

SCIENCE IN AFRICA AT THE DAWN OF THE 21st CENTURY

Under the leadership of Roland Waast and Jacques Gaillard

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NIGERIA

By

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EXECUTIVE SUMMARY, by Yann LEBEAU

General presentation

With a population estimated at more than 120million people, from over 250 ethno linguistic communities, Nigeria is the most populous and the most diverse country in Africa. It is also among the most volatile with this heterogeneity being constantly manipulated by traditional, religious and modern political elite in their race for the control of the state resources

This fragile composition was assembled in 1914 under the British domination, with the amalgamation of the southern and northern Nigeria protectorates along with the Lagos colony. The Nigerian state was by origin a state of colonial conquest and an instrument of subjugation that forced many different nationalities to live together in a single territorial unit. This origin was not conducive to the development of a close identification with the state or to the growth of a legitimate authority at the centre. The postcolonial political history of Nigeria has been a continuous attempt to counter the effects of sectional (religious, ethnic, communitarian) interests and loyalty, through a reinforcement of the centre's powers, which often ended in the supremacy of military authoritarian regimes.

Following nearly 16 years of military rule, a new constitution was adopted in 1999 and a peaceful transition to civilian government completed. The new president faces the daunting task of rebuilding a petroleum-based economy, whose revenues have been squandered through corruption and mismanagement, and institutionalising democracy. In addition, the Obasanjo administration must defuse longstanding ethnic and religious tensions, if it is to build a sound foundation for economic growth and political stability.

Labelled "giant of Africa" in the 1970's on account of its promising human and natural resources, Nigeria entered in the early 1980's in an unprecedented period of recession following the domination of corruption over government operations, the fall of the oil market price, and the introduction of a structural adjustment programme in 1986. Despite its potential wealth, Nigeria is ranked today as part of the world's 30 least developed countries

This context has of course severely affected institutions of higher learning and the scientific community through the twin effects of the deterioration of the working conditions and that of the purchasing power of academic staff. However, our study, based on visits in 9 of the most prestigious research institutions and interviews with 45 scientists in their working environment, reveals that, contrary to all expectations, research has not died. It has rather been transformed, in various ways, along the survival strategies evolved by the scientists and the needs of the international community.

A brief history of science

The history of science and Technology is briefly examined here, in terms of establishment of institutions and major areas of specialty. To understand the development of scientific institutions in Nigeria, one must bear in mind that it followed two distinct lines. On one hand, research was meant to take advantage of the colonial potential and was therefore developed in the form of experimental stations linked with research institutes in Britain. On the other hand, higher

education, developed much later in response to the nationalists' pressure, witnessed a more autonomous research activity in terms of linkages and outputs.

In the pre-independence era, the first higher institution for the production of S&T manpower was the Yaba higher college, established in 1932 for the purpose of producing assistant medical officers, assistant agricultural officers, assistant surveyors and assistant education officers. For as long as Yaba remained a sub-degree level institution, its products remained assistants to the expatriate officers. Post world war agitation by the nationalists led to the establishment of the University College, Ibadan in 1948. Amongst others, it offered degree courses in the basic sciences and agriculture, and pre-clinical courses in medicine.

But the oldest experimental stations had been in existence for long, to boost production in those aspects of the economy that were export-oriented. The oldest agricultural experimental station in Nigeria was established in 1899, and the Geological Survey Department in 1919. Of the 11 research institutes that existed in 1960, 10 were agricultural. The number of institutes jumped to 22 in 1983, with 18 of them again catering for agricultural research.

After independence, both research institutes and University-based laboratories were paid great attention. While institutes were clearly established in line with the developmentalist ideology, the creation of universities followed the political elites' strategies to benefit from the "national cake". In other words, universities were politically supported for their capacity to strengthen the high-skilled regional elites, while their research activities were left apart, and developed in directions that had to do more with the international scientific affiliation of the scholars or the donors' interests, than with the needs of the federation or the 1964 UNESCO recommendations (*see Lebeau's report*).

A step towards a more interventionist policy came with the setting up by the military junta (1977) of the National Science and Technology Development Agency. At the same time, a quota system in favour of scientific disciplines was introduced in the university admission system (60:40 ratio). In 1979, the new civilian government went a step further with the creation of the ministry of Science and Technology, but the expected increase of the country's S&T activities did not occur due to the lack of willingness of the political elites. The new ministry was allocated 0.85% of the budget for the 4th National Development Plan (1980-85), which was probably just sufficient to meet its administrative overheads. As a result, scientific laboratories in secondary schools remained scarce and poorly equipped, and scientific disciplines at the higher were never able to attract more than 30% of the student enrolment, thus showing the failure of the ratio policy.

In the mid-1980's, Nigeria's scientific landscape was made of about 30 federal or others state owned universities, and of 22 federal research institutes. While the first were polyvalent by tradition (except for the universities of technology), the latter remained dominantly oriented towards the use of the natural resources found in Nigeria.

The reinforcement of the state authoritarianism under Babangida's administration (1985-93), coupled with a sudden state resources reduction led to a serious crisis in research and higher education and left universities and research institutes in a state of despair on which a lot has been written.

The relative strength of the Nigerian scientific community allowed the universities to continue, for a while, to be active in research both at local and international level. Institutes, which were more "application oriented" and therefore hanged to the wills of their authorities, were immediately affected by the state disengagement. It is admitted that they currently account for less than 15% of the total Nigerian research output.

Science and technology organs

The Federal Ministry of Science and Technology was established in 1979 to prepare an outline of Science and Technology Policy for Nigeria, which was still being finalised when it became merged with the Federal Ministry of Education in January 1984. In 1985, the Science and Technology section was again carved out and constituted into a full ministry. Following this period of constant structural changes, the institutional framework has remained unchanged up till the appointment of Chief Ebitimo Banigo as minister of Science and Technology of the newly elected Obasanjo administration in 1999.

Though the NST Policy has attempted to define new approaches to the development of science and technology in the Nation, results as far as research was concerned, have always been far below expectations for at least two reasons. First, in the area of financing science and technology, the policy specified a three-tier funding system involving the Federal Government, the State Governments and the private sector. The Federal Government, which was to fund science and technology programmes up to 5% of its annual budget has never fulfilled its commitments and spent less than 1% of its 1999 budget on this sector. Secondly, the implementation of the National Policy on Science and Technology is not a special preserve of the Ministry of Science and Technology. Research is developed in not less than 22 research institutes (under various ministries or under the presidency), 38 State or Federal universities and 30 State, private and Federal polytechnics. Aspects of the policy touch on the mandates of other agencies such as the National Universities Commission through which research grants are channelled towards the various departments. The frequent changes in leadership, structure, location within the machinery of government did not augur well and even prepared the ground for the economic crisis of the 1980s, which dashed all hopes of a long term development of science and technology.

Current Scientific outputs

Considering the bibliographical panorama offered by the PASCAL database, Nigeria's scientific production (coming from the country's laboratories only) has been divided by two in last decade. This of course, reflects partly the state of crisis referred to in the above chapter. Nigeria's research institutions are no longer in position to develop research strategies at the institutional level, and most of their researchers have lost contact with the international scientific community. In addition to this, the intellectual and economic environments of the last 15 years have discouraged the most renowned scholars of the country to continue to work at home. It is admitted that Nigeria has lost half of its professors and senior lecturers between 1987 and 1995.

Table1: The Nigerian scientific output. Annual records from PASCAL and SCI databases

<i>Sources</i>	1991	1992	1993	1994	1995	1996	1997	Total
PASCAL	850	754	560	448	442	452	396	3 902
SCI	632	592	555	455	487	464	450	3 635

Nigeria remained for more than two decades the most visible country of sub-Saharan Africa in terms of scientific production, though far behind Egypt and South Africa.

Scholars were then permanently exposed to the international community through the presence in Nigeria of reputable lecturers from America, Europe and the Middle East, and through the sponsorship by the government or by foreign foundations (Ford, Mc Arthur...) of research and documentation trips abroad. Nigerian scholars had therefore the opportunity to publish abroad as well as at home, where scientific publishing houses were vibrant.

With the brain drain and the collapse of the university system, Nigeria lost its enviable position and is today ranked 5th by PACAL, behind South Africa, Egypt, Morocco, Tunisia¹.

The numerous local journals, often supported by university departments, have themselves disappeared one after the other. Those that are still coming out are today so poorly edited that they have lost their most reputed contributors. From our interviews, it is obvious that local publications in Nigeria are no longer considered in the promotion of scientists. This tends to confirm the trend observed by R. Arvanitis et al. at the continent scale (*see the bibliometric study*): a lot of African journals have been discarded by scientific databases in the 90's , thus marginalizing the scientific production of these countries on the international market.

Nigerian scientists remain active and reputed in areas such as agriculture (29% of the national output) and medicine (38%), as it has always been the case, while they have almost completely disappeared from the databases in applied sciences (chemistry, geology, environmental sciences...).

However, the staggering collapse of Nigeria in the rankings reflects only partially the state of activity in the country's laboratories. The absence of career prospects, the budgetary shortfalls, and the inclusion of consultancy services in most aid programmes, have gradually disinstitutionalised the scientific research, which relies more and more (almost exclusively in applied and social sciences) on individual initiatives and strategies. Scholars from these disciplines tend to look for lucrative consultancy and expertise contracts outside the University, generally advertised on an individual basis. These works, rarely published as they are most of the time subject to confidentiality, do not benefit their authors' academic career but contribute to maintain or even improve their research skills. Therefore, the generalization of consultancy in Nigerian universities should be taken into consideration to understand better their real level of research activity, and the sharp contrasts observed from one institution to another.

¹ Nigeria is ranked 6th, behind Kenya, in the SCI database

Transformation of the profession

What we just said of the new trend in the Nigerian scientific output with the development of consultancy, should be borne in mind when talking about the transformation of the profession. The most important and brutal transformation was probably imposed by the economic and political crisis of the 1980's marked by the introduction of the Structural Adjustment Programme (1986).

Prior to this, the Nigerian scientific community enjoyed a relative wealth and a constant exposure to the international world of science. Together with their counterparts in the civil service, the army, the political class, and the managers and directors of state corporations and private enterprise, the university scholars constituted the "high society" of Nigeria. Moreover, for almost two decades after independence, 30% of the federal universities' senior staff was made of expatriate scholars (27 nationalities represented in the university of Ibadan). As academics, the Nigerian scholars were in the sixties much more internationally oriented than the average British, French or American professor at home. They were also partly trained abroad, generally for their PHD, which allowed them to develop ties that proved to be of great use when the situation deteriorated in Nigeria. In all, Nigerian scholars saw themselves very much in the context of world scholarship right from the introduction of a higher education system at home.

This probably explains why international standards for academic promotion have always been the only acceptable ones. When the Universities were meeting these standards, people were ready to publish their work in local scientific journals. At that time also, home conferences were well attended, and attracted participants from all over Africa and even beyond.

When it became obvious in the late eighties, that Nigerian research institutions would never recover their prestigious position, the scholars who were still in position to either flee and get a position abroad, or maintain links with international research groups, continued to work and publish, while most of the others (the majority of the lecturers) evolved all kinds of non academic strategies to maintain at home a semblance of their supposed social status. For them, research has stopped, except for the rare consultancy opportunities some get.

The research staff of the National Institutes have experienced a quite different fate. In the eighties, while research funds allocated to universities through the National Universities Commission were dramatically reduced, the military government continued to support the activities of the institutes that were directly under its wing. For a while, these institutes continued to carry out studies for the governmental agencies and parastatals, until their staff realized that being engaged in such local consultancy would cut them off from the scientific community and started looking for positions abroad or in the university system, while those who had the adequate connections joined consultancy networks.

As a result, the research activity in the country is today largely geared by the needs of the international community. This includes the pro-democratic and environmental NGO's from Europe and America, the UN bodies, the European Union, some national or international aid agencies and some research foundations. As revealed by the interviews collected for this study, this trend has some serious impact on both research orientations and professional culture. Being connected to a consultancy network guarantees a decent standard of living but does not necessarily contribute to the integration of the researcher in the scientific community. First, it generally implies constant changes of research topics, sometimes far from the researcher's original specialty. Second, a major feature of international consultancy today is the labour division it has generated, with scientists from the South occupying the lower ladders as data

collectors. Being kept away from the data analysis and research conclusions, they rarely enhance their own knowledge in the areas temporally under their scope, and their departments benefit very little from their experience. Cases of institutional response to this trend are very rare (the University of Lagos being an interesting exception with its dynamic consultancy unit), and it is common that a head of department devotes 100% of his administrative load to admission and time table problems. Seminars and publications have more or less disappeared - except in the few private research NGOs that have been able to survive the first contract handled by their founders – and the scholars, working alone, at home, in their office or in their lab, keep silent about their activities, giving rise to a climate of suspicion.

Perspectives. Cooperations

As we said in introduction, Nigeria is facing many challenges and pressures from all sides and has embarked upon a series of measures to sanitize its institutions and economic life. In addition, the Obasanjo administration seems more concerned than its predecessors, with the civil servants' standard of living (currently one of the lowest in Africa). Salaries of all universities and national institutes staff have been recently increased of not less than 200%.

On the other hand, this gives little idea of the government intentions towards the university and scientific sectors as wages increase is concerning all federal workers. No plan to reactivate the universities and no scientific policy have been released so far and this probably explains why the lecturers showed little enthusiasm at the salary increase announcement. This measure should at least stabilize the brain drain rate and possibly encourage the lecturers and researchers to spend more time on academic activities.

Also of importance are the signs of a reactivation of the co-operation with international foundations and of some of the numerous linkages programmes with research institutions abroad. Nigerian institutions have been kept away from the international scientific community by the economic crisis of the 1980s and later by the sanction policy adopted against the Abacha regime. The deterioration of the research infrastructures has thus been worsened by the isolation of most local scientists. To be meaningful, any research aid policy aimed at rescuing the scientific capabilities of Nigeria should work simultaneously on these two dimensions of the current crisis, by developing side by side training programmes and support for local scientific organisations and infrastructures.

Appendix : Nigeria at a glance

Population: 123,337,822

note: estimates for this country explicitly take into account the effects of excess mortality due to AIDS; this can result in lower life expectancy, higher infant mortality and death rates, lower population and growth rates, and changes in the distribution of population by age and sex than would otherwise be expected (July 2000 est.)

Age structure:

0-14 years: 44% (male 27,181,020; female 26,872,317)

15-64 years: 53% (male 33,495,794; female 32,337,193)

65 years and over: 3% (male 1,729,149; female 1,722,349) (2000 est.)

Population growth rate: 2.67% (2000 est.)

Birth rate: 40.16 births/1,000 population (2000 est.)

Death rate: 13.72 deaths/1,000 population (2000 est.)

Net migration rate: 0.28 migrant(s)/1,000 population (2000 est.)

Infant mortality rate: 74.18 deaths/1,000 live births (2000 est.)

Life expectancy at birth: total population: 51.56 years (male: 51.58 years, female: 51.55 years) (2000 est.)

Ethnic groups: Nigeria, which is Africa's most populous country, is composed of more than 250 ethnic groups; the following are the most populous and politically influential: Hausa and Fulani 29%, Yoruba 21%, Igbo (Ibo) 18%, Ijaw 10%, Kanuri 4%, Ibibio 3.5%, Tiv 2.5%

Religions: Muslim 50%, Christian 40%, indigenous beliefs 10%

Languages: English (official), Hausa, Yoruba, Igbo (Ibo), Fulani

Literacy: (definition: age 15 and over can read and write):

total population: 57.1% (male: 67.3% , female: 47.3%) (1995 est.)

GDP: purchasing power parity - \$110.5 billion (1999 est.)

GDP - per capita: purchasing power parity - \$970 (1999 est.)

GDP - real growth rate: 2.7% (1999 est.). *Inflation rate* (consumer prices): 12.5% (1999 est.)

GDP - composition by sector: agriculture: 33%, industry: 42%, services: 25% (1997 est.)

Population below poverty line: 34.1% (1992-93 est.)

Household income by percentage share: lowest 10%: 1.3% ; highest 10%: 31.4% (1992-93)

Labour force: 42.844 million.

Labour force - by occupation: agriculture 54%, industry 6%, services 40% (1999 est.)

Sources :

Africa South of the Sahara 1999, Europa Publications Limited.

