

**BEING A PAPER PRESENTED BY THE EXECUTIVE SECRETARY, TETFund, PROF. SULEIMAN E. BOGORO (FNIAS, FNSAP, FCOASN, FASAN, FFPNO, FSPSP, D.Sc(h.c), FAS, DAS), AT THE ADVOCACY ROUNDTABLE ON THE FUTURE FOR NIGERIAN POLYTECHNICS, HELD AT ROCKVIEW HOTEL, ABUJA FROM 25<sup>TH</sup> TO 28<sup>TH</sup> OF OCTOBER, 2021**

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**PROTOCOL**

**PREAMBLE**

It gives me great pleasure to address you today on a theme that is very close to my heart. The idea behind the organisation of this event is truly inspired, coming as it is at this epochal moment in the history of our dear country, at a time when an alignment of the critical factors of President Muhammadu Buhari, GCFR and the Honourable Minister of Education, Mallam Adamu Adamu's commitment and support, as well as synergy with partners such as the National Universities Commission (NUC), National Council for Colleges of Education (NCCE) and National Board for Technical Education (NBTE) have resulted in the elevation of R&D and innovation to the top of the national discourse.

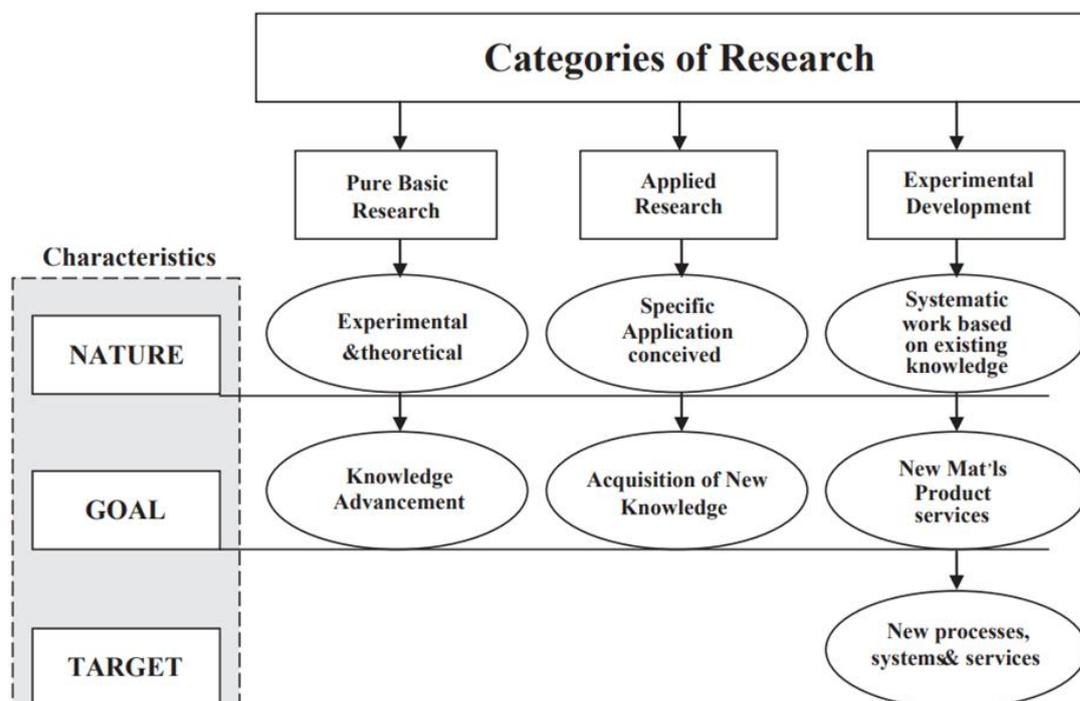
Let me begin by thanking the Academic Staff Union of Polytechnics, for this thoughtful initiative, as well as the invitation graciously extended to me. It is another testament to the enduring legacy of this foremost academic body that has been at the forefront of delivering qualitative Technical and Vocational Education and Training (TVET). You have every reason to take pride in your track record of rising to the occasion of meeting the mid- to high level technical manpower needs in the country through exceptional training. As I have observed previously, higher education should be more relevant to the society and the economy in particular through the production of skilled graduates that are job-ready, as well as the necessity for more applied research and training.

The topic I have been asked to speak on today is **“MAINSTREAMING THE CULTURE OF RESEARCH AND INNOVATION IN NIGERIAN POLYTECHNICS”**. Bearing in mind that in essence, the problem of a weak culture of R&D and Innovation is indiscriminately uniform

across ALL our institutions of higher learning, the situation with this all-important endeavour in Polytechnics is the same as in other TETs. This premise is indeed self-evident in the fact that all TETFund Research Intervention Lines, Guidelines, implementation processes and governance structures are the same for all Beneficiary Institutions, be they Polytechnics, Universities or Colleges of Education. It is therefore safe to surmise that Polytechnics are afflicted with the same R&D malaise as other TETs. I will also be highlighting the centrality of R&D and innovation to everything TETFund has embarked upon under my stewardship.

