

STRENGTHENING ACADEMIC LINKAGES AND COLLABORATION In Universities

Prof Idowu Olayinka

UNIVERSITY OF IBADAN LIBRARY

Distinguished Lecture, at the First University
of Calabar Graduate School Lecture Series,
No. 1, 28th July, 2004

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LINKAGES AND COLLABORATION**

In Universities

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Presented at the First University of Calabar Graduate School
Lecture Series, 28 July 2004.

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FOREWORD

The ultimate aim of every University, the world over, is to attain the highest academic standards in teaching, research and service to mankind. Hence, no effort should be spared to ensure that the students, staff and the management of a University put in their very best to achieve the above-stated noble objectives. The quality of the graduates produced and the quality of research papers published in learned journals are the hallmarks by which a University distinguishes itself amongst others.

The idea of a distinguished academic lecture series is to create a repertoire of intellectuals and researchers in different fields, pooling together the knowledge gained from their researches while at the same time providing a source of inspiration for academic staff and students. Its introduction is one of the best things that has happened to the re-invigorated Graduate School and the University of Calabar in general.

Professor Dave Nosa Omokaro, the new Dean of Graduate School, had in his manifesto during his campaign for election, made the introduction of a Distinguished Lecture Series one of the cardinal objectives of his Deanship of the Graduate School, as a means of promoting research linkages and collaboration amongst Nigerian Universities. No wonder that the first Distinguished Lecture in the series was on the subject of research linkages and collaboration. The weak and battered fortunes of the Nigerian economy have made this option imperative since no one University with the currently persistent poor funding situation in the country's Universities can accomplish these ideals in isolation.

The opening lecture in the series was by Professor Idowu Olayinka, Dean of the Post-Graduate School, the University of Ibadan: His topic, "Strengthening Academic linkages and Collaboration in Universities" is, therefore, a window to the possibilities and opportunities available for Universities and individual scholars aspiring to achieve academic excellence. Let us utilize the advantages of this Distinguished Lecture Series to the fullest at the University of Calabar.

Professor Ivara Ejemot Esu
VICE-CHANCELLOR

**WELCOME ADDRESS
BY
PROF DAVE NOSA OMOKARO
DEAN, GRADUATE SCHOOL,
UNIVERSITY OF CALABAR,
CALABAR.**

The initiative to commence

The Graduate School Distinguished Lecture series, of which the first is "Research Linkages, Collaborations and University development", was developed as a strategy for the promotion of academic excellence in the Graduate School.

It will be recalled that during my campaign for the Deanship of the Graduate School, the institution of regular academic lectures occupied a prominent place in my manifesto. The lecture today marks the beginning of activities that will create a highway to the attainment of scholarship and the fulfilment of my promise at Senate to foster creative academic opportunities to entrench a culture of excellence.

I have chosen the theme on research linkages, collaboration and University development because of my belief that one sure way of advancing research and remaining in the forefront of academic excellence is through linkages between universities and institutes, locally and internationally. It is common knowledge that most universities in Nigeria today lack the basic infrastructure for purposeful research; and even where facilities are available, they are usually outdated relics of primordial equipment that offer no incentives to researchers.

It is, therefore, obvious that no single university can "go it alone" in attaining high standards of research and highly competitive graduate training programmes. This realization underscores the need to forge linkages and collaboration between the Universities, Research Institutes and industries. Most desirable at this time in our university development is collaboration in the following areas:

- sharing of high precision analytical facilities
- exchange of personnel and programmes with other Universities
- data collection and analysis

- exchange of vital information on funding of research and effective planning of graduate programmes.

This lecture on research linkages and collaboration has become imperative as a "way forward" in our quest to foster scholarship in the Graduate School of the University of Calabar.

We are, therefore, highly privileged to have an expert in this area of endeavour, a geophysicist and a renowned scientist who has impacted on his academic community and premier university in Nigeria, the University of Ibadan, as the Dean of the post-graduate school. Today he will lecture us on University linkages and collaboration, from A to Z. I welcome you all to this beginning of a new dawn in our pursuit of academic distinction in our Graduate School.

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OPENING REMARKS BY PROF. IVARA E. ESU, VICE CHANCELLOR, UNIVERSITY OF CALABAR, REPRESENTED BY PROF. JOHN O. OFFEM, DEPUTY VICE-CHANCELLOR (ADMINISTRATION) ON THE OCCASION OF THE FIRST LECTURE OF UNICAL GRADUATE SCHOOL LECTURE SERIES, JULY 28, 2004

Deputy Vice-Chancellor (Academic)
First Distinguished Lecturer, Prof. Idowu Olayinka
Dean, Graduate School
Other Deans here present
Heads of Departments & Other Senate Members here present
Members of the University Community
Distinguished Invitees
Members of the Press
Ladies and Gentlemen

Let me first and foremost apologize for the absence of the Vice-Chancellor, Prof. Ivvara E. Esu at this epoch-making occasion. He had severally indicated his desire to be present at the first in the series of Graduate School public lectures at the University of Calabar. He is unavoidably absent, as he is, at this moment in Abuja attending to some very urgent official matters; hence, he has asked me to represent him.

This audience may want to know that the new Dean of our Graduate School is one of the few Nigerian politicians who has kept his campaign promise. When Prof. Dave Omokaro was campaigning to be elected Dean of the Graduate School one of the promises he made was to institute a Graduate School Lecture Series in order to stimulate the exchange of research ideas and findings amongst graduate students and inculcate the culture of regular gathering of academics to brainstorm over topical issues that would move the nation forward by promoting scholarship.

The choice of topic for this first lecture, "Research, Linkages, Collaboration and National Development" is very apt. It has come at a crucial time in the survival of the University system in Nigeria. The very poor funding situation of Universities in the country today calls for more aggressive search for alternative sources of funding in order to stay afloat. This can most likely be brought about through meaningful research linkages and collaboration with other institutions and establishments both within and outside the country.

Let me also, on behalf of the Vice-Chancellor and the Senate of this University, welcome very warmly the distinguished Guest Lecturer at this First Graduate Lecture Series, Prof. Idowu Olayinka, himself the Dean of Graduate School of the University of Ibadan. I salute your love and interest in the University of Calabar in general and in our Graduate School in particular. I say so because this lecture was scheduled to hold yesterday; but I understand that having travelled from Ibadan to Lagos, you could not make the connection to Calabar, as there was no ADC flight from Lagos to Calabar. Someone else in your situation would have given up and returned to Ibadan; but rather, you had to fly to Abuja in order to board the IRS flight from Abuja to Calabar. You arrived Calabar late in the evening yesterday. I do really appreciate this gesture of love and solidarity. You are welcome.

I have also been informed that Prof. Olayinka is an expert in University linkages and collaboration with a strong commitment to research. I therefore, have no doubt that we shall be listening to a very fascinating and beneficial lecture this afternoon. Ladies and gentlemen, let us, therefore, sit back, relax and attentively listen to this talk, as I now declare the first presentation in the University of Calabar Graduate School Lecture series open.

**KEYNOTE ADDRESS ON
"UNIVERSITY-PETROLEUM INDUSTRY PARTNERING"**

By

**S. W. Petters, FAS
Department of Geology
University of Calabar
Calabar**

INTRODUCTION

The University of Calabar has one of the leading graduate schools in the nation today. In 2003, the Nigerian National Universities Commission (NUC), under the dynamic and innovative leadership of its Executive Secretary, Professor Peter Okebukola, introduced the Nigerian Universities Doctoral Theses Award Scheme. What emerged from this exercise amounted to the most objective means of identifying and designating centres of excellence in the Nigerian university system by the NUC. For science the best thesis award was won by the University of Calabar. The Ph.D thesis was on **"Petroleum geochemistry of oils and shales from western wells (OPL 86,88) and outcrops from the Calabar Flank of the Niger Delta, Nigeria,"** by Dr. Bassey Ekpo. Other awards went to the University of Lagos (Arts, Medicine), Federal University of Technology, Owerri (Agriculture), the University of Port Harcourt (Education), Obafemi Awolowo University, Ile-Ife (Pharmacy), the University of Nigeria, Nsukka (Engineering) and Usman Dan Fodio University, Sokoto (Social Sciences).

For this keynote address, it is pertinent to note that the prize-winning science doctoral thesis from Calabar was on petroleum, based on samples supplied by the petroleum industry, with the research nested in a faculty and an institution that has a long tradition of linkage with the oil industry. Part of the research that won the national recognition in science was conducted in Germany, where, through, its Institute of Oceanography and the Department of Geology, the University of Calabar has established research linkages since the early 1980's, guided by the initiatives of Professors U. K. Enyenihi and S. W. Petters. However, for the thesis we are celebrating, Dr. Ekpo's German linkage was by merit of a fresh initiative.

In selecting the topic, **"University-Petroleum Industry Partnering"** for this keynote address, we also wish to recognize the fact that the distinguished guest lecturer, Professor Idowu Olayinka, the Dean of the Post-Graduate School at the University of Ibadan is a geophysicist, whose field of specialization falls squarely within the petroleum industry.

The choice of Professor Olayinka as our first distinguished guest speaker is, therefore, not only outstanding on account of his position at the nation's premier university, but it is a choice borne out of the broad-mindedness of Professor Dave Omakoro, the Graduate School Dean at the University of Calabar, whose sensitivity and perspicacity will undoubtedly be appreciated by the many outstanding geophysicists in our university. Research and graduate training in the field of geophysics have been very active at Calabar under eminent scholars, notably, Professors C. S. Okereke, E. E. Okwueze, E. J. Uwah, and E. W. Mbipom (just retired), who are in the Departments of Geology and Physics.

