 18 watts energy bulb or 60 watts. Incandescent bulb depicts a true energy saving lightning device. Durability problem is equally addressed as this goes with 3 years warrantee.	Extremely high potential	In Progress
53	NASENI	Solar Lighting System	Rechargeable by solar and the mains, it is designed for lighting with three extendable 3Watts bulbs. A cell phone charging port is embedded. Proffer solution to lighting problem in rural and urban areas.	Very high potential	Not yet secured
54	NASENI	Energy-saving LED Lamp (2 Watts and 15 Watts)	Energy saving led ac powered lamps. Designed to be used either on the ceilings or walls. Brightness is equal to 36 watts energy bulb or 60 watts incandescent bulb. Depicts a true energy saving lightings device. Durability problem is addressed as this goes with 3 years warrantee.	Extremely high potential	In Progress
55	NASENI	LED Tube	A rechargeable led	Very high potential	Not yet

		Rechargeable Lamp	fluorescent lamp. Good for emergency lighting and general illumination.		secured
56	NASENI	All-in-one Solar Street Light	A 10-year service free solar street light. All functional parts like battery, led light, charge control and solar panel are embedded in one rectangular frame. Provide very durable and cost effective solar street lighting system.	Very high potential	Not yet secured
57	NASENI	Pure Sine Wave Inverter (2KVA and 3 KVA)	Converts DC. Current to AC. Capable of high speed switching between the utility power and the inverted power.	Very high potential	Not yet secured
58	NASENI	Mobile Cassava Grater	This is a utility machine for cassava processing. It disintegrates cassava tubers into wash in order to facilitate detoxification and other processing unit operation. It can be moved to the farm to aid in resolving transportation challenges occasioned by the bulkiness of cassava tubers.	Very high potential	Not yet secured
59	NASENI	Briquette Stove	This is an eco-friendly stove employ to burn briquette made from loose agricultural wastes like sawdust, rice husk, bagasse.	Very high potential	Not yet Secured
60	NASENI	Viscometer	This apparatus is used for quantitative	Very high potential	Not yet secured

			determination of relative molecular mass. Comprises of glass U-tube with two bulbs connected by a capillary tube.		
61	NASENI	Air Manometer	For the measurement of positive and negative pressures. It comprises of u-tube mounted on a wooden board with a graduated ruler at the centre.	High potential	Not yet secured
62	NASENI	Extruder Manual	Extruder is a machine for cottage industries. It is simple and cheap.	High potential. Manual	Not yet secured
63	SHESTCO	Prodigioson	Anti-cancer drug produced domestically by application of principles of biotechnology.	Commercialization in process	Held on for the moment as a trade secret.
64	SHESTCO	Genotype Determination Machine and Incubator	Functional prototypes have been produced and tested.	Requires funding for mass production and commercialization.	Reserved engineering.
65	SHSETCO	Integrated Technologies for Scientific Processing of Moringa Oleifera	Moringa oleifera for production of some health and agricultural products.	Requires funding for mass production and commercialization.	Not yet secured
66	SHESTCO	Integrated Technologies for Processing of Moringa Oleifera	For the production of some health and agricultural products; Organic Fertilizer, Fish feed for aquaculture, Crop growth enhancer and livestock feed.	Some have been produced for local farmers on request. Funding required for expansion	Technology acquired and domesticated
67	SHESTCO	Temporary Immersion Bioreactor (TIB)	Rapid production of food and other economic tree crop seedlings.	Some have been produced for local farmers on request. Funding required for expansion	Technology acquired and domesticated

