

UNIVERSITY RESEARCH LINKAGES WITH INDUSTRY AND EMPLOYERS OF LABOUR: PANACEA FOR SUSTAINABLE DEVELOPMENT IN NIGERIA

BY

Jeremiah N. DAKU (Ph.D)

National Open University of Nigeria, Lokoja Study Centre, Lokoja

jerrydaku@yahoo.com

08022693458

ABSTRACT

The quest for sustainable national development continues to reverberate in contemporary national agenda in Nigeria. This paper highlighted and discussed state of the Nigerian economy, efforts made by government to achieve national development, challenges of research-industry linkages, strategies to achieve economic and overall development through research-industry-employers of labour partnerships. Nigerians are in a hurry to achieve development in economic, infrastructural, socio-political, cultural and environmental realms. Close to one hundred and fifty (150) Universities and scores of Research Institutes have been established by the Federal and State governments along with the private sector where a good number of students graduate annually. The growth rate seem to increase the growing unemployment rate in the country. The Nigerian economy that depends on oil and gas appear to be just getting out of what is described as the worst economic recession ever. Infrastructural decay, environmental degradation, poor social services, weak political institutions, high crime rate, poverty and hunger our challenges to the nation especially the rural populations. Questions that easily confront us from here are what is the relevance of Nigerian education? and what happens between Nigerian researchers link up with Industry and employers of labour? Major challenges hindering university-industry linkages discussed here include; institutional barriers, nature and size of national economy, cultural differences between universities and industries. To achieve effective partnership among these institutions, it is recommended that the Nigerian government and its institutions need to re-orient their policies to encourage partnerships and joint funding of research and development. The paper concluded that researchers and industry must agree to work together to achieve sustainable development.

Word Count: 261

Key words : **University Research, Linkages, Industry-Employers, Sustainable Development.**

Introduction

The wishes and aspirations of all Nigerians, irrespective of tribe, religion, social status, gender and location are that there should be good life, strong economy, functional social services and infrastructural facilities that are serviceable and/or in good state of repair. Most of the time it is the government that people expect to provide the said good life, which they expect should not only be enjoyed by the present generation but also by generations yet unborn. The role of industry and the private sector, complemented by university research efforts, in providing the much needed good

life is frequently ignored. This may be blamed on the fact that in Nigeria, as in other developing societies, university research capacity appears to be very limited. According to Volmink and Dare (2005), research capacity ordinarily comprises the institutional and regulatory framework, infrastructure, investment and sufficiently skilled people to conduct and publish research reports. In this regard, the Rand Corporation (2001) has described African countries, with the possible exception of South Africa, Egypt, Mauritius and Benin Republic, as a group of scientific laggards. Furthermore, Jones, N., Bailey, M. and Lyytikainen (2007) have contended that African higher education lacks capacity, not only at the system level but also at the level of individual academics. While doubts may be expressed about individual academics not being good enough to conduct useful research in Africa, deficiencies as regards African education systems and institutions can hardly be contested, in the opinion of this writer.

The limited research capacity of universities in developing nations generally and Nigeria in particular, has been described by Altbach (2002 & 2006) as a major hindrance in universities forging partnerships with industry and employers of labour because universities face constraints in funding and the building of research programmes in relevant fields of Science and Technology that would be of interest to industry and employers of labour. Yet it is an established fact that when companies and universities work together to push the frontiers of knowledge, they become a powerful engine for innovation and economic growth (Edmondson, 2012). Edmondson also believes that such collaboration usually ends up transforming the companies or industries while modernizing the roles of the university system. For the elite group of world-class universities, such collaboration is usually a priority because, as The Punch Editorial (2016) puts it, results of innovative research overtime have changed the world. Their utilization by industries in advanced economies has promoted better life for citizens. The Punch was however, quick to add that the story is markedly different in Nigeria as research output often ends up in the shelves of research institutes or in the personal archives of the researchers. In Nigeria, some research agencies have some innovations, especially in the field of Agriculture for improving yields, mechanization or processing of products which Nigerian industries have yet to embrace for development. This, in the opinion of the Punch, has retarded Nigeria's quest for technological development in no small measure.

To effectively address the issues involved in the subject matter of this topic, the paper has been structured, after the introduction, in the following manner : concepts of

university research–industry linkage and sustainable national development, state of Nigerian economy, opportunities for university–industry linkage in developing societies, benefits derivable from university–industry linkage, threats to university–industry linkage in Nigeria, efforts of Nigerian government to promote national development and university–industry linkage, challenges of university–industry linkage, new strategies for university–industry linkage in Nigeria and conclusion.