PARTNERING MILESTONES: THE NAPE-UAP EXPERIENCE

So closely intertwined are oil company and university interests in capacity-building and human capital development that, when the Nigerian Association of Petroleum Explorationists (NAPE), the umbrella professional scientific organization of the Nigerian petroleum industry, was launched in 1975, its "fundamental objectives and directive principles" sounded like a preamble to the statutes of an educational institution. Among the objectives of NAPE are:

- Advancement of the geosciences, especially as it relates to petroleum resources.
- Dissemination of information relating to the geosciences and the associated disciplines.
- Promotion of the technology for exploration and production of petroleum.
- Fostering the spirit of scientific research throughout its membership.
- Inspiring and maintaining high standards of professional conduct on the part of its members., and
- Providing the public with the means of recognition of adequately trained and responsible petroleum professionals.

As the nation's plunge into economic depression deepened during the last two decades of military rule, dragging along with it the educational system, NAPE rose to the challenge of salvaging the crippled university system withered by the brain-drain and poor funding. Universities that had produced NAPE members were now mere

shadows of themselves. They were like the sickening proverbial goose that had once laid golden eggs which incubated and hatched into the global oil and gas industry. In a positive sense the chickens came home to roost when Nigerians rose to controlling and influential positions throughout the oil industry, hence their euphemism "**pay back time**". On their part all the oil companies voluntarily, without prodding by the highly unlikely and insensitive brutal military dictatorship, offered one intervention assistance or another to salvage at least the geosciences education and profession. Under the NAPE Foundation the University-Polytechnic Assistance Programme was inaugurated in 1999 "to contribute substantially to the continuous improvement of educational standards in Nigeria, while complementing the efforts of the universities, polytechnics, government and private benevolent groups".

The mission of the NAPE-University Assistance Programme, as explained by its chairman, Prince Adekunle Adesida (2004) of Shell, include:

- To contribute substantially to the continuous improvement of educational standards in Nigeria.
- To encourage and actively participate in the cross-fertilization of knowledge among tertiary institutions and oil/mining industries.
- To create effective scholastic foreign exchange programmes, scholarships and awards programmes.
- To encourage and participate in the publication of geosciences books, journals and research funding; and
- To become regional leaders in geo-scientific capabilities.

According to Prince Adesida (2004) the NAPE-UAP vision is:

- To maintain competent leadership that can effectively handle geoscientific and environmental needs of the time and beyond while serving as role models to others.

- To make Nigerian tertiary education as competitive as others in the world before year 2010 by complementing government and university efforts; and
- To establish effective network with international geo-scientific institutions, organizations and regional leadership in other affiliated societies.

The above goals epitomize a unity of purpose which, can, undoubtedly, sustain the best linkage, partnership and educational joint venture in order to forge a fruitful relationship between academia and industry. In real terms the NAPE-UAP partnering initiative, strategies and blueprint have translated into and actualized in the following:

- Division of the country into 6 geographic zones administered by nominated zonal co-ordinators; with a nation-wide needs assessment of each geosciences department in the zones through NAPE-designated departmental co-ordinators which administer the affairs of the NAPE Student Chapters.
- Phased implementation of approved projects in accordance with drawn-up programmes between NAPE and tertiary institutions with geosciences departments.
- Development and production of Geological Excursion Guidebooks for the various sedimentary basins in Nigeria.
- Annual NAPE-UAP Leadership Forum where highly experienced geoscientists from all over the country deliberate upon the state of geosciences education and formulate far-reaching policies.
- Zonal biennial mini-conferences, so far staged at FUT, Akure and FUT, Owerri, where students present papers on petroleum and environmental issues.
- Distinguished Lectures Programme; and Grants-in-aid to qualified HND, B.Sc and M.Sc students.

Undoubtedly, the NAPE-UAP has kindled students' geosciences enthusiasm throughout the country; and created commitment to their studies, and a sense of purpose and direction in a discipline that has lately attracted an avalanche of students across the nation. NAPE-UAP has boosted student and staff morale.

Given the profound influence of the petroleum industry on the Nigerian socio-economy, the communiqué issued at the 4th NAPE-UAP Leadership Forum held at the Federal Palace Hotel, Victoria Island, Lagos (Friday, April 2nd to Sunday, April 4, 2004), is indicative of the future and decisive nature of university-petroleum industry partnering in geosciences teaching and research.

On research, training and manpower development the 4th NAPE-UAP Leadership Forum recommended that:

- It is expedient that centres of excellence should be established in collaboration with tertiary institutions in order to encourage research and develop required technical manpower for Nigeria.
- Such centres of excellence should be built around well-known and credible researchers and/or groups of researchers. In addition, the centres of excellence should render services to other related institutions and the industry. The centres should be self-sustaining.
- NAPE should charter a committee that will develop the strategy for the establishment of the envisaged centres of excellence. Government should be involved in the planning and funding of these proposed centres of excellence.
- There is a need for continuous education so that lecturers will be regularly exposed to the latest technology in the industry.

On the framework for partnering the NAPE-UAP Leadership Forum recognizes that it is necessary to identify areas of partnership and the framework necessary to achieve the desired results. Therefore, the following recommendations have been made by the Forum.

- For quality geosciences education, it is necessary to provide basic physical infrastructure such as buildings, laboratories, adequate power and water supply and so on. These

should be funded from the Community Development Projects Funds of Oil Companies, the Niger Delta Development Commission (NDDC), the Education Tax Fund (ETF) and others.

- Vice-Chancellors and Rectors of tertiary institutions should review the institutional fees they demand from contracts in order to attract experts from industry, other institutions and beyond.
- Tertiary institutions should reach out to industry and the society in general in order to generate funds while solving societal and industrial problems.
- NAPE should develop Alumni Databank for all the tertiary institutions. Invariably, this databank is a potential reliable source of funding for tertiary institutions.
- Industry should sponsor the lecturers to national and international conferences and visits to laboratories in foreign lands. Field trips should be encouraged through the provision of materials, equipment and vehicles., and
- NAPE should lobby the relevant committees in the legislative chambers, which will provide the legal framework for the provision of funds and infrastructure to our tertiary institutions.

PARTNERING ENCOUNTERS

Individual Oil Company partnering initiatives in Nigeria will be highlighted in this part of the paper. Indeed, there is no major oil company in Nigeria, especially the foreign operators, that does not provide university student scholarship scheme. This is the most basic level of partnering which takes care of the interest of the students, who are the primary stakeholders in university education. This is partnering at the grassroots. In addition all the indigenous oil companies as well as all the service companies should offer university scholarships, whether these companies operate onshore, offshore, in the ultra deep or in the Joint Development Zone.

The major oil companies, Shell Petroleum Development Company of Nigeria Ltd (SPDC); Mobil Producing Nigeria Ltd; ChevronTexaco,

Agip and TotalFinaElf each has one university assistance programme or another. Shell and Mobil, ten years ago, endowed full chairs in petroleum geology and geophysics at several universities; but nothing they have so far done in Nigeria comes close to what their parent companies have put in place in their home countries by way of partnering.

As previously noted the communiqué at the end of the 4th NAPE-UAP Leadership Forum has explicitly suggested partnering strategies. At an earlier forum, Engr. (Dr.) S. M. O. Amachree (2001), one of the keynote speakers presented a paper on **"Collaboration of Business, Education and Government The Alberta Experience and The Way Forward for Nigeria"**, in which he quoted the following from the **Calgary (Canada) Business Magazine**:

"A few months ago, a smart, aggressive guy named David Saunders was hired from McGill University as the new Business School Dean for the University of Calgary. His mandate: to catapult the institution into the top 50 of the world business schools. This may seem like sheer hubris, except that business leaders in Calgary are willing to back this goal with cash. If Saunders needs \$100 million, they will raise it. But what he really needs now is a new focus for the school. He may well find it in alliances with technology companies attracted to Calgary. Can you imagine a better business education than trying to master the challenges of companies that can go from zero to billions of dollars in just a few months?"

Amachree then asked:

"How do the Rivers State University of Science & Technology and the University of Port Harcourt which are located in Port Harcourt, the Oil City of Nigeria (similar to Calgary in Alberta, the oil producing provinces of Canada) fit in here in terms of business partnership with the companies in Port Harcourt? There is, therefore, the urgent need for closer cooperation between our universities and the business community."

