Nov 15, 2017

3rd Convocation Lecture:

A University's Obligation to Humanity and the Ecosystem

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SAM ADEGBOYEGA UNIVERSITY, OGWA, NIGERIA

IN THE BEGINNING…..

Protocols:

Acknowledgement

I would like to acknowledge the great honour of being chosen to deliver the year 2017 convocation lecture of this University.

Please accept my most sincere apologies for not being here today in person. Because I'd earlier committed to a Forum in the Middle East, the Lecture will be delivered by **Professor Thomas Ofuya, former Vice Chancellor, Wellspring University,** Evbuobanosa, Benin City. He is an accomplished entomologist, for whom I have a deep respect. So kindly regard this lecture as our joint presentation.

Jointly, we acknowledge the Pro-Chancellor, Elder Bisi Ogunjobi and the Vice Chancellor for providing needed leadership to drive the vision of the founders and proprietors of the University.

The Chairman of the Board of Trustees, Overseer (Dr) Ebenezer Okebukola, JP would probably not remember one little Class 2 boy in Victory College, Ikare in 1969 to whom he served as "College Father" and always protected then.

PREAMBLE

A Convocation Lecture, unlike a shorter Commencement Address in some universities, affords the speaker the opportunity to espouse the intrinsic academic characteristics of erudition and boldness in the perception, dissemination and preservation of the truth, academics being "custodians of the unfettered search for truth".

I have elected to speak on **"A University's Obligation to Humanity and the Ecosystem"**. My goal is "to address higher education generally or specifically, private universities to their purpose and hence mandate", i.e. "relevance to human development and environmental preservation".

INTRODUCTION

- **The Nigerian higher education system, especially the university system and indeed the nation itself are at cross-roads. We have the problems of relevance of higher education to national development aspirations, escalating graduate unemployment and consequent resort of youths to criminality of alarming and dreadful proportions.**
- **In a time like this in other climes, universities, as centers of knowledge generation, propagation and appropriation, have risen to the rescue of their nations** (goggle examples in the university cities of Manchester, Liverpool, Coventry and Newcastle upon Tyne, to mention just a few)**.**
- **So, this Lecture is calling on Nigerian Universities, Public and Private, to rise to the rescue of our nation, using knowledge.**

OUTLINING OUR DEVELOPMENT CHALLENGES

We can perceive this in terms of the 17 Global Sustainable Development Goals (SDGs), and their 169 associated targets (see box 1 in the paper).

In **Goal 1**, the world leaders committed to ending poverty in all its forms and dimensions, including eradicating extreme poverty by 2030, and **Goal 2:** end hunger and achieve food security as a matter of priority and to end all forms of malnutrition.

Goal 3 commits to ensuring healthy lives and promoting well being for all at all ages, while in **Goal 4,** which pertains to education, the leaders committed to providing inclusive and equitable quality education at all levels.

Goal 5 distinctively committed to achieving gender equity and empowering all women and girls, separating it from all other manifestations of prejudice and discrimination.

OUTLINING OUR DEVELOPMENT CHALLENGES

The leaders pledged to seek to build strong economic foundations for all countries, believing that sustained, inclusive and sustainable economic growth is essential for prosperity, and that this will only be possible if wealth is shared and income inequality is addressed.

Goal 11: which committed to "Making cities and human settlements inclusive, safe, resilient and sustainable", relates to the effort of AVCNU "to Build for Nigeria (BFN)", consists of several action points, of which we shall highlight three;

- **by 2030, ensure access for all to adequate, safe and affordable housing and basic services, and upgrade slums**
- **by 2030 enhance inclusive and sustainable urbanization and capacities for participatory, integrated and sustainable human settlement planning and management in all countries**
- **support least developed countries, including through financial and technical assistance, for sustainable and resilient buildings utilizing local materials**

OUTLINING OUR DEVELOPMENT CHALLENGES

- **It is gratifying to note that world university bodies, including the International Association of Universities (IAU), Association of Commonwealth Universities (ACU), the Association of African Universities (AAU), as well as the African Union in its Agenda 2063 have keyed into these commitments.**

- **Nigerian universities, as members of IAU, ACU and AAU must necessarily follow suit and lead Nigeria's commitment to the SDGs**

- **It is therefore also very significant that the various leaders of global institutions, such as the World Bank, IMF, etc have continued to emphasize, especially to African Leaders, including specifically, President Muhammadu Buhari of Nigeria, the need to INVEST IN HUMAN CAPITAL, as in Point 3 above relating to health and education, for these are the drivers of modern economic development.**

THE CHALLENGES FOR NIGERIAN UNIVERSITIES

We must re-strategize to face the future, through strategic re-thinking, and taking cognizance of the following:

- **Serious commitment to HUMAN CAPITAL DEVELOPMENT to mitigate serious deficits in the number of scientists, engineers, high-level expertise, and leadership in Africa.**
- **BRIDGE THE INNOVATION SKILLS GAP, by exploiting advances in ICT, business intelligence and analytics, leadership/planning, other generic skills, etc.**
- **HARNESSING THE INHERENT DEMOGRAPHIC DIVIDEND OF YOUTH BULGE (African Union, 2012) to mitigate dangerously growing youth unemployment and hopelessness, must be pursued vigorously, to avert presently unfolding and looming danger to the polity.**

THE CHALLENGES FOR NIGERIAN UNIVERSITIES

- Unpretentious **NATIONAL COMMITMENT TO A KNOWLEDGE ECONOMY:** STI to drive planning and implementation, and expertise and knowledge systems accorded necessary recognition and practical engagement.