68	SHESTCO	Metal Fabrication, Specialized Welding and Machine Parts Productions	High skills acquisition training in metal fabrication specialized welding and spare parts production.	Adequate trained engineers and technicians are available.	Service project for skill acquisitio n
69	NBRRI	Interlocking Block-Making Technology	Robust machine for the production of interlocking blocks; Ideal for the mass housing delivery and estate development	Complete technology; passed pilot testing; successfully used in commercial venture (construction of houses); commercializable	Not indicated
70	NBRRI	Laterite Grinding Machine	Ideal for the use in mass housing delivery; Minimises production cost for brick and block-making	Complete technology; passed pilot testing; successfully used in venture (construction of houses); commercializable	Not indicated
71	NBRRI	Laterite-mixing Machine	Used for the production of interlocking blocks; Ideal for use in mass housing delivery	Completed; Passed [pilot testing; successfully used in commercial venture(Constructi on of houses) commercializable	Not indicated
72	NBRRI	Pedestrian Roller Compactor	Ensures economic construction & maintenance of roads; used in community based road construction	Concluded; passed pilot; successfully used in commercial venture(Constructi on of houses); commercializable	Not indicated
73	NBRRI	Manual Clay Roof Tile-Making Machine	Can be transported and used on site where clay deposits abound; can support establishment of cottage industry; Durable and cost-effective in roofing	Partially completed; firing kiln has just been developed	Not indicated

74	NBRRI	Paving Stone-Making Machine	Paving stones produced from cement, sand And stone dust, equipped with interchangeable moulds to produce paving stones of different configuration for pedestrian and light vehicular traffic	Concluded; Passed pilot testing; successfully used in commercial venture (Construction of houses) commercializable	Not indicated
75	NBBRI	FCR Tile-Making Machine (Multi-Chamer)	It produces 1000 fibre concrete roofing (FCR) Tiles per 8-hour work day; Produced from sand/cement/fibres	Concluded; passed pilot testing; successfully used in commercial ventures(construction of houses) commercializable	Not indicated
76	NBRRI	Manual Brick-Making Machine	Produces 500 bricks per 8-hours work day; uses laterites; Ideal for individual housing delivery	Concluded; passed pilot testing; successfully used in commercial ventures(construction of houses) commercializable	Not indicated
77	NBRRI	Manual Interlocking Block-Making Machine	Produces 1000 interlocking block per 8-hours work day and two interlocking block per operation; For setting up micro enterprises in housing delivery	Concluded; passed pilot testing; used in commercial venture(construction of houses) commercializable	Not indicated
78	NBRRI	Interlocking Block-Making Machine (Electric)	Produces 3000 interlocking block per8-hour work day and two interlocking blocks per operation; ideal for mass housing delivery and estate delivery	Completed; passed pilot testing; successfully used in commercial ventures and construction of houses) commercializable	Not indicated
79	NBRRI	Subgrade Soil Map of Ebonyi State	Sub grade soils maps developed from	Work completed in 15 states;	Not Indicated

			conventional investigation and digitized to make it interactive; used for road development; Road route location and resource materials sourcing	laboratory work in 10 states; Field work completed in 35 states and yet to commence in Borno	
80	NBRRI	NBBRI Pozzolana Cement Technology	Alternative cement that can partially replace Portland cement at a ratio of 20:80 to 50:50; Reduces cost of housing delivery if used with ordinary Portland cement	Pilot plant in Ota, Ogun State (100% complete); in Bokkos, Plateau State (75% complete)	Not indicated
81	NBBRI	Community-Based Technology for the Construction/Maintenance of Cost-Effective Access Roads	Roads constructed using farm implements, light equipment and surplus labour without sacrificing quality.	Technology completed and successfully demonstrated; available for replication in different communities in Nigeria	Not indicated
82	NBRRI	Low-Cost Ceiling Boards using Molasses	Product provides a cheaper and more affordable alternative to the conventional ceiling board materials like asbestos and PVC.	Technology is 55% completed and successfully demonstrated commercializable	Not indicated
83	NBRRI	NBRRI Concrete Cube-Mould and NBRRI Cube-Mould-Cement Mortar	It is used in construction laboratories and concrete testing for pozzolana materials	Technology is completed, successfully demonstrated and commercializable	Not indicated
84	NBRRI	NBRRI Slump Cone Apparatus	Used in measuring consistency or wetness of concrete and to ascertain uniformity for different batches of concrete under field	Technology is completed and successfully demonstrated, commercializable	Not indicated