He then went on to demonstrate the Canadian partnering model statistically as shown below, using the funding sources of the

Southern Alberta (another Canadian oil province) Institute of Technology (SAIT) for Year 2000:

Description	Amount (\$)	%
1. Provincial Government Grant (State Government)	60,724,000	46
2. Industry Support in terms of cash, Technology & Equipment	25,957,000	20
3. Tuition and Fees	18,083,000	14

From this table it is evident that funds from industry sources can be quite substantial, in the case of SAIT amounting to 20%. There are also, at the Southern Alberta Institute of Technology (SAIT) ten centres for technology incubation or development built and equipped by industry partners, viz:

1. The British Petroleum (BP) Control Engineering Technology Centre.
2. Centre for Rail Training and Technology
3. CIBC Business Technology Centre
4. Clayton Carol Automotive Centre
5. Engineering Air Centre for Heating, Controls, Air Conditioning and Refrigeration
6. Industrial Coating Education Centre
7. Pan-Canadian Environmental Technology Centre
8. SAIT Global Communications Centre
9. The Highwood
10. Wellsite Production Education Centre

Other case histories involving oil companies operating in Nigeria will be considered at this juncture. As part of the Shell/Nigerian Mining and Geosciences Society (NMGS) merit Award package in 2001, I was privileged to visit the Shell Technology Exploration and Production Research Centre at Rijswijk, Holland. There, I had a most illuminating exposure to university-oil industry partnering. At Rijswijk, Shell

co-ordinates its global E&P technology capabilities involving technology strategies and planning; technology development; global implementation; deployment of global consultants; common interest networks and integrated services; and partnership with stakeholders including the establishment of academic alliances. Centres of excellence have been identified throughout the world, where Shell invests in major exploration and production technology research, viz., at the Technical University, Delft and Utrecht University, both in Holland; Imperial College, London; Norway; Russian Academy; Massachusetts Institute of technology MIT., U. S. A., the University of Colorado; Stanford University, California; and the University of Texas at Austin.



▪ Mass Spectrometer in the Geochemical Laboratory
Of the Institute of Earth Sciences,
Utrecht University, Holland

The warm welcome of Shell staff and their generosity during my week-long visit to Rijswijk included their accommodation of the programme flexibility I requested. I was, therefore, allowed to visit the Delft University of Technology, where I had discussions with Professor J. T. Fokkema, who, having previously established the Institute of Geodesy at the Rivers State University of Science & Technology, Port Harcourt, was literally excited to receive a Nigerian; and in spite of my arrival unannounced, Professor H. Blok also had to interrupt a meeting to meet me, when I crashed into his Institute of Geophysics. He presented me with a copy of a Ph.D thesis on **"Modelling and Inversion Methods for the Interpretation of Resistivity Logging Tool Response"**, a thesis written by an American lady, who was sponsored by Schlumberger, an oil service company; as a result of university-industry partnering.

According to Mr. H. S. Onyilola(2003), the managing director of Schlumberger, Nigeria, this company is investing \$ 8.0m in the Faculty of Technology at the University of Ibadan, to develop appropriate engineering capabilities, collaboration and overseas linkages for teaching and research.

But my unforgettable extra-curricular Dutch experience was the student cafeteria at Delft. There, I came face-to-face with European student dining. And I remembered our Nigerian universities, where President Obasanjo, having banned student cafeterias a quarter-of-a-century ago, had driven university students into filthy African food shacks.

At Utrecht University more hospitality and camaraderie awaited me. The environment in the Utrecht Earth Science Institute was more familiar, there being more activities in my own disciplines of biostratigraphy and sedimentology. I came across famous names either by meeting them or by reading their door name labels Profs. Meulenkamp and de Boer who actually received me; Prof. George Postma; and Mr. Paul Anten who had been with us at the University of Ibadan Geology Department on a technical assistance mission in the 1970's.

In the course of my sedimentological studies I have always been fascinated by wave-tank or flume experiments; a flume being an

artificial laboratory inclined channel used for studying stream-flow properties and effects of stream velocity and sediment supply on the bed form and sedimentary deposits. I had always imagined flumes and read about them, but I had never really seen one until that visit to the Sedimentological Laboratory at Utrecht. The flume at Utrecht occupies a very large hall. It is managed by Prof. de Boer and Mr. Paul Anten; and is funded by Shell. The experiment starts with an artificial channel flow that terminates in a large laboratory sand delta that simulates the Niger Delta! Obviously, Shell needs an experiment that can explain the controls of sand distribution in the Niger Delta back in Nigeria, where the company requires accurate prediction of oil and gas reservoir sand distribution. It must be emphasized, however, that the vast laboratory complex at Utrecht is funded also by the Dutch geological survey which utilizes its facilities, there being no separate government geological laboratory. This is excellent collaboration. The most advanced research and petroleum consultancy services in my field of biostratigraphy are also based in the Utrecht Institute of Earth Science laboratories for paleontology and palynology/paleobotany.

My Dutch encounter also took me down memory lane back to 1989, when I was a guest of Mobil at what then was their Dallas Research Laboratory (DRL). Mobil had invited me to attend their 2-week Carbonate-Evaporite Workshop. This is how it happened. Early in 1989 my former head of department at the University of Ibadan, Prof. E. A. Fayose, had asked me to be a co-leader of an excursion to the Calabar Flank which he was planning for Mobil. Naturally, I complied and prepared the Excursion Guide which Professor Fayose had also required. In the visiting Mobil excursion team was the then Managing Director, Mr. Alfred Koch, a geologist, and his wife; and the Exploration Manager, Chief Wande Sawyerr. Mr. Koch was particularly interested in the Mfamosing Limestone exposed at the Calcemco Quarry. Few weeks later, after the excursion, I received a surprise letter and an invitation from Mobil for me to proceed to Dallas, U. S. A., for a workshop.

Dallas was the most exciting geological field experience of my life. From Dallas we first proceeded to San Antonio and examined West Texas limestone outcrops until we crossed the State boundary into New Mexico. There I had the opportunity to climb the famous Guadalupe Mountains; descended into the Carlsberg Caverns, visited

the Permian Evaporite Basin, before ending up in the carbonate laboratory of Professor Don Bebout at the University of Texas Bureau of Economic Geology, Austin, Texas. Professor Bebout had actually worked for Exxon Production Research Company in Houston before joining UTA, where he taught carbonate depositional systems and consulted for the petroleum industry. Actually UTA is till today a star-studded world-renowned petroleum research centre where nearly all the global oil companies invest in oil exploration and production research.

From Texas our limestone studies was climaxed by a thrilling visit to Florida Keys. At Florida we examined Recent carbonate rocks and visited Florida Bay where we slithered through Recent shallow limy muddy water; and then into the ocean where we swam over fantastic Florida coral reefs.

After the Mobil carbonate-evaporite workshop, I then understood limestones much better. As a result, I have graduated a Ph.D on the Mfamosing Limestone; and a recent M.Sc., a Cameroonian lady now pursuing her Ph.D. on limestones at Seoul University, South Korea. The experience I have just narrated is partnering per excellence from the co-operation of geoscientists from two Nigerian universities (Ibadan, Calabar) a global link emerged out of Africa (Nigeria, Cameroon) to the U. S. A., and now into Asia (South Korea).

UNIVERSITY OF CALABAR EXPERIENCE

The Geology Department at Calabar in particular has been one of the arrowheads of university-industry partnering in the field of petroleum micropaleontology with the following milestones.

- 1983-86 consultancy with the Nigerian National Petroleum Corporation, Research and Development Division, Port Harcourt, where NNPC staff were trained by Prof. Petters
- 1987--Major publication on Mfamosing Limestone jointly with Shell geologist, Dr. T. J. A. Reijers
- 1983-89 Several geological excursions to the Calabar Flank organized for Shell, Mobil, Chevron and NNPC staff led by Prof. Petters.

Several petroleum geology graduates (M.Sc; Ph.D) joined various oil companies; and are having successful careers; some had been sent to the department on in-service training.

- 1991-99 - The Mobil/NNPC Chair on Petroleum Geology was established in the Department of Geology; but was subsequently affected by the ExxonMobil merger and re-organization. At the signing of the Agreement for the Chair endowment between the Managing Director of Mobil and the Vice-Chancellor, University of Calabar, Mobil specially desired that the Chair would conduct research on the petroleum geology of the Mfamosing Limestone, an objective that has been fully realized among other achievements of the Chair during the tenure of Prof. Petters ((Reijers and Petters, 1997; Petters and Reijers, 1997; Reijers et al. 1997)^{4,7}
- 1999 - The first African Student Chapter of the American Association of Petroleum Geologists was founded by an extremely resourceful final year student, Mr. Chukwemeka Ekejiuba.
- 1996-2001 - A landmark volume on the **Platonic Foraminifera of the Niger Delta** was contributed by Prof. S. W. Petters to the **Stratigraphic Committee of the Niger Delta (STRATCOM)** under the Department of Petroleum Resources (DPR) of the Federal Ministry of Petroleum.
- 2001, 2003 - In recognition of the above and other contributions the Department of Geology, University of Calabar, is the first institution in the country where its staff has won the highest professional prizes in the petroleum industry, viz. **The Aret Adams Award of the Nigerian Association of Petroleum Explorationists; and the Shell/Nigerian Mining and Geosciences Society (NMGs) Awards**. Both awards were made to Prof. Petters independently by the two professional bodies.
- 2002 - Prof. Petters was on the Nigerian National Delegation to the 17th World Petroleum Congress in Rio de Janeiro, Brazil.

PARTNERING ENVIRONMENT

The University of Calabar experience offers a window into the enormous partnering opportunities that exist in the petroleum industry. At the core of the energy sector, the oil industry, both global and local, is full of technological, scientific, operational, business, research and environmental challenges. In its complexity, the Nigerian oil industry is an unparalleled fertile ground for joint multi-disciplinary research partnerships, especially given its new deregulated environment and investments in gas utilization; in addition to huge investments in Liquefied Natural Gas export. Although the oil companies themselves are not mass employers of labour, they thrive on a seamless supply web of equipment fabrication, installation, maintenance and other support services, which consume the products of many other industries, thus generating huge engineering and business opportunities. But a unique feature of the Nigerian oil business climate is the emphasis placed now on sustainable community development. The days of unfettered oil exploration, production and export are over. Not only have the host communities woken up to be angry watch-dogs of their environment, the oil industry must put sustainable local economies in place for each barrel of oil they extract, be it on land, in the swamps or under the sea. In all these, our universities ought to be sensitized and poised to serve both the industry and the local communities. Rather Non-Government Organizations sometimes manned by former university lecturers are flourishing in consultancies and partnerings.