- **A new STRONG COMMITMENT TO RESEARCH: in the entire system, but particularly in science and technology and creating a tech-innovation ecosystem (next slide).**

- **HARNESSING OUR NATURAL RESOURCES FOR SUSTAINABLE DEVELOPMENT,** through good governance and transparency in the extractive industry sector, as well as integrated development of the industrial sector, through strategic growth of micro, medium and small scale enterprises and deliberate promotion of all-embracing knowledge - industry/civil society/environment - government partnership.

UNIVERSITIES AND THE TECHNOVATION ECOSYSTEM

- **Technovation Ecosystem comprises of:**

Universities; Research institutes; Tech businesses; Hubs/accelerators; Entrepreneurs ; Startups; venture capital; industrial mentors; service providers; law firms

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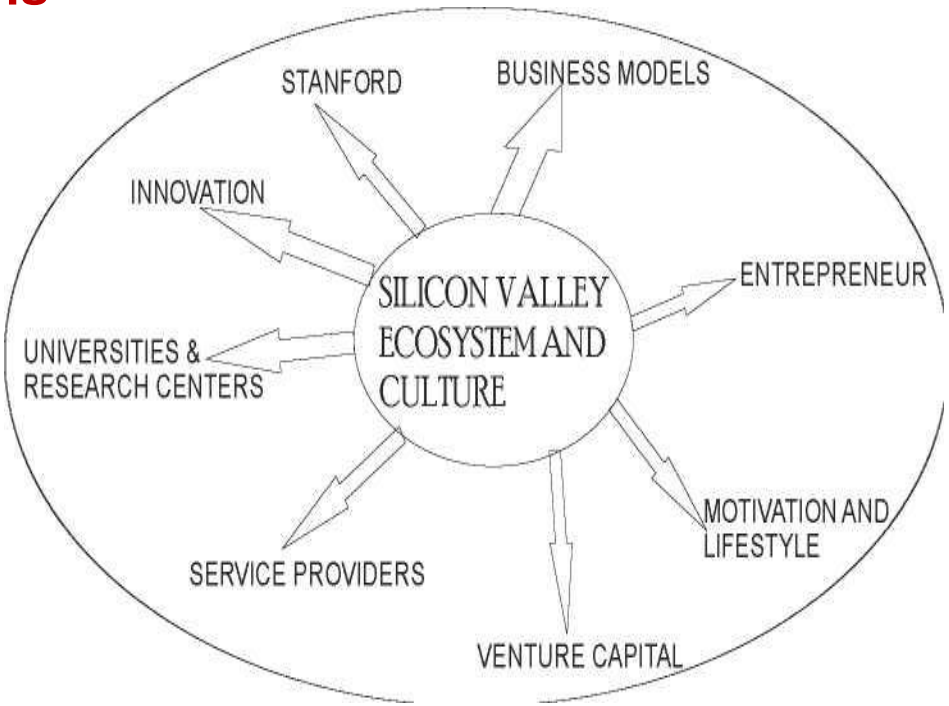


EXAMPLE: THE SILICON VALLEY ECOSYSTEM AND CULTURE

ELEMENTS OF THE INNOVATION VALUE CHAIN

The Global Innovation Index (GII): Developed by Cornell, INSEAD & WIPO: 84 indices

COMPONENTS OF THE VALUE CHAIN:

POLICY/OPERATING ENVIRONMENT:

Institutions (e.g. political environment, regulatory environment, business environment); infrastructure (e.g. ICT's, General Infrastructure, Ecological sustainability); market sophistication (e.g. credit, investment, trade & competition); venture capital/joint ventures.

HUMAN CAPITAL AND RESEARCH:

Human capital & research; Centres of Excellence as innovation catalysts/hubs

ELEMENTS OF THE INNOVATION VALUE CHAIN

RESEARCH & INNOVATION UPTAKE:

Business sophistication (e.g. knowledge workers, innovation linkages, knowledge absorption); Knowledge & technology outputs (e.g. knowledge creation, patent, prototypes, knowledge diffusion); Creative outputs; sustainable knowledge cities or technology parks and knowledge incubation facilities; Co-evolution, etc; Technological learning, Entrepreneurship and Technology transfer

IMPACT (on Industry, Society, Environment):