### **INTRODUCTION - The Concept of Research and Development**

According to Siyanbola et al. (2011), R&D is a post Second World War phenomenon and absorbs a sizeable proportion of corporate and public funds in developed countries. It is largely carried out by researchers in higher educational institutions (HEIs), research institutes and industrial firms. R&D comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, culture and society, and the use of this stock to devise new applications (OECD, 2002). It involves three main activities: basic research, applied research and experimental development.

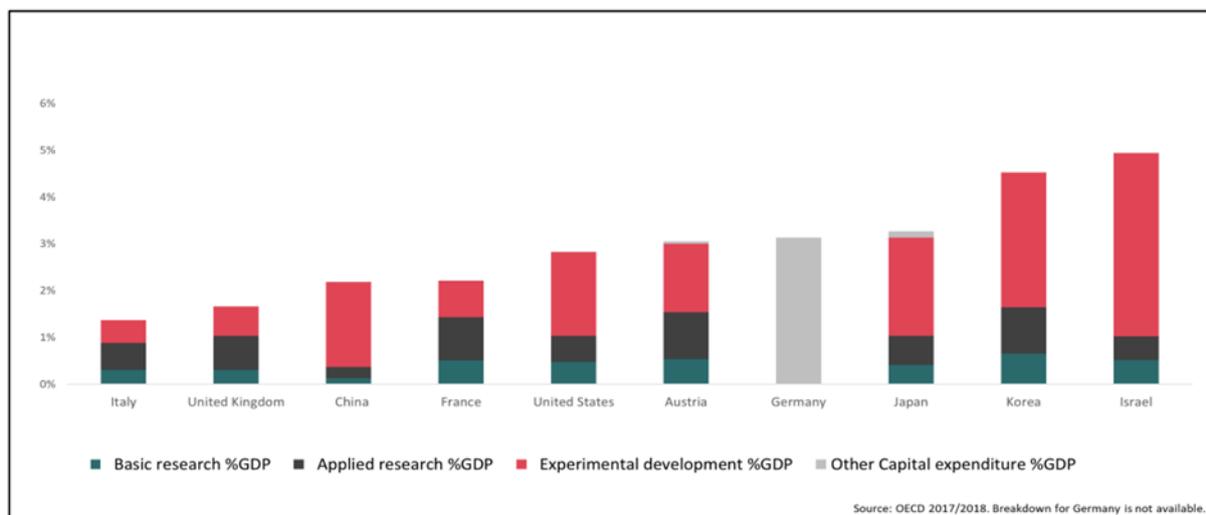


The three categories of research (Source: Siyanbola W.O. et al. / Asian Research Policy 2 (2011) 20-35)

Basic research refers to experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts without any particular application or use in mind. It analyses properties, structures and relationships with a view to formulating and testing hypotheses, theories or laws.

Applied research is also original investigation undertaken in order to acquire new knowledge (OECD, 2002). It is, however, directed primarily towards a specific practical aim or objective and undertaken either to determine possible uses for the findings of basic research or to determine new methods or ways of achieving specific and predetermined objectives. Applied research involves considering the available knowledge and its extension in order to solve particular problems. Results of applied research are intended basically to be valid for a single or limited number of products, operations, methods or systems.

Experimental development concerns systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed toward producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed (OECD, 2002).



Basic research, Applied research and Experimental Development as % of GDP

## **RESEARCH AND INNOVATION IN THE NIGERIAN ACADEMIA - THE CASE FOR A PARADIGM SHIFT**

With almost a century of research in our institutions of higher learning, it begs the question: where is the research output and what impact has it had on the Nigerian economy? Sadly, most of the research in our HEIs today is undertaken for academic career advancement and intellectual prestige, rather than for any socio-economic impact. I have always held the firm belief that no Academic worth his/her name as a researcher has any excuse being broke! Instead of adherence to the “Publish or Perish” mantra, your research output should be your ticket out of hardship and into financial security and independence.

From the industrial revolution to the invention of radio, from vaccines to the World Wide Web, the contribution that science, research and innovation make to the world and people’s lives is unquestionable. Through inventiveness comes great progress. In light of the COVID-19 crisis, the importance of being able to find ingenious, practical and timely solutions to the most challenging problems is even clearer. Research and development will be critical to economic and social recovery from the impacts of COVID-19, enabling us to build a wealthier, healthier and more resilient country. Science and innovation have helped drive major progress in global development over the past two decades and are vital to achievement of the UN’s Sustainable Development Goals. Our goal at TETFund is to further strengthen science, research and innovation across the country, making them central to tackling the major challenges we face, and taking advantage of opportunities.