The World Factbook 2000, CIA (online)

The Britannica Encyclopedia 2000 (online)

1- THE HISTORY OF SCIENCE IN NIGERIA, by Ifeanyi ONYEONORU

Introduction

Scientific research and development in Nigeria can be located broadly within the framework of four distinct but related historical periods as follows: 1830-1947; 1948-1959; 1960-1980; 1981-1999. The 1830-1947 era represents a period of colonial policy in scientific research - mainly in the areas of tropical medicine for the health of colonial settlers and agriculture for export. 1948-1959 covers the postwar period marked by the establishment of the university college in Ibadan and the beginning of indigenous participation in scientific research and development. There was also increasing change in focus of scientific research from the colonial institutes to the universities. 1960-1980 marked a period of expansion of the university system and research institutes. The period witnessed the establishment of what became known as the first, second and third generation universities (after the University College, Ibadan), as well as research and development institutes and centers. The period 1981-1999 is mainly identified with the economic crisis and adjustment in Nigeria, under anti-intellectual military rulers. It was a period when the universities, research institutes and development centers experienced severe neglect in the areas of scientific research funding and staff motivation. It was also characterized by a somewhat inconsistent movement in the structuring of the research and development system and the policy environment.

1.1- Scientific Research in The Colonial Period: 1830-1947

The picture of scientific research in colonial Nigeria illustrates some of the principal features of the British approach to development in the colonies. The role and nature of research as well as the structure of the research institutions provide an insight into the narrow objectives of research in British colonies. Research in most cases were undertaken by British scientists to find solutions to certain problems faced by British settlers in the African environment. Such problems included tropical diseases and agricultural exports. This focused research emphasis on tropical medicine and agriculture.

In medicine, the main objective was to control diseases such as malaria that inhibited the activities of the colonial settlers. In agriculture, research activities were primarily aimed at developing better cropping systems and higher yields of varieties of cash crops by improving land use and cultivation. The endeavour to establish research institutions for agriculture and medicine began within the last quarter of the 19th century.

In the area of agricultural research, a botanical station was established in Lagos in 1883 and a model farm in Ibadan in 1899. The latter was located at Moor Plantation - to propagate rubber trees and general agriculture. In 1910, the Department of Agriculture established its headquarters at Moor Plantation, where a chemistry laboratory was also constructed in 1926.

In line with British policy, the local colonial government in Nigeria was the major sponsor of research activities in the first part of the 20th century. Initiatives were taken locally with very limited inter-territorial collaboration or coordination. Separate departments of agriculture, medicine, etc., were established and staffed with permanent research officers. With forty-nine British expatriates, the number of technical agricultural research staff present in Nigeria in 1938 placed it in a leading position in Sub-Saharan Africa, after the union of South Africa. The British staff most of whom already had university degrees and research training were,

however, inundated with duties that could have been entrusted to auxiliary 68 staff. This created the need to train indigenes to serve as subordinate staff, not only in agriculture, but in other spheres of research activity. But significant funding from the home office for colonial research was not forthcoming to fulfill the objectives, until after the Second World War.

Meanwhile the expanding scope for development in such activities as health services, civil engineering and administration brought about by British colonial enterprise in Nigeria from the 1860s, spurred local merchants to privately sponsor their children for professional training overseas. As professional career increasingly became the medium for class ascendancy in the colony, Nigerians intensified their search for higher education abroad. Fourah Bay College in Sierra Leone founded in 1827, and affiliated in 1876 to Durban University in England as a degree granting institution primarily served the purpose. Until about 1945, Nigerians constituted more than fifty percent of the college degree student population. This initial aspect of elite building in Nigeria led to the first crop of indigenous scientists in such areas as medicine and civil engineering. By 1913, eight doctors for instance, and two civil engineers had qualified.

Emphasis on a regional approach in British West Africa from the 1930s led to the creation of research coordinating and funding mechanisms, and the organization of conferences at the metropolitan level. The first British Commonwealth scientific conference was held in 1938. A colonial research committee was established in 1942 to advise the Secretary of State for the colonies. This development was instrumental in the establishment of the West African Research Organization (WACRO). This was a regional network of research institutions intended to cover the four British colonies in West Africa: Nigeria, Ghana, Sierra Leone and Gambia. Two of these institutes had their headquarters in Nigeria: They are the West African Institute for Oil-palm Research (WAIFOR) and the West African Institute for Trypanosomiasis Research (WAITR). WACRO also included: the West African Rice Research Station (WARRS), the West African Maize Research Unit (WAMRU), the West African Cocoa Research Institute (WACRI), the West African Institute for Social and Economic Research (WAISER) and the West African Council for Medical Research (WACMR).

Each institute was required to set up its own research stations. Just before independence in 1957, Nigeria had fifty-seven scientists in seven institutions, while the West African inter-territorial science and technology services had seventy scientists in nine institutions. The structure of WACRO clearly expressed the colonial attitude. Priority was given to a number of primarily export crops such as rice, maize, palm oil, and cocoa. Modern scientific agricultural development in Nigeria was founded on the objective which favoured the adoption of a single-product, problem-oriented approach suitable for large scale producers. This resulted in the emergence of a dual agricultural economy with one as a plantation economy serviced by a network of scientific institutions and the other a subsistence agricultural economy with less scientific attention. WACRO was dissolved in 1962 - two years after Nigerian independence in 1960.

1.2- Emergent Nigerian Scientific Elite : 1948-1959

As the 19th century progressed and the colonial regime in Nigeria became firmly established, the second root of the development of scientific research began to show itself in the concern of the African elites for the elevation of the black race. This concern was a by-product of a growing race-consciousness among the educated elite, not only in West Africa but throughout the Negro world in the late nineteenth century and early twentieth century. In West Africa, the best-known early exponents of the new race consciousness included Dr. James Africanus Horton, a Sierra Leonean of Nigerian descent, Dr. Edward Wilmot Blyden, a Liberian, James Johnson (1874-1917), a Nigerian and Joseph Casely Hayford of the then Gold Coast (Ghana).

A corollary to the growing race consciousness among educated Africans was an awareness of the technological gap between the black race and the white race which scientific development bequeathed to Europe since its industrial revolution from the late 18th century. This awareness was at the heart of the desire for higher education by Africans.

Against this background, the National Congress of British West Africa, comprising of educated Africans from the four Commonwealth West African countries, under the leadership of Casely Hayford, demanded a British West African university. The Training College and industrial Institute proposed in 1896, by leading citizens of Lagos was the first notable attempt at establishing a university in Nigeria. The plan envisaged a college with two departments inspired by Booker T. Washington's Tuskegee Institute. The first, was to be an industrial department teaching the conventional mechanical trade and scientific/practical agriculture. The second, a literary department which however, was to host such science courses as mineralogy, botany and geology. The scheme was premised on Washington's philosophy that education to serve the purpose of elevating the negro race must combine intellectual and industrial training. The college plan, however, failed due to lack of funds and in particular, the lukewarm attitude of the colonial government to the project.

The establishment of the Yaba Higher College - a government sponsored institution aimed at producing "well trained assistants for various departments of government and private enterprise" somewhat changed the scenario. The College was to have five courses dominated by the sciences as follows: medicine, agriculture, engineering, surveying and teacher-training. Products of the college were to serve the government at various levels: medical officers, agricultural officers, engineering assistants at the Public Works Department and the Nigeria Railway Department, teachers at the secondary schools etc. Students of survey at Yaba did two years of basic science courses and two years of practical work at Oyo. But the Nigerian intelligentsia was very critical of the college following the view that it will produce men incapable of independent thought, docile professionals and tools in the hands of expatriates. Whatever its defects, by 1944, Yaba had produced among others, twenty medical assistants, fifteen assistant agricultural officers, fifty eight teachers, six surveyors and three forest supervisors. These notwithstanding public opinion with regard to the Yaba scheme was that it was too narrowly vocational. The Yaba project was adversely affected by World War II as part of the campus was taken over by the army.

Liberal sentiments towards "backward nations" that emerged in the postwar period changed the attitude of the British colonial government towards education and scientific research in the colonies. The potentials of the colonies both for the development of the colonized people and the economic advancement of Britain was increasingly recognized. In this regard, a Royal Commission in 1945 concluded that university education in the colonies was a crucial factor. As

a follow up to this, the British government set up two Commissions to examine the question of higher education in the colonies.

The Elliot Commission reports submitted in June 1945, were an important milestone in the history of scientific development in particular and higher education in general - in the colonial Nigeria. In recognition of the need for the establishment of higher institutions locally, the Commission observed that British West Africa should have its own centers of higher learning if its people were to take their honourable place in the community of nations and become captains of their own destiny. In the majority report of the Commission, nine of the fourteen commissioners (including three Africans) recommended among others the establishment of a university college in Nigeria to be located at Ibadan, and another on the Gold Coast (Ghana) - to offer courses in Arts and science. The college in Nigeria was also to have schools of Medicine, Dentistry, Agriculture, Engineering, Forestry, Veterinary Science and Teacher Training. Aside from reinforcing much of the Elliot Commission's recommendations in its report in 1945, the Asquith Commission recommended the establishment of an inter-university council (IUC) for Higher Education, comprising among others, representatives of universities in the United Kingdom.

The Majority report of the Elliot Commission was accepted by the British conservative government in June 1945. The acceptance of the recommendation of the Asquith Commission's report also led to the setting up of the inter-university council in March 1946. In 1947, the new labour government approved in principle the establishment of two new universities in West Africa - one in Nigeria and one in Ghana. On May 8, 1947 Dr. Kenneth Dike, a highly distinguished scholar was named the principal designate of the University College to be located at Ibadan. The University College Ibadan founded in 1948 shortly after the World War, represented the fulfillment of many years of aspiration by Nigerians for the establishment of a local institution of higher learning where scientific research and related forms of education could be carried out. Aftermath of this, scientific research in Nigeria became dominantly a university concern just like in Britain and unlike in Francophone countries - where scientific research is linked more to specialized institutions. It was, therefore, during the latter part of the colonial period that a Nigerian scientific community began to take shape.

The university college comprised the nucleus of staff, students and equipments transferred from the Yaba Higher College. The college population was made up of 104 students including 38 students for intermediate science and 28 for surveying. By October 1948, the Yaba Medical School (established in 1930) was formally incorporated into UCI, though pre-clinical courses continued at Yaba until November 1950. Two hundred and ten students in October 1948 began their courses under the special relationship programme with the University of London which began on February 1948.

While the special relationship with London University lasted, the staff of UCI in conjunction with the University of London adapted the syllabuses to suit African needs. Lord Tedder one of the founding fathers of UCI in his foundation day address at UCI on 17 November 1952, reiterated this dream when he emphasized that the Medical School should become an important center for the study of tropical diseases.

Many Nigerians were, however, not satisfied with the range of studies available at UCI. In March 1948, Nigerian members of the Legislative Council deplored the absence of a faculty of engineering to provide courses in civil and mechanical engineering as recommended by the majority report of the Elliot Commission. This was because although UCI admitted students for engineering, most of them completed their courses abroad after passing the intermediate degree examination in Ibadan. Mellanby in his Glover Memorial Hall Lecture in April 1948, however, attributed this to lack of facilities for practical training - since the college was unwilling to train engineers who were no more than "theorists".

Members of the Inter-University Commission (IUC) visitation to UCI in January 1952 suggested that the College of Arts, Science and Technology assumed primary responsibility for developing engineering education in Nigeria. The IUC then advised that the Engineering school at the Zaria branch of the College of Arts, Science and Technology be brought into special relationship with the University of London through UCI. The IUC thus regarded the Engineering school at Zaria as "the Faculty of Technology of the University College, or, as the first element of such a faculty". The special relationship arrangement recommended by the IUC in 1957, was approved by London University in 1958. Thereafter, the University of London recognized the Department of Engineering at Zaria, as UCI's Faculty of Engineering. From its inception, UCI gave the question of medical education urgent consideration. The Faculty of Medicine as well as three other faculties of Arts, Science, Agriculture and Veterinary Science were already in existence during the 1948-1949 season. Concerning the training of medical students, UCI faced two main problems - standards and a well equipped medical school for clinical teaching. The aim, from the beginning was to secure the recognition by the General Medical Council of the United Kingdom of clinical facilities and standards in Nigeria. The UCI authorities attempted to obtain recognition indirectly through the M.B., B.S. degrees of London University, already recognized by the General Medical Council. In 1949, London University recognized the pre-medical and pre-clinical training offered by the Faculty of Science and the Yaba-based medical school respectively. The problem of extending similar recognition to clinical training remained since facilities at the Native Administration Hospital at Adeoyo and the Government Hospital Jericho Hospital (Ibadan) for which the Faculty of Medicine was responsible since 1948, were inadequate. UCI's attempt to secure recognition by London University for clinical activities in Ibadan, between 1950 and 1951, failed after the two successive adverse reports submitted by Dr. T.C. Hunt of the London University Medical Faculty.

The decision in August 1951 by the Nigerian Government to provide sufficient funds for a 500 bed new Teaching Hospital, away from UCI's permanent site, raised hopes that by 1956, improved clinical facilities, of a standard required by London University, would be available. By 1953, the Nigerian Government had spent about N7 million on the new teaching hospital. Before its completion, the IUC, London University and the Colonial office helped to provide clinical training in the United Kingdom for Nigerian Students who had completed their pre-medical and pre-clinical courses at UCI.

But in a memorandum dated March 1951, Professor A. Smith, the Dean of Faculty of Medicine, had predicted that with a five hundred bed teaching hospital, Nigerian could produce 50 doctors a year. He, however, emphasized:

If Nigeria were to be provided with doctors it seems certain that she must train them here in Nigeria. She cannot recruit them abroad in anything like the numbers required, nor can she obtain admission for her medical students at the British Medical Schools ... Surely, there can be no doubt that provision must be made for a supply of doctors if only on a scale so modest that it will ultimately stabilize at a ratio of one doctor per 15,000 of the population.

One of Ibadan's main achievement has been the development into one of the most important scientific centers in Africa for undergraduate and postgraduate training. In the area of science, there are among other Departments: archeology, botany, mathematics, physics, chemistry, geology, zoology and statistics. The department of biochemistry, physiology and pharmacology which belong to the faculty of medicine also offer courses to science students as does the Department of geography in the Faculty of social Science. The Faculty of Agriculture, Forestry and Veterinary Science constitutes of eight departments: Agricultural Biology, Agronomy, Agricultural Economics, Animal Science, Extension, Forestry, Veterinary Anatomy and Physiology, Veterinary Medicine and Surgery and Veterinary Pathology.

With increasing demand for higher education increasing number of Nigerians went to study abroad. In the 1950s and 1960s the influence of the United States on Nigerian students became evident in Black American accents commonly heard on Nigerian university campuses. Nigerian researchers soon divided into two rival groups - one supporting the English tradition and the other the American tradition. The distinction between the two groups, however, progressively died out as training diversified.

1.3- Expansion of the Scientific Community : 1960-1980

The post-independence era witnessed a considerable expansion in the scientific community in Nigeria. This followed the need to train skilled indigenous manpower to take over the running of the Nigerian state. The expansion within the period embraced both the universities/polytechnic etc. and the research and development institutes and centers. The period also led to the emergence of a science and technology structure and policy in the post-independence Nigeria.

1.3.1- Emergence of a National Science and Technology Structure and Policy

The evolution and development of research in each of the different sectors of science and technology occurred at different times, essentially because the driving force in each case differed in its motivation. This resulted in a sort of go-stop-go trend in structure and policy.

Except for the regional development in agriculture a decade before independence, whatever advancement was recorded in the industry, agriculture, medicine and even education in Nigeria during the colonial era occurred without much of central coordination. There was no plan by the colonial administration to evolve an explicit national science policy for Nigeria. This situation persisted for the first few years after independence.

Two major international events which constituted external motivations was to change the scenario from 1966. These were the United Nations and UNESCO conference on "The Application of Science and Technology for the Benefits of the Developing Countries held in Geneva in 1963 and UNESCO organized African International Conference on Research and Training held in Lagos in 1964. The two events inspired the developing countries to set up science policy-making bodies and national machinery for science policy as a means of harnessing available science and technology potentials for national development.

Following political independence on 1 October, 1960, and the dissolution of WACRO in 1962, the need to create a central co-ordinating body for research activities became apparent in the scientific community.

As a result of the military seizure of power in 1966, Decree 7 (No.83) was promulgated, which established the Nigeria Council for Scientific and Industrial Research (NCSIR). This body was advisory without power to actualize their plans and goals. There were rapid changes in government structure at the topmost level and further confusions in the body polity which culminated in the civil war of 1967-1970.

In 1970 the Nigeria Council for Science and Technology (NCST) was established as published in Decree 6(8) of 1970. Although the Council was purely advisory to Government, it was the first establishment set up to co-ordinate scientific activities between the various institutions of Government, universities and the private sector. Some of the objectives for setting it up were as follows:

- a. To determine priorities for scientific activities in the Federation in relation to the economic and social policies of the country and its international commitments;
- b. To advise the Federal Military Government on a national science policy including general planning and the assessment of the requisite financial resources;
- c. To ensure the application of the results of scientific activities to the development of agriculture, industry, and social welfare in the Federation.