But an important caveat about university-oil industry collaboration is the fact that the industry is global in nature, with global business principles and best practices, hence the same strict universal research and service standards and business ethics in Europe, South America, and Asia applies to Nigerian partners and consultants.

Historically, the Nigerian government petroleum policy at this point in time is most favourable to local universities. Of great significance is the **local content policy** of the Federal Government.

LOCAL CONTENT POLICY

This policy is most relevant as it creates ample opportunities for partnering. It stipulates that:

- All materials that are locally available must be sourced locally
- Contract review clauses would be included in all major agreements with the oil firms while detailed engineering designs must be submitted for approval
- Oil companies are henceforth expected to clearly demonstrate evidence of local content input into all contracts to be awarded by them before formal approval by the NNPC.
- Government also promised to facilitate appropriate legislation in the National Assembly to provide legal backing for the new local content policy.

Known as the Nigerian Content Development Bill, this legislation has set local content targets for oil companies at 40 per cent by 2005; and 60 per cent in 2010. The bill also seeks to position competent Nigerians in managerial, professional and supervising cadres while ensuring that local manufactured equipment are sourced from within the country.

Industry Response

The local content policy has been welcomed by some multi-national oil companies operating in Nigeria. In December 2002 Chevron Nigeria Ltd. invited 20 U.S oil services companies to visit Nigeria and establish partnerships with local companies. Apart from establishing their operational bases, partnerships should enhance lending arrangements for local companies to raise money from financial institutions. The American companies that were invited by Chevron are to establish their manufacturing factories in Nigeria rather than producing them abroad and merely exporting such equipment to Nigeria as finished products.

University Participation in Local Content

While the local content policy has been taking shape Nigerian universities and geosciences departments have been passive bystanders, without inputs, expectations and niches they could carve for themselves.

Models of university involvement are proffered in this paper based on similar roles by overseas institutions.

UNIVERSITY-PETROLEUM INDUSTRY SYMBIOSIS

A few years ago, a Nigerian production geosciences manager, simply dismissed the notion of University involvement in exploration and production research, by declaring that the technology used in the oil industry did not come from Nigerian universities. In case there are still such lingering impressions anywhere a cursory review of global university-based research in oil exploration and production (E&P) is pertinent. It must be emphasized, however, that both Nigerian Universities and Industry should recognize the fact that geosciences departments overseas that are contributing to E & P research and enhancing human resources development and their local content, are staffed by professors who had successful careers in industry, before they took early retirement and joined the university system. Highlights of petroleum geosciences disciplines and their leading professors with petroleum industry background can now be presented. Professor Selly edited a book on African Sedimentary basins in 1997, to which I contributed a chapter.

Stratigraphy

Professor A. J. Whiteman who occupied the Chair of Petroleum Geology at the University of Ibadan from 1968 to 1972 had worked in Algerian oil exploration, before he joined the University of Khartoum, from where he relocated to Ibadan. From Ibadan he proceeded to the University of Aberdeen, where he established what is today a leading multi-disciplinary petroleum geosciences programme in the world, that is well supported by international oil corporations.

Professor Hollis Hedberg, well known for the "**International Stratigraphic Guide**" was supported by the then Gulf Oil Corporation, U. S. A., where he had worked before retiring to occupy the chair at Princeton University in the '60's and '70's. Creighton Burk, a Gulf geophysicist, was also at Princeton at the same time. Professors E. Klitzsch and Richard Selley had also worked with industry in North Africa before retiring to achieve outstanding research breakthroughs at the Technical University, Berlin and the Imperial College. Professor Klitzsch invited me and hosted me in Berlin at the Institute for Advanced Study, where I wrote the book on African geology. In addition to geological mapping of North-East Africa, Prof. Klitzsch produced many African Ph.Ds during his time.

Biostratigraphy

Oil micropaleontology using foraminifera, palynomorphs and lately calcareous nannoplankton grew largely from oil exploration, starting from its pioneers Hans Bolli and J. P. Beckmann of Shell Trinidad in the 1940's; to Bill Berggren and F. T. Barr who had served in Oasis Oil, an American company in Libya; to the Exxon group of foraminiferologists, Notably R. M. Stainforth and H. P. Luterbacher, who all retired from industry and occupied university chairs. Bolli joined the Swiss Federal Technical Institute (ETH), Zurich; Berggren joined Woods Hole Oceanographic Institution in the U. S. A., where he developed the global Cenozoic quantitative time-scale that is used in the oil industry today; while Luterbacher took up the chair of micropaleontology at the University of Tübingen, Germany, where he supervised several Nigerian Ph.D's in petroleum geochemistry and basin analysis; and hosted me for research at Tübingen during my visits between 1987 and 2000.

Limestone Studies

Perhaps no field of geology benefited more from the petroleum industry for its advancement than carbonate petrology and sedimentation; where great names like R.C. Murray; Gerald Fiedman; Ken Hsu; James Lee Wilson; A. G. Fischer who started in Shell exploration research at Houston and later moved into North American universities where they could publish research findings that completely changed our understanding of carbonates from their ancients in the Alps and the Guadalupe Mountains, to their modern analogues in the Persian Gulf, Florida and the Bahamas; from the evolution of carbonate fabric and porosity in reservoirs through dolomitization, to the lithification of beach rock today in Bermuda, in the Caribbean. I am glad that I imbibed the knowledge generated by these great men directly from R. C. Murray, A. G. Fischer, Gerald Friedman and Ken Hsu who I knew personally; in addition what I have learnt from Prof. Mike Oti, our world-class Nigerian carbonate petrologist.

Other Case Histories

To conclude this catalogue of examples of the symbiotic relationship and cross-fertilization between industry and university, two more examples will suffice. First, is the well known recent case of sequence stratigraphy where Peter Vail and his group in Exxon applied an old

academic concept of Larry Sloss of Northwestern University, Illinois, to seismic interpretation of continental margins; and arrived at the latest and a most powerful tool for oil exploration based on geological and geophysical models. Vail had been a student of Larry Sloss at Northwestern.

Professor Weber of the Institute of Earth Sciences at the University of Utrecht, Holland, is famous for his classic papers with Dr. Edmund Daukoru, on sedimentation and stratigraphy of the Niger Delta (1971, 1975). Weber retired into the chair of production geology at Utrecht, where he continued with research and training. Following the career trajectory of all Nigerian oil men who eventually disappear into highly lucrative consultancies or ascend into the corridors of power, Daukoru became the Group Managing Director of the NNPC; and lately the Federal Special Adviser on Petroleum. But because of Weber's abiding interest in the Niger Delta, this subject has remained at the core of petroleum research at the institute in Utrecht, as we have already seen.

Lastly, the fact the Bulletin of the American Association of Petroleum Geologists publishes outstanding research contributions from both industry and academia should inspire the oil industry in Nigeria to sustain quality research and geoscientific training in our universities. The **local content** law will now provide the most legitimate and compelling reasons for the desired synergy.
Thank you.

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STRENGTHENING ACADEMIC LINKAGES AND COLLABORATION IN UNIVERSITIES*

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1 INTRODUCTION

The Vice-Chancellor, represented by the Deputy Vice-Chancellor(Administration)
Deputy Vice-Chancellor (Administration),
Deputy Vice-Chancellor (Academic),
Registrar,
Bursar,
University Librarian,
Deans and Directors,
Heads of Departments,
Director of Academic Planning,
Members of the University community,
Members of the Press,
Distinguished Ladies and Gentlemen.

It gives me great pleasure to be here this afternoon to share my experience with members of the University of Calabar community on research collaboration and academic linkages. My assignment, as provided by the Deputy Registrar and Academic Secretary of the Graduate School, Sir John A. Obongha, in his letter dated 23 June 2004, includes the following: "Advantages of linkages and collaboration: University of Ibadan experience, avenues of accessing linkages, tips for the sustenance of linkages, linkages and collaboration for individual and institutional research efforts, etc". I was also reminded that this lecture is the first in the series. I will try as much as possible to justify the confidence reposed in me by your kind invitation to present this talk.

According to Allen (2000), linkage can be defined either as the act or instance of linking or being linked or a system of links. By the very nature of their establishment, universities are expected to reach out to their proprietors, the industry and sister institutions.

* Presented at the First University of Calabar Graduate School Lecture Series, 28 July 2004.

Universities the world over are acknowledged as repositories of ideas and solution providers to all the problems of humanity. In a world that is fast becoming a global village the importance of internationalization of academic programmes in universities cannot be overemphasized. This is particularly important in Africa where many higher educational institutions do not possess the critical mass of both human and material resources required to implement a wide variety of capacity-building, development-oriented or research projects. It is necessary to sustain the system in the face of increasing demand for higher education and dwindling resources. Since individual universities cannot continue to rely on government for all her needs it becomes imperative for them to explore other internal and external sources to complement governments' grants. A lot can be achieved in this direction if universities and industry explore areas of cooperation in training, research and development. This often takes the form of a linkage programme.

In general, linkages can originate from any of the following:

- informal staff contacts which eventually evolve into formal cooperation,
- out of multilateral research projects,
- a deliberate effort on the part of an institution to forge a linkage with another institution.