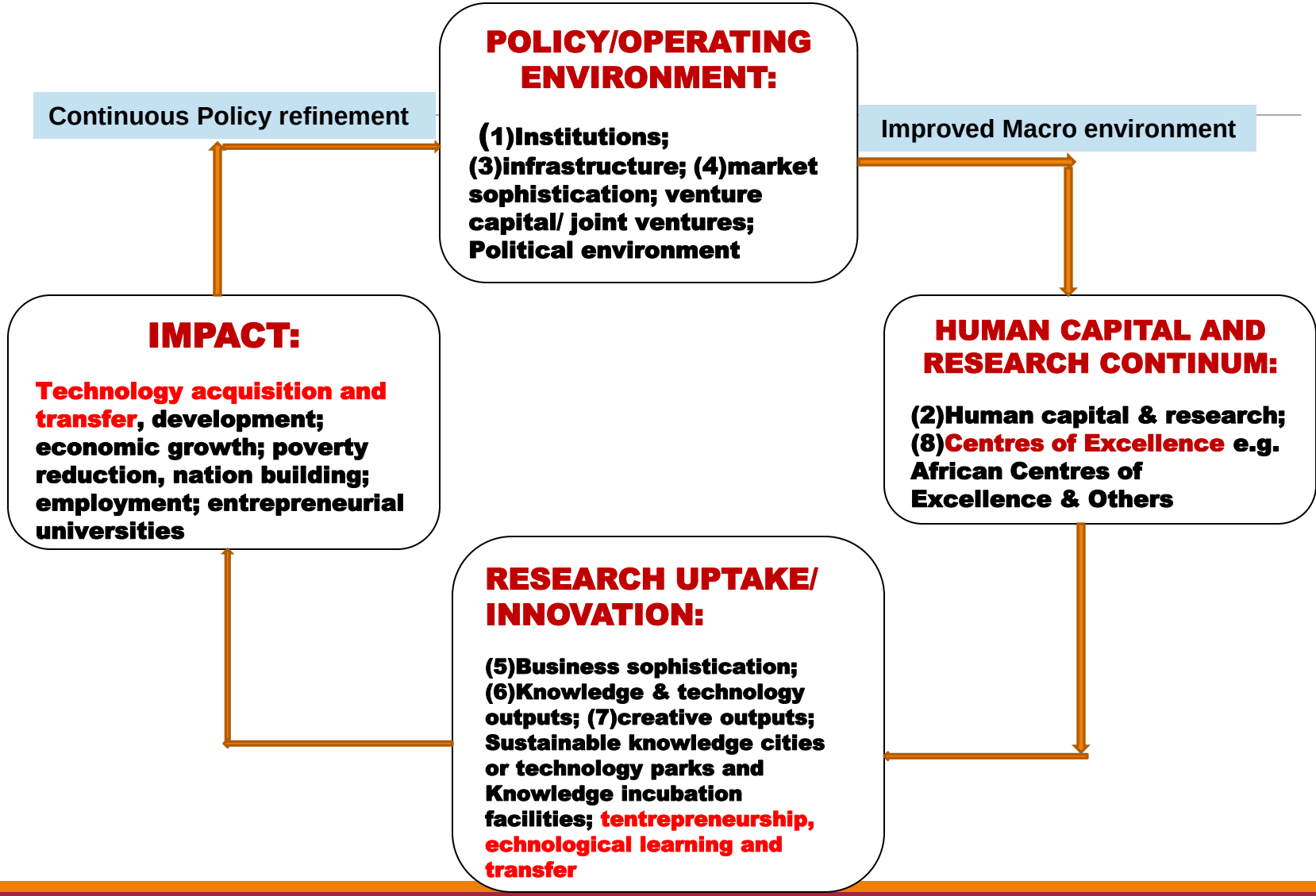
Technology acquisition and transfer; Development; economic growth; poverty reduction, nation building; employment; entrepreneurial universities.

THE INNOVATION VALUE CHAIN

- **Our construct of the innovation value chain (next slide) entails the transition from how POLICY (political vision, legislation/laws, research and innovation funding etc) and the entire national/global environment (fiscal, monetary and industrialization policies, globalization etc) shapes a country's HUMAN CAPITAL, education and research management to generate knowledge and innovation, to how INNOVATION UPTAKE is managed by the National System of Innovation (NSI) to instigate the IMPACT that grows and builds a nation sustainably.**

- **Under research uptake and innovation is the need for the concepts, structures and processes (business sophistication; knowledge & technology outputs; creative outputs; sustainable knowledge cities/technology parks and knowledge incubation facilities) that will instigate and facilitate technological learning and hence technology transfer. IT IS THE ABILITY OF AN ENTITY TO CAUSE THIS TO HAPPEN THAT LEADS TO TECHNOLOGICAL PROGRESS, AS TECHNOLOGICAL LEARNING IS AT THE CORE OF TECHNOLOGY TRANSFER.**

SCHEMATICS OF THE INNOVATION VALUE CHAIN



THE INNOVATION VALUE CHAIN & GII

- **The immediate and ultimate impact of fully traversing the innovation value chain include socio-economic development; economic growth; poverty reduction, nation building; employment generation, which are structurally better reinforced by technology acquisition/transfer.**

- **Countries that score very high on the global innovation index (GII) are those who have accounted well for all the 84 parameters encapsulated in assessing their mastery of the complicated but reassuring trajectory of the innovation value chain.**

- **There are no circumvents, but the trajectory can be modified, varied or shortened by new and emerging knowledge, such as through convergent technologies.**

UNIVERSITIES AS CENTRE OF RESEARCH AND INNOVATION

- **The key role of STI Policy is to fuel Industrial progress. STI policy essentially links the laboratory, the design offices to the factory through the convergence of scientists, engineers, entrepreneurs, venture capitalists and consumers to create new markets locally to raise GDP. Thus, we need to build a professional alliance to turn the current crisis in Nigeria into an opportunity to revive industrial production. This is a task for Nigerian research/innovation schools, led by the university system.**

