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# "GENERATION OF INTELLECTUAL PROPERTY, PATENTING TECHNOLOGY ACQUISITION AND T RANSFER FOR NATIONAL DEVELOPMENT" PAPER PRESENTATION AT A 2 -DAY RESEARCH AND INNOVATION EXHIBITION OF THE NNAMDI AZIKIWE UNIVERSITY, AWKA ON 1ST JUNE 2015

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## INTRODUCTION

The importance of Research and Innovation in the development of any Nation cannot be overemphasized. The dividing line between the developed and underdeveloped economies of the world lies in the ability to conduct research that will ultimately lead to creation of wealth. Likewise, the absence of meaningful and demanded research in any Nation makes the Nation to be perpetual import dependent with the resultant adverse economic consequences. The Universities, indeed, all the higher education Institutions and research institutes are expected to be the drivers of R&D and home-grown Technologies. Expectedly too, the R&D results are to lead to indigenous industries and also power multinational companies within the country. Furthermore, it is very important to clarify at this introductory level that it is imperative to understand that technology is a key factor in driving the success in all the sectors for sustainable development which cannot be obtained without research.

In the present circumstance of our national development most particularly with reference to the importance and objective of this lecture, it is worth reflecting on a statement of the famous Albert Einstein (a German Born American Physicist 1879 – 1955):

***"We can't solve problems by using the same kind of thinking used when we created them"***

The above points to the need for change and possibly a total transformation in the way we do things if we are to achieve tangible and measurable progress in transforming our economy. This further implies that we need to clearly identify the problems, establish their causes, and develop implementable strategies that will yield results.

At the initial stage in the course of my research to develop this lecture, I came across an interesting material in a book titled "21st Century Technologies: Promises and Perils of a Dynamic Future"

written by the Organisation for Economic Co-operation and Development (OECD) in 1998. In chapter 2, page 34, it stated that

***"World 3 (the 3rd World) refers to those countries – Bangladesh and Nigeria are examples – that are in severe straits with no clear path to a positive future"***

This statement will make every Nigerian anywhere spontaneously wonder why this "derogatory remark" should be attributed to this great country. In actual sense, any patriotic Nigerian would want to have the opportunity to sentimentally "settle scores" with the authors of such material. But, equally, the statement should also (in my opinion) make us reflect deeper and think of WHY THIS? Especially coming from OECD, an organization composed of mainly 1st World Countries!

In terms of sustainable development, a more sober reflection on the statement would reveal that Nigeria, since independence in 1960 (about 53 years ago), despite its endowment with a large population, abundant natural resources (including large deposits of oil and gas) has disappointingly failed to provide the World with any of the following among many others:

a) Globally branded products from its indigenous knowledge and industrial efforts

b) Multinational Companies with outputs based on local technology and knowledge system;

c) Global technical and managerial expertise bred from its knowledge system and applicable in international industry;

d) Worldwide range of Intellectual Property exploited globally to add value and generate revenue; etc.

This may be a pointer to the way we are developmentally perceived internationally, especially regarding the way we progress competitively to deliver sustainable development on the global stage using quality knowledge and technology.

This lecture intends to unwind some of the mysteries of this failure and profess some viable solutions for a positive change as we tackle many sectoral issues particularly research and innovation for sustainable development of our economy.

**RESEARCH AND INNOVATION**

*Research* is a means of demonstrating one's ability and capability in solving an identified problem in a particular area in a peculiar way. It therefore plays an important role in national development of a nation. Research identifies problems and proffers solutions. The nation's technological capability is demonstrated by research through production of publications and patents. Patents as well as academic peer-reviewed journal publications are part of the criteria used in ranking tertiary research institutions globally and for assessing the technological strength and innovation prowess of nations. Research also spurs Human capacity development of Nations through Searching and Researching of solutions to problems. Perhaps, the most important role of research is in breeding industrialization which brings about jobs and wealth creation, arrests social menace

and assists in curbing rural-urban migration. But in order d, research and development (R&D) to play important role, a visionary leadership is necessary needed in order to transform Nigeria. In 2010 alone Nigerian Researchers published about 4000 articles in peer reviewed journals, a significant feat by any nation, yet no Nigerian university was ranked among the top 5000 globally, while the poverty, power outages, bad roads, accidents, etc continues to rise as national development depreciates. The development model of key western and Asian countries is based on Research and Leadership. These countries have successfully applied research and visionary leadership to transform developments in their respective countries.