### **THE STATUS OF R&D IN NIGERIA**

The key players in R&D in Nigeria are the higher educational institutions (HEIs), the research institutes (RIs), the private research establishments, government agencies with R&D mandates, etc. (Siyanbola et al., 2011). However, in spite of the large number of HEIs with R&D capacity, cases of specific R&D breakthroughs are rather rare (Siyanbola, 2008). It has been established that R&D in Nigeria is well characterised by an inherent discontinuity among the research activities in institutions, the development activities required to produce artefacts and subsequent manufacturing and marketing of these artefacts. Contrary to the current global

practice, researchers in Nigeria still tend to adopt a 'linear' approach to their research without recourse to the complementary activities that will guarantee the social usefulness of such research results.

Systematic decline of research in Nigerian HEIs is traceable to the late 1980s, dovetailing with the first wave of the brain drain between 1985 and 1992 that saw Western European and North American institutions pillaging our best and brightest academics. In summary, the slump in research productivity can be attributed to the following constraints, among others:

- a) Poor and irregular funding
- b) Obsolete and decaying research infrastructure
- c) Poor research motivation
- d) Rising workloads associated with a deteriorating staff/student ratio, leaving little time for research
- e) Lack of skills in modern research methods
- f) Deficiency in competent research personnel
- g) Frequent industrial action.

Limitation	% researchers
Lack of funding for research	87
Inadequate supply of electricity	82
Lack of R&D facilities	76
Obsolete facilities	67
Lack of exposure to modern lab skills	55
Inadequate water supply	54
Lack of quality research assistance	50
Inadequate access to recent journals/library materials	45
Lack of exposure to conferences	43
Inadequate time for R&D	29
Poor attitude to collaboration among researchers	29
Lack of research drive	24

Source: NACETEM (2011)

The above factors, in conjunction with general lack of strategic research focus and absence of linkages between researchers and industry are yawning gaps in Nigeria's higher education research

ecosystem that TETFund is striving hard to bridge. These constraints constitute severe impediments to the research capacity of our institutions.

There is no gainsaying the need for course correction and a relentless pursuit of excellence anchored on the realisation that R&D and innovation hold the keys to Nigeria's technological breakthrough. It is also clear that for the desired impact to be felt across the board, a critical mass of reorientated researchers embracing global best practices must be induced at all costs in our HEIs. To this end, concerted efforts must be directed towards ensuring that:

1. Researchers acquire a deep knowledge of their environment, such that research is driven by "felt" needs, rather than perceived needs. This will require deliberate recalibration of methodologies and needs assessment.
2. Research designs are simplified to allow participation of stakeholders.
3. Alternative dissemination platforms besides the traditional journals and academic conferences are exploited (posters, jingles, interface with stakeholders, faith-based organisations, community-based organisations, dramatization, etc).
4. Increased use is made of open access frameworks for publication and uptake of research findings.
5. Institutions insist that research projects indicate clear channels and strategies for dissemination and uptake.
6. HEIs, including Polytechnics introduce research uptake as part of courses in research methodology.

Furthermore, in order to maximise benefits from R&D activities the following factors, each of which I will discuss in turn, are highly critical:

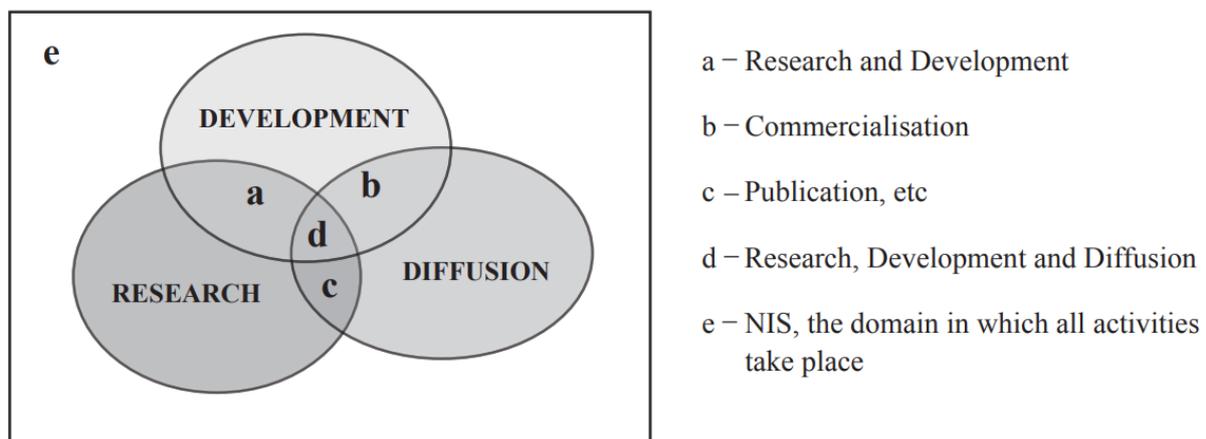
1. Virile National Innovation System (NIS)
2. Individual re-orientation
3. Institutional re-arrangement
4. Functional Government/Research Institutes-Industry Linkage through Networking
5. Effective Technology Transfer Model