			condition		
85	NBRRI	NBRRI Vibrating Table (Machine)	It produces paving stones using stone dust, cement and sharp sand. It uses plastic moulds which are re-usable. Useful for pedestrian and light traffic	Technology is completed and successfully demonstrated	Not indicated
86	NBRRI	Palm Kernel Shell (PKS) Grinding Machine	The machine is used in the production of pozzolana cement to reduce the cost of cementations' materials required for building and road construction in the country. Useful for pedestrian and light traffic.	Fabrication completed; Test-running completed commercializable	Not indicated
87	NBRRI	Ceramic Tile Production from Waste Bottle Cullets	Cullets recovered from waste materials and used as an addition to material for the production of ceramic wares	Project just being completed and currently test-running	Not indicated
88	RMRDC	Water-Borne Plant from Blends of Natural Rubber Latex & Poly Vinyl Acetate	An acrylic binder and emulsion paints	Accepted by Paint Manufacturing Group of MAN. Favourably compared with commercial paints available in Nigeria. Pilot Plant being developed	Patented
89	RMRDC	Production of Calcined Kaolin	As substitute for titanium dioxide in paint making	70% fabrication of the calciner for pilot scale production has been complete	Commenc ed process of patenting
91	RMRDC	Development of Water-based Thermostable	For control of Newcastle Disease in Rural Poultry, Product	Product already being produced on contract to	Still awaiting approval

		Vaccine	available in lypphilized form at NVRI, VOM	interested farmers	from the internatio nal collaborat or before being patented
92	RMRDC	Development and Production of Web Offset Ink in Nigeria	About 85% local raw materials. It is used for the print media	Has been completed and awaiting commercialization	In the process of patenting
93	RMRDC	Development of Pilot Plant for the Production of Caustic Soda & Precipitated Calcium Carbonate	Pilot plant being developed in collaboration with NARICT and presently being fabricated by BON Affair Com. Nigeria Ltd.	About N3 billion in foreign exchange will be saved with job creation. Caustic Soda from laboratory scale meets specification of soap industry.	Not indicated
94	RMRDC	Upgrading Indigenous Technology for Acha Dehulling	Project completed and the performance evaluation of equipment ascertained.	Technology commercialized as finished and packaged Acha can be found in major supermarkets across the country.	Patenting process has been initiated
95	RMRDC	Development of Automotive Brake Pad Lining using Palm Kernel Shell	Project completed and samples met SON and has also been tested in United States and found to meet standards for brake pads	100 pairs of the product (PKS braked pad) field-tested prior to public presentation and commercialization	Awaiting patenting
96	RMRDC	Production of Solar Inverter and Industrial Control Panel	An inverter and with industrial control panel developed through reverse engineering technique for solar power generating plant.	Fabrication of 2 units of Inverter had been completed for use by commercial electricity users	Not Indicated
97	RMRDC	Design and Fabrication of Flash Dryer at	RMRDC collaborated with some private firms in designing and	The Dryer has been commissioned and is currently in use	Patented

		Godiligo Farms.	fabricating a functional flash dryer for production of high quality cassava flour (HQCF)	at Godilogo Farms in Obudu.	
98	RMRDC	Developing of Prototype Leather Glazing Machine	The Machine was developed to replace the use of bottles to impact gloss (luster) in collaboration with NARICT	Technology accepted by tanners and leather producers in the country	Not Indicated
99	RMRDC	Upgrading of Sesame Post-Harvest Technology	A threshing and winnowing machines	Presently used extensively in Kebbi State for processing Sesame seeds	Not Indicated
100	RMRDC	Cashew Processing Plants	Two cashew nut processing plants as well as a one ton/day cashew nut shell liquid extraction plant	The plants have been tested locally and found to be effective Used at commercial level	Not Indicated
101	RMRDC	Community Based Cattle Breeding/ Upgrading and Milk Collection/ Processing Centre	A community based cattle breeding/upgrading and milk collection centre	The milk collection and colling facility has been replicated at Paikon Kore, Gwagwalada	Not Indicated
102	RMRDC	Production of Castor Seed Sheller through Reverse Engineering	Castor Seed Growers, Processors and Marketers Association of Nigeria (CASGPMAN)	Reverse engineering to be adopted for reference purpose. Replication is almost complete	Not Indicated
103	NARICT	Tomato Paste Technology	A proven technology domesticated from Vietnam with capacity for 1-5 tonnes per day of paste	3 plants at NARICT, Kudan (KDS) and Ajiwa (KTS)	In process based on modification s introduced
104	NARICT	Neem-based Organic Fertilizer	FGN has established 3 factories in Katsina, Kogi and Anambra States	Already commercialized	Formulation yet to be registered
105	NARICT	Portable Chemistry Labs for Nigerian	Domesticated from South Africa but adapted to local needs	Awaiting NECO/WAEC accreditation	Filed with Ministry