Other requirements of a successful research include Knowledge of the subject matter, writing a sound research proposal, Up to date information on the subject, state of the art materials/equipment, good IP regime, market to commercialize research results and finance/funds.

*Innovation* on the other hand is the application of new solutions that meet new requirements, inarticulate needs, or existing market needs. This is accomplished through more effective products, processes, services, technologies, or ideas that are readily available to markets, governments and society. It is therefore of importance for increasing the wealth of nations and human welfare not only in the narrow sense of increased prosperity, but also in the more fundamental sense of enabling them to do things which have never been done before at all. It is critical not only for those who wish to accelerate or sustain the rate of economic growth in this and other countries, but also for those who are appalled by narrow preoccupation with the quantity of goods and wish to change the direction of economic advancement, or to concentrate on improving the quality of life. It is critical for the long-term conservation of resources and improvement of the environment. Innovation differs from invention in that innovation refers to the use of a better and, as a result, novel idea or method, whereas invention refers more directly to the creation of the idea or method itself. Innovation differs from improvement in that innovation refers to the notion of doing something different rather than doing the same thing better.

**BRIEF STRATEGIC REVIEW OF WHERE WE ARE AND WHERE WE WANT TO BE**

A careful review using the traditional strategic **S**trength, **W**eakness, Opportunities and Threats (SWOT) analysis would reveal the following mix on Nigeria:

a) A population of nearly 200 million is actually a **S**trength;

b) The huge natural resources including oil & gas are both **S**trengths and **O**pportunities;

c) A poverty incidence that ranges between 60 – 70% (accounting for over 100 million people) is a clear **W**eakness;

d) The dominance of rural life among our people is both **W**eakness and **T**hreats;

e) The prevailing weakness of physical infrastructure is a **W**eakness;

f) The prevailing weak socio-economic system is actually a **T**hreat;

g) The specific weak education system is a clear **W**eakness;

h) The weak performance of "local" industries is a **W**eakness;

i) Challenges of bad leadership including high incidence of corruption is a Threat;

j) The maturing democracy within our polity presents **S**trength and also an **O**pportunity;

k) Land Area of over 900 sq.km as a strength if gainfully and efficiently exploited;

l) Steady growth in the GDP since 2007 as strength if the increasing growth can be sustained;

m) Low literacy level of about 45% of the population is a Threat;

n) High poverty level of over 60% living below $1 per day as both weakness and threat because of the attendant consequences;

o) Annual Unemployment growth of about 5% as both weakness and strength. It can be turned to strength if jobs are created through the development of mechanized farming, development of local technologies exploited in the SMEs, franchising of the rich local delicacies etc;

p) Over 70% of the population depending on agriculture as weakness based on crude & traditional methods of farming, fishing, Cattle rearing etc but can be turned around as strength through the development of mechanized farming systems, farm settlement, farm plantation, dairy farms etc;

q) Brain drain in search of "greener pastures" by professionals especially in the Health and Education sectors but can be turned to strengths through the provision of incentives and adequate and commensurate income distribution system etc.

Despite the above scenario, Nigeria naturally still desires to attain sustainable development with overwhelming economic attributes that include the following:

a) A modernized economy;

b) A well-focused productive country;

c) A credible global visibility;

d) A global competitive industry;

e) A dynamic population;

f) A viable knowledge economy;

Undoubtedly, the attainment of all the above clearly depends on the vibrancy of the National Science, Technology and Innovation system which will breed intellectual property (IP). This is the Master key to sustainable National Development anywhere in the globe.