## Virile NIS

The concept of a National Innovation System (NIS) has provided a useful framework for technology policy formulation, since the concept makes explicit different kinds of inputs necessary for an innovative economy and hence competitive in today's increasingly globalised markets (Bamiro et al., 2008). The concept first appeared in the mid-1980s in the context of debates on industrial policy in Europe (Sharif, 2006).

Presently, many international organisations such as the Organisation for Economic Cooperation and Development (OECD), European Union (EU) and the United Nations Conference on Trade and Development (UNCTAD) use NIS as an integral part of their analytical perspective (Lundvall, 2002 in Sharif, 2006).

Today, nations that have successfully transformed their economies to compete and thrive in technology and knowledge intensive sectors have done so by creating and strengthening their NIS. Finland was the first country to adopt the concept as a basic component of its science and technology policy, and Sweden has given the concept legitimate status in its own right by naming a new central government institution the "Systems of Innovation Authority" (Sharif, 2006).



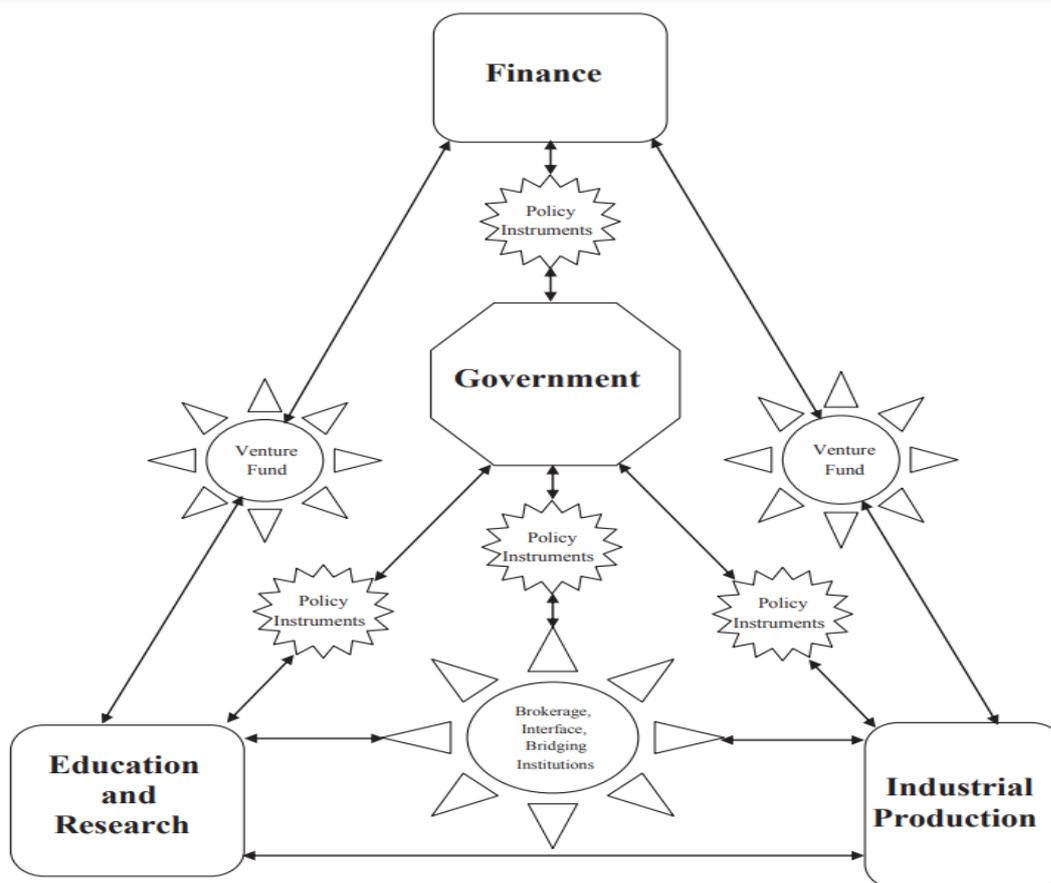
Model for the relationship among research, development and diffusion (Source: Siyanbola W.O. et al. / Asian Research Policy 2 (2011) 20-35)

NIS has been described as a set of institutions that contribute to the development and diffusion of new technologies. These institutions provide the framework within which governments form and implement policies to influence the innovation process. As such, it

is a system of interconnected institutions that create, store, and transfer the knowledge, skills, and artefacts which define new technologies.