Concepts of University Research-Industry Linkage and Sustainable National Development

University research-Industry linkage, in the context of this article, carries the idea of partnership, collaboration and cooperation between the universities and industries in conducting research together for the benefit of both institutions. Research, according to Nwadiani (2017), whether it is basic or applied, experimental or non-experimental or even theoretical, is a systematic and organized activity, powered by knowledgeable and capable persons towards finding solution(s) to identified problems or critical needs of people. Basic research usually aims at generating new knowledge without regard to practical application while applied research is oriented toward the solution of immediate problem(s). Research, generally, helps in the understanding of issues that either hurt or promote humanity in mortal estates or among human beings. Research, whatever type it may be, has the following characteristics:

- (a) It is systematic, largely because it follows laid down procedures that guide the entire process;
- (b) It involves a planned organization, adopting relevant research methods to carry out the investigation;
- (c) Due to its scientific nature, questions are raised on one hand and/or on the other hand, hypotheses formulated. Questions and hypotheses are central to the research process;
- (d) To give meaning to the research efforts, questions are answered while hypotheses are tested, using relevant tools for data analysis; and
- (e) Research leads to invention the adoption and application of which brings about innovation. The adoption and application of research invention not only leads to innovation but also to diffusion of such innovation, which is very critical to the contributions of research to human and material development.

Sustainable Development

Sustainable Development has to do with meeting the needs of the present generation without compromising the needs of the future generations (Brundtland, 1987). Development is not just about improvement of communities and the general environment but it concerns individuals. Rodney, cited in Nwadiani (2017), noted that at the level of the individual, development implies

increased skills and capacity, greater freedom, self discipline, responsibility and material well-being. At national level, development entails addressing questions about hunger or food security, health and wellness of the people, unemployment, illiteracy and quality of schooling, income distribution, justice, political institution leadership, poverty, spirituality, physical and social infrastructure, physical security and cherished societal values. It is when these issues or concerns are adequately met, resulting in the improvement and advancement in the quality of life of the people that national development can be said to have been achieved. If the present generation can pass these improvements and advancement to the succeeding generations, then Nigeria can boast of sustainable national development

If the Nigerian University system is to contribute to national development as envisaged in the Federal Republic of Nigeria's National Policy on Education (2013), then the effort to involve universities in the process will have to be re-examined. University-Industry partnerships need to be redefined to include not only the businesses and economic sectors but also the community-based organizations, government and civil society organizations. This is because national development is not limited to economic sector but also the society and the nation at large. In essence, this means development must target all sectors in the nation. The functions of universities, apart from teaching and research, include community service or outreach. Community service or outreach, in this context, includes service to community as well as collaboration with local industries for regional development. This calls for a holistic approach in universities partnering with industry and multidisciplinary research teams, involving the private sector, university, local communities and government can contribute to this holistic approach.

State of Nigerian Economy and Sustainable Development

Nigerian economy, according to Bamiro (a) (2015) has, for decades, relied almost solely on oil and gas even when this long term reliance on the oil and gas sector has not and cannot lead to the required industrialization of Nigeria, for the main reason that oil and gas sector is an enclave. One of the most important prerequisites for economic well-being and prosperity of any nation, Bamiro has insisted, remains sustainable development which oil and gas cannot offer to Nigeria. The rather poor local content in the oil and gas sector has contributed to the weakness of Nigeria's technical manpower coupled with weak capital goods industry. Oil and gas companies do not patronize local Nigerian materials, such as timber, paints, cables and cement because, according to their consultants, these materials are deficient in both quality and quantity and cannot meet their prescribed standards. Unemployment and under-employment have continued to bedevil the Nigerian state. Sadiat (2014) has reported that even the National Population Commission (NPC) has confirmed that unemployment in Nigeria rose from 21.0 percent in 2010 to 23.9 per cent in 2011.

Daku & Oyekan (2014) have also reported a rising trend of unemployment from 21.0 per cent in 2010 to 29.5 per cent in 2014. Details of this steady rise in unemployment are presented in table 1.

Table 1 : Unemployment Trend in Nigeria between 2010 and 1st Quarter 2017

S/N	YEAR	PERCNTAGE
1	2010	21.1%
2	2011	23.9%
3	2012	NA
4	2013	24.3%
5	2014	29.5%
6	2015	12.1%
7	2016	13.9%
8	2017	14.2%

SOURCES : Maicibi & Daku, 2017, P.108. and NBS, 2017, P. 2. NA =Not available; NBS = National Bureau of Statistics.

On why there is massive unemployment in Nigeria, so many reasons have been adduced by different authors or scholars. Adebayo (2013), Abari, A. O., Oyetola, I. O. and Okunaga, A. A. (2014) and Nigerian Education Reports Editorial (2014) all reported poor quality of graduates, irrelevant qualifications to job requirements, poor national development, laziness on the part of graduates and leadership ineffectiveness in Nigeria as well as disparity between what is taught in tertiary institutions, (especially in universities) and industry as well as labour. Other authors, like Aluko (2017) and Haruna (2017) have also blamed the curriculum in use in universities. While Aluko quoted Dr. Sam Amaga, Chancellor of Salem University as saying that the Nigerian University curriculum is “obsolete, orthodox and lacking in creativity and innovation...73% of Nigerian University graduates are unemployable because Nigeria has clung to the generic educational system she developed or inherited in the 1960s” (Aluko 2017 : 10), Haruna advocated the need to look at the curriculum in Universities as it is today to see whether it is actually relevant to the Nigerian societal needs, adding that there is need to inject more Science and Technical Education into the curriculum in order to develop entrepreneurs and innovators, to produce people that can be self-employed and contribute to the growth of the economy.