- **The emergence of the World bank sponsored AFRICAN CENTRES OF EXCELLENCE (see Table 1) and their performance so far has ignited hope that we really can have top rated research institutes that will be able to compete favourably with others in Africa and indeed the world. The ACEs are to be nurtured and developed as top rated research universities.**

NIGERIAN AFRICAN CENTERS OF EXCELLENCE

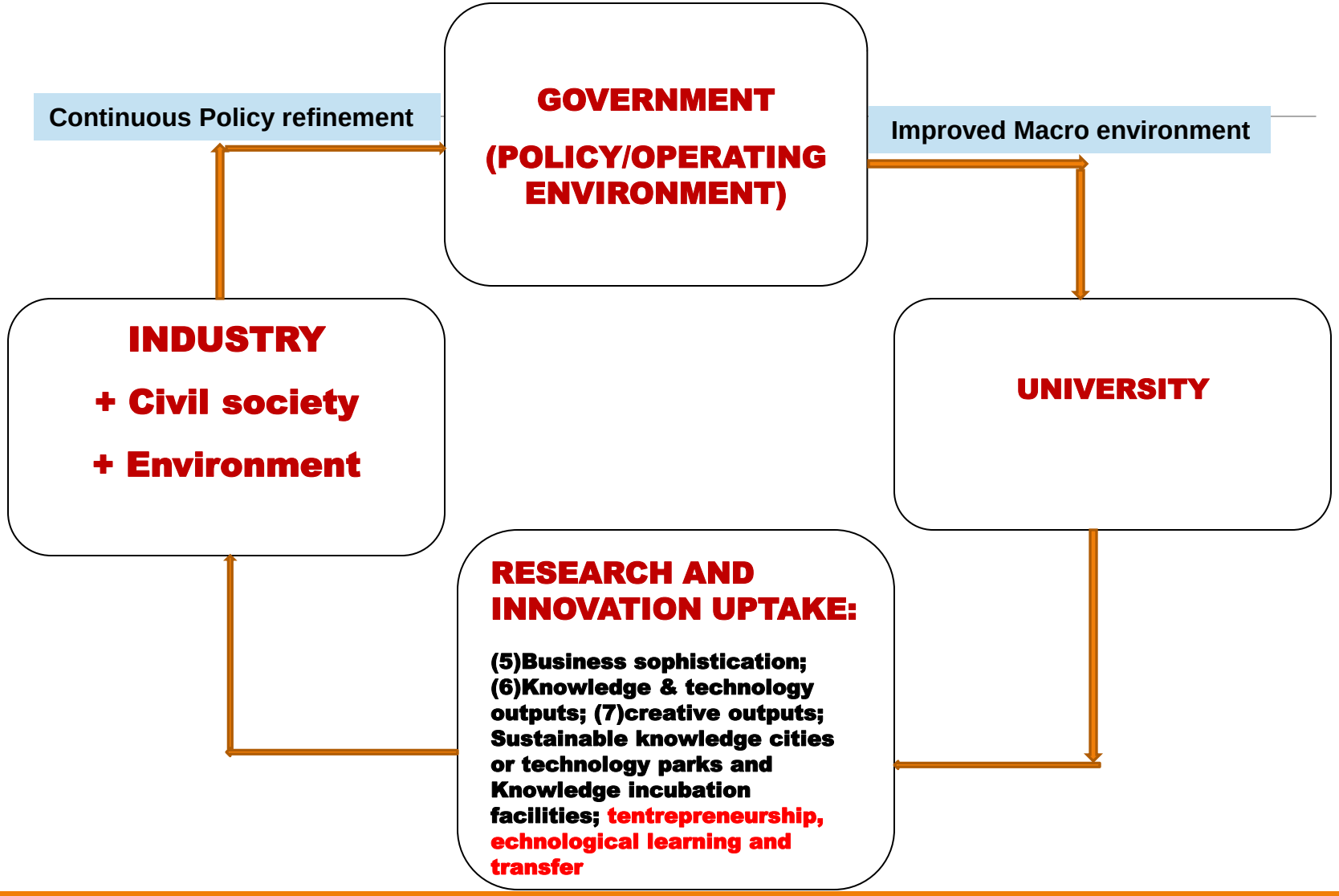
S/ No	Lead Institution	Project Title	Scientific Discipline
1	Redeemers University, Ede	ACE for Genomics of Infectious Diseases	Health
2	African University of Science and Technology, Abuja	PAN African Materials Institute	STEM
3	Federal University of Agriculture, Abeokuta	Centre for Agricultural Development and Sustainable Environment	Agriculture
4	Ahmadu Bello University, Zaria	ACE on Neglected Tropical Diseases and Forensic Biotechnology	Health
5	University of Jos, Jos	Phytomedicine Research and Development	Health
6	University of Benin, Benin City	ACE for Reproductive Health and Innovation	Health
7	University of Port Harcourt, Port Harcourt	ACE Centre for Oil Field Chemicals	STEM
8	Bayero University, Kano	Dryland Agriculture	Agriculture
9	Obafemi Awolowo University, Ile-Ife	National Science Technology and Knowledge Park Initiative	STEM
10	Benue State University, Makurdi	Centre for Food Technology and Research	Agriculture

MODELS OF INNOVATION UPTAKE: RESEARCH-INDUSTRY-GOVERNMENT LINKAGE

- Partnerships between research institutes (universities or otherwise) and industries are crucial to encourage increased research and promote innovation, and the literature is awash with writings on this concept. Recent efforts in China to reform national innovation systems serve to demonstrate the importance of "motivating universities and research institutes, building up the innovative capacities of enterprises, and promoting industrial linkages."