## THE NATIONAL SCIENCE, TECHNOLOGY AND INNOVATION SYSTEM

There are many ingredients or recipe to evolving a functional and viable Science, Technology and Innovation (STI) System. The main elements include:

a) A Sound education system from the basic level up to the tertiary level;

b) An excellent scientific research and development;

c) A dynamic Intellectual property generation and management system;

d) A functional and effective technology transfer mechanism;

e) A strong base in traditional technologies, techniques and skills; and

f) A competitive and dynamic environment for innovation.

To further comprehend the dynamics of STI, a closer and incisive look into the three elements of the system (STI) will reveal the following key characteristics:

**i. SCIENCE:**

The workers are Scientists, they are highly trained and qualified (in most cases with PhDs), they are high wage oriented, and target technical details on the "hows", "whys" and "whereas". Their tools of trade in laboratories are unique, delicate and expensive. In most cases they have very clear concept and detailed knowledge on the subject matter. Their outputs in most cases are Knowledge that are published in various forms and at various levels of quality as a result of which they further produce more PhDs. These outputs are their joy, because their work, where relevant and acclaimed, leads to a personal recognition and ranking in form of becoming Professors, mentioned as citations in other technical documents (demonstrating mastery of the subject) which further leads to the desire of other scientists to partner, cooperate and network. All these, on stand-alone basis, do not demonstrate much relevance when gauged on the scale of economic development of any nation. Due to its high specialization, an estimated 10% of people are involved in this phase. These scientific outputs must be taken to the next level in a value chain to be more relevant. This leads us to the Technologies.

**ii. TECHNOLOGY**

In this category, the workers are mainly Engineers and Technologists. They are also well trained but have the attribute of using specialized tools of trade that are of high value, in addition to being highly skilled, to transform high value knowledge in proving the concepts from SCIENCE into indications of products, processes and skilled operational knowledge. These generate Intellectual Properties (IP). At this level, concepts proved will normally be in the form of prototypes, pilots, and confident field and technology deployment skills. The main outputs at this level are Industrial Property and Copyright protectable IP. Again, the relevance of these outputs to dynamic and real time economic development is limited. In this phase, participation of an estimated 20% of people are involved. Further value addition is needed which is what leads us to the category of Innovation.

**iii. INNOVATION**

This is the phase where value is added to technology and skills to evolve products and processes that are viable, competitive and dynamic. In this phase, skillful business, marketing and product development skills dominate the activities. The IP transforms to assets protected by specific IPRs. Skills to transfer the IPs (technologies) to industry dominated this

phase. Anybody with business skills can participate in this category. This is a phase where an estimated 70% of people can actively participate. The innovation phase is the most critical phase in any dynamic and real time sustainable economic development. In most cases, it serves as the platform to evaluate the effectiveness of the domestic technology production processes.

iv. **STI**

In view of the brief analysis above, it may be correct to assert that for the economy of any country to develop, it is very strategic to have its science functional and fully driving its technology system, which will ultimately, drive its innovation system. This is the master key for modernizing and developing economies. The efficiency of the STI system in this regard is explicably tied to the effectiveness of the Technology Transfer dynamics.

**STI ANALYSIS IN NIGERIA**

In the pursuit for the attainment of Vision 20-2020 through the Transformation Agenda, it is worthy to take a cursory look at the Nigerian system so that an objective analysis can be carried out on some of the required actions. The analysis reveals the following visibility:

a) That the knowledge infrastructure is elaborate, currently composed of 125 Universities, 125 Polytechnics, 98 Colleges of Education, over 300 institutions composed of Research Institutes, innovation agencies and policy implementation departments, Multi-National Companies (MNCs), large pool of Skilled labour force including a sizeable number of Diasporas;