Nigerian economic space is still infested with rising and frightening crime and criminality, which Maicibi & Daku (2017) have attributed to the stunted Nigerian national development. Rich and influential Nigerians and their relations have become endangered species because they are now targets of armed robbers, kidnappers and even cultists. There is widespread inequality among Nigerians and a very high poverty rate. According to Maicibi & Daku, peace and harmony seem to be eluding many Nigerians and the existence of Nigeria as one, indivisible nation, is being

threatened. This insecurity is, largely man-made, leading to terrorism, kidnapping, robbery, insurgency, vandalization of public assets and demands for secession by some parts of the country. It is an established fact that insecurity hinders development in many ways – including low productivity or no productivity at all, diversion of resources towards measures aimed at combating security challenges. Nigeria cannot hope to develop, let alone sustain her development under these insecure circumstances. This appears to be the reason why Bogoro (b) (2015) has advised that aside from cultivating and maintaining peace and harmony, there is need to diversify Nigerian economy into no-oil sectors to provide services, produce consumer and capital goods, create new products and processes, generate new companies/opportunities and provide, in the process, unlimited new jobs for the population. Machando (2000) believes that the new industrial revolution that can result from such diversification of the Nigerian economy will multiply the technology management complexity ten-fold. Nigeria's quantitative requirements in terms of number of skilled human resources will be astronomical. They will have to satisfy the needs of existing enterprises, newly created enterprises, innovation agents, such as research and development centres, consulting enterprises, standards and metrology boards, financial institutions science and technology policy agents, incubators and many others. There will, then be plenty of job opportunities in the country.

Opportunities for University-Industry Linkage in Developing Societies

There is no doubt that universities are under pressure to make their products relevant to economic and social needs of Nigerians and one of the ways they can achieve this is collaboration with industry to support the growth of regional and national economies. Factors that can facilitate University-Industry linkages anywhere in the world, according to Vedovello (1997) and Bercovitz, J., Feldman, F. M., Feller, I. and Burton, R. (2001) include the following :

- (i) Universities' research productivity;
- (ii) The organizational structure of Universities which is an important dimension in their technology transfer performance; and

Geographical proximity between Universities and Industry or companies can also facilitate partnerships between them, especially if such Universities have high research products.

Unfortunately, in most African countries, linkage or collaboration between local industries and universities and /or research institutes, is not common. This, in part, is why the business of transforming research results to products or technologies is usually left to the individual researcher(s), who, without the necessary institutional framework and experience, only allows or allow the idea to gather dust in their shelves or in a little known journal. (Bamiro, 2015a). In the specific case of Nigeria, Creso (2014), held that only very little is known about the relationship between universities and industry because empirical studies of university-industry linkages have

focused mainly on technologically developed countries. Because these linkages usually involve sophisticated research and innovations, universities in developing countries generally and in Nigeria in particular, are thought to lack the ability to engage more constructively with industry. Yet, opportunities abound for university-industry linkage or collaboration in all developing societies, Nigeria inclusive. According to Bogoro (2015a), such opportunities are limitless with long term planning, coordination and organization between universities and industry. Such opportunities include the following:

- (a) There must be clear partnership policies that are integrated into broader national development strategies at the system level;
- (b) Administrators in universities should take the lead and engage industry by demonstrating the capacity of universities to answer to business sector priorities; and
- (c) Many opportunities abound in such sectors as Agriculture, Engineering and Telecommunications.

UNESCO (1994) launched the University – Industry Science partnership programme in Africa to promote cooperation between Universities and Industries in Africa. The idea was to :

- (a) facilitate indigenous technology development by transferring research results from Universities to industries to assist the continent in indigenous technology development that would be specifically targeted at small scale manufacturing enterprises and their local problems.
- (b) Dill and VanVught (2010) have advocated the stimulation of technical advance in industry, which he viewed as a necessity for promoting economic growth and one of the ways to achieve this is University–Industry partnership. Policy makers across countries, including developing ones, are seeking to stimulate Universities to become more entrepreneurial, engaging more actively with the productive sectors in order to generate employment and grow the economy. They argued that the best way to address the call for relevance of Universities in promoting economic development is by encouraging stronger and sustainable linkages between Universities and industries. Such linkages are particularly relevant in Nigeria as Universities were established with a specific mission to contribute to nation building.
- (c) Universities can only contribute to technological innovations relevant to industry in, among others, the following ways :
 - (i) Conducting research in technological fields relevant to industry;
 - (ii) Providing technical assistance to local firms;
 - (iii) Educating well-trained professionals; and Supporting faculty to engage in consulting and commercialization activities (Geiger and Sa, 2009).

Benefits Derivable from University-Industry Linkages

If and when ever Universities and industry successfully link up or collaborate to conduct relevant research on the activities of the company, Edmondson (2012) and Bogoro (b) (2015), believe that the following benefits are derivable:

- (a) universities can benefit from additional funding for research, graduate practical training, facilities and equipment because there will be substantial streams of external funding;
- (b) University researchers and their students benefit from the opportunity of working on real – world problems faced by industry. This opportunity presents researchers with new ideas
- (c) Professors and graduates have enhanced opportunities to work on ground-breaking research;
- (d) Students gain valuable practical experience just as Universities get vital inputs to keep teaching and learning on the cutting edge of the various disciplines
- (e) Industries gain access to specialised expertise, the latest knowledge in relevant disciplines and potential future employees (students) and they enjoy the impact of the solutions to global challenges being delivered to them by researchers.; and
- (f) knowledge that feeds into their innovative processes, improved products and processes as well as technical solutions to their problems.