- It is indeed significant to note, in all the three cases studied in this Lecture, the ROLE OF GOVERNMENT/POLICY in assisting and accentuating the collaboration between knowledge/research and industry/civic engagement/practice as encapsulated in the innovation value chain. This is a practical demonstration of the Triple Helix.

SCHEMATICS OF THE TRIPLE, QUADRUPLE, QUINTUPLE HELIX



TRIPLE, QUADRUPLE, QUINTUPLE HELIX

"The Triple Helix innovation model: Focuses on university-industry-government relations. Acknowledges explicitly the importance of higher education for innovation. However, in one line of interpretation it could be argued that the Triple Helix places the emphasis on knowledge production and innovation in the economy so it is compatible with the *knowledge economy*.

The Quadruple Helix Innovation model: Embeds the Triple Helix by adding as a fourth helix the 'media-based and culture-based public' and 'civil society'. Encourages the perspective of the *knowledge society*, and of *knowledge democracy* for knowledge production and innovation. In a Quadruple Helix understanding, the sustainable development of a knowledge economy requires a co-evolution with the knowledge society.

The Quintuple Helix innovation model: Broader and more comprehensive by contextualizing the Quadruple Helix and by additionally adding the helix (and perspective) of the 'natural environments of society'. The Quintuple Helix stresses the necessary *socio-ecological transition* of society and economy in the twenty-first century; therefore, the Quintuple Helix is ecologically sensitive." – (Carayannis & Campbell, 2010).

LINKING THE INNOVATION VALUE CHAIN WITH THE INNOVATION HELIXES

- **The Triple Helix is thus regarded as the simplest depiction of the innovation partnership model that regards the "industry" in the broadest sense to include; industry/firms, people (poor, rich, women, etc) and society and the whole of the terrestrial environment.**

- **The variants quadruple and quintuple helices only add weight and emphasis to civil society/people and the social and ecological terrestrial environment as the fourth and fifth pillars respectively.**

- **When the triple/quadruple/quintuple helices are examined in relation to the innovation value chain model of Figure 1, we can deduce the model of Figure 3, in which the policy domain actually depicts Government, the human capital domain depicts University, and the impact domain in Fig 1 now represents Industry + Civil Society + Environment in Fig 3.**

LINKING THE INNOVATION VALUE CHAIN WITH THE INNOVATION HELIXES

- In essence, the overall impact in the innovation value chain relates to human and terrestrial ecosystem, encompassing industry, society and people as emblemized by civil society advocacy, the land, water, plant and animal environment, the seas and oceans.

- This is a significant novelty that links the helix representation of innovation to the innovation value chain. It can only be inferred further that our dynamic and ever changing or transforming world will continue to evolve with the exploits of knowledge, science, technology and innovation. We are currently in the 4th industrial/nano-digital revolution of the internet of things, and we do not yet completely know where artificial intelligence is taking us, with the emergence of thinking and feeling robots.

LINKING THE INNOVATION VALUE CHAIN WITH THE INNOVATION HELIXES

- **Our greater concern here as Africans, is that Africa must also be part of this evolution as creators of content and not just consumers. It is the African knowledge system, her universities, that can come to the rescue of the continent.**

- **The Nigerian Nollywood analogy gives us hope that we can do it. By putting African content into the global movie/motion picture industry domain, the narratives have since changed, as more and more people now watch African Magic movies and this is cascading to the African music and fashion industries. Yet people have not recognised the place of the quiet artistic knowledge revolutions in the Drama Schools of Obafemi Awolowo University, Universities of Ibadan and Port Harcourt, where the late Olarotimi, Nobel Laureate, Wole Soyinka, Femi Osofisan and late Dapo Adelugba etc, inspired a new generation of actors and actresses.**

LINKING THE INNOVATION VALUE CHAIN WITH THE INNOVATION HELIXES

- **African science and innovation must emulate these developments in the Nollywood, African music and fashion industries and situate African scientific and technological innovation in the locus of local and global transformation. Mr Pro-Chancellor and Vice Chancellor, THIS IS THE THESIS OF THIS CONVOCATION LECTURE.**