With the establishment of NCST, Nigerian science policy making and research planning system became a three tier-structure. This consisted of NCST as the first level of policy making, research councils as the second level, and research institutes and university departments as the third level. The research council represented four major areas of research, more delineated than those of WACRO. They were; agriculture (The Agricultural Research Council of Nigeria- ARCN), industry (The Industrial Research Council of Nigeria - IRCN), Medicine (The Medical Research Council of Nigeria - MRCN) and natural sciences (the Natural sciences Research Council of Nigeria-NSRCN). The period of NCST control seems to have been characterized by liberalism and relative autonomy for the various institutions. This promoted basic research.

The NCST, which existed between 1970 -1976, made some modest impact on the framework for science and technology policy of Nigeria.

The main dilemma of the Council was the conflict that existed between it and the established Federal Civil Service system especially at the top level, made up of the powerful permanent secretaries who felt that the Council would erode their authority. Thus, the Council lacked the goodwill at the top level of Government machinery at that time.

The NCST was dissolved along with its four sectoral Research Councils in 1976, and the Federal Military Government established a new body - the National Science and Technology Development Agency (NSTDA) in 1977. The structure of the NSTDA was far better than that of NCST specifically because the Agency had an executive capacity, that means it was not just an advisory body to government, and the chairman was the Chief of Staff, Supreme Headquarters. Thus the issue of Science and Technology was for the first time taken at the highest level of government. Bureaucratic red tape however, became a significant factor.

A major argument for centralizing the management of research activities included the need for a strong organizational advocate for research during budgetary periods. Indeed, the Ministry's beginnings were marked by a substantial growth in research budget. Another argument was the capacity of central organization for transferring knowledge among Ministries and

between federal and state agencies. Successive decreasing budgetary allocations, however, reduced the effective role of the Ministry.

During its short-lived period the Agency was able to launch four scientific journals, published research results in agriculture, medicine, engineering, and natural sciences. Within this period also the agency awarded research grants to support research activities of national relevance to groups within universities and other institutions. A working document on science and technology policy for Nigeria was prepared towards the end of its existence in 1979.

With the change of government in October 1979 the Federal Ministry of Science and Technology (FMST), replaced the NSTDA. The National Science and Technology Act 1980, was declared by Mr. President as a conscious act to give practical expression to the national desire of promoting science and technology necessary for the country's rapid technological development. Not much happened under this administration though, to match the noble ideals declared at its inception on science and technology.

In January 1984, the Buhari/Idiagbon led military regime merged the Ministry of Science and Technology with Ministry of Education to become the Federal Ministry of Education, Science and Technology (FMEST). This was part of the government's responses to the emergent economic crisis of the time. A coordinating director headed the Science and Technology section with little or no change in the sectoral setting. However, science matters received little attention compared to the educational sector as probably to be expected. This affected various programmes already initiated in the Ministry of Science and Technology before the merger.

In August 1985, the Ministry of Science and Technology was once again separated from education and restored to its former status by the new (Babangida led) military regime. This implied a new focus and a crucial role which science and technology was to play under the new dispensation. The restored Ministry operated through six departments, which included :

- Agricultural science
- Planning, policy and development, and
- Industrial science and energy research.

A panel set up for national policy for science and technology produced a document which was approved by the Council of Ministers in 1986; and launched by the President in July 1986, as the National Policy for Science and Technology.

Science and technology policy in Nigeria is aimed at addressing the following four principles :

- a. Co-ordinate and select technological objectives consistent with national development goal and strategies;
- b. Set the required norms which govern the ways and means in which science and technology are to be developed, transferred and applied;

- c. To harness the required resources and provide the basis for the organization and development of scientific and technological resources to achieve the selected objectives; and
- d. To set up the structure for continuous monitoring and evaluation of the results and implications of the policy in line with the overall national development objectives.

This important document appearing for the first time in national science and technology scene has three basic chapters;

- 1. National objectives and policies
- 2. Financing of science and technology activities, and
- 3. Research development application and marketing.

The policy addressed key issues summarized below:

i. Scientific and technology manpower development.

The policy in this area is three-pronged, namely;

- (a) to emphasize science at all levels of the nation's educational system;
- (b) to embark on a mass movement for science and development in the country; and,
- (c) to offer special incentives and/or remunerations to individuals engaged in science and technology endeavour. The objective of this policy is to socialize the entire society towards science and technologies and adaptation of existing ones for the improvement of societal well being

ii. Localization of capital goods development and manufacture

In order to ensure a solid and stable technological base for a self-sustaining industrialization process and to attract and channel capital into the engineering industry for its local growth the policy requires:

- (a) the production of industrial machinery and equipment to be largely locally based; and
- (b) that financial incentives be created to encourage the growth of machine tools and heavy engineering equipment industry. This informed the establishment of Nigerian Machine Tools, Oshogbo.

iii Material Resources for Industrialization

The policy in this area targets the exploitation, processing and utilization of the nation's material resources to be programmed in such a manner as to promote self reliance. Successful implementation of this policy is to guarantee a steady and assured source of raw materials for local industry.

iv. Energy Exploration, Exploitation and Utilization

Energy is recognized in the policy as the all pervasive in the overall economic and social life of the nation. In this regard, the policy seeks to ensure that the energy resources are protected and optimally utilized in the over all interest of the nation at all times.

v. Technology - Generation, Transfer, Development and Control

The policy identifies technology as the key and the basis of true development. Its cultivation was recognized as the assurance and guarantee for any nation to attain reasonable level of self reliance and national security. Under this, the policy is to achieve the following;

- (a). The maximal utilization of technology in all aspects of day-to-day activities;
- (b). The acquisition of foreign technology in an "unpacked" form for main government projects involving these.
- (c). Insulating strategic capital goods industry from foreign control;
- (d) Offering incentives for organizations that maintain locally based research and development activities; and,
- (e) Ensuring that important national development projects are not based on unproven foreign technologies.

The policy also identified areas of technology development where priority attention should be paid thenceforth. These included agriculture and food production, health and health care delivery, and industry. The agricultural machinery manufacturing industry was to be covered under this sector.

vi. Financial Policy

In the area of financing science and technology development activities in the country the policy specifies a three tier funding system involving the Federal Government and its parastatals, the state government and the private sector establishments. In particular Federal government will fund science and technology development programmes up to a level of 5% of its annual budget while the state is to contribute by way of sponsored research projects. A significant financing policy is also evident in the establishment of a national science and technology development fund which shall be contributed to compulsorily by major enterprises, public and private operating in Nigeria.

vii. Other Areas

The other specific areas addressed by the policy include the development of military science, control and enhancement of the environment, strengthening of international cooperation in science and technology and active promotion and dispersal of the results of the research. The

Ministry in July 1988 also produced an action plan for the implementation of policy guidelines. The President moreover, launched the national science and technology fund the same day the policy was launched in 1987. This fund was to be managed by a board of trustees. A one percent of annual GDP was recommended as allocation to carry out the objectives of the plan. Allocation to science and technology has never exceeded 0.2% since the launching of the policy.

The Raw Material, Research and Development Council (RMRDC) was established in 1988 by the FMST basically to promote the expectation of locally available raw materials for industrial uses. The effect of this Council was reflected in import substitution programmes - assignment carried out in collaboration with various sectoral groups. Added to this is the responsibility of the Council for the Development of the Capita Goods Sector in the production of necessary equipment for processing agricultural based materials.

The Minister of the FMST then, Professor G.O Ezekwe made a host of submissions on different occasions that informed and shaped the direction that science and technology will take in the country.

The Minister also submitted that science and engineering infrastructure was the missing link in the chain of the country's national economic development. This is because it was not adequately developed in contemporary Nigeria. In order to achieve the full objectives of the Structural Adjustment Programme being implemented at the time, the Minister argued that it was necessary to initiate other programmes which will not only boost the local production of goods and services, but will also develop an effective home-grown capability for the production of the tools, machinery and primary equipments required to be able to establish home-bred industries and industrial raw materials - thus self reliantly achieving the increased local mass production of goods and services. Prior to 1990, observed the Minister, science engineering and Technology, were embedded within a generalized science and Technology framework, that neither had a formal strong linkage with the nation's development goals, nor with the activities related to the extant economic requirements. Such a conventional approach lacked the directed dynamism required to enable the sectors to participate in active manner in the nation's economic structural transformation and development. Consequently, he argued, they did not play the requisite role of powering and sustaining the productive sectors of the economy.

It is believed that the above observation by the Minister informed the eventual major shift in the policy and policy direction of science and technology development in the country. The major initiative was to identify, develop and utilize science, engineering and technology (SET) by putting in place the mechanism for developing and activating the related infrastructure, so as to utilize them to strengthen the development process within a reasonable time.

Consequently on 18th July 1990, the President inaugurated the National Committee On Engineering Infrastructure made of 150 engineers with the mandate to draw up a blue print of a programme for the development of an endogenous engineering infrastructure in the country. The blueprint was to be the sum total of policy proposals, funding requirements, financing proposals as well as the implementation action plans. A detailed report was submitted in February 1991 in three volumes which covered the work of seven groups.

In July 1992, the decree setting up the National Agency for Science and Engineering Infrastructure (NASENI) was promulgated. This decree reflected most of the proposals detailed in the three-volume report of the government commissioned panel of 1990, as well as the report on science infrastructure of 1992. The focal point was the setting up of the Institution basically for the building of Science and Engineering Infrastructure with control at the apex of government and a clearer mandate than ever stated in the science policy. The first stated function of the Agency in the Decree was to gear its organization and programmes towards the practical

implementation of the National Science and Technology Policy, with the mandate that Research and Development system is managed outside the civil service system.

The mandate of NASENI include to formulate policies and advise government on the establishment by the public and private sectors of the National Science and Engineering Infrastructure and through the National Council For Science and Technology (NCST) and state and local government elicit the active participation of corporate bodies, citizen groups and individuals in the establishment of the National Science and Engineering Infrastructure.

The old structure of the Ministry of Science and Technology was replaced with a new one. The Agency was headed by an Executive Vice Chairman responsible to a Board with the President as Chairman and having the following directorates:

- An administrative directorate headed by a coordinating director known as the secretary to the Agency;
- An Engineering Directorate headed by a coordinating Director for Engineering;
- A Science Directorate headed by a Coordinating Director for Science;
- Science and Engineering Infrastructure Development Complexes to be established by the Agency in selected places in Nigeria headed by Directors.

The Agency was relieved of the direct management of most of the research institutes (mainly agricultural and medical Institutes) formerly under the scrapped Federal Ministry of Science and Technology which were returned to their respective ministries.

The Agency had under it the following:

- Project Development Agency (PRODA) Enugu;
- National Research Institute for Chemical Technology (NARIST), Zaria;
- Nigerian Building and Road Research Institute (NBRRI), Lagos;
- Nigerian Institute of Pharmaceutical Research and Development (NIPRD), Abuja;
- Federal Equipment Manufacturing Centers at Enugu and Minna;
- The Energy Centers (Nsukka and Sokoto).

The Agency was charged with the responsibility of establishing and operating a Science and Engineering Infrastructure Development Programme, with a mandate to set-up nine systems of Science and Engineering Infrastructure Development Complexes.

The Decree establishing the Agency also repealed the National Science and Technology Act of 1986, and the National Science and Technology Fund Act; while all assets funds and resources were transferred to the Agency..

The National Policy on Science and Engineering Infrastructure like the preceding National Policy on Science and Technology contained well thought out objectives and procedure for implementation. It provided a means of motivating the nation to achieving the stated goals through research, development, human resources development and utilization and in-built structures for publicity, investment, stability and continuity.

In August 1993, the Interim National Government (ING) of Nigeria, resuscitated the erstwhile Federal Ministry of Science and Technology (FMST) by appointing a Secretary for a Ministry of Science and Technology, an action which was later upheld by the Abacha Government that succeeded it, by the appointment of a Minister and a Director General for FMST in 1994. This left behind, the Federal Ministry of Science and Technology and the National Agency for Science and Engineering Infrastructure (NASENI).

1.3.2- University Expansion

Three major trajectory periods can be identified at the level of university development after Ibadan: 1960-1970; 1971-1975 and 1976-1989. The process was ignited by the establishment of the University of Nigeria, Nsukka in 1960. Two strands of arguments justified the Nsukka dream. The first was that the University College Ibadan alone was incapable of satisfying the aspirations of numerous qualified Nigerians who were desirous of pursuing higher education. The second was a product of the nationalist movement/black consciousness of the time - the need for a truly indigenous African university that was not tied to the apron strings of the colonial home. From this viewpoint, the Ibadan University College was considered too elitist and not oriented towards local development needs and aspirations. The Nsukka dream was aimed at filling this gap.

By 1970, six first generation universities (including the University of Ibadan) were established in the country with a total enrollment of more than 23,000. The second phase of expansion took place in 1975 when seven second-generation universities were established. This second wave of university expansion was made possible by the rapid growth of oil revenue from 1973 and brought the total undergraduate enrolment in Nigerian universities to about 31,511. The third phase occurred in the 1980s. Between 1980 and 1983, the Second Republic politicians established seventeen universities made up of seven federal universities of technology, one federal university at Abuja, six state universities and one military university. By the end of the 1983/84 session, there were more than 90,000 undergraduates in Nigerian federal universities alone.

The responsibility for higher education is shared between the three tiers of government in Nigeria - local, state and federal governments. Private universities are not popular. This is partly due to their dismal performance during the experimentation period in the early 1980s, hence their prohibition in 1984. A few of them re-emerged in the late 1990s, but the prohibitive cost of patronizing them have kept many potential applicants away.

1.3- Crisis and Adjustment: 1981-1999

The economic crisis and adjustment and its policy environment negatively affected the scientific research community - both at the level of university system and the research and development institutes and centers, and produced in them crisis of its own.

The IMF/World Bank programme and policies have contributed to this situation. The World Bank emphasis on the "poorest-of-the-poor" towards the end of the 1970s shifted the

resources of some donors to some of the least developed countries. World Bank/IMF conditions for debt negotiation with Nigeria which emphasized the rolling back of the state - reduced public sector involvement and expenditure also affected the universities and research institutes in two distinct but related ways.

First, university and research funding drastically declined when the university system was expanding - partly due to labour market (unemployment) constraints. Second, concerted government efforts at attaining reductions in public wage bill in concert with IMF/Bank prescriptions led to low wages in the public service sector including universities and research institutes. Hence, although oil price fell by the 1980s, Nigerian governments remained committed to the creation of new universities. This was due to ethnic motivations and political considerations by the politicians of the second Republic (1979-1983) who saw university education as the major route to the Nigerian labour market and hence, access to the "national cake". A second explanation is perhaps, the lack of projection by the politicians that the oil glut will persist for sometime.

The very rapid rate of expansion of new universities had a clear negative impact on the financing of the older universities. Shortage of experienced teachers (Nigeria or expatriates) became a serious problem by the early 1980s, when many universities had to rely on teachers on short-term contracts. Overall, shortage of funds has been a problem since the mid-1970s and became particularly acute in the mid-1980s, at the same time when debt servicing increased dramatically. At that time, most universities experienced budget cuts from 50% to 80%. In the 1978/79 session for instance, grants requested by the universities increased from N280 million in the previous academic session to N394 million, while the National University Commission (NUC) requests increased to N232 million from N182 million in the previous session, and the government's grant ironically decreased from N154 million in the previous year to N140 million in the 1978/79 session. With such a decline in funding, allocation per student in constant naira values as an estimate of public expenditure on university education declined drastically from N3424.00 in 75/76 session to a mere N409.00 in the 1989/90 session. By 1991, the gap between the request made by NUC and the actual grants to the universities was as high as 87.2%. Consequently, many universities could not maintain existing academic facilities, pay lecturers and provide funding for research programmes.

Table 1: Nigerian Universities

Name	Year of Establishment	Student Enrollment till 1989-90
<i><u>First Generation Universities</u></i>		
University of Ibadan	1948	12,403
University of Nigeria, Nsukka	1960	12,403
University of Lagos	1962	10,000
O.A.U University	1962	12,479
Ahmadu Bello University	1962	15,103
University of Benin	1970	10,000
<i><u>Second Generation Universities</u></i>		
Bayero University	1975	Less than 3000
University of Port-Harcourt	1975	Less than 3000
University of Ilorin	1975	Less than 3000
University of Maiduguri	1975	Less than 3000
University of Jos	1975	Less than 3000
University of Sokoto	1975	Less than 3000
<i><u>Third Generation Universities</u></i>		
University of Technology, Makurdi	1980	Less than 3000
University of Technology, Owerri	1980	Less than 3000
University of Technology, Yola	1980	Less than 3000
University of Technology, Akure	1980	Less than 3000
University of Technology, Bauchi	1980	Less than 3000
University of Technology, Minna	1980	Less than 3000
National Open University Abuja	1980	Less than 3000
The Military University	1989-1990	Less than 3000
University of Abuja	1989-1990	Less than 3000
<i><u>State Universities</u></i>		
Rivers State University of Science and Technology		
Anambra University of Science and Technology	1980	Less than 3000
Bendel state University Ekpoma	1981	Less than 3000
Ondo State University	1981	Less than 3000
Imo state University	1983	Less than 3000
Ogun State University	1983	Less than 3000
Lagos State University	1983	Less than 3000
Oyo state University	1983	Less than 3000
Cross Rivers State University*	1989	Less than 3000
	1989	Less than 3000
	1989	Less than 3000

*The names of the universities have since changed

Source : Chatelin Y., *et al.*

By 1990, there were twenty-one federal, one military, and nine state universities that were established. Today, Nigeria has the largest and most diversified system of higher education in Sub-Saharan Africa (See table1).