Threats to University- Industry Linkages in Nigeria and Reasons for them

Nigeria, ordinarily, is a land of great opportunities yet it has remained a sleeping giant of Africa with very slow pace of development. Research and innovation that arise from university-industry linkages and have played prominent and strategic roles in the development of leading nations of the world have been hampered seriously because of the weakness of the partnerships that exist between universities and industry in Nigeria. Some of the reasons why University-Industry linkages are encouraged and facilitated in advanced societies include the trend in high technology industries towards better and closer linkages with University research, firms' readiness to seek out multiple sources of knowledge, which is critical for success in fiercely competitive markets (Chesbrough, 2003). These conditions drive large companies to establish more partnerships with research institutions, where knowledge is generated and advanced. While some of the afore mentioned conditions can be said to exist in companies operating in Nigeria, there are several reasons why the enabling institutional arrangements for such partnerships have not developed over the years and these, according to Bamiro (b) (2015) include :

- (a) Weakness of the research infrastructure which leads to the scarcity of Scientific research of economic value;
- (b) The nature of the local industries which tend to be infant factories of particular parent factories which are located in Europe and America. These local industries do all their technology

development through their foreign parents and therefore, they have no reason to develop partnerships or linkages with local universities and research institutes;

- (c) The issue of relevance of research work even where universities develop their own research agenda based on their career advancement needs. Most of the university research works are irrelevant to industry needs because industries have no input into the subject matter of such research works;
- (d) Local industries and entrepreneurs have no desire to forge partnerships with Nigerian universities/research institutes because their research results cannot be commercialised. This inability to commercialise local university research results has often led to frustration among Nigerian Scientists and ultimately, to brain drain in the country.

Efforts of Nigerian Government to Promote National Development and University-Industry Linkages

In the desperate bid to promote sustainable national development and university-industry partnerships the Nigerian government has taken certain bold steps. Some such steps include the following :

- (a) Subscription to international development initiatives, like the Millennium Development Goals (MDGs) (2000 -2015), now translated into the Sustainable Development Goals (SDGs) (2016 -2030), the World Summit on Sustainable Development (WSSD), The Blair Commission Report for Africa (BCRA) and the New Partnership for Development in Africa (NEPAD). These development programmes have stipulated time limits and globally defined measurable indicators of progress. They all recognise that sustainable development pillars, which are economic, environmental and social pillars of development. Nigeria joined them to receive assistance, since they preach the need for developed/developing countries to forge global partnerships to fight climate change, champion free and fair trade, technology innovation, transfer and diffusion as well as promote financial stability and also learn from them the techniques and processes of national development (Bogoro, 2015b).
- (b) Formulation and implementation of relevant policies in the areas of education, Science and Technology as well as Research and Development. These include :
 - (i) **National Science and Technological Policy**, which was first formulated in 1986 and was reviewed in 1997, 2003, and finally in 2005 by Nigeria working with UNESCO. This review by Nigeria and UNESCO was tagged Science, Technology Innovation (STI) reform initiative. It stressed that economic development initiatives, institutional governance, research and development (R&D) agenda for the country, funding mechanisms, intellectual

property (IP) and Science, Technology Innovation infrastructure development be adequately by government in any other future Science and Technology Innovation (STI) revised policy.

(ii) **The National Policy on Education (NPE)**, was first formulated in 1977 and has undergone several revisions until the 6th and latest edition was published in 2013. Section 3, sub-section 56c of that policy says that Vocational Enterprises Institutions shall provide technologically based skill training that ensures that students understand how their expertise fits into improving the society and fulfilling national goals. Section 5, sub-section 87 says, concerning University research, that it shall be relevant to the nation's developmental goals. Particular attention shall be paid to research and promotion of indigenous knowledge in Nigeria. ... Universities shall be encouraged to collaborate with government, industry and the global community in the context of research and dissemination of research results. Sub-section 90 provides that Technologically-based professional courses in Universities shall have relevant industrial, professional experiences and other components such as exposure to relevant future working environments.

(iii) The Federal Universities of Agriculture, Act, CAP. F 22 Laws of the Federation of Nigeria (LFN) (2004) and Federal Universities of Technology, CAP.F 23, (LFN) (2004) are laws that envisioned University – Industry linkages. The Universities were mandated to identify Agricultural and Technological problems and needs of Nigeria and find solutions to them within the context of overall national development, which they believed, could be achieved through an effective partnership between universities and industry. Unfortunately, the focus of universities, for now, is chiefly on training the workforce with less emphasis on directly impacting on national economic development.