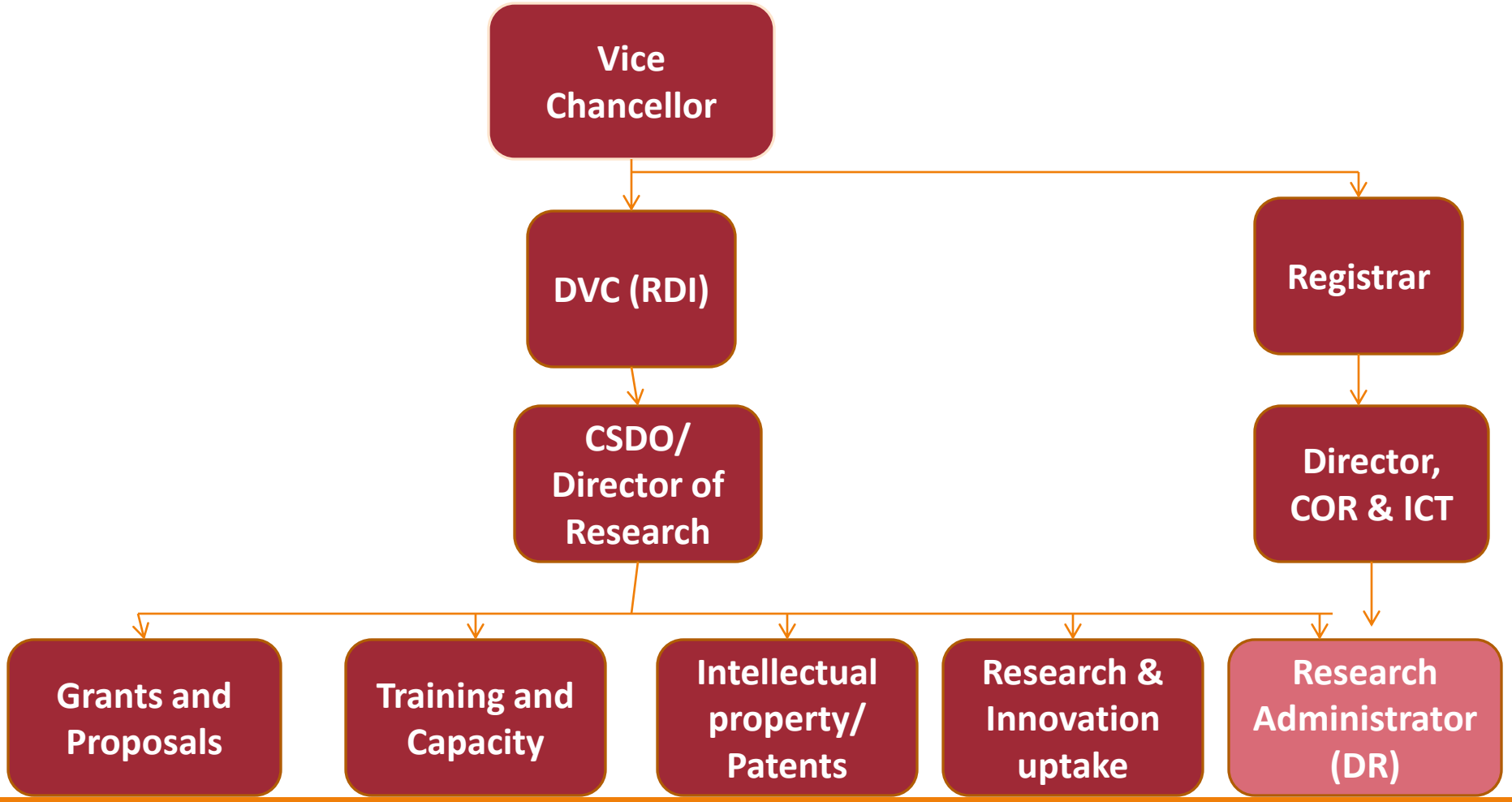
ACHIEVING EFFECTIVE RESEARCH AND INNOVATION UPTAKE

➢The **research and innovation uptake function requires specialised/independent structures (or Special Purpose University-Industry Vehicles, SPUVs).** Available frameworks/models include:

- **University ventures,**
- **Industrial development centres**
- **Incubation centres/hubs,**
- **Science and Technology Parks,**
- **Industrial Parks,**
- **Knowledge parks, etc**

➢**Such vehicles should not impair the basic research and development functions of universities. Hence, governance of such entities must be handled by experts, and separated from academic functions**

TOP-LEVEL RESEARCH & INNOVATION GOVERNANCE STRUCTURES



RESEARCH & INNOVATION GOVERNANCE STRUCTURES

- **There should be a Central Office of Research, with an Intellectual Property Unit: to coordinate all research groups. It must be equipped with necessary research management tools, including bibliographic/citation management tools and linked to the University Library Repository;**

- **There should be a Research Policy for every institution: to ensure that the research function is well coordinated, with clear institutional focus/niche.**

- **There is need to build institutional capacity in Research management, Uptake & Intellectual property Management, Promote Partnership and Collaboration (multidisciplinary, institutional, International and industrial): to ensure conformity with the institution's research policy**