b) A presence at every level of science and technology bandwidth including at the High levels such as Space science, Intermediate levels including numerous machinery and processes, Low levels including unit operation based innovations, and Traditional level that is wide ranged and numerous;

c) That Nigeria actually has all that is needed to transform and become the largest economy in Africa;

d) However, despite the impressive records highlighted in paragraphs (a), (b) and (c) above, the economy is still technologically very weak with a national poverty incidence averaging 60%, implying that over 100 million Nigerians are dwelling under the poverty line;

e) The prevailing situation in (d) above depicts that the Nigerian knowledge based STI finds it difficult to improve people's quality of lives, indicative of the existence of an "STI valley of death";

f) Many reasons might be responsible for the existence of this valley, but it certainly include:

   i. A "weak" technology based industrialisation strategy (policy, planning etc);

   ii. Lack of innovation support (venture capital/ technology risk funds etc);

   iii. A weak policy focus on relevant technology acquisition and transfer;

iv. A weak IP creation & management system;

v. A weak technology based entrepreneurship drive (product & process development, management expertise);

vi. A weak strategic business planning skills (feasibility, business plans, branding), etc.

g) Nigeria maintains a high appetite for consuming imported products and foreign technology dependent locally produced items on which the low capacity to absorb and domesticate is very clear;

h) The summary of all the above is that Nigeria's Science does not seem to be "aggressive" in pushing to acquire and apply the needed Technology to transform the economy, resulting in high consumption of foreign technology based Innovations. Literally, the STI in Nigeria demonstrates all known symptoms of functional weakness including high incidence of poverty, weak physical and social infrastructure, very low production capacity especially among the indigenous industries. These are the key indicators for the desire to transform the economy.

**CHRACTERISTICS OF OUR UNIVERSITIES RESEARCH**

Our Universities and indeed all other Tertiary Institutions and research Institutes are engaged into research activities characterized by:-

- Strictly academic titles in most cases
- Production of a number of publications
- Production of many prototypes and
- Almost zero patents

These facts can be attested to when in 2009, Nigeria became the second country in Africa with highest number of publications. It only came second to South Africa whose number of publication surpassed Nigeria's 4000. Also a compilation publication from 1996 to 2011 ranked Nigeria as 51$^{st}$ Country out of about 500 Countries in terms of publication *H-index*. Therefore, our institutions most especially the universities cannot be said to be doing badly I terms of publication. After all, the academics survival and progression is more often than not dependent on publications. One could only wish that this effort is extended to the area of innovation.

Looking at the number of Universities in the country, about 40 of them are Federal universities. These universities are categorized into three groups viz; Conventional, Technology and Agricultural universities. This categorization is not by accident. It is done with the purpose in turning out R&D results in very many areas with the hope that also innovations will spring from these institutions. The present situation depicts a different picture from the good intentions behind establishing the universities in the R&D efforts. This therefore suggests that something must be done and fast too in order to turn the universities around in areas of R&D and innovation. A retreat of this nature that will bring out the truth is the first step in the right direction to address challenges.

**THE ROLE OF NOTAP IN SUPPORTING RESEARCH**

The National office for Technology Acquisition and Promotion (NOTAP) was established in 1977 by Decree No. 70 of 1979 (presently NOTAP Act, CAP N62, LFN, 2004). NOTAP is a parastatal under the Federal Ministry of Science and Technology and was established as one of the main instruments to implement the National Policy on Science, Technology and Innovation (STI). Part of this Policy stipulates the encouragement of the flow of relevant technology into the country in order to strengthen industrial development and encourage domestic enterprises to acquire foreign technologies that are suitable to the local environment. At the same time NOTAP is making concerted efforts to develop locally motivated technologies. Part of the means to achieve this objective is linking the industrial sector with the National Innovation System (NIS) in the areas of R&D, capacity building and Intellectual Property Rights.
NOTAP is mandated to evaluate and register all Technology Transfer Agreements and contracts considered valuable to the National economy. It also monitors the implementation of the Technology Transfer Agreements so registered to promote economic and industrial development of Nigeria.