Linkages have been recognized globally:

- as a way of developing newer or less endowed institutions and
- as a way of projecting the image of older and more established ones.

In this regard, for a participating institution to derive optimum benefit from academic linkages, such an institution has to consider areas in which it has comparative/competitive advantage over others.

Linkages can take any of the following forms:

- between one university and another university or research institute in Nigeria, the rest of Africa or overseas,
- between University and Government,
- between University and Industry, and
- between University and Non-Governmental Organisations.

This paper seeks to situate the contributions of linkage programmes in training and capacity-building at the university level. In Section 2, we discuss the modalities involved in establishing academic linkages. Section 3 outlines some specific areas of academic and research linkages, while Section 4 deals with the framework for university-government- industry collaboration. Sections 5 and 6, respectively, deal with some of the constraints and prospects for academic linkages in Nigeria. A case study of linkage programmes at the University of Ibadan is presented in Section 7. We conclude with recommendations that can help in strengthening academic and research linkages in the final Section.

2 MODALITIES IN ESTABLISHING ACADEMIC LINKAGES

Three major steps can be identified in establishing a successful academic linkage (Osinusi, 2004).

2.1 Preliminary considerations

There is need to:

- identify the area(s) in which linkage is required,
 - define the goals of partner institutions (e.g. infrastructure, personnel, opportunities)
 - define current and potential resources (both human and material) of partner institutions
 - establish that there is institutional commitment to sustain the linkage
 - identify the institutions that have the strengths and capabilities required
 - establish that your institution's academic and research standard will indeed be enhanced by the linkage
 - identify the existing contacts between the institutions that could form the basis for the linkage
 - establish that the linkage will not be dependent upon the interest and activities of a small number of people, because the cooperation will become inactive if those staff leave or their interest change
 - establish any natural affinities between the partner institutions e.g. language
 - work out the financial implications of the proposed linkage for the partner institutions
 - establish achievable goals and feasible plans within some specific time frames (e.g. 3 years, 5 years, 10 years, or longer; short term, medium term, long term)

The foregoing may entail writing an unsolicited research proposal. This has the following major steps or stages (Bamiro et. al., 2003):

- Formulating the project idea;
- Developing and writing a concept paper;
- Obtaining peer group reaction to the concept paper and/or support of collaborating individuals or agencies.
- Identifying and communicating with potential donors;
- Writing a full-blown proposal;
- Follow-up action and rewriting and resubmission (where necessary).

The first step of an unsolicited research proposal involves recognizing the existence of a problem, an unmet need, a condition that requires a change in the present course of action or inaction. It may be at the policy-making level or at the conceptual theoretical level of a process or intervention which eventually influences policy-making in the long-run. It is necessary to define the problem in a researchable form such that it meets the requirements of most potential donors. In this regard, writing a full blown proposal may be time-wasting and unwise, in case the concept is not acceptable to any funder.

The trick often employed is to write a CONCEPT PAPER (sometimes also called LETTER OF INTENT or LETTER OF ELIGIBILITY) of between five to ten pages. This paper identifies briefly:

- the research problem and the need to address it;
- the objectives of the study;
- the theoretical framework/literature review and methodology;
- the anticipated results and its value-added to knowledge and/or policy-making (i.e. the potential benefits of the project).

The next stage involves obtaining the feedback of colleagues, bosses and other professionals to the concept paper. Be prepared for criticism! If one reader doesn't understand parts of your text, others are likely to have the same problem. This stage also involves communicating with possible collaborating agencies whose support potentials donors might require later. This area requires being able to "sell" one's idea to those whose help one might need later and hence needs careful handling, particularly the possible human relations issues that can ensue. In this regard, it is important to be able to

identify the useful comments and those that are not too-useful, in trying to improve the concept paper later, in case it is adjudged good enough to develop to a full-blown proposal by potential donors.

2.2 Negotiating the agreement/contract

The second step involves making contacts and negotiating the linkage agreement.

- A clear and shared understanding of the objectives and benefits of the proposed linkage must be arrived at by the partner institutions.
- Detailed preparation for the linkage should include input from and solid commitment of the affected departments. This is particularly critical in the case of student exchanges, where the issue of mutual understanding of curriculum and recognition of credits would have to be addressed.
- During the period of negotiating the linkage agreement, preparatory visits between the linkage partners are usually deemed appropriate and useful.

2.3. Endorsing the contract

Following resolution of all issues, a written agreement (or contract) should be prepared for the signatures of the administrative persons in charge of linkages in the partner institutions. The agreement should contain the following provisions:

- mutual goals,
- a statement of who the participants are
- payment of fees and other costs
- responsibilities of each institution
- a clause providing for future resolution of problem areas in the agreement
- renewal of the agreement subject to mutual satisfaction and withdrawal clause (providing for advance notice)

Regular contact between the institutions following a consummation of the agreement will help to ensure that the linkage remains relevant, effective and free of serious problems.

2.4 Who can enter into contract for a university.

A university is a body corporate and can enter into contracts (Ajayi, 2004). However, the university is an artificial creation of law that must be operated by human beings. Herein lies the importance of the Act which provides for the various component units in the university such as a Chancellor, Pro-Chancellor and a Council; Vice-Chancellor and a Senate; the Congregation; the Convocation; other principal officers; staff and students. Since academic linkage programmes are academic in nature, they have to pass the test placed on such by the Senate which is the highest body as far as academic matters are concerned. Moreover, linkage programmes have financial implications and as such the Governing Council comes in as far as the regulations on expenditure and property are concerned. Since the Vice-Chancellor is the Chief Executive Officer, he/she is placed on a higher status above the ordinary staff, to that of an agent that can bind the university as well as the other party in contractual relations. The Vice-Chancellor usually signs most of the agreements in form of Memorandum of Understanding, in conjunction with the Registrar, who is the Secretary of both Council and Senate.

In cases where collaboration with foreign institutions and organisations, officials of the Federal Ministry of Education and the Ministry of Foreign Affairs as well as the National Universities Commission (NUC) may also be involved. One recent example was reported barely 12 days ago in the news media (Nwankwo, 2004) involving the University of Uyo and the University of Lancaster, United Kingdom. The focus of this linkage was joint academic programme development and implementation. It was reported that the initial emphasis of the linkage would be on geography, economics and finance, bio-degradation and safety engineering.

Some of the specific areas of collaboration between universities are examined in the following section.

3 ASPECTS OF INTER-UNIVERSITY COLLABORATION

(a). Research supervision

It has been argued (Poole, 1993) that having one supervisor for a research student could be dangerous. It is standard practice in many universities to have a supervisory committee for each research student; in the US this often comprises three members of the faculty for each doctoral candidate (two for masters). The

Postgraduate School Ibadan is working out modalities for implementing this. Supervision of postgraduate researches by faculty members in universities other than their own as main supervisors or co-supervisors is feasible. Many candidates in the Faculty of Agriculture and Forestry at the University of Ibadan have co-supervisors who are senior scientists with the International Institute for Tropical Agriculture (IITA), Ibadan. IITA is located just about seven kilometres north of our campus. The Postgraduate School at Ibadan greatly cherishes and appreciates this partnership which enables our students and faculty members to participate in leading-edge research.

It is to be noted that this innovative process helps to build teams and it also serves to promote a broader and richer experience for the postgraduate student. This form of collaboration will be greatly assisted by developments in Information and Communication Technology (ICT).

(b). Sharing of facilities (laboratory, equipment, information).

Some of these sophisticated facilities are so expensive that it may neither be cost-effective nor desirable for each university to own them. Some universities have dedicated Central Laboratories for this purpose. Members of staff and students from other Universities could be granted access to the equipment at minimal cost.

The use of ICT enables staff and students:

- to pay virtual visits to the partners' institutions,
- to download teaching, learning and research materials from the partners' websites
- to participate in virtual experiments, such as telemedicine,
- to access the virtual libraries of partner institutions,
- to discuss research findings with their counterparts in partner Institutions using teleconferencing
- to engage in daily academic discussions with their counterparts in partner institutions by means of a listserv.

The foregoing shows that both staff and students in an institution can gain international experience without physically leaving their institution to a foreign institution. This is particularly important in

many countries in Africa where there are huge problems associated with archaic visa requirements, expensive air fares, infrequent and often unreliable flights between capitals, long travelling times, needlessly stringent immigration controls, etc.

(c) Staff development

Individual universities can strength their human capacity-building through staff development by sending junior academics on postgraduate training in partner institutions. Members of staff who benefit from this will be able to use specialised equipment, library, computing and ICT facilities which may not be readily available in their home institutions. Experience has also shown that such beneficiaries who already have academic or administrative positions in their own institutions are more likely to return on completion of their sojourn rather than emigrate to greener pastures than those just coming fresh from university sent on scholarships. Moreover, senior academics and administrators may also have opportunities for sabbatical visits to partner institutions.

(d) Distinguished lectureship programme

The aim of a Distinguished Lectureship programme is to facilitate information across Departments and Faculties on the research efforts of staff members that have multidisciplinary import. A colleague from another University identified to be doing an interesting research either individually or as a leader of a team would be invited to address the forum. It is expected that such an exchange of ideas would result in better understanding and appreciation of the research efforts of individuals or groups within and outside the University as well as collaboration in multidisciplinary research.

(E) Occasional studentship programme

Undergraduate and postgraduate students registered for degrees (or higher degrees) in a university can spend part of the period of their studentship in another university, to conduct aspects of their work. The students will eventually return to their home Universities for purpose of completing and earning the degree.