Another negative effect of the Structural Adjustment Programme was the dramatic reduction of the purchasing power of civil servants in general due to gross devaluation of the local currency (naira) and the consequent brain drain - massive loss of teaching staff and researchers. In some universities like the Ahmadu Bello University, Zaria, about 80% of the staff had reportedly left in the late 1980s.

Federal Research Institutes and Development Centers

In Nigeria, federal research institutes are also involved in significant research activities in the area of Science and technology. By 1980, for instance, there were twenty-two federal research institutes which collectively employed about 15,000 scientists and supporting staff. Most of the research institutes are oriented towards the use and adaptation of the natural resources found in Nigeria for development (See table 2).

The institutions considerably vary in size with some employing 100-300 workers, and others employing around 2,000. In general, the largest institutions (like the Cocoa Research Institute and the Forestry Research Institute) tend to be the oldest, while the smallest tend to be the most recent ones. By 1977 the biggest broad category of scientists was that of plant scientists who comprised 62 per cent of total manpower. Within this category, agronomist made up 42 per cent (or 26 per cent of the total), while plant pathologist and soil scientists made up another 40 % in roughly equal proportions. Four other broad categories (engineering, animal sciences, social sciences and other sciences) represented around 10 per cent each. Among social scientists, the economists were not integrated directly into the formulation of research projects but were usually involved either in extension work or in specific social studies along with sociologists.

TABLE 2: Federal Research Institutes

Institutes	Specialty	Location
Cereal Research Institute	Rice, maize and other cereals	Ibadan
Institute of Agriculture, Research and Training	Lowland rain forests Sudan and Sahel savannah zone	Ife Zaria
Horticulture Research Institute	Fruits and vegetables	Ibadan
Root Crops Research Institute	Cassava, yams, other root crops.	Umudike
Cocoa Research institute	Cocoa coffee, kolanuts	Ibadan
Institute for Oil Palm Research	Oil palm and other palms	Benin
Rubber Research Institute	Rubber	Benin
Agricultural Extension and Research Liaison Services	Information and extension.	Zaria
Stored Products Research Institute	Storage and preservation	Lagos
Forestry Research Institute	Forestry and wildlife	Ibadan
Lake Chad Research Institute	Resources of Inland lakes	Maiduguri
Kainji Lake Research Institute	Resources of man-made lakes	Kainji
Institute of Oceanography and Marine Research	Oceanography and marine resources	Lagos
Animal Production Research Institute	Livestock production	Zaria
Veterinary Research Institute	Livestock disease	Jos
Institute of Trypanosomiasis Research	Trypanosomiasis	Kaduna
Leather Research Institute	Leather utilization	Zaria
Institute for Medical research	Medical Research	Lagos
Federal Institute for Industrial Research	Food science and related field Engineering design and development	Lagos Lagos Enugu
Project Development Institute		
Building and Road Research Institute	Material and design	Lagos

Source: Yvon Chatelin et Rigas Arvanitis

While the proportion of actual research scientist averaged about 5 per cent of the total in terms of qualification, around 25 per cent of the research staff possessed Ph.D. degrees, 25% M.Sc, and 50 % B.Sc degrees. Overall, the skill level of the research scientist in the federal research institutes is lower compared with that of the universities (particularly the oldest universities).

Many institutes provide a variety of services. Some institutes carry out extension and liaison work, but on the whole they are more concerned with transferring technologies. Much of the time of the research staff is also devoted to education and training, and to routine testing and maintenance services.

With the economic crisis government could no more cope with the financial burden arising from the expansion of universities and research institutes in the 1970s and 1980s. Moreover, the reckless spending, authoritarianism, corruption and wilful neglect of the universities by the military regimes of the Babangida and Abacha era (1985-1998) led to starvation of funds and interventionist principles. All these led to low morale, low employee motivation and incessant industrial crisis which were not in the best interest of the institutions.

The decade of the 1970s was particularly a period of growth for the Nigerian Scientific community with spectacular growth in the number of academicians publishing in scientific

reviews. When the country's six oldest universities were considered in 2 five year periods (1970-1974) and (1975-1979), the number of published university academic or researcher associated with the universities and research and development institutes, doubled from one period to the next. Part of the explanations for the growth was the genuine economic boom from which Nigeria, a petroleum exporting country since 1969 prospered. Scientific research and university education were thus supported with favorable funding which resulted in the advancement of science and technological studies. Thus, it is estimated that Nigeria universities represent about 85 per cent of the total research output in Nigeria measured in the number of mainstream publications.

The number of Nigerian scientific authors publishing in the most influential scientific journals monitored by the Institute for Scientific Information (ISI) continued to increase until 1987 when it reached a peak of slightly more than 1,400 in a year. By 1991 when the adverse effects of the economic crisis and the implementation of the IMF/World Bank Structural Adjustment Programme led to dwindling research funding and deteriorating facilities, publications by Nigerian scientists decreased to slightly more than 700.

Another important factor associated with stifling working conditions in the research community was the human right abuses during the predominant military rule which led to international sanctions against Nigeria. The consequence was that the research community was starved of foreign research grants at a time when local grants were very limited.

Yet, one should not underestimate the impressive achievements of Nigerian universities as centers of learning and research. Over a very short period of time, they have produced a large number of graduates, provided services to people outside the university system and significantly contributed to Nigeria research outputs.

Indications are that there was a core of academic scientists in Nigeria who continued to be active and published in highly reported journals despite the crisis.

Nevertheless, the Nigerian scientific community has to be considered having spent two full decades in a state of crisis - socio-economic and political. Despite the difficulties, the Nigerian Scientific community continued to publish and to conserve its supremacy in sub-Saharan Africa (excluding South Africa)².

² In fact, according to ISI, Nigeria is now 6th in Africa, behind (of course) South Africa and Egypt, and (more surprising) Morocco, Tunisia and Kenya. This means a considerable involution, since Nigeria was an unreachable 3rd and the leader of sub-Saharan Africa by the 80's. See Y. Chatelin et al. "Colossus with feet of clay..."

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2- THE POPULARISATION OF SCIENCE THROUGH MEDIA AND SCHOOL PROGRAMMES IN NIGERIA, by Franklin K. UKAH

Introduction

Science as an ordered arrangement of testable and tested bodies of knowledge is an essential feature of modern societies. This is generally reflected by the importance, if not the authority, attributed to the scientific discourse and language in daily social interactions.

In Nigeria, the scientific discourse is diversely diffused in the social experiences of the people. It may be important to see how the teaching of science is introduced in the very first levels of formal education. But in a country, where half of the adult population never had access to formal education, the social impact of science must also be assessed by examining how its discourses are presented in the modern media.

2.1- The Teaching of Science in Nigerian Primary Schools

Ordinarily, for an enduring scientific culture, the primary schools are the right place to begin. The Federal Government of Nigeria has a clearly articulated vision of how to inculcate the culture of science and scientific thinking among primary school pupils. Government policy and vision is crystallized in a publication of the Federal Ministry of Education titled CORE CURRICULUM FOR PRIMARY SCIENCE, published twenty years ago (1980).

The core curriculum for Science Education at the primary school level was designed by a panel of experts in primary education drawn from the Federal Ministry of Education, the Academia, the Nigerian Education Research Council, Lagos State primary Science Project and from six states of the country, namely: Imo, Lagos, Sokoto, Ondo, Benue, and Bauchi.

The publication had two sets of objectives worth enumerating: The general objective was to improve the quality of science education in Nigeria and to develop a science culture in the contexts of local needs and available resources. The specific objectives included the teaching of the Nigerian child:

- To observe and explore the environment;
- To develop basic science process skills;
- To develop functional knowledge of science principles and concepts;
- To explain simple natural phenomena;
- To develop scientific attitude of curiosity, reflexivity and objectivity;

It also aimed at promoting the application of scientific knowledge to everyday problems, developing self-confidence and self-reliance through problems solving activities in science, and developing functional awareness of the orderliness and beauty of nature.

There is no doubt that the above sets of objectives are noble and heart-warming. The week-by-week design of the curriculum would probably be appropriately directed towards the attainment of the set goals in the context of a large and homogeneous diffusion of formal education, which is not the case in Nigeria. Moreover, some basic obstacles have been militating against the achievement of these goals:

First of all, the Federal Government has always and consistently shown that education generally, and primary education in particular, is not a national priority. Consequently, the teaching of science at primary schools remained underfunded. The basic scientific teaching tools have not been manufactured and distributed to schools across the nation as recommended by the Core Science Curriculum. In fact, whatever meagre sum of money that had in the past been earmarked and released for the manufacture of science teaching aids has mysteriously found its way into the bottomless pockets of government officials, whose responsibility was to implement and direct government policy on Science in Nigeria. Science teachers have always been in the minority in Nigeria. Since there is an evident lack of social respect and economic integrity for teachers in general, the more qualified have left the profession while half-baked ones have been allowed to pillage the field. Not knowing anything about science themselves, they are ill equipped to impart what they lack.

There is also in Nigeria, a cultural behaviour that weighs heavily against the inculcation of scientific thinking and praxis. All over the country, "traditional" worldviews still dominate. The people have always tried to use traditional or pre-modern means (like rituals, magic, religious invocations and charms) to access modernity and its values. Society as a whole has placed little premium on education and science since soldiers and businessmen have gained access to the wealth of the nation without having any appreciable level of education. Furthermore, the people have been shown through popular discourses like the very nationally popular home videos that one can live the "good and viable" life of abundance made possible by modernity without knowing a thing about science. Attendance at some weekly or monthly religious activities, it has been claimed, is sufficient to make one prosperous. In fact this is the line of action that many people now are interested in following rather than the rigorous and scientific ways of resolving human problems and gaining access to the good things of modern life.

These factors, in different ways, affect the teaching of science in primary schools and Children's ability to inculcate the scientific attitude and outlook on life.

2.2- Science and the Mass Media in Nigeria: The Interface

Modern instruments of mass communication are a pervasive feature of modern societies. Today, the influence of mass media permeates every facet of life, both public and private. The media have brought about different ways in which people perceive themselves and interact with others, as well as engage in popular discourses concerning politics, religion, economics and so on. Even those living in far remote areas from where important events are taking place are increasingly gaining access to the mediated experiences of social life. One area that the media in Nigeria pay a great deal of attention to is science and scientific discourses.

Science as an ordered arrangement of testable and tested bodies of knowledge is an essential aspect of modern communities. In Nigeria, the discourses of science are diffused in diverse social experiences of the people. The social impact of science can be assessed by examining how scientific discourses are presented in the modern media in Nigeria.

2.2.1- The Reportage of science and Technology News in Nigerian Media

It has sometimes been claimed that the Nigerian media are the most vibrant and free in the whole of Africa. Very often what is meant here is the print media of newspapers and magazines. The broadcast media of radio and television, up till recently, have been in the exclusive hands of the government. Consequently, their perception of social events and their reportage have been coloured by the official state voice on such happenings. In the area of critical reportage, the electronic media are not as vocal and focused as their print media counterparts. The introduction of private radio and television stations from the middle of the 1990s has not radically altered this state of affairs.

The reportage of science and science news is given prominence in both the print and electronic media in Nigeria. An examination of the newspapers, for instance, shows that there are five discernible categories of science reports, viz.:

- There are news reports on scientific conferences, seminars, symposia and exhibitions. These conferences may be locally organized with the participation of foreign scientists or they may be held abroad with the participation of Nigerian scientists. This category of science reportage merely provides information on what the media journalists consider as news worthy event that may interest the general public.
- There are feature articles on topical issues in science written by Nigerian scientists or foreign scientists. Sometimes these articles are not written by scientists at all but by interested members of the public who think and believe that they have some enlightened opinions to share with the general public. Some of these articles are at times culled out from some foreign magazines and newspapers where they were first published.
- There is also general news on Research and Science Institutes in Nigeria. This general news may be concerned with anniversaries of the institutes, appointments to important positions of authority in the institutes, deployments, new research discoveries and developments from these institutes or research centres. An example of such news reportage may be "FIRO Develops Porridge from Sorghum", (*Daily Times*, June 28, 1995, p.30).
- Interviews of prominent scientists like directors of Research institutes, heads of science, engineering and technology departments of universities or polytechnics. The subject matter of these interviews covers such issues as:
 - (a) the problem of underfunding of research institutes;
 - (b) Poor public and governmental utilization of research results and findings;
 - (c) lack of private sector participation in scientific research;
 - and
 - (d) problems of cultural attitudes towards science and scientific findings and scientific change.
- There are also the advertisements of science workshops, conferences, symposia and seminars. These advertisements are sponsored by the organising bodies of these different workshops.

It is fairly easy to discern regular and non-regular columns in the above five categories of print media reportage of science and technology in Nigeria. There are weekly regular

Column on information technology (titled "Infotech" in both *Daily Times* and *Post Express*), Science Health, Agriculture and Transport/Automobile technology. The non-regulars are feature articles, science news and advertisement.

Science and its publics in Nigeria is difficult to assess. This situation of affairs is brought about as a result of several factors. The most important of these factors is the media audience analysis in Nigeria is still in its infancy. Accurate statistics about the number of mass circulating newspapers and newsmagazines do not exist. One reason for this is that some of these newspapers and newsmagazines are not even registered with the relevant Federal regulating body. Besides, some newspapers and magazines are clearly regional while others are national in scope and circulation.

Aside from the above reasons, an up-to-date national literacy rate does not exist. But is estimated that less than fifty per cent of the total population of the country is functionally literate in English language. Only Yoruba language newspapers have been something of a success. And even in this sphere, there is no existing figure of the number of people who actually have access to these indigenous language newspapers.

Furthermore, it is not known the number of persons who actually buy newspapers and newsmagazines in Nigeria. Sales figures are unfortunately unreliable here because a good number of companies and government agencies buy daily newspapers and newsmagazines for their employees. A good number of people have access to newspapers only in their work environments. Even in this environment, the number of hour workers can devote to newspaper reading is regrettably minimal. Consequently, it can be argued that in-depth reading of any important article is not possible; only superficial digestion of headlines and brief write-ups is possible in the context of daily work.

A greater percentage of those who are literate in English language do not buy newspapers because they are expensive. Daily newspapers are expensive judging by the living standard of the average person³. Many people, especially students and lower cadre workers depend on some libraries or office papers or cursory glimpses of headlines at newspaper stands for their access to daily news paper stories.

Some people also collect the previous days' papers from friends who buy these papers. To them, the news contained in previous days' papers may not be outdated since they are yet to access them. Most people however depend, for the newspapers stories, on morning review of top news in the daily newspapers by Frequency Modulated radio stations in the country. Most of these radio programmes last for fifteen minutes but a few last for as long as thirty minute. The problem with these programmes in relation to science news is that they usually ignore science news in preference for human angle stories and some other national events reported in the papers. Science stories are usually reported as dry and abstract and therefore less appealing to the general public.

From the foregoing, it can be said that the audiences for science news are narrow indeed. Nevertheless, from an analysis of the language and content of the various types of print media reportage of science, one can point out the general target audiences of these articles. The

³ In July 2000 a national daily newspaper costs about N70 (€0,7) .

interviews of prominent scientists and feature articles are targeted at the professional scientific community. The issues these types of reportage address are very often technical, if not completely esoteric for the average newspaper reader. These articles demand some professional and above average exposure and experience and expertise in order to be assimilated. Sometime too, these professional scientific discourses are directed to some government bureaucrats responsible for some aspect of science policy implementation. Even though these types of science reportage may be primarily directed at a special class of readers, some other persons with above average level of education may find such write-ups of general interest to them.

The advertisement of science events like seminars and conferences and symposia, etc. is primarily aimed at the professional and amateur scientific community. Though the general reader may be able to access the information on paper, such adverts are of less interest to him/her. The scientific community, made up of science and technology institutes and also the science and technology faculties of universities and polytechnics, are the main target group of the adverts.

General news on research, science and technology have a more generalised audience. These news items are often scripted by journalists of print media rather than by professional scientists or experts. General information of scientific developments and invention or innovations have the general public as their audience.