		Secondary Schools			
106	NARICT	Jathropha Oil Cooking Stoves	Training for technology transfer to local artisans	Tested and confirmed	Registered no. NGP/2014 /102
107	NARICT	Football Production	Foot balling	Domesticated from Pakistan	Not registered; NFA Accredited
108	NARICT	Jute Bags Production from Kenaf	Set of equipment fabricated in NARICT and tested successfully.	Scale up needed for commercial production	Not registered
109	NARICT	Essential Oil	Oil	One commercialized unit done in Kano State	Not registered; PZ Plc accredited lab coming on board in NARICT
110	NABDA	Mobile Biogas Production Technology	A waste to wealth project that involves the conversion of biodegradable domestic/urban waste into cooking gas	Ready for Commercialized	Not Indicated
111	NABDA	Organic and Solid Waste to Electricity/ Biogas Technology	The generated gas can be used for cooking, lightening and power generation	A generator is required which can be fabricated in collaboration with PRODA and NASENI	Not stated
112	NABDA	Commercial level Bio-Ethanol Production Technology	This technology involves the use cassava starch for the commercial production of bio-ethanol: it generates ethanol with 95% purity	The bio-ethanol can be used domestically, industrially and in medical establishments; It can also be further purified to 99 and blended with petrol (PMS) to power vehicles	Not stated

113	NABDA	Animal Feed Formulation Technology	Special feed formulation developed based on locally available ingredients	Found adequate for production at commercial level of both livestock and fish feeds.	Not stated
114	NABDA	Mushroom Production Technology	Mushroom production	This technology involves the production of spawn for commercial mushroom production, processing and packaging	Not stated
115	NABDA	Fish Seed Production Technology	Small, medium and large scale fish production	This technique involves the production of high quality and quantity fish seed	Not stated
116	NABDA	Temporary Immersion Bioreactor (TIB) Technology	Production of tree crops massively	This technology enables mass propagation of healthy, viable, planting materials of crops, fruits and vegetable	Not stated
117	NABDA	Moringa Seasoning Powder/ BAOBAB (KUKA) Seasoning Powder	Seasoning products for both local and continental dishes	Pilot studies indicate that the demands for the products are good and ready for commercialization	Not stated
118	NABDA	Moringa Tea Bags	Used for tea	The technology of processing, packaging and preserving Moringa leaves has been domesticated and ready for commercialization	Not stated
119	NABDA	Moringa Oil	Oil	The technology for the extraction of oil from Moringa	Not stated