(c) Emergence of Tertiary Education Trust Fund (TETFund)

The emergence of TETFund is a direct result of funding crises in the higher education sector in the 1980s and 1990s (Bogoro (a), 2015). Since its introduction, the largely ugly trends of lack of facilities, equipment, training opportunities for academic staff and many of the other problems that bedevilled tertiary education institutions before have now been largely addressed by TETFund's intervention through the following programmes

(i) **National Research Fund**, which was introduced to promote the evolution of knowledge-based, globally competitive Research and Development (R&D) driven socio-economic development process in Nigeria. A total of 3 billion Nigerian Naira has been set aside by the Federal Government of Nigeria as National Research Fund and a 21- man committee has been set up and inaugurated by the Federal Government to manage it (Idoko, 2017).

(ii) **Establishment of Research and Development (R&D) /Centre of Excellence Department in 2014.**

The department was created to work with the National Research Fund to aggressively promote collaborative research and development activities (partnerships) across the tripod of government – academia – industry to enhance commercialization of research and development outputs and thus ensure sustainable job creation, wealth generation and increased local content in industrial production activities.

The National Research Fund, to be operated by the 21- man committee under the Research and Development / Centre of Excellence and with the supervision of TETFund, are charged to achieve the following specific objectives :

- (i) To promote Research and Development (R&D) as a national imperative towards technological revolution and sustainable economic competitiveness;
- (ii) To institutionalize research and development through research and innovative partnerships between universities/research institutes, industry and government;
- (iii) To provide funding support for the public tertiary institutions to establish and sustain research and development units towards uptake, parenting and commercialization of innovative research outputs or results;
- (iv) To ensure collaboration between research committees of TETFund/tertiary institutions and research and development committees of industry and public agencies for synergy and uptake of innovative research findings;
- (v) To advocate for the establishment of a National Research and Development fund as a policy of government;
- (vi) To support and promote problem-solving research activities in priority areas of national development;
- (vii) To create research leadership and competence in institutions of higher learning by developing the tools of Science, technology and innovation in a socially responsible manner;
- (viii) To sustainably promote integrated capacity building (human, infrastructural and institutional) activities in order to encourage public-private-domestic/international partnerships; and
- (ix) To promote multi-disciplinary research and multi-stakeholder collaboration in the national interest,

Despite these elaborate efforts by the Nigerian government, aimed at ensuring sustainable national development through university-industry linkages, not much appears to

have been achieved. The Blair Commission Report (2005) has revealed that many African countries (Nigeria inclusive) still lack scientifically and technically proficient staff that can identify opportunities arising from innovation and scientific discoveries and develop policies in the areas of science, trade and resource management. African countries continue to lose skilled manpower to the developed world through brain drain. The report estimates that around 70% of Ghanaian medical officers trained in the 1990s have left home and it has also been estimated that there are more African Scientists and Engineers working in the United States of America than in the whole of Africa. Many of Africa's higher institutions of learning lack required infrastructure, internet services, libraries, textbooks, equipment, laboratories and classroom spaces even when the demand for education is increasing. Hit by these pressures and a lack of adequate funding, the report added, the research capacity of Africa's institutes has declined. Existing capacity is not being used efficiently as there is limited collaboration, human and financial resources are spread thinly and the Science gap between Africa and the rest of the developed world is widening and is likely to continue to grow.

Challenges of University – Industry Linkages in Nigeria

Several fundamental problems have, over the years, militated against the much desired university research – industry linkages. Some of the problems are institutional in nature while others may be linked up to the long established classical approach to research and development (R&D) within the university system. Essentially, the challenges', according to OECD (2009),Bogoro(b) (2015) andMacharia (2017) may be summarised as follows :

(a) Institutional Barriers.

These barriers stem from the differences in cultural climate between universities and industry. Some of the differences include the fact that :

- (i) While the University is knowledge-directed and cherishes abstract theoretical thinking, industry is action-directed and cherishes concrete, practical thinking;
- (ii) Universities encourage a strong partition into single Scientific disciplines and sub-disciplines but industry encourages a multi-disciplinary approach to challenges because the average real industrial problem is multidisciplinary in nature and has to be approached holistically;
- (iii) Industry or economic operators have long considered Science and Technology an academic exercise that has only long term implications and is, therefore, of little relevance to their current or prevailing concerns;

- (iv) Researchers in universities have, for years, been concerned with the imperative to “publish or perish” and had practically no interaction with the economic operators;
- (v) There is a general lack of confidence by industry in the ability of universities to contribute to economic and this is exacerbated by weak investments in research infrastructure and poor governance practices, such as corruption;
- (vi) There is a lack of strong leadership capabilities of university administrators, which hinder effective university – industry partnerships;
- (vii) Local Nigerian industries (which are usually on a small scale) have limited financial capacity to partner with university because of the size and nature of the economy.

(b) Nature and Size of national economies and Research infrastructure in Developing countries.

The nature and scope of African economies in general and Nigerian economy in particular, is a major structural factor that hinders linkages between universities and industry. The overwhelming majority of Nigerian and other African countries’ corporations are branch offices of Multinational companies and so, decisions on where to invest in research and development are made at the headquarters of such corporations. In the circumstance, partnerships between universities and industry are hardly ever made with local universities.