An NIS consists of four main elements

- government/policy;
- academia;
- the private sector/industry and
- the finance element.



Each of these has its own unique roles which, however, depend on the functionality of the others for success. It has been noted that the innovative performance of an economy depends on how the individual institutions and actors perform in isolation and how they interact with each other as elements of a collective system of knowledge creation and use, and on their interplay with social institutions (OECD, 1997).

Egbetokun et al (2007) noted that the success achieved by any nation in exploiting new, especially scientific, knowledge for growth and development depends on the effectiveness of the nation's National Innovation System. This implies that the NIS provides a framework for evaluating holistically a nation's attempt at generating and applying knowledge for meeting the needs of its society.

### **Individual Re-orientation**

The basis for any change in a systemic paradigm is a change in the individual paradigm, meaning that for there to be R&D-driven growth in Nigeria, every researcher must improve in orientation. Certain key facts must now be accepted as 'gospel truth'. Chief among these is the realisation that the days of isolated, territorial research are long gone. Every serious researcher, rather than jealously concealing their own work, should be willing to share knowledge and work with others for the common good. Also, the perception of research as a mere means to an end, where the end is promotion-oriented publications, is not beneficial at the macro-level. While individual researchers might get promoted after many years of this research approach, the nation is left with numerous 'egg-heads' with purely curiosity-driven research results that have almost no direct social relevance. In summary, personal changes are required in individual mindset, ideology, orientation and value system.

### **Institutional Re-arrangement**

The fact that R&D is not impacting national development, despite the extensive institutional framework in terms of number of HEIs and research institutes, indicates that something is not right. Changes are therefore required either in the way these institutions are configured or in their function. As noted earlier, R&D is underfunded in Nigeria, resulting from poorly funded institutions. The benefit of an institution-based approach is two-fold. First, each institution can readily focus on areas of relative strength. Secondly, monitoring the use of such grants will be a lot easier as each institution can conveniently use its existing mechanisms to follow up on the R&D activities of its staff. Two crucial steps are recommended here. First, every research institution needs to perform an internal analysis of its strength and weaknesses and

accordingly create a pragmatic R&D agenda. Such agenda should be prioritised so that any R&D activity will focus on pre-determined niche areas. Secondly, institutions need to create strong and virile research councils that will be responsible for overseeing R&D activities to ensure that they are consistent with established priorities and that they yield appropriate results for investments.

Given the dynamic nature of national needs, there will be a need to review national priorities in a consistent manner to ensure appropriate interconnectivity of all activities. From a macro perspective, institutions must encourage interdisciplinary and collaborative research. Several approaches can be adopted, ranging from the creation of Centres of Excellence in multidisciplinary research to the establishment of Central Science Laboratories in institutions to the creation of interdisciplinary R&D grants for the purpose of pooling resources and ensuring that researchers from varied disciplines work together.

### **Functional Government/Research Institute-Industry Linkage through Networking**

The place of 'working in a net' cannot be overemphasised. Networking is what ensures that resources are efficiently utilised and that personnel are effective. Historically, networking within Nigeria's NIS has been extremely difficult. In fact, even within single institutions, researchers often find it difficult to work together due largely to distrust, territorial behaviour and a go-it-alone attitude. Multidisciplinary research is, therefore, at an all-time low in the country. Facilitating networks of researchers is particularly critical for R&D to have any meaningful impact on development in Nigeria. It then becomes possible, for instance, for a researcher in an institution in the northern part of the country to identify a researcher in a public research institute in the southern part who shares common research interests; or for the industry to place specific research questions to scientists in an area of need; or for researchers to jointly work on a research issue.

### **Effective Technology Transfer Model**

R&D outputs do not suddenly appear in the marketplace. A process must be followed to ensure that the outputs meet market

expectations and to improve the prospect of success. Such processes will help in moderating and removing barriers as well as amplifying the profit and sustainability potentials of any technology. The recommended model is one that begins the technology transfer management from the idea stage to ensure that the market is considered. Through Technology Transfer Offices (TTOs) and the activities of technological entrepreneurs, organisational forms built around R&D outputs can then be taken through the incubation system and subsequently through the Science Park system before they are diffused into the open market.

### **MAKING R&D WORK IN NIGERIAN POLYTECHNICS: THE ROLE OF TETFund**

Upon assumption of duty as the Executive Secretary of TETFund back in April 2014, Prof Bogoro presented a Strategic Plan, which proposed the establishment of a new Department to drive R&D, along with Centres of Excellence in our TEIs, with the expectation that these Centres of Excellence would ultimately partner with Research Institutes/Centres, private TEIs and the industry. This redirection of focus by TETFund underscores the paradigm shift towards deepening our interventions more in the core academic components, and specifically R&D, alongside physical infrastructure development.