2.2.2- Science and Technology News in the Electronic Media

There are slight differences between science and technology news in the print media and in the electronic media. Basically, there are three types of S&T news in the electronic media. These are as follows:

- General News: These include such news bulletins that may contain specific items on S & T like new technological inventions or new advances in science. They may also include such general interest news about scientific conferences, seminars and workshops, including communiqués if any. News bulletins may also contain some aspects of scientific controversies and some experts' opinions on raging issues of the moment.

Discussion programmes: There are some discussion programmes on both the radio and the television on some aspects of science and technology considered immediately relevant to the common interest of all in the society. Some of these discussion programmes may be live and also involve phone-in segments where members of the audience can ask questions and make contributions to the discussion. This type of audience interaction is designed to get audience opinions and questions. Audience questions are usually directed to one of the "experts" discussing the issues. Members of the audience who can make contributions to such programmes are limited by the fact of availability or otherwise of telephone facility.

The OGBC⁴ II (FM) radio station has some of these programmes. Perhaps the most popular of these is *Sunday Morning Live of Fm* which has been on air for more than five years now. The programme is not entirely devoted on science and technology but is mainly a current affairs programme, selecting its theme from what is in vogue. When the person to be interviewed happens to be a scientist or scientific bureaucrat, the discussion and audience contribution are bound to centre around science and technology, the state of S & T and the problems and prospects of S & T in Nigeria.

⁴ Based in Abeokuta, owned by Ogun State Government.

On the television, NTA Tuesday Nightline also serves as a unique current affairs programme that sometimes devotes attention to the issues of S & T in Nigeria like The problems of electricity power generation and supply in the country has been featured repeatedly on this programme. Such discussions usually concern the state of S & T and its applications to the benefit of the general populace and improvement of general well being of the people.

iii. Documentary: Documentary films are a staple diet on television stations in the country. These documentaries are of two types. The first is the documentary films made about specific institutes of science and research on their activities, achievements, prospects and difficulties. These films may focus on some agricultural policy and technology or some other aspects of S & T in Nigeria. All these documentary films that are made by Nigerians are designed to showcase the current state of research endeavours in Nigeria. There is a weekly NTA network⁵ programme titled "Science Digest" which is devoted to presenting the current state of scientific research to the general public.

The second type of documentary films that are shown regularly are foreign films specifically on science and technology. NTA⁶ Ibadan, BCOS television⁷ and Galaxy Television all show these films whenever they have free airtime. Every Sunday morning, for instance, NTA shows one of these documentaries. This Sunday morning show lasts for one full hour. On Galaxy television, which is a private local (Ibadan) station, there is a 30-minute science documentary every Thursday evening.

These documentaries focus on general aspects of science and technology in Europe and the United States of America. For example, one may focus on Germany industrial plants and their impact of the environment or the state of research in molecular biology in some British research facilities or institutes, advances in cancer surgery culled from the German television station, DW, and so on.

Like the problem in discerning the audience of print media reports on science and technology, it is very difficult to know those who watches or listens to electronic media reportage and presentation of S & T. Since all the different types of new and reportage of S & T are in English language, it is only fair to assume that the audience is English speakers and those literate members of the society. Besides, to show a programme when many people are away on Sunday service or are yet to be back from the day's work means that very few people will be ready and willing to view it

Except for such programmes like "Junior Science" whose audience is specific to secondary school students, the other programmes are accessible to those who have the linguistic skills to understand and appreciate the content of the programmes.

2.2.3- Scientific Debates and Controversies

A special category of general science and technology news and reportage in the media is scientific controversies and debates. A debate is a contention in words and argument; and a controversy is usually a war of opinions concerning a specific subject. A scientific controversy in this sense would mean a contention between different and incompatible opinions concerning a

⁵ National Television Authority (national network).

⁶ NTA Ibadan has local programmes in addition to the network news and shows.

⁷Based in Ibadan, owned by Oyo State Government.

scientific subject. In recent times the media have provided the space and sphere within which certain important issues that have practical relevance to the lives of the people have been trashed out and critically assessed. A number of these issues are worthy of mention.

Just at the inception of the civilian administration in Lagos state last year, the civilian governor, Ahmed Tinubu, said he was going to initiate plans to establish a private or state-owned electricity power generating station, to be known as Independent Power Project (IPP). The print media extensively covered the story and the signing of the contract. Just then the problem started. The cost of the project and the duration of the emergency electricity power supply and how much consumers are going to pay in Lagos state became issues of debate on the pages of newspapers. By far the hottest point of the controversy was reached when the Lagos state governor alleged that the management of NEPA⁸ was sabotaging his efforts to get the project off the ground. Accusations and counter-accusations were traded on the pages of newspapers between Lagos state government officials and officials of NEPA. Till date the controversy is still raging on mainly on the pages of newspapers.

Also worthy of note was this controversy concerning Pastor T. B. Joshua and his claim to miraculously cure HIV and full-blown AIDS (*Newswatch*, July 12, 1999, pp.20-27). We have also had the "Test-tube Baby Controversy in Lagos, the potential health risks of cassava, the impact of oil exploration on the environment, the health hazards of certain brands of food seasoning in Nigeria, and so on.

The problem of HIV/AIDS has from the beginning attracted public attention. The first case of full-blown AIDS in Nigeria was reported about 1986/87. Since this time, not less than 22 people have laid claim to having found a cure for the dreaded ailment. Nearly all these people were celebrated in the media, especially the print media. Each of these resulted in some mild controversy that was short-lived. But by far the hottest controversy concerning a remedy for AIDS/HIV is the claim made by Dr Jeremiah Abalaka of Medical Specialist Hospital in Abuja.

Abalaka's claim is simple: he has developed both a preventive and curative vaccine for HIV infection but not for AIDS! (*TELL* magazine, April 24, 2000). The papers report that more than two hundred HIV -positive patients including thirty from the Army and five from the Air Force, (*Vanguard*, April 13, 2000, pp.1-2). The media have taken particular interest in what has suddenly become "The Abalaka Controversy" and "The Vaccine Controversy".

Dr Jeremiah Abalaka is from Kogi state and is a trained surgeon. He started researching for a cure for HIV in 1991, and in February 1999 announced that he has developed "an effective preventive vaccine against the HIV". According to him, "a preventive vaccine is by definition, a vaccine given to a healthy person to prevent him from acquiring a particular disease" (*Prime Sunset*, April 18, 2000, p.5). The controversy started on November 18, 1999 when he held a world press conference where he claimed that his vaccine can cure HIV.

However, while Dr Abalaka had worked with certain government agencies like the National AIDS/STD Control Programme (NASCP), National Agency for Food and Drug Administration (NAFDAC) AND The National Institute of Pharmaceutical Research and Development (NIPRD), the ministry of health in the person of the minister of Health, Dr Tim Menakaya, has said Abalaka is a fraud (*The Guardian on Sunday*, April 9, 2000, p.20). To further enhance the confusion, the ministry of Commerce has announced granting a patent to

⁸ National Electricity Power Authority

Abalaka's vaccine in Nigeria, even when the ministry of health insists "on proof of Abalaka's HIV vaccine", (*Vanguard* April 17,2000,p.1).

The crux of the controversy rests on the criteria for scientific proof, verification and validation. The ministry of health says proof consists in Abalaka sharing his research findings and formula with the rest of the scientific community in Nigeria and subjecting his vaccine to scientific scrutiny and analysis, in other words, making his knowledge and methodology public. Abalaka says "NO!" "The only scientific proof to show the efficacy of any preventive vaccine is to challenge the immunised person with the agent involved and see if the vaccine has indeed offered the claimed protection" (*Prime Sunset*, April 18,2000,p.5). Abalaka argues further: We do not know the formula used for making coca-cola, but we all drink it in Nigeria. The coca-cola formula is a scientific formulation too like my HIV vaccine", (*Guardian*, April 17,2000,p.3).

The on-going Abalaka's vaccine controversy has seen the Federal government-owned electronic and print media pitched against the privately owned electronic and print media houses. The Government media carry the views and arguments of the officials of the ministry of health while the private media houses express evident sympathy for the views and plight of Abalaka and his research. The *Vanguard*, for example, carried an editorial captioned "HIV/AIDS: GENESIS OF ABAALAKA CONTROVERSY" (April 17,2000, p.12) where the paper likened the plight of Abalaka to that of the British surgeon Edward Jenner, who, in 1796, came up with a curative vaccine for smallpox. Jenner's finding brought him opposition, reproach, condemnation from his colleagues who ought to have known better, but today the same vaccine has helped in eradicating smallpox all over the world.

The *Vanguard*, the *Post Express*, The *Comet* and the *Guardian* have all been in the forefront of bringing Abalaka's views to the court of public opinion, and at the same time try to expose some form of "secret agenda" on the part of officials of ministry of health to short-change Abalaka on the economic implications of his discovery. For example, *Tell* magazine has stressed "the threat Abalaka's discovery poses to the big business of anti-retroviral drugs and condom", (*Tell*, April 24,2000,p.49). Those who import these drugs into third world countries and their first world manufacturers would not like to see Abalaka's discovery see the light of day. The truth may be that Abalaka probably has no intention of hiding his 'answer' but it may be fair to say that he expects the rest of the world and this part of the world to pay good money for it.

The Abalaka controversy and many others like it take place primarily in the public domain where there are sides or different parties to the debate. Claims, arguments and counter-claims and counter-arguments are marshalled on the pages of newspapers and news magazines; the electronic media of radio and television participate by generating further debates through interview of the principal social actors in the 'drama' or by soliciting some sort of professional opinions on the issues under debates and through news bulletins.

The primary purpose of such reportage of scientific controversies may not just be the creation of awareness or information, but through the generation of reasoned and informed opinions of both experts and non-experts, the public "conversation" could be steered toward the resolution of such scientific debates for the general interest of the public. Through such debates, the public may be better prepared to access the benefits of science and technology.

Media reportage of science and technology news and activities brings the present discussion to the consideration of the interest of the media in science and technology discourse. Generally, science is not an alien sort of activity to the indigenous peoples of Nigeria. The iron smiting industry of the Awka people of Anambra state was an indigenous technological application of scientific reasoning and activity to the practical existential needs of the people. For

the media, the dissemination of science and technology news has both informational and utilitarian values.

A close reading of the different types of science and technology news shows a four-fold interest of the media in science and technology. Of primary interest to the media in their reportage of S & T news is the health of the people. S & T news is presented with a basic assumption that in the long term, science and technology improve the health of the people. Consequently, health and medical issues have so far received the greatest coverage in the daily newspapers, news magazines and documentaries on television as a matter of regularity and consistency. With the current scourge of the AIDS/HIV pandemic and the "Abalaka's vaccine controversy", health and medical themes have simply come increasingly to the fore.

The media report on science and technology also shows the underlying belief that science should transform social life and economic arrangement in a positive way. In other words, science is shown in the media as the cornerstone of socio-economic development in the contemporary world. This basic belief is given ample space in the plethora of articles on scientific agricultural practices, latest automobile technology, and information science and technology (*Post Express*, June 11, 1998, p.28; *Tribune*, Sept 21, 1998, p.9; *Post Express*, June 25, 1998, pp.25 & 26).

Development as a multi-discursive and multi-dimensional concept and state of affairs implies a general improvement in the total situation of a people: politically, economically, socially and culturally. The interest of the media in science and technology is guided by the desire to better the lot of the people who are encouraged, or sometimes cajoled into consuming these S & T news in the hope that there will be improvement in general outlook (worldview) and attitude.

The media in Nigeria (especially the print) are both a forum for reasoned debate about S & T, and a sphere for the cultivation of images of S & T. The media generally have moved scientific research and activity from the private sphere and domain of the scientist and researcher to the public sphere of open argument and debate, which is a way, and means of forming public opinion and resolving some controversial socio-scientific issues of importance to the society.

In all, the interface between science and the media reflects the nature and consequences of the social relations associated with the practice and culture of science and scientific reasoning. This brief essay shows that the nature of scientific knowledge very often depends on social factors that make such knowledge possible, needed and consequently accepted.

3- MYTHES ET REALITES DE LA COMMUNAUTE SCIENTIFIQUE NIGERIANE, par Yann LEBEAU

Marginalisation des universités et individualisation des pratiques professionnelles

Introduction

L'éducation et la recherche scientifique comptent parmi les domaines qui symbolisent le mieux la permanence de la présence de l'Etat. Dans la plupart des pays africains, le développement des écoles (du primaire au supérieur) et des instituts de recherche a connu un boom spectaculaire durant les deux décennies suivant les indépendances. Moteurs du développement, l'éducation et la recherche devaient assurer l'indépendance des pays vis-à-vis de leurs anciennes métropoles, et renforcer leur position dans la compétition internationale.

Le changement de cap des années 1980, marqué notamment par un désengagement négocié ou imposé des Etats d'une sphère économique désormais mondialisée et abandonnée à une régulation par les seuls marchés, s'est traduit dans de nombreux pays par une déstabilisation de la fonction de l'école et du savoir, sans que le secteur ait nécessairement été "abandonné" au secteur privé.

Le cas du Nigeria, présenté ici, est à plusieurs égards exemplaire : la croissance continue de la rente pétrolière s'est vue remise en cause au début des années 1980 entraînant une baisse brutale des ressources de l'Etat. Les fonctions régulatrices (y compris régaliennes) de ce dernier ont été affectées au moment même où le Nigeria traversait une période d'instabilité politique.

La recherche universitaire, choyée dès l'inauguration, par les britanniques en 1948, de l'Université d'Ibadan, puis dopée par la dynamique politique de l'indépendance qui poussait à la multiplication du nombre des universités, a connu un tarissement soudain des financements publics au milieu des années 1980.

Ce sont les réactions à cet état de fait qui nous intéressent ici : la "communauté scientifique", fortement structurée et hiérarchisée se transforme sous l'action concomitante d'une baisse généralisée du niveau de vie des enseignants-chercheurs, d'une marginalisation de leur production scientifique par interruption des subventions aux recherches et aux publications, et d'un renforcement de l'autoritarisme d'Etat. Aux transformations des relations avec la tutelle étatique s'ajoutent les conséquences de l'internationalisation des pratiques de recherche : les chercheurs nigériens s'inscrivent de plus en plus dans un système mondialisé de la recherche, qui les autorisent à communiquer en temps réel sans se déplacer et les situe dans une hiérarchie nouvelle de la production scientifique.

3.1- Les universitaires et le mythe communautaire

3.1.1- La société des universitaires : construction et déconstruction d'une catégorie sociale

Il existe une population d'intellectuels nigériens, diplômée des universités européennes et américaines, depuis le début du XXe siècle. Cette population constitue très vite l'avant-garde de la revendication nationaliste pour le développement d'un enseignement universitaire digne de ce nom. Le Nigeria ne dispose pas pour autant, avant l'indépendance en 1960, de communauté scientifique nationale au sens ou le définit Thomas Schott (1991 : 42) :

“ The scientists within a country form a national scientific community, a community within the world scientific community. They enter the national scientific community through the relatively similar scientific education which they have undergone and their acquisition of the shared culture of science--at an elementary level. They perform their research in the framework of national institutional arrangements for research such as universities with similar patterns, the same national associations and journals, supported by the same national foundations and the same bodies which set the national science policies; thus, they perform their research within a common institutional and intellectual setting. All this prepares them for participation in the more differentiated and specialized traditions of scientific knowledge and research, and for personal connections which are more intense with colleagues who are nearby working on similar subjects and problems, and also with more remote colleagues. ”

Non que la puissance coloniale britannique n'ait eu d'intérêt dans le développement de la science dans ses possessions d'Afrique de l'Ouest⁹, mais il faut attendre l'entre-deux-guerres mondiales pour que, sous la pression de la demande nationaliste et dans un souci de désengagement économique, une politique de formation de cadres autochtones soit envisagée. Cependant on ne peut encore pas parler de “ chercheurs ” puisque la politique éducative des britanniques sur la période obéit au besoin de formation d'une main d'oeuvre intermédiaire, et au refus de consolidation d'une classe intellectuelle africaine qui n'aurait eu sa place dans le système d'administration indirecte (Nwauwa, 1996: 62).

La communauté scientifique nationale nigérienne ne prend forme que dans les années soixante, soit près de vingt ans après la création de l'université d'Ibadan. La mise en place de tutelles telle que la Commission nationale des universités (NUC), le développement des formations doctorales (que les Anglais n'avaient pas développé à Ibadan), l'apparition de revues scientifiques locales, l'existence d'un statut commun régissant les carrières des universitaires de toutes régions (le Nigeria compte six universités en 1970) contribuent alors à institutionnaliser la profession de chercheur.