(c) Cultural Differences between Universities and Industry or Private Sector

- (i) The view that universities act as “Ivory Towers” has itself become a barrier to linkages between universities and industry. Some private sector personnel believe that some university Professors have the attitude that there is nothing new to learn from industries and that they are difficult to get in touch with;
- (ii) Some business sectors also have little awareness of the academia because some business owners lack university training and knowledge to understand the context and culture of universities;
- (iii) The academia and industry have different sets of goals and priorities. While industry is concerned with bottom line and short term goals, universities tend to prioritize long term goals and partnerships. Industry looks at specific problems with commercial implications, while universities tend to look at the multiple angles of issues;
- (iv) Lack of confidence in universities by industry and some members of the public.

(d) Weakness of Research Infrastructure and Poor Funding

The very weak research capacity, coupled with poor funding of research and development in less developed countries, like Nigeria, have inhibited sustained research role and prevented universities from training a large number of Scientists and retaining productive researchers in their countries (Mohammebhai,2008, Boulton (no date), and Atuahene, 2011. Consequently, there is a huge gap in the existing literature on University-Industry linkages in, especially Africa. What we have with respect to University-Industry partnerships are mere reports and conference publications of various national, regional and international organizations (Massaouri, 2002; Kruss, Lorentzen, Odekunle, Adeyinka, Nabudere, Mukasa, Eabaro, and Mananja, (2009), AAU (2000 & 2012) and World Bank(2010 & 2012)

(e) **Dearth of Relevant Research Literature in Less Developed countries.**

The existing gap in the literature on University-Industry linkages is worrisome because many international donors have acknowledged the contributions of higher education to economic development (Yusuf, 2009).The report by AAU andAUCC (2012) on the state of university-industry linkages in Africa generally and Nigeria in particular, has revealed the following :

- (i) University research output is limited by the low percentage of academic staff with Ph.D training and qualifications as well as brain drain of qualified Scientists;
- (ii) Many African universities have attempted to foster linkages with firms by creating offices and staff positions in charge of such affairs but that such offices lack the material resources and expertise to handle industry partnerships and technology transfer successfully;
- (iii) In Africa, there are very few Science parks and technology incubators in academic institutions. African universities hardly engage in managing Science parks and technology transfer;
- (iv) A good number of African industries are mainly extractive and natural resource-based. Branches of multinational corporations own most of these industries and their headquarters are in developed countries, where they perform their research and development activities. The technology used by

multinational companies in Nigeria is , thus, imported, which is why they do not collaborate with Nigerian Universities in matters of research and development. It also contributes to our over-reliance on imported technology and prevention of the development of local inventions and innovations.

- (v) Poor funding, resulting in poor quality of researches conducted, irrelevant findings to the needs of industry as well as prevalent weak coordination and collaboration between research institutions, civil society and industry are all among factors that limit or hinder partnerships that would have brought about economic buoyancy and lots of jobs for the teaming, qualified youths in Nigeria.

New Strategies for University – Industry Linkages in Nigeria

For Nigerian Universities to contribute more actively to innovation, industrial and economic development in Nigeria, there is need for both universities and industry to collaborate and make their ample contributions in that regard. Universities should endeavour to champion or stimulate debates on local economic, social and technological challenges. At such events, academics and industrial representatives and other stakeholders should be hosted. Such debates and events, hosted by universities can facilitate engagements and interactions between academics and industrialists. Industry, on the other hand, should work with higher education institutions to improve research and training capacity, such as providing internship positions for students, establishing educational standards, making their staff available for guest lectures and bringing their own expertise to universities. They can establish educational standards to inform the curriculum and educational experience of students in relevant fields. Industry can also be a supportive partner in the creation, support and staffing of research laboratories through gifts, donations and research funding.

Bogoro (a) (2015) has argued that ensuring new and more effective strategies for research and industry partnership has two levels – the policy and institution-based levels:

(a) Policy Level

- (i) There is need for a new partnership compact between industry and researchers, with government ensuring more sustainable funding support from the industry as a national policy;
- (ii) There is need for a new legislation to guarantee better funding for Science, technology and innovation;

- (iii) The legislation – backed establishment of a national Research and Development (R&D) foundation (NRDF), with multiplier effects and benefits to research, the industry and sustainable development of the economy;
 - (iv) There is need for improved budgetary sources of funding for research and education; and
 - (v) Need for more incentives, revised value and reward system and attitudinal change by officials and staff of universities and also of industry.
- (b) Institution – based level**
- (i) It is very important that universities and other institutions of higher education must have heads (Vice Chancellors, Provosts and Rectors) that are innovative and have capacity to, not only effectively and frugally manage resources, but also attract grants and funds to their institutions;
 - (ii) Square pegs must be planted into square holes. This implies that only suitably qualified persons should be appointed and/or elected into very sensitive academic positions, such as Directors of Research and Development Institutions, Deans of Post-graduate Schools and Directors of Pivotal Research and Academic Centres/Units;
 - (iii) Senior academics going on sabbatical leave to an industry must justify the relevance of their sabbatical leave and must write technical reports that show evidence that their sabbatical leave to the industry or any public agency or research and development desk or otherwise, added value to the tertiary institutions' research and innovation priorities. Sabbatical leave cannot and should no longer continue to be for mere added personal financial benefits only.