				seeds has been domesticated	
120	NABDA	Biorganic Fertilizer (Solid and Liquid)	Used for improving yield of agriculture produce	This product has been tested and proven	Not stated
121	NABDA	Hot Water Starch	Starch	The product is adequate for both domestic and industrial purposes	Not stated
122	NABDA	Shea Butter Liniment	The application of shea butter is widely recognized both locally and internationally	The technology has been domesticated	Not stated
123	NABDA	Honey with Ginger and Garlic	Fortification of honey with garlic and ginger	Domesticated	Not stated
124	FIIRO	High Quality Cassava Floor Production		Technology already adopted by local entrepreneurs/cassava processors	Patented
125	FIIRO	Cassava Starch Production		Technology already adopted by local entrepreneurs/cassava processors	Patented
126	FIIRO	Mechanized Gari Production		Technology already adopted by local entrepreneurs /cassava processors	Patented
127	FIIRO	Instant Pounded Yam Flour Production		Technology already adopted and proliferated	Patented
128	FIIRO	Soy Gari Production		Gradual adoption of technology	Patented
129	FIIRO	Soy-Ogi Production		Discussion in progress with local and international companies for adoption	Patented
130	FIIRO	Sorghum Malt Production		Technology already adopted by most breweries	Patented
131	FIIRO	Palm Wine Bottling and Preservation		Technology already adopted by local entrepreneurs	Patented

132	FIIRO	Groundnut Paste Production		Gradual adoption of technology by local entrepreneurs	Patented
133	FIIRO	Body Lotion Production		Technology is already adopted by many local entrepreneurs	Patented
134	NILEST	Military Boots			Not Patented
135	NILEST	Paramilitary & Industrial Safety Boots			Not Patented
136	NILEST	School Sandals/ Cover Shoes			Not Patented
137	NILEST	Upholstery Leathers			Not Patented
138	NILEST	Fashioned Leathers			Not Patented
139	NILEST	Fat Liquors and Vanishes			Not Patented
140	NILEST	Buffing Dust			Not Patented
141	NILEST	Activated Carbon			Not Patented
142	NASRDA	High Precision GPS Device	This is a portable four dimension position information device. It relays information such as Latitude, Longitude, Altitude and speed of objects with accuracy.	100% Domesticated	Not Patented
143	NASRDA	Environmental Monitor & Gas Pollution Detector	This is a multifunctional device that combine the tasks of characterizing the environment with gas pollution level monitoring.	100% Domesticated	Not Patented
144	NASRDA	Range Finder	This is a unique instrument for digital measurement. It ideal for field works laboratory	100% Domesticated	Not Patented

			measurement and tasks that require high precision digital measurement		
145	NASRDA	Infrared Temperature Meter	This is an Infrared thermometer. It is used to take temperature reading of any object without and physical contact	100% Domesticated	Not Patented
146	NASRDA	Intrusion Detection & Alert System	This is a security system for intrusion detection and alert	100% Domesticated	Not Patented
147	NASRDA	Automated Weather & Environmental Superstation	A weather station that measures variations in temperature, pressure, humidity etc.	100% Domesticated	Not Patented
148	NASRDA	Solar Tracker	Intelligent solar tracker that optimizes the energy output of the solar panel from the sun.	100% Domesticated	Not Patented
149	NASRDA	Ground Based Magnetometer	A device for monitoring of the strength and direction of geomagnetic field.	100% Domesticated	Not Patented
150	NASRDA	Embedded Prototyping Kits	For embedded system design and educational systems for science and technology in secondary and tertiary institutions.	100% Domesticated	Not Patented
151	NASRDA	Cluster Computing	To build small to medium scale clusters of computers for computing data processing needs	100% Domesticated	Not Patented
152	NASRDA	Radio Propagation Map in Nigeria	This is propagation impairment map of Nigeria needed for network planning and improved quality of service.	100% Domesticated	Not Patented

153	NASRDA	GPS Tracking Device	GPS tracking device capable of mitigating situations like kidnapping, theft, burglary, accidents etc.	65% Domesticated	Not Patented
154	NASRDA	High Altitude Sensors	To design an autonomous experimental sensor payload platform and carryout high altitude balloon launch in order to measure temperature, pressure and other parameters at about 30,000 feet (10 km)	60% Domesticated	Not Patented
155	NASRDA	Magnetorquer Rod & Reaction Wheel	Satellite Attitude Orbit Control System (AOCS) modules	70% Domesticated	Not patented
156	NASRDA	2M Parabolic Banana Dish Antenna Bunch	For satellite telecommunication, telemetry and control transmission	80% Domesticated	Not Patented