TETFund's Department of Research & Development/Centres of Excellence (R&D/CE) is saddled with the responsibility of coordinating, managing and implementing some of the academic content-based intervention programmes of the Fund. Based on my unwavering conviction in the critical role of R&D in driving the socio-economic development of Nigeria in an increasingly globalized and highly competitive knowledge-driven world economy, I re-established and reinforced the R&D/CE Department upon my reinstatement as Executive Secretary in January 2019.

The TETFund National Research Fund intervention line was introduced in 2009 as a Special Intervention Programme, aimed at promoting the conduct of applied research and innovation by academics in public tertiary educational institutions and research institutes. In order to actualize these objectives, the TETFund Board of Trustees set up the NRF Screening and Monitoring Committee

(NRFS&MC) and charged it with the responsibility for implementing and administering the intervention. Following extensive consultations with experts and various stakeholders, the blueprint for roll-out was produced. The blueprint mirrors Nigeria's National Research Agenda, encapsulating the priority areas of research, captured in three main categories, namely: Humanities and Social Sciences (HSS); Science, Engineering, Technology and Innovation (SETI) and Cross-Cutting (CC). A seed fund of N3b was approved by the Board of Trustees in 2011 for the initial take-off, augmented with an additional N1b in 2015. Upon my reinstatement in 2019, we transformed the NRF into an annual intervention and enlarged the funding envelope to N5b. As at the 2020 iteration of the NRF Grant Cycle, we had increased the funding pot to N7.5b. For 2021, we have made available N8.5b, indicating a clear progression and our determination to keep moving in the right direction.

On the directive of Mr. President last year, the Hon. Minister of Education, Mallam Adamu Adamu, instructed TETFund to support the Federal Government initiatives of responding to the Covid-19 threat through ground-breaking research for Phyto-medical drugs, prophylactics, PPE and eventually vaccines. I am pleased to inform you that TETFund has made significant headway towards implementing the President's directives and very soon, we will be announcing positive results. Funding has since been made available for eight (8) carefully selected Special Covid-19 Research Projects amounting to over ₦260 million. These projects are now at advanced stages of implementation. Similarly, we have proposed to sponsor three (3) Mega Research Grants worth ₦750 Million for medical (Covid-19 vaccine/genome sequencing and phyto-drug research from our approved 2021 budget.

Towards the end of 2020, we presented Allocation Letters for the establishment of the pioneer 12 TETFund Centres of Excellence (TCoEs, 2 in each geopolitical zone of Nigeria) to the Heads of Host Institutions. With a seed grant of N1b and a gestation period of 5 years, another set of 12, making a total of 24 TCoEs established in 2 years, we expect these Centres to come on stream imminently and catalyse the explosion of R&D and innovation activities across the length and breadth of our country.

On 24<sup>th</sup> September 2020, another momentous event took place at the Transcorp Hilton Hotel in Abuja, where 165 eminent Nigerians from home and abroad, drawn from the highest echelons of Academia, Industry and Government were, brought together at the inauguration of TETFund's R&D Standing Committee. The committee was subsequently split into 13 thematic sub-committees, in line with the most critical areas of the National Research Agenda.

Distinguished Colleagues, believe me when I say that my excitement at the calibre, proficiency, wealth of experience and depth of expertise in the membership of the TETFund R&D Standing Committee could never be adequately captured in words. As it turned out, my confidence in its ability to deliver was not misplaced, because less than six months later on February 1<sup>st</sup> 2021 at the same venue, the committee reconvened for the validation and adoption of reports from the 13 Thematic Groups and the verification and endorsement of the National R&D Foundation (NRDF) Establishment Framework. In light of the incredible milestones achieved to date, I am even more excited today at the prospects the work of the Committee portends for the future of our dear country.

As a result of the amazingly great work of the TETFund R&D Standing Committee, I am pleased and humbled to inform you that a draft Executive Bill for the establishment of a National R&D Foundation (NRDF) has already been produced and will soon be presented to the Hon. Minister of Education, Mallam Adamu Adamu, for onward delivery to the Presidency and the National Assembly. Having a Foundation established by Law, with a Policy Instrument and clear Mandate to coordinate, oversee and most importantly, secure funding for R&D and Innovation activities in the country would lay the foundation, as well as define the trajectory, not just for the transformation of our beleaguered Tertiary Education Institutions from mere 'citadels of learning', where inputs and outputs have left much to be desired for far too long, but crucially, to the springboard of Nigeria's leap into the knowledge economy paradigm. In a nutshell, the successful establishment of a National R&D Foundation (NRDF) would constitute the ignition for catalysing the explosion of research and innovation activities, not just in our Polytechnics, but across all our institutions of higher learning. As far as policy options are concerned, a functional NRDF would encapsulate, devise and

finetune strategies for mainstreaming the culture of research and innovation in Nigerian HEIs, Polytechnics inclusive.