Conclusion

The fact that university-industry partnership has contributed a great deal to national development in advanced countries is never in doubt. It is equally true that developing countries are yet to benefit from university-industry linkages due to a number of reasons, including the fact that university-industry partnerships are hardly ever encouraged in developing countries as a result of the dependent nature of the economies of such countries, poor funding of research and development programmes, the culture of aloofness taken on by universities in developing countries and the cultural differences between universities and industry. The government of Nigeria, having realised the relevance of university-industry partnerships to the socio-economic of the country through job creation and betterment or improvement in the lives of the people, has taken steps by way of partnering with international organizations, development of policies in Science and Technology and the establishment of research and development department. Yet the country remains disadvantaged as regards achievement of development through university-industry partnerships.

For Nigeria to make progress in the area of sustainable development, government has a vital role to play, not just through policy formulation and effective funding mechanisms but universities, themselves, should continue to build capacities by improving their human resources training and developing communication strategy with the outside world. Industry should be more willing to cooperate with universities in funding economically relevant research activities and programmes. Specific action to strengthen Science, Engineering and Technology to enable Nigeria to find her own solutions to her problems and to bring about step-changes in the areas of health, water supply, energy and sanitation is not only desirable but necessary. Such action will also facilitate improvements in dealing with the new challenges of urbanization and climate change and assist Nigeria to critically accelerate economic growth, job opportunities and to enter the global economy. Routine university research, which is generally directed at improving and up-grading academic staff, should be focused more on economically relevant activities both to improve graduate employment and raise their appeal to the productive economic sector. If these steps are taken, Nigeria will be the better for it.

References

- Association of African Universities (AAU) (2012). *Report on technology generation and uptake in African Universities*, Accra, Ghana, AAU Publications.
- Association of African Universities & African University College of Communications (AAU & AUCC) (2012). *Strengthening university-industry linkages in Africa : A study on institutional capacities and gaps*, Addis-Ababa, AAU Publications
- Abari, A. O., Oyetola, I. O. & Okunaga, A. A. (2014). Institutional leadership effectiveness and higher education for innovation and development, *Journal of Educational Review (JER)*, 7(1), January-March, 2014.
- Adebayo, J. A. (2013). Private Universities : The journey so far, *Nigerian Educational Reports*, 1 (2), April-May, 2013.
- African Union (2008). *Study on the informal sector in Africa*, Sixth Ordinary session of the Labour and Social Affairs Commission of the African Union, Addis Ababa, AU Publications.
- Altbach, P. (Ed.) (2002). *The decline of the guru : The academic profession in developing and middle income countries*, New York, Palgrave/ Macmillan.
- Aluko, O. (2017). Some Nigerian Varsities' Courses are obsolete, says Sam Amaga, *The Punch Newspaper*, 41(217990, Friday, August, 11, 2017.
- Atuahene, F. (2011). " Re-thinking the missing mission of higher education : An Anatomy of the research challenges of African Universities, *Journal of Asian and African Studies*, 46(4), pp 321-341.

- Bamiro, A. O.(a) (2015).*University-Industry partnership in the innovation process : Cases for Nigeria and Ghana*, Published in the proceedings of the Regional Conference on Innovation Systems and Innovation clusters in Africa, Dar-esalam/Baganuwo, Tanzania, February 18 – 20, 2015, pp.341-366.
- Bamiro, A. O. (b) (2015).*The Nigerian University system and the challenge of building a World-Class Science and Technology institution*, Convocation lecture delivered at the Modibo Adama University of Technology, Yola, August, 14, 2015.
- Bercovitz, J., Feldman, M., Feller, I & Burton R. (2001).Organizational structure as determinant of academic patent and licensing behaviour : An exploratory study of Duke Hopkins and Pennsylvania State Universities, *Journal of Technology Transfer*, 26, June, 2001, pp, 21-35.
- Bogoro, S. B.(a) (2015).*Institutionalization of research and development (R&D) as launch pad for Nigeria's technological revolution*, Being an invited paper presented as the guest lecturer at the 62nd University of Ibadan Inter-disciplinary Research Discourse HELD at the main hall, Conference Centre, University of Ibadan, Nigeria, Tuesday, December, 9, 2014.
- Bogoro, S. B.(b) (2015). *The imperatives of a national research and development fund (NRDF) to fasttrack knowledge-driven development in Nigeria*. Being a lecture delivered at the Federal University of Agriculture, Makurdi, August, 3rd, 2015.
- Boulton, G. (No date). What are Universities for ?www.newstateman.com : www.universityworldnews.com. Retrieved on August, 10. 2017.
- Chesbrough, H. (2003).*Open innovation : The new imperative for creating and profiting from technology*, Boston, Harvard Business School Press.
- Creso, M. & Sa, C. (2014).*Perspective of Industry's engagement with African Universities for the African Association of Universities*, Addis – Ababa, AAU Publication.
- Daku, J. N. &Oyekan, A. O. (2014). Education and employment generation : Entrepreneurial education and youth development, *European Journal of Humanities and Social Sciences*, 30 (2), ISSN 2220 - 9425
- Dill D. &Vught, F. (2010).*National innovation and the academic research enterprise*, Baltimore, MD : John Hopkins University.
- Edmondson, G. (Ed.) (2012). *Industry – University work : Lessons from successful collaborations*, Science/Business Innovation Board, AISL.
- Federal Republic of Nigeria (FRN) (2013). *National Policy of Education*,6th Edition, Yaba, NERDC, Press.
- Gieger, R. & Sa, C. (2009). *Tapping the riches of Science : Universities and the promise of economic growth*, Cambridge, Harvard University Press
- Haruna, A. F. (2017). Education must be relevant to the needs of society, *Nigerian Tribune*, Thursday, Thursday, August 17, 2017, page 21.