La définition proposée plus haut par Thomas Schott reflète sans doute mieux les réalités européennes ou nord américaines que celle du Nigeria. La communauté scientifique universitaire

⁹ La recherche britannique au Nigeria s'est, selon un schéma colonial assez classique, développée dans les domaines de la médecine tropicale et de l'agriculture. En 1938, le Nigeria occupait le second rang derrière l'Afrique du sud pour le nombre de chercheurs agronomes, tous britanniques (Chatelin *et al.*, 1997 : 131).

des années soixante y est certes nationale par le lieu d'exercice, mais formée à 100% à l'étranger (au niveau doctoral), et composée en certains lieux (Ibadan et Zaria notamment) encore majoritairement de personnel non nigérian.

Cette "communauté" s'est développée par à-coups dans diverses directions, plutôt que par sédimentation. En fait, la recherche s'institutionnalise (en même temps qu'elle se nigérianise) par une volonté politique nouvelle (celle de l'indépendance), alors qu'elle est déjà inscrite dans des réseaux internationaux de recherche. Comme dans beaucoup de pays du Sud, la science s'est également institutionnalisée bien avant de se professionnaliser. Les investissements importants de l'Etat post-colonial dans la création d'unités de recherche et de laboratoires, l'accueil de personnalités scientifiques, nigérianes ou non, conduit rapidement au développement de pôles de pointe, sans que cette recherche soit stimulée par une demande industrielle. Le passage d'une communauté scientifique relativement cloisonnée selon des clivages disciplinaires et ethno-régionaux à un "groupe scientifique professionnalisé", caractérisé par des coopérations interdisciplinaires et des formations, et des alliances stratégiques avec certains pans de l'économie (Gaillard et al., 1997 : 21) ne se produit que vers la fin des années 1970, et encore partiellement..

L'intégration des équipes de recherche reste très parcellaire pour au moins deux raisons : le Nigeria n'a jamais eu de politique scientifique et la recherche est essentiellement produite pour un marché extérieur au pays. Les chercheurs appartiennent en revanche à la communauté internationale scientifique, et constituent dès la fin des années soixante un groupe social relativement homogène et une corporation solide.

Particulièrement cajolée dans les années 1970, la fonction publique nigériane jouit de revenus et d'un statut proches de ceux alors connus en Europe occidentale. Les universitaires nigériens entretiennent leurs réseaux à l'étranger (souvent bâtis au moment de leur doctorat) en se déplaçant régulièrement, et des chercheurs réputés, mis à disposition dans le cadre de la coopération, ou originaires de pays à faible pouvoir d'achat (notamment de l'ancien bloc de l'Est et du Moyen-Orient) continuent de palier au manque de main d'oeuvre locale jusqu'au début des années 1980. L'Université offre alors un visage "international" qui la valorise au sein des couches urbaines scolarisées, et les universitaires exhibent volontiers les signes de leur aisance matérielle (Van den Berghe, 1973). Le statut commun des universitaires tend à niveler les importants écarts que le système génère en termes d'équipement et de réputation des établissements, et donc, de qualité des chercheurs. Enfin, l'adoption par toutes les grandes universités fédérales d'un système de campus renforce l'impression d'une culture homogène en imposant les conditions d'une écologie (un environnement physique et émotionnel) et un climat (un ensemble de perceptions à l'égard du mode d'organisation de l'institution) communs à l'ensemble de la profession (Toma, 1997 : 682).

Dans ces conditions, seule l'homogénéité des modes de vie fait surface, renforcée par un solide esprit corporatiste. En effet, rappelons que l'Université s'installe au Nigeria contre le désir des autorités de la colonie (Nwauwa, 1997). Immédiatement, la question de l'équivalence internationale devient l'enjeu de la formation supérieure. En 1934, la bourgeoisie lagosienne boude le Yaba College car il ne propose pas de diplômes supérieurs "reconnus". Cette révolte des "éduqués" locaux sera pour beaucoup dans l'affiliation immédiate (1948) de l'université d'Ibadan à celle de Londres dont elle délivre les diplômes. L'embryon de communauté universitaire qui se constitue alors à Ibadan va ériger en principe la question de l'autonomie de l'institution face aux caprices de l'Etat. Seules les normes internationales de la formation et de la recherche sont acceptées. Ce sentiment se renforce après l'Indépendance quand tous les universitaires achèvent leur parcours de formation à l'étranger, et que pointent les velléités de contrôle étatique ou régional sur les contenus des enseignements.

3.1.2- Le syndicat intouchable

Organisé sur un modèle corporatiste, le syndicat des universitaires nigériens fédère les unions locales des enseignants-chercheurs depuis 1965¹⁰, et symbolise depuis 1978 (création de ASUU) la résistance de la profession aux régimes les plus dictatoriaux.¹¹ Syndicat représentant l'ensemble du personnel académique nigérien, ASUU est aujourd'hui un mythe. Nous le verrons plus loin, les pratiques professionnelles ont changé dans le sens d'une individualisation de la gestion des carrières et des revenus. En revanche les discours (en public) sur ASUU ne varient guère. Les décisions contradictoires prises par une branche locale de l'Union sont suffisamment rares pour attirer les sarcasmes de la profession, même si localement, les enseignants sont de plus en plus nombreux à ne pas suivre les mots d'ordre du syndicat (en 1999 à l'Université d'Ibadan des dizaines d'enseignants assuraient secrètement leurs cours pendant la grève).

Seul syndicat capable de résister au démantèlement des organisations orchestré par le pouvoir militaire à partir du milieu des années 1980, ASUU oppose alors un rempart collectif à l'anti-intellectualisme ambiant, et garantit la survie de la profession, même si au quotidien les années de l'ajustement engendrent des "stratégies de survie" individuelles qui piétinent les principes académiques :

"The Nigerian experience suggests that although academics are more likely in the short-term to resort to individualistic survival strategies to cope with the impact of intense economic crisis and structural adjustment, in the long-term, they would tend to rely more on collective strategies through organized union struggles. While doing so, however, their struggles would tend to be radicalized, focusing not only on "bread and butter" issues but also, quite significantly, on broad issues relating to the democratization process and contestation of authoritarian power of the state." (Jega, 1994: 66).

Les luttes syndicales, en se radicalisant et en se politisant à partir des années 1980, offrent une nouvelle figure de la communauté universitaire, celle d'une mouvance politique d'opposition à la classe dirigeante. Le pouvoir (militaire en particulier) et les dirigeants d'ASUU, ont ainsi contribué au travers de leurs conflits, à renforcer l'imagerie communautaire entretenue autour de la population des universitaires.

¹⁰ Alors appelé *Nigerian Association of University Teachers* (NAUT), le mouvement se concentre sur des revendications ayant trait au bien-être, voir au maintien de certains privilèges du personnel enseignant (Jega, 1994 : 8).

¹¹ Selon A. Jega (1994 : 9-17), le projet plus politique de ASUU (*Academic Staff Union of Universities*) par rapport à NAUT tient en partie à l'émergence d'une nouvelle "classe" d'universitaires nigériens à la fin des années 70, formée par le système national lors des années du boom pétrolier, et rapidement frustrée par le revers économique perceptible des 1980 et par la mainmise des régimes militaires sur les commandes du pays.

3.1.3- Des rapports ambivalents avec la classe politique

L'ambivalence des rapports entre la communauté universitaire, représentée par son syndicat, et le pouvoir politique, n'est pas un phénomène nouveau que l'on pourrait par exemple associer au seul processus d'exacerbation de l'autoritarisme d'Etat sous le régime du Général Abacha¹². Dès les premières années de l'indépendance, chaque création d'établissement, chaque nomination de recteur d'université entraîne des conflits et des interventions du pouvoir politique dans les affaires académiques (Amuwo, 2000 : 2). Dans les années 1960, l'université est un enjeu politique majeur qui justifie ces tensions. Le contrôle de la fabrication de l'élite nigériane, pense-t-on alors, passera désormais par celui des institutions d'enseignement supérieur. L'investissement colossal d'alors sur les universités obéit en grande partie à ces considérations géopolitiques (les leaders des grandes formations politiques représentant peu ou prou les intérêts des trois groupes ethniques dominants), mais aussi au fait que, dans un pays où 70% de la population adulte est analphabète, les universitaires représentent, aussi peu nombreux soient-ils, un groupe important au sein de l'élite lettrée. D'autant plus influent d'ailleurs, que nombre d'universitaires des années soixante ont été les camarades de classe en Angleterre ou aux Etats-Unis des grands leaders politiques régionaux nigériens. De plus, comme le montre bien P. Van den Berghe (1973 : 55) à propos d'Ibadan (U.I.), de puissants liens informels unissent ces élites sur des bases ethno-régionales :

“ Since U.I is a federally supported institution, the university has few formal ties with the Western State government, except insofar as the latter has jurisdiction over a secondary and two primary schools on campus. Informal social and political links between university and State government are, however, numerous and crucial. U.I. is the Mecca of the Yoruba intelligentsia, and the Western State incorporates the bulk of the Yoruba nation. The Yoruba members of the university staff naturally have many ties to other people in the region, most particularly with other sectors of the elite in the professions, the civil service, and more recently, the army”.

La création des universités de Nsukka (1960) et de Zaria (1962), respectivement gérées dans un premier temps par les régions Nord et Est, renforce la dimension régionale, voire ethnique des liens de solidarité entre universitaires et élites politiques, en stimulant le repli des enseignants vers “ leur ” université.¹³ Ceux-ci se retrouvent alors au cœur des tiraillements politiques internes à leur région, comme à Ibadan en 1965 (Soyinka, 1994), ou subissent la marginalisation, voire l'ostracisme, dont leur région est victime (l'université de Nsukka et le pays Igbo après la guerre du Biafra).

Les premiers régimes militaires (1966) ne remettent pas fondamentalement en cause ces liens, au contraire. Le Nigeria a besoin de formateurs et la nigérianisation de l'université est loin d'être achevée.¹⁴ Il convient alors d'être prévenant avec les universitaires, de ne pas les laisser s'échapper vers le privé ou l'étranger :

¹² Au pouvoir de 1993 à 1997.

¹³ En dépit d'une vocation internationale “ historique ” et de son statut fédéral, l'université d'Ibadan compte aujourd'hui près de 75% de Yoruba parmi son personnel académique.

¹⁴ En 1963, les cinq universités nigérianes rassemblent 516 enseignants-chercheurs, tous grades confondus, parmi lesquels 360 étrangers, occupant notamment 90% des postes de Professeurs (Fafunwa, 1971 : 261).

“I am aware that there are certain rights and certain universal functions that are the preserves of all reputable institutions of higher learning. I am also conscious of the fact that a great university can only emerge in an atmosphere in which the teacher is secure in his tenure and is free to push forward the frontiers of knowledge through unfettered teaching and research”¹⁵

Trente ans plus tard (1995), c’est un autre discours que tient le chef de l’Etat nigérian (le général Sani Abacha) à l’adresse des universitaires en grève depuis six mois :

“I appeal to the staff of universities and other tertiary institutions to reciprocate the good gesture of the government by working extra hard to produce graduates that are qualified to contribute their quota to the growth of the country. Dissipation of energy in pursuit of personal gains or unnecessary union activities tantamount to misplaced priorities and contribute to lowering of standards of education. The recent dissipation of so much energy in campus politics by staff instead of devoting time to the primary duty of teaching is of growing concern to government”¹⁶

Pour Kunle Amuwo, la distance entre ces deux citations traduit à la fois l’évolution de la mission assignée à l’université et la dérive répressive des juntes au pouvoir dans les années 1980 et 90. Solidement ancrée dans une tradition d’autonomie, la communauté universitaire serait, selon lui devenue le seul contre-pouvoir efficace dans les années 1990, alors que l’emprisonnement (MKO Abiola, O. Obasanjo...) , l’assassinat (K. Abiola...) et l’exécution (K. Saro-Wiwa) semblaient les seules réponses du pouvoir du général Abacha aux revendications de la société civile. Selon ce schéma, l’université oppose dans les années 1990 une véritable réaction “communautaire” aux abus du pouvoir politique (Gana, 1993). Elle défend en bloc derrière ses syndicats (enseignants, étudiants et personnel non-académique) une université libre et bien dotée dans une société démocratique. En somme, et plusieurs auteurs nigériens convergent sur cette interprétation, la véritable rupture entre les deux mondes s’opère lorsque les militaires perçoivent dans les élites académiques une menace au monopole du discours patriotique.

Les voix des sciences sociales au Nigeria étant également celles du syndicat ASUU, on retrouve cette logique de la confrontation à la base des interprétations de la crise proposées par de K. Amuwo, A. Jega et A.T. Gana. Leurs analyse pèchent cependant à mon sens par manque d’observation de l’évolution du statut social de l’université et donc des universitaires sur les vingt dernières années au Nigeria.

Le pouvoir politique aujourd’hui revenu aux civils n’annonce pas le retour d’une communauté universitaire soudée, autonome, socialement valorisée et politiquement cajolée (Lebeau, 1999). Le bras de fer des années 1990 a permis de mesurer le désintérêt croissant des responsables politiques pour une institution coûteuse, devenue marginale dans le façonnement des élites politiques. L’université, devenue lieu d’expression, constitue sans aucun doute une sorte de défi à l’Etat. Mais la communauté universitaire a surtout souffert des stratégies d’“évitement” et de déstabilisation économique de ces vingt dernières années (Lebeau, 1996 :

¹⁵ Brigadier General Adebayo (1969), gouverneur militaire de la région Ouest sous l’administration Gowon, cité dans Amuwo, 2000 p. 3.

¹⁶ Cité dans Amuwo, *Op. cit.*

65). La position sociale de cette “ communauté ” en est aujourd’hui affectée au point qu’elle peut difficilement apparaître derrière un paravent unique. L’évitement et la déstabilisation ont fait basculer l’université dans une sorte d’ajustement instable, décrit par B. Niane (2000) comme étant caractéristique de l’émergence d’un champ “ informel ” (stratégies de déviance par rapport à l’institution).

On constate d’ailleurs aujourd’hui au Nigeria, dans un régime démocratiquement élu, marqué par l’occupation rapide de l’espace public par des organisations jusqu’alors anéanties ou bâillonnées, que le syndicat universitaire ne brille ni par ses propositions politiques, ni par ses contestations. Démobilisé par une conjoncture économique et politique plus propice à la recherche de revenus alternatifs qu’à un engagement politique et syndical collectif, ASUU s’oriente plutôt vers la défense d’intérêts corporatistes, plus directement liés au statut social des enseignants-chercheurs qu’à celui de l’institution universitaire en tant que telle.¹⁷

3.2- Perceptions et légitimité de la recherche et du métier d’enseignant-chercheur¹⁸

Ce sont les activités d’enseignement (les plus visibles, celles qui affectent directement une large population d’étudiants, de parents ou de tuteurs) qui fixent l’image de l’universitaire dans la société nigérienne, alors que c’est la recherche, qui depuis toujours, détermine l’avancement de sa carrière et conditionne ses possibilités de voyages, voire d’expatriation. Or l’évaluation de la recherche en Afrique, se fait largement hors d’Afrique, comme le montre l’empressement des chercheurs à écarter de leur CV les revues africaines absentes des bases de données bibliométriques américaines ou européennes. L’appréciation du statut social de l’enseignant-chercheur par les intellectuels repose sur des critères éloignés de la grande majorité des non-lettrés pour qui l’intellectuel est selon les circonstances et les époques, un tribun privilégié, le titulaire d’un pouvoir de sanction, l’influent ... (Diouf, 1993)

3.2.1- Le mythe de l’intellectuel, la valeur du diplôme et le spectacle du déclassement social

Je retiendrai ici, parce qu’il est large et extensible, le concept d’intellectuel proposé par M. Diouf (1993 : 39) :

“ En Afrique, sont considérés comme intellectuels les acteurs sociaux qui, par la place privilégiée qu’ils occupent dans le système de production des idées et de leur diffusion, par la détention d’un savoir ou d’une expertise, produisent la conscience historique, donnent sens aux faits sociaux en les ordonnant de manière lisible, et ont une influence sur les intermédiaires politiques et culturels ”.

¹⁷ Au début de l’année 2000, les universitaires ont obtenu, sans grève, une revalorisation spectaculaire (150%) de leurs salaires et primes. Celle-ci a largement contribué aux mouvements de grève qui ont ensuite affecté les universités (les personnels non académiques accusant ASUU d’avoir négocié cette augmentation secrètement) puis toute la fonction publique. Il est intéressant de noter que le ministre de l’éducation est lui même ancien dirigeant de ASUU.

¹⁸ La recherche n’est pas au Nigeria exclusivement universitaire. Il existe en effet des dizaines d’instituts publics entièrement destinés à la recherche. Celle-ci s’exerçant cependant d’abord à l’université (85% des travaux publiés), j’ai fait le choix de laisser de côté les instituts, dont les activités, trop confidentielles, sont inconnues du public.