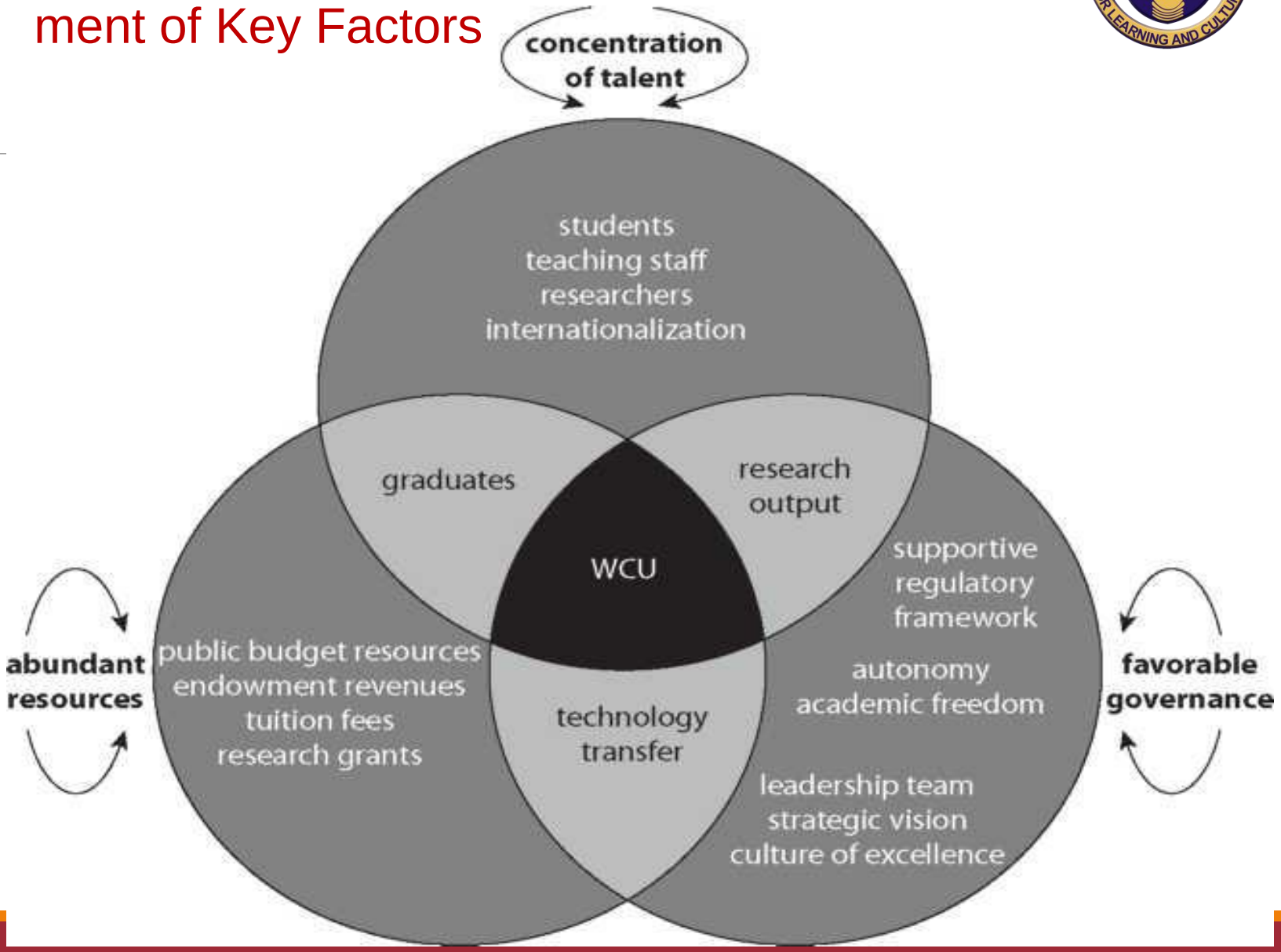
- **Faculties and Departments should have Research Coordinators/Committees**

NOTE: Many universities already have an admin unit for research, but this needs to be strengthened with a DR and combined with ICT to be a substantive Directorate, with a Director. This new structures are necessary to reposition our universities for research and ICT governance excellence.

What did Korea do: Policy programmes for R&D Collaboration

Programme	Purpose/Rationale	Year
Excellent Research Centre (ERC)	Enhance and accelerate technological development capabilities and innovation of firms. Well qualified R&D staff and activate basic research capabilities. 30 since 2003	1989
Regional Research Centre (RRC)	Extends ERCs to regional level. Conduct research strategic regional technology areas. 112 since 2002 in 15 regions	1995
Technology Innovation Centre (TIC)	Develop region-specific technologies by aggregating the technological regional resources. Activate start-ups and promote innovation in SMEs 39 by 2003, merged with RRC in 2005	1997
Technology Business Incubator (TBI)	Encourage creation of start-up coys, linked to universities. 166 by 2003. 930 Coys applied for funds, 322 succeeded.	2000
Business Incubators (BI)	Selects business incubators in universities, RDIs and Private Coys to support entrepreneurs to enhance star-up rate. By 2003, 283: 238 in Universities, 20 in RDIs and 7 in Private Coys & 18 others.	1993
The Techno-parks	Makes virtuous cycle out of technological innovation: university idea-technology development-firms innovation & commercia-lization-profit re-investment in technological development. 6 by 1996.; additional 6 since 2003 for intensification.	1997
Industry-University-Institute Consortium	Boost technological capabilities of SMEs thro knowledge support. At least 7 SMEs to a regional university to form a consortium. By 2004, 218 consortia formed to support 2,900 SMEs. Betn 1993-2000, from 1421 SMEs, 1911 patents applied, 4852 prototypes & 3,350 process improvement.	1993

Schematics of Factor Groups that Make an Impactful World-Class University through Alignment of Key Factors