- Idoko, C. (2017). FG inaugurates 21 man committee on national research fund, Nigerian Tribune, August, 17, 2017, page 2.
- Jones, N., Bailey, M. &Lyytikainen, M. (2007). Research capacity strengthening in Africa : Trends, gaps and opportunities, DFID & IFORD, Retrieved on 20/9/2017 from http://www.odi.org.uk/sites/odi.org.uk/files/odi.assets/publications-opinion_files/2774.pdf.
- Kruss, G., Lorentzen, J., Petersen, I., Odekunle, K. Adeyinka, F., Nabudere, D., Mukasa, L., Eabaro, E. & Mananja, D. (2009). *Knowledge for development : University – Firm interactions in Sub-Saharan Africa*, Cape Town, Unpublished Report, HSRC.
- Laws of the Federal Republic of Nigeria (LFN), (2004). *The Federal Universities of Agriculture, Act*, CAP, 22. Abuja, Federal Govt. Press.
- Laws of the Federation of Nigeria (LFN) (2004). *The Federal Universities of Technology, Act*, CAP 23. Abuja, Federal Govt. Press.
- Laws of the Federal of Nigeria(2011). *TETFund Act, 2011*, Abuja, Federal Govt. Press.
- Macharia, J. W. (2017). *African higher institutions of learning as seats of research and innovation for development : Reality demystified*. Paper presented at the International Conference on Research and Development, organised by the National Institute for Educational Planning and Administration (NIEPA, NIGERIA), Ondo, on 24-28 July, 2017.
- Machando, A. (2000). *Developing technological capabilities for Global competitiveness : Some Perspectives*. Paper presented by UNDO Representative at the 3rd Nigerian Army School of Military Engineering (NASME) International Conference and Exhibition on Globalization and the challenge of SMEs Development I Africa, Abuja, Nigeria, 10 – 16 November, 2000.
- Maicibi, A. N. &Daku, J.N. (2017). Promoting security and sustainable national development in Nigeria ; Challenges and prospects, *Nasarawa Journal of Education*, 1 (1), ISSN 1118 – 8689, February, 2017.
- Massaquoi, J. G. M. (2002). *University-Industry partnership for cooperative technology development in Africa : Opportunities, challenges, strategies and policy issues*, Report on the meeting of University-Industry partnerships in Africa, Harare, Zimbabwe, May, 21-24, 2001.
- Mohammedbhai, G. (2009). *The effects of massification on higher education*, Accra, Ghana, Association of African Universities (AAU).
- Nigerian Educational Reports Editorial (2014). 1(2), April-May, 2014.
- Nwadiani, M. (2017). *Overview of the roles of research and innovation for national development , (RIND)*, A keynote address presented at the first Research and Innovation conference organized by the National Institute for Educational Planning and Administration (NIEPA), Ondo, on 24-28 July, 2017.

- Organization for Economic Cooperation and Development (OECD) (2009). Africa factsheet: a in economic indicators, [http://www.oecd.org/daf/inv/investmentfor development/47452483.pdf](http://www.oecd.org/daf/inv/investmentfordevelopment/47452483.pdf) Retrieved on 15th August, 2017.
- Rand Corporation (2001). Science and Technology collaboration : Building capacity in developing countries? <http://www.rand.org/content/dain/rand/pubs/monographs.reports/2005/MR1357.0.pdf>. Retrieved on 23rd August, 2017.
- The Punch Editorial* (2016). Monday, March 14th, 2016, p.15.
- The World Bank (2010). *Annual World Bank Conference on Development Economics*, Washington DC, The World Bank publications.
- The World Bank (2012). Africa's Pulse : The World Bank, [http://siteresources.worldbank.org/INTAFRICA/Resources/Africa'spulse-brochure, vol.16.pdf](http://siteresources.worldbank.org/INTAFRICA/Resources/Africa'spulse-brochure_vol.16.pdf). Retrieved 20, August 2017.
- Vedovello, C. (1997). Science parks and University-Industry interactions : Geographical proximity between agents as a driving force, *Technovation*, 17(9), pp.491-502.
- Volmink, J. & Dare, L. (2005). Addressing inequities in research in Africa, *British Medical Journal*, 331(7579), pp.705-706.
- Yusuf, S., Saint, W. & Nabeshima, K. (2009). *Accelerating catch-up : Tertiary education for growth in Sub-Saharan Africa*, Washington DC, The World Bank.