A key aspect of our research-focused initiatives at TETFund is the need to adequately equip our academics with the requisite Research Proposal Writing and Research Grant Management skills in order to adequately prepare them for the onerous task of writing grant-winning research proposals and research project management. To this end, Train-the-Trainer Capacity Building Workshops have been sponsored by the Fund since 2019, at which about one thousand participants have so far been trained. We expect another set of 728 selected participants to form the 2020/2021 cohort. The idea is for the beneficiaries of this capacity building programme to cascade the training down to their colleagues back at their respective institutions.

Another vital prong in our strategy for institutionalisation of R&D in Nigeria is the establishment of R&D Units in all TETFund Beneficiary Institutions, as well as the necessity for capacity building in Research Administration for the Directors/Heads of these Units. Since 2019, Research Administration Capacity Building Workshops have been ongoing and so far, all public university Research Administrators have benefitted from this all-important programme. Directors of R&D/CE Units of Public funded Polytechnics are next in line to receive this training, followed by Colleges of Education.

As the Fund continues to drive the agenda for inculcating the culture of R&D in the country's TEs for the purpose of engendering cutting edge problem-solving research, we appreciate the fact that no meaningful research activity can take place without well-equipped laboratories, staffed by well-trained technologists and technicians that are proficient in the deployment and use of the latest systems and technologies. We have therefore embarked on a training program to urgently address this need. Consequently, we have signed a Memorandum of Understanding in France with the Association of University Institutes of Technology (ADIUT) and the French Embassy in Nigeria to train Laboratory Technologists from TETFund beneficiary institutions. As part of the pilot programme, 30 Laboratory Technologists will benefit in the pilot program and subsequently another 100 will undergo the training.

We have also entered into bilateral Partnership and Collaboration Agreements with world leading Institutions and Organisations at the cutting edge of R&D, for the purpose of knowledge transfer, capacity building and development of the staff of TETFund Beneficiary Institutions. Some of these include:

- i. Sao Paulo Research Foundation (FAPESP), Brazil;
- ii. Federal Ministry of Science and Technology (FMST);
- iii. Raw Materials Research and Development Council (RMRDC);
- iv. Nigerian National Merit Award Secretariat (NNMA);
- v. National Institute for Pharmaceutical Research & Development (NIPRD);
- vi. Forum for Agricultural Research in Africa (FARA);
- vii. Skill-G Innovation Centre;
- viii. Morgan State University, USA; and
- ix. Central State University, USA.

At the core of TETFund's Paradigm Shift is the notion that research should be problem-solving, with outcomes that make a positive impact on the lives of the citizenry. Let me reiterate here, that my passion for research and innovation is anchored on the abiding conviction that the technological and socio-economic advancement of Nigeria will continue to elude us, so long as we continue to pay lip service to R&D, honouring this critical endeavour more in the breach than the observance.

With the NRDF coming on stream imminently, we would be able to conceptualise how to:

- Increase our investment in research, unlocking new discoveries and applying research to solving our most pressing problems in government, industry and across society. We will embrace the idea that transformative research has a high chance of failure but can produce the greatest long-term rewards, especially when combined with support for applied research, development and implementation. Longer-term, we will review how we fund and assess discovery and applied research, to cut unnecessary bureaucracy and ensure that institutional funding and international collaboration can support our ambitions.

- Become adept at securing the economic and social benefits from research. We would be able set up an Innovation Expert Group to help review and improve how we support the whole innovation ecosystem, including strengthening the interactions between discovery research, applied research, innovation, commercialisation and deployment. It will be critical to stimulate private sector investment and support public services to get the most out of our research base.
- Provide long-term flexible investment into infrastructure and institutions. This will allow us to develop and maintain cutting-edge research, development and innovation infrastructure, with agile and resilient institutions able to play their fullest role.
- Engage in new and imaginative ways to ensure that our science, research and innovation system is responsive to the needs and aspirations of our society – delivering better quality of life, economic growth and environmental improvements. We will ensure future generations are inspired to pursue careers in R&D in a wide range of sectors and show that science is for everyone.

The NRDF would kickstart a national conversation on what policy options and actions need to be taken and how. We want to know:

- How can we best increase knowledge and understanding through research, including by achieving bigger breakthroughs?
- How can we maximise the economic, environmental and societal impact of research through effective application of new knowledge?
- How should we strengthen our research infrastructure and institutions in support of our vision?
- How should we most effectively and safely collaborate with partners and networks around the world?
- How can we harness excitement about this vision, listen to a wider range of voices to ensure R&D delivers for Nigeria, and inspire a whole new generation of scientists, researchers, technicians, engineers, and innovators?