(f) Development of joint research proposals and projects.

The linkage activity can be used to develop joint research projects with principal resource persons drawn from the participating institutions. e.g. the Alliance for Earth Sciences, Engineering, and Development in Africa (AESEDA), led by the Pennsylvania State University, and many other universities in the USA and Africa (including the University of Ibadan).

(G) Curriculum development

Universities can collaborate in various aspects of curriculum development, including joint teaching of courses and development of new programmes. The specific areas of emphasis for each partner may differ but the overall theme would provide a common denominator. It is now possible to take advantage of the tremendous growth in e-education and distance education to deliver courses to a large number of students, far exceeding the capabilities to exchange students across continents. This education mode enables a paced learning, and allows us to create classes that are more active, integrated, reflective, engaging, inclusive, accessible and individualized. Faculty members from partner institutions will be able to participate in the development of these courses and to learn how to deliver the courses in or out of the classroom.

(h) Sundry forms of collaboration

There is also collaboration involving a University and an individual in a sister institution. This includes the system of external examination and external assessment of candidates being considered for promotion, especially at the professorial cadre. While these may not qualify as a formal linkage programme, they constitute a sort of collaboration, albeit one between a university and an individual.

In carrying out external examination, academics from other institutions are selected to have input into the curriculum of an institution by:

- evaluating the totality of students' performance,
- determining the appropriateness of the examinations given, having regard to the approved academic programme for the particular degree,

- moderating all examination questions in the area and endorsement of all draft questions after moderation
- scrutinizing and if necessary revision of the marking of answer scripts in consultation with the Chief Examiner,
- assessing all relevant oral and practical examinations including final thesis/dissertation in consultation with the Chief Examiner,
- submitting to the Vice-Chancellor a confidential report on the general standard of the examination and the performance of the candidates and undertaking of a critical appraisal of the conduct of the examination including the standard of marking by the internal examiner(s) with suggestions for improvement in the future.

The external examiner often has to be physically present in the department which has invited him/her, this providing opportunity to interact more closely with colleagues on their areas of teaching and research interests. The experience gained by all parties concerned can be quite refreshing and of immeasurable benefits to all concerned. It has been suggested (Olubunmo, 1985) that the external examiner should present a seminar on his research efforts to his host institution. Because of the enormity of the work involved, he went as far as suggesting that no academic should accept more than one external examination position in a given session.

Moreover, following approval of prima facie cases, candidates being considered for elevation to the professorial cadre (Readers/Associate Professor and Professors) are required to be assessed externally. Each proposed assessor is expected to have attained both national and international eminence in particular relevant disciplines and the academic or equivalent status of a professor. Moreover, he/she is expected to be an expert in the fields of specialisation of the candidate being assessed.

There is no doubt these measures have been put in place for quality assurance of the products of individual universities (i.e. their graduates) and the faculty.

4 UNIVERSITY - GOVERNMENT - INDUSTRY COLLABORATION

The foregoing discussion has been largely concerned with inter-university collaboration. However, collaboration could also involve universities, government and the private sector. The National Policy on Education (NPE, 1981) recognizes that government will support **closer links between the universities, industries and various research councils (Fig. 1)**. Government will encourage locally-based industries to develop direct links with universities to facilitate research into their products and problems. Universities will be required to keep both government and industry better informed about their research results. Government will ensure effective utilization of the results of universities' research, and promising research results will be taken up and developed by government (NPE, 1981).

Nowadays, the trend is to encourage entrepreneurship and innovation. Entrepreneurship is simply the creation of value by people working together through applying creativity, drive and a willingness to take risks. The five core elements of entrepreneurship include (Accenture, 2003):

- creativity and innovation. These are the heart of entrepreneurship which enable entirely new ways of thinking and working, most importantly, allowing entrepreneurs to identify opportunities that no one else has noticed.
- an ability to get things done. Effective translation of thoughts into action and results through the use of available resources in applying creativity.
- Drive. (Believing in ability to change the way things are done and possessing the force of will and the passion to achieve success).
- a focus on creating value. (Being able to see the potential worth of new ideas).
- a willingness to take risks

On the other hand, the current educational curriculum focuses heavily on producing "job-ready" employees not entrepreneurs. The typical school nurtures skills and knowledge not the attributes of creativity and drive that breed entrepreneurship.

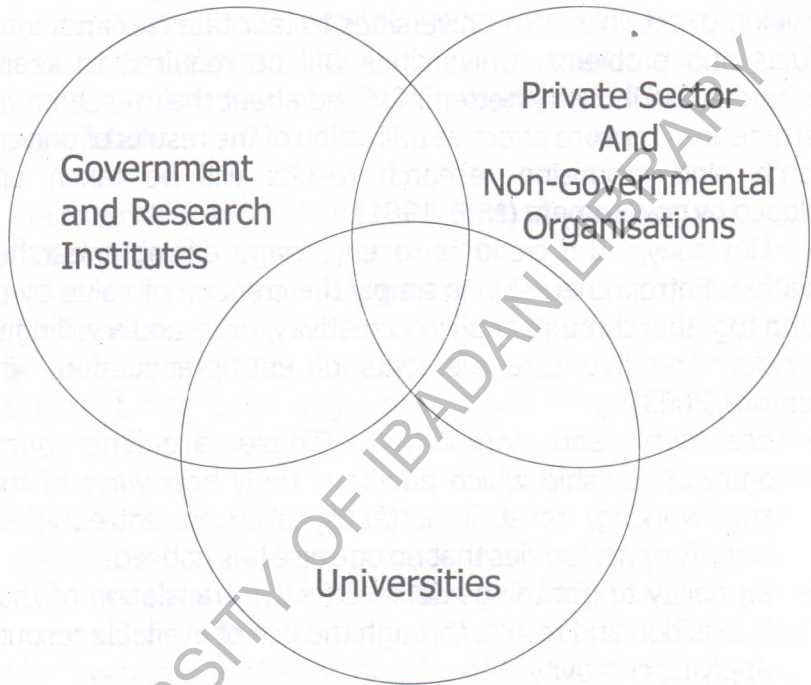


Fig. 1. Framework for university-governent-industry collaboration/partnership (modified after Bamiro, 2003).

Institutional barriers militate against university-industry partnership. As pointed out by Raymond (2003):

“it is evident that a good relationship and strong interaction between university (especially their science and engineering faculties) and industry are of utmost importance for both parties. It is equally evident that there exist serious barriers which hinder this interaction. Many of these barriers stem from the differences in cultural climate between university and industry.

- **University is knowledge-directed.**
- abstract theoretical thinking is in high esteem, and
- there is a strong partition into scientific disciplines and sub-disciplines.

On the other hand,

- **industry is action-directed.**
- concrete practical thinking is a must for success, and
- generally a real industrial problem is of a multidisciplinary nature and has to be approached in a holistic way.

The gap is most painfully felt between university and the small and medium industry (SMI). In those small industries, managers with university degrees are more exception than the rule, and in university circles often a certain disdain towards the money-making world of small enterprise exists. This makes it difficult for both sides to approach each other”.

As pointed out by Ogotuga (2003),

“The private sector is out to make profit but may be willing to seek knowledge from universities as long as such knowledge supports this primary aim or motive. While universities have knowledge they need to make the private sector see the opportunities derivable from their skills and knowledge. If universities can produce sound, original work which has economic potential, it is the private sector that will come knocking at the door. The private sector can see through poorly researched work and will not show any interest. Through private sector funding, universities can focus their

work better, in terms of application of science, and transformation from the laboratory to real life. Universities need to make themselves relevant to the private sector. The search for sound research has led many large companies to establish their own Research and Development laboratories. Nigerian universities can also make their contribution to the private sector. This will require liaison to know the required areas of knowledge”.

Yet, in a fast changing world it is highly desirable for industry to keep in close contact with technological development and to cope with all the demands and requirements of society that grows more and more complex every day. Raymond also observed that:

“Institutional barriers that come in the way of strengthening partnerships between government, industry, and universities stem from economic, political, social and cultural environment prevailing in a particular country. 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 concerns. This condition is also exacerbated by the scientists' own view of their role in society. For many years scientists were concerned with the imperative to 'publish or perish', and had practically no interaction with the economic operators. The science and technology policy they framed was no different from the earlier science policy and was not integrated into the national socio-economic development policies.

- **There is now a growing realization that these policies have to be recast, and science and technology policies closely linked to the social, economic, industrial, and trade policies of the countries.**
- **The role of universities also has to be reviewed, especially in the face of dwindling financial resources and government support”.**

It has been estimated that about 3 million people enter the labour market in Nigeria every year, and most of these are graduates or dropouts from the various levels of the education sector. It is widely

accepted that only about 10% of these graduates find jobs in the formal sector. The vast majority of the remaining 90% are usually unemployed or underemployed for many years, with many drifting into the informal sector. Part of this human capital is lost when talented Nigerians emigrate to other countries where they presume they can find better environments to put their talents to use. Whichever way we view these developments, they represent lost opportunities to the development of our country.

There is little tradition between the business and research communities in Nigeria. Consequently, only a few cases of Research and Development results have led to new enterprise formation.