NOTAP in pursuit of its mandate carries out the following activities:

1. Evaluation and Registration of Technology Transfer Agreements.
2. Monitoring the implementation of Technology Transfer Agreements.
3. Capacity building of Researchers.
4. Development of critical mass(Technology Magnets)
5. Promotion of Intellectual Property Culture in Tertiary Institutions.
6. Assistance in Patenting of Inventions/R&D results
7. Promotion and Commercialization of indigenous Technology.
8. Linking R & D with industry.

As a result of the monitoring of the implementation of Technology Transfer Agreements, NOTAP observed many inadequacies and disconnect between industries and the National Innovation System, which had resulted in the absence of value creation beneficial to the national economy.

NOTAP has taken strategic steps to ensure that industries increase their local value addition and also endeavour to enhance national technological development through appropriate linkages with universities and research institutes, encourage research-industry linkages and enhance creative and innovative activities to facilitate national development. Therefore, NOTAP since 2009 initiated key programmes, projects and schemes to address these challenges and gaps. Some of these programmes are:

(i) Establishment of more Intellectual Property and Technology Transfer Office in Tertiary Institutions

(ii) Collaborations with ISESCO for capacity building of Researchers and Scientists

(iii) Creation of Technology Story Board for Secondary and Primary Students

(iv) Abuja Technology Transfer Corridor to encourage spin-offs

(v) NOTAP-Industry Technology Transfer Fellowship (NITTF) for PhD studies.

**THE NOTAP INDUSTRY TECHNOLOGY TRANSFER FELLOWSHIP (NITTF)**

In 2009, NOTAP initiated the NITTF scheme under the NOTAP-Industry partnership project to provide an efficient process for the acquisition and domestication of foreign technologies as enshrined in ***Section 4(c) of NOTAP Act.*** In order to address the weaknesses and huge gaps in the process of acquiring and adapting imported technologies into Nigeria, NOTAP in collaboration with some industries is implementing the NITTF. The programme will serve as a platform through which industries will voluntarily support the process of building the needed critical mass of highly skilled knowledge workers and the development of specialised personnel, strategic managerial skills and provision of key technology acquisition process (industrial R & D capacities and capabilities).

The NOTAP-Industry Technology Transfer Fellowship (NITTF) is a techno-PPP platform designed to gradually create an indigenous critical pool of elite applied knowledge workers in Nigeria through special PhD programmes tenable in Nigerian Universities. The support is for a maximum period of 4 years to be jointly implemented by NOTAP and Industry. The fellows will basically be all future academic workers in Universities and Research Institutes and will be required to enter into clear contracts/agreements with NOTAP, Industry/Research Institute such that close relationship will be developed during the study period and after completing their studies, they will return as lecturers or Researchers in the universities or Research Institutes (RIs). This mode of fellowship will ensure speedy technology transfer.

The scheme is a tripartite arrangement where industry will provide fund and laboratory facilities, the university will take care of training the fellows while the government i.e NOTAP initiates and manages the interface to produce *"pool of critical mass of manpower*" needed for speedy economic development of the country.

NOTAP is partnering with all industries having technology transfer agreements registered with the office and other organizations and individuals in the implementation of this programme. NITTF is administered by NOTAP and its partners.

**OBJECTIVES OF NITTF**

The objectives of NITTF are to :

1. Create a pool of knowledgeable and skilled manpower that will facilitate technology acquisition, assimilation and diffusion.

2. Provide academic staff of universities with broad and direct experience of industry to benefit research and enhance the relevance of teaching.

3. Stimulate and translate research results to the Private Sector to develop a

sustainable technology-based economy.

4. Establish appropriate linkages between universities, research institutions and industrial sectors.

5. Establish a process and system for the commercial exploitation of research results.

6. Encourage the setting up of joint ventures and partnerships to sufficiently promote and profit from R & D results.

7. Encourage the use of spin out and spin off companies as vehicles for promoting technology transfer and commercialization.