## **IMPROVING THE CULTURE OF RESEARCH**

There is a huge amount of work to be done to engender a research culture and make the most of the wealth of talent in Nigeria. We will need to invest in developing, mentoring and inspiring leaders who will then nurture and develop future talent. The overall strategy

will allow us to create a new deal for funding postgraduate research – increasing the investment in research training, models of delivery, stipend levels and helping graduates transition successfully into the next stage of their career, whether that is in academia, industry or in the public sector. We will bring fresh thinking and an increased diversity of perspectives from a breadth of disciplines to support the development of policy and research funding across the country.

The technical workforce is essential to research and innovation – from contributing new knowledge, developing and maintaining equipment and vital national infrastructures to training future researchers and innovators. Their role in research and innovation has been undervalued for too long and this is the time to change it. As the foremost funder of research in Nigeria today, TETFund will continue to build upon existing examples of what works, by expanding delivery of experiential learning and training across its network of Beneficiary Institutions, Centres of Excellence and Research Institutes. We will work with training providers, including higher and further education, and local and national industry sectors to identify skills needs for academia and importantly, industry, where skills gaps are already known to exist. This will be particularly important in the necessary continuous reskilling of the technical workforce at all levels.

Our target is to create a system that unlocks innovation and growth throughout all parts of the economy across Nigeria. We need to work with businesses of all sizes to understand the challenges they face and the opportunities they see. The NRDF would convene an Innovation Expert Group, comprised of experts with the deep knowledge, experience and clear vision to help shape innovation policy, drawing from industry, public services, the investment community and across the relevant disciplines of the research community. The Group will be well placed to provide advice to government on the priority actions and early opportunities that need to be taken to boost innovation.

It would be one of the NRDF's priorities to optimise the support that the Government provides to unlock innovation in the sectors and technologies that can drive Nigeria's future growth and prosperity.

In the short term, this would include identifying the most effective programmes, with input from the Innovation Expert Group.

In some cases, “challenge-based” funding may be the most appropriate lever to address the Government's top priorities, such as food security, health, renewable energy and affordable housing. In other cases, innovation grants or loans – or even taking equity stakes – may be more effective. We would review the evidence on all of these approaches, including from abroad. We want to build on our success with the National Research Fund, alongside longer-term ambitions to put Nigeria at the most auspicious position to imbibe wholly new sectors that are emerging around transformational new technologies such as Artificial Intelligence (AI), Quantum Technologies and Robotics, and in the applications where they combine.

Another underutilised lever is procurement, in which government and public service providers can act as an early adopter and first customer for new Polytechnic research outputs, adaptive technologies and ways of working. We will look to improve how we use government procurement to support innovation and in turn use innovation to improve public services and the use of innovation tools.

We have to make support for innovation available more quickly, easily and flexibly by reducing red tape and providing flexible funding arrangements which support a broader range of businesses and start-ups at the right time. We must explore experimental funding models, building on approaches developed by venture capital firms, enabling us to take more calculated risks.

Accelerating the journey between concept and commercial application is critical to securing the contribution of our fledgeling research base to productivity, growth and social benefits. A common concern with the current innovation landscape is that, while some support is available for early-stage research and development, this support falls away before ideas are commercialised and brought to market. Commercial and entrepreneurial skills and a mindset of enterprise and innovation are important across all academic disciplines to effectively leverage

R&D investments. Productive interaction between the business and academic communities is often impeded by a shortage of the relevant knowledge and skills in research translation and entrepreneurship.

## **CONCLUSION**

Distinguished colleagues, Ladies and Gentlemen, I hope this interaction and the content of our deliberations at this event will:

1. Serve as a veritable reminder of the intrinsic greatness of our Nation, thereby triggering a sense of nostalgic reminiscence, as well as righteous indignation at the parlous state of our R&D infrastructure and superstructure, with a view to taking urgent remedial action;
2. Highlight the perils inherent in honouring the critical enterprise of R&D and innovation more in the breach than the observance and
3. Focus our minds towards rekindling that ingenuity and creative flame that the most populous Black Country on the planet has been so richly blessed with.

Today, Nigerian doctors, scientists and engineers are making waves and remarkable contributions all around the world, including in Europe and North America. Nigerians are continuing to record stellar academic performances at home and abroad. With initiatives like this, we can rest assured that we are on the cusp of laying the foundation for celebrating a bountiful harvest of incredible breakthroughs in all fields of human endeavour in no distant time. The sky, ladies and gentlemen, should no longer be the limit, but rather a pit stop on our journey of creativity, innovation, invention and discovery.

I thank you for listening.

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