Ce concept présente l'intérêt d'inscrire les intellectuels dans le tissu socio-économique tout en identifiant " les logiques de l'(auto)attribution d'un statut ". A cet égard, M. Diouf montre bien que c'est dans le " ghetto surprotégé " de l'université que s'est construit, un peu partout en Afrique le statut de l'intellectuel. D'où une forte polarisation des médias sur une population symbolisant tout à la fois le savoir, la dissidence, l'opportunisme, et une certaine tradition élitiste européenne entretenue de l'intérieur des campus.

Le statut social de l'universitaire est intimement lié à celui de l'école et à la valeur sociale et économique du titre scolaire. Le Nigeria présente à cet égard un paysage contrasté avec des zones où les taux de scolarité avoisinent de longue date les 100% dans le primaire et le secondaire (les Etats du sud en général), et d'autres (Etats de Yobe, Borno et Sokoto dans le Nord), où aujourd'hui encore, à peine 15% des enfants fréquentent l'école primaire (UNDP, 1998). Les causes historiques de ce phénomène sont bien connues et la persistance de ces inégalités reflète de fortes variations culturelles dans la perception de l'école et dans l'élaboration des stratégies familiales vis-à-vis de celle-ci et du savoir en général (Gérard, 1997).

En résulte une appréciation différenciée de la notion et de la fonction de l'intellectuel, du professeur, et à plus forte raison du chercheur. Dans les régions méridionales, où l'enseignement supérieur s'est imposé dès les années 1940, l'image de l'universitaire détenteur de savoir (l'auteur, le professeur, le conseiller) et de pouvoir (admissions en université, attribution des diplômes) s'est durablement installée à la faveur d'images idéalisées projetées depuis les campus (Lebeau, 1997). Les deux-tiers des universités nigérianes sont aujourd'hui situées dans cette partie du pays, où elles génèrent des dizaines de milliers d'emplois directs ou indirects, et ont contribué dès les années soixante à une véritable institutionnalisation du titre scolaire comme accès privilégié aux ressources de l'Etat. Dans les Etats du Nord, c'est le statut socio-économique des universitaires qui a le plus contribué au prestige de leur fonction.

L'effondrement du pouvoir d'achat des fonctionnaires à partir du milieu des années 1980, le recours généralisé des enseignants à des activités lucratives non-académiques (petit commerce, agriculture, transport) pour combler le déficit de leur revenu salarial (Hudu, 2000), l'expatriation des plus renommés d'entre eux, le spectacle de conditions de travail dégradantes (sans électricité ni papeterie), les grèves à répétition...sont venus remettre en cause l'image, évoquée plus haut, de l'universitaire aisé, voyageur, protégé sur son campus, des vicissitudes de la vie quotidienne au Nigeria. Cette véritable mise à nue a largement contribué à la réorientation des actions collectives des universitaires, en même temps qu'elle suscitait de nouvelles stratégies professionnelles individuelles en contradiction totale avec les règles formelles et informelles et les hiérarchies statutaires héritées de l'académisme colonial.

A ce déclassement d'une profession, s'est superposé celui de l'école dans le processus de mobilité sociale. A partir des années 1980 au Nigeria comme chez ses voisins, la profession d'enseignant-chercheur offrant, comme l'ensemble des positions salariales d'ailleurs, peu de perspective de mobilité sociale, c'est le secteur informel qui tend à entraîner la dynamique économique. Cette " désalarisation " (Lautier, 1994), s'est accompagnée dans de nombreux pays d'une déscolarisation (Lange, 1991 : 112) contribuant elle-même à la dévalorisation de l'image des enseignants.

Les universitaires ont beaucoup contribué, par leur actions collectives, par leur mode de vie et de paraître, à l'élaboration et à la reconnaissance de leur statut d'intellectuel au Nigeria. Le pouvoir politique, par sa gestion des crises universitaires a également régulé cette image, la

dévalorisant surtout, en affaiblissant la position économique des universitaires, et en menant une politique hasardeuse du développement de la recherche et de l'enseignement supérieur.

3.2.2- Les finances publiques et la volonté politique en Sciences et Techniques

Si les créations d'université ont obéi au Nigeria à des objectifs politiques précis, le développement de la recherche a bénéficié, de l'indépendance jusqu'à la fin des années 1970 d'un libéralisme remarquable. Le pouvoir militaire du Général Obasanjo (1976-79) a freiné ce développement, littéralement stoppé par la crise économique des années 1980.¹⁹

Les sciences développées en priorité à l'époque coloniale (agriculture et médecine) dominant sans surprise les investissements et la production du pays bien après l'indépendance. Si l'Etat nigérian ne brille pas par une véritable stratégie de développement de la recherche, il suit pendant une vingtaine d'années d'une part les grandes orientations recommandées par l'UNESCO et d'autre part, la dynamique enclenchée dans les universités nigérianes par des fondations extérieures. Ford, Rockefeller, Nuffield et Carnegie investissent alors lourdement dans les universités, soit directement (construction et équipement de laboratoires, de bibliothèques...), soit indirectement par le financement de bourses d'études doctorales, de travaux de terrain, de voyages scientifiques à l'étranger, de mise à disposition d'experts étrangers (Fafunwa, 1971). Ce sont ces fondations, qui prenant le relais de la tutelle universitaire britannique, évaluent la production scientifique du pays, lui donnent accès à la scène internationale et aux publications. Non que la recherche nigérianne se place totalement sous une nouvelle aile étrangère : des revues nationales, des associations scientifiques par branches, des éditeurs scientifiques publics et privés forment un maillage scientifique national unique en Afrique subsaharienne par sa couverture géographique. Cependant, et le phénomène est d'autant plus marqué avec les restrictions financières des années 1980-90, la référence reste étrangère, et le lien entre recherche et développement souffre d'un déficit de volonté politique, et du faible développement de l'industrie. L'isolement du chercheur, dénoncé dans les années 1960 est probablement plus marqué encore en situation de crise : alors que se tarissent les sources publiques de financement de la recherche (production et diffusion), on imagine mal les chercheurs actifs, autrement dit sponsorisés de l'extérieur du pays, dépenser leur énergie à promouvoir les résultats de leur recherche au Nigeria, alors que l'évaluation de leurs travaux au moment de la promotion refusera de prendre en compte les publications et communications nationales.

Le marasme financier dans lequel se trouvent les universités est tel aujourd'hui, que les chercheurs, notamment les plus âgés d'entre eux, n'envisage même pas la possibilité de recourir à de l'argent public pour le financement de leur travaux. Il s'agit d'un des enseignements principaux des entretiens menés dans le cadre de notre étude : l'Etat nigérian est considéré par tous comme ayant abandonné l'enseignement supérieur et la recherche, au point que les procédures de financement existantes ne sont même pas connues de tout le monde. L'extrait suivant, d'un entretien réalisé en février 2000 avec un professeur de l'université d'Ibadan (biochimie) reflète cette tendance. Quand bien même l'Etat nigérian n'a en fait jamais été le principal financeur de la recherche, c'est à lui qu'est attribué la responsabilité du dénuement actuel et de l'individualisme ambiant au sein des départements :

¹⁹ Les activités scientifiques au Nigeria, supervisées depuis 1970 par le *Nigerian Council for Science and Technology* s'exercent sous la responsabilité de 4 conseils sectoriels (agriculture, médecine, industrie, sciences naturelles), jusqu'à la création du Ministère Fédéral des Sciences et technologies en 1979. Celle-ci annonce un ère de contrôle et de bureaucratisation de la recherche, observable en particulier dans les Instituts placés sous tutelle directe des ministères (Chatelin et al., 1997 : 137).

“ I think in Nigeria we’ve not been so lucky to have enlightened leaders. These are politicians, who, for the most parts have not been very very educated. So they don’t understand that research is important. I am not blaming them, it is just their level of understanding. Whereas in Europe, it is a different thing. Even if a lawyer is the president or the Prime Minister, even though he doesn’t understand the details of research, he understands that this is a culture that has to be developed and that some how it is going to help in the development of the whole country. That is the understanding that our leaders in Nigeria have not got. They believe in importing what other people have already done. They don’t understand they can also do research and do something that will be helpful to the country... (...). In the olden days when we had equipment and everything was working, we use to have research teams; People working together, publishing together. But as things became tougher; equipment started breaking down, people tended to withdraw to themselves for example some people know they cannot do research here anymore, it is impossible so their only hope is to go out from here to another country where they can occasionally do some research. But other people like me, who can still do something here but of course with funding from outside, we don’t want to change. ”

(Laugh.) “ There is also... we are trying to overprotect ourselves because if this breaks down for example that is the end of my research. All my research students have to wait until they are repaired and one doesn’t know how soon. So people are tend to withdraw on to themselves. That is an unfortunate development. It was not so in the past ”.

3.2.3- La vulgarisation du savoir scientifique au Nigeria

Le statut des chercheurs s’est transformé avec celui de leurs institutions, et la recherche, déjà largement dépendante de financements extérieurs n’a jamais, en dépit des discours politiques, fait figure d’instrument du développement du Nigeria. Pourtant, le discours scientifique et la vie des institutions de recherche ont bonne presse, et bénéficient de plages importantes dans la programmation des médias audio-visuels nationaux, comme le montre l’étude de F.K. Ukah.²⁰ On y apprend notamment que tous les quotidiens nationaux ou régionaux, disposent d’une rubrique hebdomadaire dédiée à la vulgarisation de la recherche scientifique. Ces rubriques existent aussi sur les chaînes de télévision. Dans les deux cas, il s’agit en fait de documentaires achetés à des agences de presse (ou des télévisions) européennes et américaines. Ces programmes sont, à la télévision et sur les radios parfois suivis de “ programmes de discussion ” interactifs. La recherche nigériane, quant à elle, y apparaît sous deux aspects. Tout d’abord au travers des “ publi-reportages ” des médias électroniques d’Etat sur les “ avancées de la science nationale ”, et également dans un grand nombre d’articles de presse écrite relevant de l’information générale. F.K. Ukah a cherché à établir une typologie de ces articles : la plupart d’entre eux traitent des institutions et de leurs problèmes (financement, nominations ou évictions arbitraires, grèves...) au travers d’interviews ou d’investigations (surtout dans les universités). Ces articles sont nombreux et précis. D’autres portent sur les controverses scientifiques et leurs prolongements politiques, comme la polémique du début de l’année 2000 sur la découverte par le Dr Alaka d’un vaccin contre le SIDA.

²⁰ Voir dans cette étude la contribution de Franklin K. Ukah, “ The Popularization of Science through Media and School Programmes in Nigeria ” qui repose notamment sur une analyse de l’occurrence d’articles traitant de la science et de ses institutions dans 5 quotidiens nationaux nigériens. Les programmes scientifiques de trois chaînes de télévision ont également été suivis.

Les articles consacrés à la vie scientifique et universitaire au Nigeria méritent ici une attention particulière, car leur récurrence peut sembler paradoxale au vu des mes commentaires sur l'ouverture plus internationale que nationale de la recherche nigériane. La vie universitaire est incontestablement plus médiatisée au Nigeria qu'elle ne l'est en France par exemple, ce qui témoigne des liens qui unissent universitaires, journalistes et lecteurs. Il est par ailleurs important de souligner la forte présence d'universitaires dans les comités éditoriaux des grands quotidiens. Des journaux sérieux comme le *Guardian*, *Post-Express*, ou plus récemment *Comet*, sont même devenus, avec la crise des publications de recherche, le véhicule des communications scientifiques internes au Nigeria. La presse et l'université sont deux facettes d'un même "petit monde" : les informations sur les colloques circulent mieux dans *This Day* que par internet (la plupart des départements n'ont pas le téléphone), et les pages "idées" du *Guardian* ou de *New Nigerian* sont celles où les meilleures contributions en sciences sociales sont écrites, en l'absence de revues locales publiées régulièrement.

Ukah souligne dans son rapport qu'en l'absence de statistiques, il est bien difficile de se faire une idée du lectorat de la presse nigériane, et que dans un pays où à peine plus de 50% de la population adulte est alphabétisée et pauvre, la presse écrite ne circule que dans un milieu extrêmement fermé. Les données fournies par Michèle Maringues (1996) sur le tirage des principaux quotidiens confirme ces impressions : la presse nigériane est urbaine et essentiellement lue dans le Sud.²¹

En dépit de ces restrictions, on retiendra que les médias ouvrent largement leurs colonnes et leur antenne à la science et aux institutions de recherche. En revanche, l'Etat, et plus particulièrement le ministère de la recherche, n'offre pas de relais à ces informations, en dehors de l'entretien d'une cité de la technologie à Lagos, et d'un programme ambitieux de vulgarisation de la science dans les écoles primaires, datant d'un vingtaine d'année, mais resté lettre morte en raison de restriction budgétaires.

L'image des chercheurs dans la société est donc beaucoup moins influencée par l'information scientifique que par le statut des universitaires, et par la valeur sociale des diplômés.

3.3- L'immixtion de la norme et du classement international

Les propos des universitaires les plus âgés sont clairs : pas de carrière à l'université sans reconnaissance de la valeur du chercheur. Or, si l'évaluation de la compétence se construit sur des normes internationales, voire systématiquement étrangères, un chercheur nigérian replié sur son espace national stagnera aux échelons inférieurs de la hiérarchie des positions universitaires. Les choses évoluent cependant, moins dans le sens d'une nationalisation de la recherche, que vers une immixtion de la norme internationale dans des travaux locaux non publiés, et non reconnus dans l'évaluation académique. Cependant un fait demeure : l'international, comme référence obligée jamais démentie depuis la création d'Ibadan en 1948, commande la conduite des carrières et la production scientifique du Nigeria.

²¹ En 1996 (derniers chiffres connus), vingt-quatre quotidiens paraissaient au Nigeria, dont onze détenus par le gouvernement. On comptait également 25 hebdomadaires et une trentaine de mensuels, privés pour la plupart. Les tirages varient de 5000 à 10 000 exemplaires pour les quotidiens du Nord et la presse régionale en général et 70000 pour les grands quotidiens de Lagos. Au total, la presse quotidienne nigériane tire à moins d'un million d'exemplaire (pour 120 millions d'habitants). A titre de comparaison, la presse sud-africaine tire à 3 millions d'exemplaires (29 titres), et les trois quotidiens égyptiens d'Etats, entre 500 000 et un million d'exemplaires chacun. (Maringues, 1996 : 87 et 93).

3.3.1- L'excellence, une valeur nécessairement exogène

Les grandes institutions de formation et de recherche ont été, dans la plupart des pays africains, créées par les puissances coloniales européennes. Les universités de Dakar et d'Ibadan par exemple sont restées, après les indépendances, arrimées aux institutions qui ont garanti l'équivalence de leurs diplômes²², et au-delà, une reconnaissance internationale de leur personnel académique.

J'ai déjà évoqué le militantisme de ceux que l'on nommait alors les "élites éduqués" en faveur d'un "label" international de la formation supérieure au Nigeria. Ce souci de l'"excellence", partagé par les colonisés et les colonisateurs, restait, dix ans après l'indépendance, une véritable obsession des universitaires d'Ibadan:

"Whatever the reasons, the Nigerian scholar sees himself very much in the context of world scholarship. The university as a whole is extremely conscious of its international standing, and this appears with great regularity in official addresses of vice-Chancellors. Similarly, to the individual scholar, his discipline and his professional association are very important reference groups. The achievement of international scholarly status is perhaps the most important criterion of prestige within U.I., superceding even successful academic politics as an avenue of promotion." (Van den Berghe, 1973 : 64).

Depuis les observations de Pierre Van den Berghe, le paysage universitaire s'est transformé, mais le discours des Vice-Chanceliers de U.I. a peu évolué : l'excellence d'Ibadan, sa position prestigieuse d'antan sur la scène internationale, doivent être retrouvées (Lebeau, 1997, ch. 7) en travaillant d'arrache-pied et en combattant les mesures égalitaristes prises par le gouvernement dans les années 1970 pour généraliser l'accès à l'enseignement supérieur (Okudu, 1983). La norme de l'excellence n'a pas disparu avec le repli remarqué de la recherche nigérienne de la scène internationale depuis le début des années 1990, ni avec l'effondrement du statut social des universitaires, bien au contraire. Comme pour les établissements (Niane, 1992) , le "transnational" s'est imposé aux chercheurs comme seul signe d'excellence sur un marché de plus en plus concurrentiel.

Cette position conservatrice a, dans les années 1970, placé la communauté universitaire dans une situation difficile vis-à-vis des discours développementalistes et nationalistes que tenait le pouvoir politique sur l'enseignement et la recherche. Les universitaires, y compris leur représentants syndicaux, ayant très vite compris qu'"excellence" ne pouvait rimer avec "national" du point de vue de leur carrière, se sont écartés, voire opposés, à toute mesure visant à remettre en cause ce sur quoi ils fondaient le principe de distinction entre équipes de recherche et entre établissements.