8. Create a robust and dynamic R & D structure in Nigeria

**THE TRANSFORMATION AGENDA, VISION 2020 and NATIONAL DEVELOPMENT**

The Transformation Agenda of the Jonathan Administration is literally a collective resolution by Nigerians (leaders and followers) that there is no more business as usual. In part it means that Nigeria will not "cut corners" but will take full advantage of the merits of technology to achieve the development status necessary to be among the top 20 economies in the World. A brief reflection on the status of the top 20 economies reveals the following interesting attributes:

a) The top 20 economies are currently found in North America, Europe, South America, Asia and Oceania;

b) In each of those countries, their National STI Policies are clearly well focused, practical, implementable and aligned towards driving ALL SECTORS of the economy;

c) Their Science, Technology and Innovation (STI) system is vibrant;

d) They have successfully bred well synergized Institutional Systems of Innovation (NSI);

e) Each Sustains a respectable Research and Development (R&D) Investment;

f) Where any of those countries manifests Raw Material Endowments, downstream value addition is highly vibrant;

g) Each of those countries implements prioritized Technology Acquisition Focus, with clear STI Mentor;

h) Each of those countries maintains a strong Intellectual Property (IP) system;

i) Intense Deployment of ICT characterizes the automation mode on every sector in those countries;

j) All the countries demonstrate viable Research - Industry Linkage models including speedy evolution of Hi-Tech companies, Efficient Technology Incubation, establishing numerous Science and Technology Parks, Research Parks, Innopolis, and Technopolis;

k) Investment in the development of Human capital to produce the needed Scientists and Technologists; and

l) Efficient operation of infrastructural facilities that favour industrial development e.g. uninterrupted power

supply, quality water supply, reliable security etc.

In all the attributes above, the commitments and intensity of functional STI systems is quite clear and prominent.

**POINTERS AND PREVAILING INDICES ON THE TRANSFORMATION EFFORTS OF GOVERNMENT**

Since 2007, the political leadership in the country has sustained the campaign for a radical transformation of the Nigerian economy and improve the quality of lives of Nigerians. From the time of the late President Umaru Yar'Adua, when the Vision 2020 was launched and based on the implementation of a 7-Point Agenda, to the current time of President Goodluck Jonathan, where the attainment of same Vision is sustained through the implementation of a Transformation Agenda, the objective has basically remained towards evolving a Nigerian economy where:

a) Absolute poverty among Nigerians is totally eradicated;

b) Every man, woman, and child in the nation should have access, not just to basic minimum needs, but to all the opportunities to lead a happy and fulfilling life; and

c) For Nigeria to emerge as knowledge and a learning society built on values of hard work, honesty, transparency, discipline, and a collective sense of purpose.

The leadership also sustains all indicators for its desire to ensure that STI is entrenched in the process of transforming the economy. The following continuous remarks by the President attest to this.

> "We are going to run our economy based on Science and Technology….because nowhere in this World now that you can move your economy without science and technology. For the next 4 years we will emphasize so much on S&T because we have no choice, without that we are just dreaming…."
>
> ***Dr. Goodluck E. Jonathan GCFR, President Federal Republic of Nigeria, Birnin Kebbi, Kebbi State, April 2011***

> "We will continue to emphasize investment in Science and Technology as a tool to drive the transformation agenda of this administration"
>
> ***Dr. Goodluck E. Jonathan GCFR, President Federal Republic of Nigeria At the Federal Executive Council of 17th August 2011***

These are great signals, with clear pointers towards the evolution of a functional sustainable development system, in which the traditional "triple helix" concept will become a reality in Nigeria: This helix concept indicates that;

a) The Government as an apex helix will provide the Political, Economic, Moral and Technological leadership;

b) The energy in (a) above will facilitate the Knowledge helix to mature into providing the needed knowledge and technology; and

c) The Industry helix will naturally respond to both (a) and (b) above to ensure that the economy becomes productive, sustaining the generation of

gainful and high wage jobs, that will subsequently ensure sustained wealth creation in the economy.