Technology transfer classification of WCU

Attribute 1: Knowledge Creation and Knowledge Dissemination

Attribute 2: Knowledge Infrastructure

Attribute 3: Centre of Inventive Activities and Technology Transfer

Attribute 4: Facilitation of Knowledge Convergent System

OTHER NECESSARY PRODUCTIVITY ENHANCING MEASURES

- **ENCOURAGING RESEARCH PARTNERSHIPS** (international, regional and industrial), and engaging with academics, researchers and professionals in the Diaspora. There must be a conscious effort to exploit Diaspora potentials, as China, India and Japan have demonstrated.
- **PRIORITISING THE UNIVERSITY'S THIRD FUNCTION** of visible Civic Engagement, such that all staff are aligned to the vision of the university in this regard. Staff assessment must also emphasise and reward exemplary accomplishments.
- **PROFESSIONALIZING THE REGISTRY**, will entail smarter ways of administering research, advancement, teaching excellence etc.
- **CAPACITY BUILDING**, especially focusing on the next generation of research, innovation and technology transfer leaders, scientists innovators, etc. A number of such programmes are emerging; the next Einstein forum, innovative graduate level teaching and research chairs, TETFund development fellowships. Universities must take advantage of these.

PROSPECT FOR TOP CLASS PRIVATE UNIVERSITIES IN NIGERIA

- **We now have 68 private universities in Nigeria out of the total of 154. This trend is becoming an African phenomenon, and it is an indication that the private university concept has come to stay.**

- **Globally the top ranking league universities are indeed private. Of the top 50 universities in the world in 2012, 35 were in the USA, and only one of them, University of California, Berkeley is public while the rest are private.**

- **African private universities must appreciate their niches, self-regulate and envision the giant goals of transforming the world around them through research impact.**

PROSPECT FOR TOP CLASS PRIVATE UNIVERSITIES IN NIGERIA

- **We are indeed beginning to see this manifestation, in the good medical programmes of ABUAD, BOWEN and BABCOCK. In 2015, Surgeons from the Babcock University School of Medicine successfully carried out heart surgery in their newly constructed Tristate Heart and Cardiovascular Center (*Daily Trust*, Oct 12, 2015, p14), while Landmark University is blazing a commendable trail in agriculture.**

- **The national strategy towards top class universities should embrace all institutions. The time has come for us to liberalize access to TETFund research and staff development funds to all universities, including the privates universities. Furthermore, a trust fund should be established to aid the ordered development of private universities, including their knowledge infrastructure.**

SAU AS A TOP-CLASS UNIVERSITY

- **The first question is: what niche for Samuel Adegboyega University to attain top class status? Your strategic plan must identify and promote this to set a research focus for your staff and invariably post graduate students.**

- **The College of Basic and Applied Sciences should work collaboratively in multi-disciplinary teams, to hold the ace to your commitment to scientific and technological innovation, taking advantage of convergent knowledge and practices in genomics, molecular biotechnologies, agricultural and industrial biotechnology, as well as, material science and technology advances in nanotechnology, smart materials, high-performance materials and advanced catalyst materials, etc to chart new frontiers in designing and developing smart materials technologies in several niche areas.**

SAU AS A TOP-CLASS UNIVERSITY

- **We foresee the College of Management and Social Sciences as the pillar of your pedagogical and practical commitment to entrepreneurship *for all programmes and all students*, while the College of Humanities should be creative and innovative, with modern technology to hold its fort in providing the philosophical and ethical basis for the university branding, setting of core values and its progress.**

- **IT WILL BE MY JOY TO COME BACK IN A FEW YEARS TIME TO WITNESS THE CELEBRATION OF THIS EXCELLENCE.**

- **Remember, the requirements to make the SAU strategic vision come true; commitment (by the Proprietors, the University leadership and Community, and indeed by the State Government), funding, talents (staff and students), and good governance.**

CONCLUDING…

- Universities have never been as crucial to nation states as they are today if such nations are to be competitive in the global economy. They need their university sector to produce and apply knowledge, and to produce knowledgeable and well-skilled workers across the skills spectrum. Universities must therefore be well funded and accorded needed recognition, and in return they must respond to this crucial need that will determine their relevance and social value.

- **In this regard, universities generally should have the research uptake and innovation function as their hallmark and most distinguishing feature, requiring specialised/independent structures and expertise or special purpose innovation vehicles (SPIVs) that should not impair their basic academic, research and development functions.**

- African science and innovation must boldly emulate the developments in the 'Nollywood' and African music and fashion Industries, and situate African scientific and technological innovation in the locus of local and global transformation.

CONCLUDING…

- Globalization (in spite of its enslaving potentialities to weak nations in a skewed world order) and the emergence of convergent technologies (nanotechnology, biotechnology and genomics, cognitive science and ICTs) have provided a platform for less developed nations, through their higher education and research institutions, to be active players in the exploitation of science, technology and innovation (STI) for their development, and they must help their nations to take adequate advantage of this opportunity.

- Like every other university, Sam Adegboyega University is entitled to aspire to be a global top-class university, once it can identify its niche and match such determination with the necessity of abundant resources, concentration of diverse global talents (staff, students and other knowledge workers) and more importantly, good governance, both internal and external.

THANK YOU ALL
FOR YOUR ATTENTION