5 CONSTRAINTS TO ACADEMIC LINKAGES

The main obstacle to strengthening inter-university cooperation in Africa can be attributed to inadequate institutional funding (Ekhaguere, 2004). Arising from this are such other problems as the following:

- poor teaching, learning and research environments, evident in the poor state of libraries, laboratories and the ICT infrastructure,
- poor living conditions for staff and students
- incessant strikes by university staff unions which lead to disruptions in academic calendars. It was reported (Abubakar, 2003) that the nationwide strike embarked on by the Academic Staff Union of Universities (ASUU) from January to May 2003 led to a financial loss of some N43.3 billion. Other losses include the loss of worth of our certificates, knowledge, skills and overseas' scholarships.
- inadequate resource provision for inter-institution cooperation
- poor quality staff, both teaching and non-teaching
- lack of scholarship and bursaries to the vast majority of students
- poverty among students, leading to many cases of those who are registered as full-time students but at the same time are working full-time/part-time
- declining ethical and moral values,
- inadequate staff development activities
- rising scourge of the HIV/AIDS pandemic on campuses

- poor state of campus facilities such as road, water supply, and electricity supply,
- unsafe campus environment and endemic campus violence,
- poor campus sanitation

6 STRENGTHENING COLLABORATION BETWEEN UNIVERSITIES

Some of the measures that can help in fostering inter-university collaboration include the following:

- strategic planning
- striving for excellence in teaching and research
- improving the ICT infrastructure (for a university to be in a position to compete favourably in the present-day world, the need for a functional and robust website cannot be overemphasized). Apart from other information, it is necessary to showcase the reservoir of expertise that abounds within the university.
- improving the state of infrastructure on the campuses (roads, water supply, electricity supply, telecommunication)
- regularizing the academic calendar
- improving ethical standards in teaching and research
- recognizing credits for studies abroad
- operating a functional international relations office
- internationalizing the curriculum
- dealing with policy and management issues
- broadening participation in regional initiatives (e.g. NEEDS, NEPAD, AGOA)

There is an urgent need to strengthen inter-university cooperation in Nigeria in order to promote academic mobility within the country. This will also foster national and international inter-university collaboration in research projects.

7 THE UNIVERSITY OF IBADAN AS A CASE STUDY

Established as a college of the University of London in 1948, the University of Ibadan is the oldest such institution in Nigeria.

The new Vision of the University is **"to expand the frontiers of knowledge and transform the society through innovation"**.

The Mission is **"to be a world-class institution where conditions for learning are excellent, research and services are outstanding, and where staff and students are worthy in character and sound judgement."**

Conscious efforts are being made to expand postgraduate intakes such that ultimately 60% of the total student population will be postgraduates. The total student population in our university stands at about 20 000, with about 7000 (35%) being postgraduates.

There are now about 54 Universities in Nigeria and this number is likely to rise in the coming years with the licensing of private universities by the National Universities Commission. By virtue of its age and its well developed postgraduate programmes, Ibadan is expected to train candidates up to the doctoral level for many of the younger universities, if only in her own enlightened self-interest to prevent poaching of its more experienced academics. The University is at a vantage geographical position to do this. There are 14 degree awarding institutions within a distance of less than 300 km of Ibadan. Moreover, available data suggest that in the last five years, most of the new postgraduate intakes at Ibadan completed their first degrees at Universities other than Ibadan (Table 1). This trend is likely to continue in the years ahead as the authorities have decided that Ibadan should concentrate more on postgraduate studies as part of the new vision and mission statement. Formal linkage programmes between the University of Ibadan and the other Nigerian universities will go a long way to benefit the partnering institutions.

Table 1: Summary of university attended by newly admitted postgraduate students

Session	Ibadan graduates	Non-Ibadan graduates	Total	% Total that are Ibadan graduates
2002/03	503	2870	3373	14.9
2001/02	908	3340	4248	21.0
2000/01	1215	3295	8510	26.9
1998/99	1346	2224	3570	37.7
1997/98	1402	3323	4725	29.7

The University of Ibadan Academic Links Programme (UIALP) was established in 1981 to promote academic and intellectual exchange for the advancement of knowledge and understanding between the University of Ibadan and institutions in other parts of the world. The UIALP seeks to identify specific fields and activities appropriate for co-operation, including the sharing of experiences and resources. The Chairman is the Deputy Vice-Chancellor (Academic), indicating the great importance the University attaches to her linkage programmes.

Some examples of linkage programmes between the University of Ibadan and partner institutions and organisations are outlined in this section.

(a). University of Ibadan and University of Pennsylvania

The University of Ibadan signed an agreement with the University of Pennsylvania for a linkage programme in May 1981. It was clearly stated that the exchange would operate in a spirit of reciprocity and cooperation, in approximate parity between the two universities. At the beginning of the collaboration, each university was enjoined to identify specific fields and programmes appropriate for cooperation and the sharing of resources, and the two institutions were to work together to set up joint activities wherever possible and desirable. These activities were to include joint research, the exchange of teaching or research staff, student exchange cooperation with respect to library and research

facilities, cultural exchanges of information on university administration, and such other projects as were deemed mutually beneficial.

Some specific areas of collaboration included the following:

MEDICINE

The University of Pennsylvania School of Medicine agreed to set up a Visa Qualifying Examination test program at Ibadan. The School will send a team to give an intensive course at a time appropriate to the examination date. The University of Ibadan was willing to receive applications from University of Pennsylvania medical students for clinical electives especially in the areas of tropical medicine, public health, community and rural health and paediatrics.

The University of Pennsylvania biomedical computer unit centre agreed to accept a researcher from the University of Ibadan for further training in the use of medical computer facilities.

DENTAL MEDICINE

The School of Dental Medicine at the University of Pennsylvania agreed to assist Ibadan in the development of dental education, especially in areas of Curricula/ Teaching Resource Development.

NURSING

The University of Pennsylvania expressed support for assisting the University of Ibadan in the development of a graduate program in Nursing. The University of Pennsylvania helped to supply leadership resources to the University of Ibadan through sabbatical exchanges during the period of development.

VETERINARY MEDICINE

The School of Veterinary Medicine at the University of Pennsylvania assisted in the training and development of the Ibadan faculty particularly in veterinary clinical studies. There was also an agreement to carry out joint research activities especially in the field of pathobiology.

SOCIAL WORK

The School of Social Work of the University of Pennsylvania designated some faculty members to assist Ibadan in developing interdisciplinary graduate program in social work.

The School of Social Work assisted the Ibadan Medical School to develop academic programs and internships for medical social workers.

ENGINEERING

The School of Engineering and Applied Science (SEAS) at the University of Pennsylvania arranged by mutual agreement, visits of University of Pennsylvania engineering professors for two to three-week periods during which they presented intensive and specialized lectures in fields of interest mutual to Ibadan and Pennsylvania.

The University of Ibadan faculty was encouraged to present applications for doctoral studies admission of their most promising students, especially those they hoped may obtain faculty positions eventually at Ibadan.

ARTS AND SCIENCES

The University of Ibadan invited a professor to visit Nigeria in the academic year 1982-83. The University of Pennsylvania invited an African historian to visit the University of Pennsylvania.

LAW

The University of Ibadan expressed interest in the support of the University of Pennsylvania in the development of the Ibadan law school, and to this end a professor from Pennsylvania was specially invited to visit Ibadan to be part of an international team to assess, and advise on, the structure of the law curriculum. The University of Pennsylvania played an important role in furthering education and preparation of students for the practice and teaching of law in Nigeria.

LIBRARY

The University of Ibadan librarian assisted the library of the University of Pennsylvania to acquire materials to help enrich its Africana collection.

STUDENT EXCHANGE

The University of Pennsylvania sent some undergraduates for study at Ibadan as part of student exchange. The general principles of this regular student exchange are as follows:

Students participating in this exchange will study as visitors i.e. non-degree candidates at the other institution for a semester or a year. The University of Pennsylvania was primarily interested in sending

undergraduates to Ibadan in all fields and graduate students to the Institute of African Studies. Ibadan was primarily interested in sending graduate students to Pennsylvania. The exchanges were conducted in approximate parity.

Final decisions on the admission of students were made by the host institution.

Students were responsible for their own travel costs.

Tuition costs were waived at both institutions for a period no longer than one year.

All applications to Ibadan from the University of Pennsylvania passed through the Office of International Programs at Pennsylvania.

All applications to Pennsylvania from the University of Ibadan passed through the Academic Link Board Office of the University of Ibadan.

JOINT RESEARCH

Both universities agreed to explore cooperation in the following areas:

- joint activities in the field of education
- a comparative American/African literature program
- a visit of the University of Ibadan theatre troupe to the University of Pennsylvania
- assistance to the University of Pennsylvania in African studies.

In all, the exchange of persons involved:

- 69 from Ibadan and
- 72 from Philadelphia

As part of the Ibadan-Pennsylvania Exchange, a special joint lectureship programme was established whereby once each year, a selected member of each university, appointed by joint agreement, delivers a lecture or series of lectures at the other. In the period 1981-1988, a total of 11 lectures were delivered; five of these were presented in Philadelphia by Ibadan professors while the remaining six were given at Ibadan by professors from Philadelphia. These lectures have since been published in a commemorative volume edited by Ogunmola and Rutman (1989).

It is gratifying to note that after a long period of lull, following reciprocal visits, the University of Ibadan has recently signed a new links agreement with the University of Pennsylvania to cover staff and student exchange, joint academic programme development and collaborative research. This includes a two-year collaborative programme in research and capacity building in Peace and Conflict Studies and Nursing.