These are all possible because the World has seen similar transformation in Dubai and the United Arab Emirate at large. Also such transformation has manifested in Lagos State under the current leadership of His Excellency, Governor Raji Fashola.

**THE IMPERATIVES**

For the desired transformation to manifest, riding on the current efforts of the Transformation Agenda of Government, it must be based on the change strategy of "**no business as usual"**. We must ensure that words are matched with actions to evolve quality leadership and followership. A logical and strategic approach of immediate, short term, medium term and long term programmes and projects implementation must be adopted.

In summary, the degree to which Nigeria will unleash it's technical and managerial capacity & capability to engage in innovation and specialization will depend on its ability to maximize the opportunities strategically based on results of a comprehensive system SWOT analysis in tandem with a functioning STI system. This must mean that we are being innovative at the Product, Process, Managerial and Organisational levels. These are the functional levels that will guide the way for the evolution of a viable sustainable development of the Nigerian economy and further facilitate the emergence of an effective STI system.

**CONCLUSION**

To conclude, the proper instrument to link Industry to Academia is no doubt through a viable research which will generate and develop indigeneous technology. This however depends on a number of other things one of which is a viable strategy to transfer technology by domesticating imported knowledge/ knowhow. But whatever the situation, a triplex helix, Government/Industry/ Academia, approach is needed for a sustainable Academia-Industry linkage to transfer viable research efforts. Other practical endeavours that can assist this to happen are proposed as follows:-

1. There must be a deliberate programme to develop a viable middle class in Nigeria. This would require knowledge workers and technology service providers to modify their language of communication such as mounting a programme that would lead to the creation of 1,000,000 technical & managerial jobs using Nigerian technologies and knowhow (most of which are efforts having direct implications on the development of production technology);

2. To ensure that we build the required critical mass of skilled manpower, we must be very innovative. We must use the platform of implementing all capital projects to build such technical capacities;

3. We must mount deliberate programmes to intensely and proudly promote technologies and innovations emerging from the National Innovation System, especially through viable partnerships, synergies and networking of related institutions on both supply and

demand. Such promotional activities must be regular and qualitative;

4. We must institute a deliberate posture on "thinking out of the box" to acquire and transfer technology, to ensure that a clear linkage of academia to industry prevails. A typical tool on this is the establishment of functional science and technology parks infrastructure;

Facilitate the development of a patriotic and nationalistic culture through a deliberate innovation based on a micro agenda called Agenda 1777. This agenda is based on specific projects that will demonstrate:

i. A United Nigeria (the 1);

ii. For the period of the next 7 years - 2012 to 2019 (the first 7);

iii. That Nigeria will be identified with 7 globally acclaimed quality branded products from its knowledge system (the second 7);

iv. That 7 indigenous Multi-National Companies (MNCs) will emerge in Nigeria to ensure that the knowledge system will mature to support industry and generate high level Intellectual Property for both local consumption and export (the third 7).

1) For all the above to quickly happen, Nigeria must functionalize and manage the recently approved National Scientific Technology and Innovation Fund (NSTIF) through the quick pooling of financial resources to boost investment in Research and Development in all sectors, to a minimum of 1% of the GDP (in line with the resolution of the AU Heads of States at the 2007 AU Summit in Ethiopia);

2) Finally, there is the need to also quickly and effectively implement and operationalize the National Science, Technology and Innovation Council (NSTIC) Chaired by His Excellency the President himself. This will position knowledge governance appropriately at the highest level, a feature commonly observed in most of the countries of the top 20 in the World.

Implementing all the above in tandem and logically will certainly ensure that we generate viable intellectual property and acquire and transfer technology through scientific R&D for sustainable National development.

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