(b). University of Ibadan and the African Economic Research Consortium (AERC)

The University of Ibadan submitted a bid to the Nairobi, Kenya-based African Economic Research Consortium (AERC) for a Collaborative PhD Training Programme in Economics. This programme envisaged collaboration among African universities on the premise that an inter-university graduate programme can work very well in sub-Saharan Africa. As far back as 1993, the AERC had concluded that, first, a decline in external support for doctoral-level training had left large gaps in qualified staff at the region's universities. Second, the decline in opportunities for training at this level had negatively impacted the development of capacity for research and analysis of economic issues within public agencies and, increasingly, in the private sector. Third, there was a disjuncture between the quality and relevance of existing doctoral training and the more specific need for skills and contextual relevance of such training in African countries. Fourth, there was a need for further analysis to establish the effective demand for doctoral-level training and to determine the most appropriate approaches to meeting the demand.

The programme is intended to:

- further strengthen teaching and research capacity in economics in sub-Saharan African countries.
- increase the sub-region's pool of potential researchers and policy analysts
- reduce the need for African countries to purchase training abroad when services of comparable quality can be provided at home at reasonable cost
- integrate theory, tools and African applications into academic teaching, thereby ensuring that theory is firmly grounded on the empirical side, and

- facilitate the gradual build up of a community of African scholars who have the expertise and the vocation to identify relevant research issues in economics and provide leadership in addressing them.

The programme at the University of Ibadan is open to citizens of English-speaking West African countries (Nigeria, Ghana, Liberia, Sierra Leone and The Gambia) sponsored by public sector institutions and/or organizations engaged in research and training in economics and those whose primary mandate is economic management in these countries.

Entry into the Collaborative Ph.D. Programme shall be on a competitive basis. The criteria for admitting students to the programme will include the following:

- An applicant must have a good 1st degree (1st class or 2nd class (upper) or equivalent), in Economics or in related field from a recognized university.
- The applicant must also have a good Master's degree in Economics (with a course work component) from a recognized University.

Eligible candidates shall be required to take a selection test and attend an oral examination both of which shall be conducted by the Department of Economics of the University of Ibadan. Possession of other qualifications such as the Graduate Record Examination (GRE) scores in Economics and literary as well as mathematical aptitude tests shall be added advantages. Successful applicants receive a generous maintenance grant from the AERC. The AERC also pays their tuition fees. Our Department of Economics and the University are also to be assisted both in terms of human and financial resources.

The PhD candidate shall be required to

- take both Compulsory and Elective courses in Economics at the Ph.D. level and pass examinations in these courses
- pass a Comprehensive Examination at the end of their course work and
- write a Ph.D. thesis under Supervision and submit him/her-self for an oral examination for the award of a Ph.D. degree in Economics by the University of Ibadan.

The first intake, comprising six students, enrolled in January 2003, while the second set has also been admitted. An advertisement for the next set was placed in The Punch of Friday 16 July 2004 and further information can be accessed on our website for prospective PhD candidates. (Visit <http://www.postgraduateschool.ui.edu.ng>).

(c). The Alliance for Earth Sciences, Engineering and Development in Africa (AESEDA).

The Alliance for Earth Sciences, Engineering and Development in Africa (AESEDA) is designed to enable the integration of science, engineering, and social sciences in order to develop human resources, promote economic vitality and enable stewardship. It is a strong partnership among Penn State University, select African Universities and Historically Black Colleges and Universities in the US (HBCUs) who will pool their research and educational capital and focus it on developing geo-resources extraction technologies for sustainable livelihoods in Africa. The Alliance is designed to focus on developing innovative research themes that will attract large-scale funding from government funding agencies and multinational corporations. It is designed to develop new educational initiatives as well as enabling the infrastructure to deliver them. It also envisions a multi-faceted mode of interactions among partner institutions.

The central theme of the Alliance is Geo-resources extraction, management and utilization for sustainable livelihoods in Africa. Geo-resources in this context include water, energy and minerals. Livelihoods include both household strategies as well as broader industrial and economic activities that are the backbone of human and national socio-economic development.

The partnerships will serve to:

- build contemporary human capacity in Africa that will drive and sustain geo-resources management as the engine for economic growth
- formulate a greater basis for economic opportunity and sustainable livelihoods
- develop a technically sound framework to support decision-making and policy development
- encourage Africa's full participation in the global economy
- capitalise on new and emerging educational methods and technologies to enhance human capacity development.

Although many benefits will accrue to society through a successful achievement of the goals of the Alliance, a few key benefits to all stakeholders include:

- Stimulation of collaboration-both intra- and inter-institutional.
- Enduring solutions to resource optimization problems
- Capacity-building in partner institutions human, research and educational.

A few strategically positioned Universities have been joined to form the core of the Alliance. The first two countries with designated partner institutions are Nigeria and South Africa. Within each, two Universities have been selected based on human resources and infrastructural facilities that they are able to bring to the table. In Nigeria, the University of Ibadan and the University of Lagos are the core partner institutions while in South Africa, they are the University of Cape Town and University of the Witswaterstrand. Each university is committed to the Alliance based on face-to-face meetings with the faculty and senior university leadership.

(d). University of Ibadan and the National War College

The University of Ibadan and the National War College, Abuja, have a subsisting linkage agreement for the training of senior military, police, and security personnel for the degree of Master of Strategic Studies (MSS) in our Department of Political Science. The candidates undertake the first leg of their programme at the National War College. During this phase of the programme, senior academics from Ibadan also participate in teaching of courses. On the basis of a satisfactory level of performance, the best students are then selected to proceed to the MSS during which they come into residence at Ibadan for a semester. A number of our professors have spent their sabbatical leave at the War College as part of this initiative.

(e). University of Ibadan and Southern Illinois University Edwardsville (SIUE)

There is a linkage programme between UI and SIUE on joint research projects, faculty development, collaborative research agenda, curriculum development, and outreach programmes. Six faculties and one postgraduate student from UI have visited SIUE while eight faculty members from SIUE have come over to Ibadan as

part of the programme. The core participants from Ibadan are from the Departments of Linguistics and African Languages, English and the Institute of African Studies. In the area of faculty development, both teams pay special attention to acquiring significant scholarly materials which are hard to come by on their campuses. In the case of SIUE faculty, they are determined to utilise the opportunity to investigate the history and culture of the communities they visit. More importantly, it is an opportunity for them to acquire primary documents, either oral or written in nature. In the same vein, the faculty from UI use their visit to the SIUE to acquire source materials on different topics of their investigation which are not readily available to them in Nigeria.

The faculty teams from both universities cooperate on a number of significant research themes and topics. They attempt to utilise multi- and inter-disciplinary research methodologies. Not only do the team members cooperate on identifying and collecting source materials for their research themes, they also cooperate in employing multiple data analysis techniques in assessing their research results.

The project participants attend learned conferences as a way of disseminating the result of research endeavour. A number of articles have been submitted to academic journals for review and subsequent publication.

While in Ibadan, SIUE developed curricula for the Departments of Archaeology and Anthropology, Geography, History, and Linguistics and African Languages. When the courses are fully operational in both universities, students and faculty will benefit immensely from the intellectual exchanges which will result from the undertaking.

(f) UI/ZINOX Technologies Limited

The UI/ZINOX Technologies Limited (an indigenous ICT Company) partnership is an example of university/private sector collaboration, under the MacArthur Foundation programme. ZINOX Technologies Limited is an indigenous ICT Company. There is a Memorandum of Understanding between the two partners. Specifically, the objectives of the partnership are to (University of Ibadan Official Bulletin, 2004):

- provide opportunities to both organizations to benefit from their respective skills and resources
- provide avenues for skills development of staff and students of UI through research and industrial attachment

partnership are to (University of Ibadan Official Bulletin, 2004):

- provide opportunities to both organizations to benefit from their respective skills and resources
- provide avenues for skills development of staff and students of UI through research and industrial attachment
- facilitate access of ZINOX to the varied and highly sophisticated market in the area of industrial attachment
- promote access of ZINOX to multidisciplinary problem-solving teams in the areas of engineering, management, including product-development, marketing, financing, among others
- provide an avenue for challenging the creative abilities of Nigerians through research and consultancy to address peculiar technological problems confronting ZINOX and other relevant research and development issues in innovation and entrepreneurship related to information technology; and
- serve as a model in University-Private sector collaboration for other organizations and universities in Nigeria.

ZINOX Technologies Limited has agreed to a special scheme for staff computer ownership. The University will guarantee a 20% down payment, while the remaining 80% will be paid over six monthly instalments, through direct salary deduction.

CONCLUDING REMARKS

In this paper, we have examined the various ramifications of linkages and collaboration that universities can profitably engage in. These start from small-scale collaboration between a university and an individual in a sister institution either as external examiner to students written examinations and projects, dissertations and theses or external assessors of candidates being considered for elevation to the professorial cadres. On a more formal level, collaboration may be at inter-university levels. Moreover, there can be linkages and collaboration between universities, governments, non-governmental organisations and industry. Suggestions have been made on the need for universities to create a more pro-active approach to bridging the

university-industry divide, especially on how to promote entrepreneurship among science and technology students. The need to forge solid linkages cannot be overemphasized in the light of the limited human and material resources at the disposal of individual universities at any point in time. In every instance, the operative keyword is partnership as any university willing to participate must be in a position to bring something to the table. As part of creating and sustaining a community of scholars and promoting academic mobility for both students and staff, a university stands to benefit from academic linkages and collaboration.

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