Aujourd'hui, la référence à l'international ou au transnational²³ s'exprime de manière diffuse tant au niveau des établissements, qu'à l'intérieur de ceux-ci. De la capacité à entretenir

²² L'académie de Bordeaux pour Dakar, l'Université de Londres pour Ibadan.

²³ S'agissant de la compétition pour l'accès aux symboles d'extraterritorialité entre établissements supérieurs au Sénégal, Boubacar Niane précise : " Le second terme (transnationalisation) conviendrait mieux dans la mesure où il renverrait plutôt à une sorte de dépassement des nations, à l'émergence de nouvelles valeurs supra. Ces nouvelles postures, relativement rentables dans un espace presque complètement remodelé, sont fortement suggérées, pour ne pas dire imposées, par une " dernière instance " que seraient les organisations transnationales comme le système des Nations Unies...quant à l'internationalisation, elle renverrait à une sorte d'échanges, d'influences réciproques, pour tout dire, à une intégration des valeurs. Ici, les spécificités nationales ne seraient point gommées, niées. Ce qui est relativement loin du cas du Sénégal. " (Niane, 1997).

des liens avec l'étranger (y compris dans le contexte d'isolement politique du Nigeria entre 1995 et 1999), dépend l'image de l'enseignant-chercheur auprès des étudiants les mieux informés. C'est encore elle, quand les salaires ne nourrissent pas une famille plus d'une semaine, qui permet d'afficher les signes extérieurs de richesse.²⁴

3.3.2- La communication avec l' " extérieur "

Les rapports des chercheurs nigériens avec la communauté internationale se sont sensiblement modifiés avec la crise. Grosso modo, nous sommes passés d'une relation où l'international vient au Nigeria, souvent dans le cadre d'accords inter-universitaires, ou par le biais des fondations, à une situation où les chercheurs s'appuyant sur leurs réseaux antérieurs, entretiennent individuellement, parfois même secrètement, leurs relations internationales.

Deux cas typiques peuvent être relevés dans l'élaboration de ces stratégies, qui recourent deux générations d'universitaires en activité.

La première figure, celle du professeur d'une grande université fédérale de première génération²⁵, rassemble des universitaires formés d'abord au Nigeria, puis en Grande-Bretagne ou aux Etats-Unis pour leur doctorat vers la fin des années 1960 ou début 70. Embauché directement dans son université d'origine après le doctorat, ce chercheur a développé ses travaux au Nigeria, dans un environnement matériel comparable à celui de ses collègues européens, sans perdre de vue l'établissement où il fut formé à la recherche (participation à des colloques, publications conjointes...). Sa capacité à entretenir ces réseaux a grandement déterminé la suite de sa carrière au moment où l'université nigérienne s'est installée durablement dans la précarité. En maintenant ces contacts, il continue à voyager, il finance sur des fonds extérieurs à l'université (en économisant parfois sur ses *per diem*) ses travaux au Nigeria, qu'il fait évoluer au gré de la demande ou des intérêts de son réseau.

Le professeur I. du département de microbiologie à Lagos incarne ce premier type : formé à Kent (maîtrise) puis à Crownfield (doctorat), spécialiste de *Petroleum Microbiology*, il s'oriente résolument dans les années 1980 vers l'étude de l'impact des activités pétrolières sur l'environnement, domaine qui lui permet de maintenir son activité de recherche et son statut de formateur en dépit de l'absence de financements publics locaux :

"...I went once back to Crownfield on a UNESCO fellowship for 3 months. Even the 3 months were very resourceful and useful, because the 3 months in U.K is like 10 years in Nigeria. What you are going to achieve in 3 months you cannot compare it to what you are going to do here because the facilities are there, chemicals are available, electricity supply is uninterrupted anything that you need to carry out research is available and to finger-tips, that you cannot do here you cannot plan because the basic for research infrastructures for research is lacking.

Q : From this trip have you established links that you are maintaining today and that are of use in your day to day work in Nigeria?

A : *Yes...For example I told you I started in Kent University, so I sent a PHD student to go and work in Kent for 3 months, so what he did in Kent was what actually enhanced his PHD work because he had access to electron microscope, to equipment that we don't*

²⁴ Quinze années de crise n'ont guère affecté l'importance accordée par les universitaires à ces signes, comme en témoigne à Ibadan le véritable culte voué à certains modèles de voitures dont la possession signale aujourd'hui le retour d'une année sabbatique à l'étranger, ou la signature d'un contrat d'expertise avec une organisation internationale.

²⁵ Ibadan (U.I.), Nsukka (UNN), Lagos (UNILAG), Zaria (A.B.U.) et Ifé (O.A.U.).

have around even in Nigeria. Then I sent another student to Israel, to the University of Tel-Aviv who also had the same opportunity because Israel is like U.K or any part of the world in terms of facilities and development. The work he did also enhanced the quality of his PHD work substantially. So I have a link in Israel, Kent and Crownfield.”

Formé au Nigeria jusqu'en maîtrise, puis à part égale à l'étranger ou au Nigeria (souvent sous la direction d'un professeur expatrié), un deuxième type rassemble les *seniors lecturers* des universités de première et deuxième générations. Les liens extérieurs y sont de nature variée (parfois inexistant), c'est également la génération d'universitaire la plus touchée par le *brain-drain* de la fin des années 1980.

Les liens avec l'extérieur peuvent revêtir la même forme que dans le cas évoqué ci-dessus, soit une relation académique classique, mais individuelle et entretenue aux frais de l'intéressé (l'accès internet gratuit n'existe pas dans les établissements publics de recherche au Nigeria). Ils peuvent également s'établir momentanément ou régulièrement en dehors du milieu académique, le chercheur consacrant alors l'essentiel de son temps à l'expertise pour des organisations internationales. Ces travaux ne seront pas publiés, ne contribueront donc pas en principe à sa promotion dans l'université, mais ils lui assureront les revenus nécessaires à la recherche académique qu'il ne doit pas perdre de vue :

*“ ... I had to, on my own, go into private business, get some money to buy a P.C, you know, to even publish the materials I have. So you cannot say that the material are there and you are working. I had to go out on my own to seek for money and - - - now use it to plunge into research, which ought not to be. That is what we are saying, it ought not to be. I had to, on my own, go out, (you do consultancy) the money is for my own private use and other things. It is not good for me going back to get something to support me in my research personally. So that's how I cope and if I see something I have published, it makes me happy. You know you sat down, did all that, you can move, you know if we don't publish, we perish ”.*²⁶

Dans les sciences sociales, où la consultance internationale tend à s'imposer comme une norme de la production scientifique, les publications et colloques peuvent être littéralement abandonnés, le statut socio-économique de l'expert connaît alors paradoxalement une ascension rapide et parfois spectaculaire, bouleversant même une hiérarchie sociale sur le campus censée refléter celle des grades du corps académique.

Cette catégorie composite est la plus influente aujourd'hui dans la communauté, elle rassemble ces “jeunes talents” évoqués par A. Jega, qui ont fait les heures de gloire du syndicalisme universitaire de la fin des années 1980 jusqu'aux années de terreur du régime Abacha.

La majorité des universitaires nigériens ne trouve sa place ni dans l'une, ni dans l'autre de ces catégories. Elle est constituée des *lecturers* pour qui les liens avec l'extérieur sont inexistant. Formés au pays dans les années 1980, ces enseignants-chercheurs ont été recrutés au moment où les fonds publics destinés à la mobilité des chercheurs, à l'achat de livres pour les bibliothèques et l'organisation de colloques, ont trouvé d'autres priorités. Démunis sur le plan matériel, isolés dans des universités éloignées des pôles de la vie économique et politique nigérienne, donc rarement sollicités, ces chercheurs sans “connexions” n'ont accès ni aux réseaux de la

²⁶ Entretien avec Mrs. O, department of Plant science and biotechnology, University of Port-Harcourt. Juin 2000

consultance internationale, ni à l'information scientifique, et n'ont jamais recours aux activités "nobles" du métier pour augmenter leurs revenus (Hudu, 2000).

3.3.3- Les migrations scientifiques

C'est dans le même "milieu" des universitaires liés à des centres de recherche étrangers (européens et nord américains) qu'ont été recrutés ceux qui en dix ans ont divisé par deux le nombre de professeurs et de *senior lecturers* en poste au Nigeria.

Au début des années 1990 les perspectives de redressement du système universitaire nigérian sont nulles, la prolifération annoncée d'institutions privées se fait attendre et ne semble pas représenter pour les universitaires renommés une alternative envisageable.²⁷ Le choix qui se pose à certains d'entre eux de rester ou de partir n'est pas simple, ses enjeux sont variables selon les disciplines, les établissements, et selon le grade et la renommée du chercheur.²⁸

Les premiers à partir (dès la fin des années 1980) furent les professeurs renommés de plus de cinquante ans (médecine, science sociales, littérature) à qui étaient offerts, en particulier en Amérique du Nord, des postes équivalents dans des universités connues.

Derrière eux, un grand nombre de collègues plus jeunes se sont vus offrir des positions moins confortables (à durée déterminée) dans des établissements moins visibles (universités noires du sud des Etats Unis...). Pour ce groupe, nous disposons de peu de données qualitatives sur les implications de la migration sur la carrière. Certains ont disparu de la scène internationale de la recherche qu'il occupaient jusqu'alors, après avoir opté, pour des raisons strictement alimentaires, pour des établissements où ils se sont entièrement consacrés à leurs tâches d'enseignement. D'autres ont également perdu, par le simple fait de la migration, la "place" qu'ils occupaient dans la division internationale du travail scientifique : dans les sciences sociales ou en épidémiologie par exemple, les chercheurs africains sont, dans bien des cas, des "témoins" ou des "collecteurs" d'autant plus indispensables que les pays sont peu accessibles à la recherche européenne (cas du Nigeria dans les années 1990). Sortis de ce contexte, ces chercheurs perdent de leur intérêt et les sollicitations dont ils faisaient l'objet au pays, se raréfient. On trouve parmi ces "disparus", de nombreux universitaires nigériens actuellement en poste en Afrique du Sud.

Au milieu des années 1990, les universitaires nigériens sont les plus mal payés d'Afrique (Hudu 2000) et l'on assiste à un retournement spectaculaire des mouvements migratoires entre universités africaines, qui voit notamment les universitaires nigériens se précipiter sur tout poste offert à Legon.²⁹

Nous avons, lors de l'enquête IFRA, posé à tous les chercheurs³⁰ la question du départ. Les réponses sont variées, mais quelques motifs récurrents jalonnent les propos de ceux qui véritablement, sont restés par choix .

²⁷ Aucun des universitaires interviewés dans notre étude n'a évoqué cette option, alors que non seulement quelques universités privées existent, mais surtout les "campus satellite" des universités publiques gérés en association avec des entreprises privées dans les centres urbains les plus riches (Lagos, Abuja), recrutent quantité d'enseignants des universités publiques.

²⁸ La Banque Mondiale estimait pour l'année 1995 à 25000 le nombre de migrations extracontinentales d'universitaires africains. Parmi eux, on comptait alors 10 000 Nigériens installés aux Etats-Unis.

²⁹ Que l'on pense aux images de l'expulsion des immigrés ghanéens du Nigeria (ils étaient alors entre un et deux millions), parmi lesquels un grand nombre d'enseignants du secondaire et du supérieur).

³⁰ Pour la plupart, des personnalités nationales, voire internationales, dans leur domaine de recherche, figurant dans les données bibliométriques.

Le professeur G, du département de psychiatrie à Ibadan, de retour d'un congé sabbatique en Australie explique:

“ I had a permanent job in Australia and I also was doing private practice. My income there will probably be times 200 of what I get here and I have a permanent resident permit there too. So if I want to go back tomorrow I just go and get a plane. The reason for coming back and for being around, sometimes it is a bit difficult to explain but I think for me it's probably got to do with what you might call relative impact.[...]. I didn't go to psychiatry because I want to become a millionaire but I went in there because I had some particular interest, both clinical and research. And like I said I was very lucky in Australia I did all the things that I probably should be doing in an environment like that but when you look at it just pulling me out of that system, the system is not going to rattle but here, I hope is not a grandiose idea that one person, certainly myself or anyone else will make more impact being here than elsewhere and that not just to the system but also for oneself that what should do in an environment that not much is known. If you are bringing things for people to know and you are doing them in such a fairly standard way that people can relate to them tend to make more contribution than if you were just part of a large crowd of other people elsewhere ”.

Le Professeur S, chimiste dans la même université :

“ ...I am lucky that many of the people I worked with are very sympathetic in support of the course of development here. So, I saw myself as being backed up by a lot of development efforts. So, I am not isolated; these people kept me in fairly comfortable situation [...] the motivation for staying is as a result of back up and that because my science has been part of international science I mean I benefited a lot from research support and that kept me. I mean I had grant report to write and things like that. However, even that drives you against hostile environment. I mean you do have a commitment to keep, you do have work, and then you see yourself ...competing with others. I think that to my mind it is a major achievement to be able to work in his type of environment ”.

Les offres à l'étranger étant nombreuses et les soutiens extérieurs conséquents, le choix de rester est ici totalement intégré à une stratégie de carrière. Les chercheurs peuvent dès lors invoquer des raisons telles que la nécessité de travailler pour son pays ou l'intérêt du terrain nigérian, et donc de leur travaux, pour la communauté internationale. A aucun moment ils n'apparaissent menacés dans leur position sur le marché qui est le leur, en dépit de conditions de travail jugées désastreuses. Leurs recherches sont menées avec des fonds extérieurs pour un marché extérieur, et le plus souvent, ils analysent les données collectées et rédigent leurs conclusions en dehors de leurs départements (chez eux sur du matériel personnel ou à l'occasion de séjours scientifiques à l'étranger).

En somme, c'est une stratégie similaire de placement sur le marché international qui oriente, pour les chercheurs les plus renommés, le choix de rester ou de partir. Pour tous les autres, c'est l'opportunité ou non de fuir des conditions de travail et un statut dégradé qui détermine, dans le contexte actuel, la conduite de la carrière.

Les revalorisations conséquentes de salaire (150%) obtenues par les universitaires en juin 2000, les situent désormais dans la moyenne des salaires perçus par leurs collègues en Afrique sub-saharienne. On peut donc envisager un ralentissement du *brain drain* en direction des pays à faible potentiel de visibilité sur le marché international.

3.4- En conclusion : Privatisation des universités ou privatisations dans l'université ?

L'université est une institution publique au Nigeria, et les enseignants-chercheurs des fonctionnaires. L'émergence annoncée au début de la décennie 1990, d'établissements privés, capables de concurrencer le public et de déstabiliser le marché de l'enseignement supérieur, se fait attendre, remettant en cause les perspectives imaginées par la Banque mondiale, de rationalisation de ce marché.

Les investisseurs privés ne se sont pas précipité sur la fenêtre juridique ouverte par l'Etat nigérian avec le décret autorisant les universités privées.

D'une part, le label " Université " et la reconnaissance nationale des diplômes sont soumis à un cahier des charges très contraignant, émis par la *National University Commission*, elle-même composée d'anciens universitaires et administrateurs d'institutions publiques. A ce jour, seuls deux établissements privés exercent officiellement sous l'appellation " université " au Nigeria.

D'autre part, l'université, en tant qu'institution de recherche, se doit d'employer des universitaires. Or, pour les raisons développées dans cet article, les stratégies de carrière de ces derniers sont motivées par un ensemble de références et de normes extraterritoriales. Malgré des publicités dans la presse, pour le recrutement de leur personnel, calquées sur celles des universités américaines (fortes exigences de compétence et haut niveau de rémunération mis en avant), les universités privées n'ont pas réussi à débaucher les universitaires du public. Pire, les prises de position de ces derniers sur la virtualité de l'activité de recherche dans des établissements privés tendent à décourager jusqu'aux étudiants les mieux informés de l'inégale valeur des diplômes offerts sur le marché.

Qu'on ne s'y méprenne cependant pas. L'investissement privé dans l'enseignement supérieur et la formation est au Nigeria extrêmement dynamique. Il y a plus de dix ans que les diplômes de gestion de type MBA sont proposés, plutôt dans le cadre de la formation continue, par les " satellite campuses " installés dans les centres urbains à fort potentiel économique. Ces structures ont totalement encadré le marché privé avant même l'introduction du décret autorisant les instituts privés (1992), en s'associant à des universités publiques, dont elles portent le nom.

Les frais d'inscription y sont très élevés (environ 10 fois supérieurs à ceux d'un établissement strictement public pour un cursus équivalent), et généralement pris en charge par les employeurs (banques, firmes multinationales....) qui y voient une alternative aux séjours très coûteux de formation à l'étranger. Les " satellite campuses " recrutent leurs " intervenants " parmi les meilleurs universitaires du pays, qui bénéficient ainsi de revenus dits " complémentaires " largement supérieurs à leur salaire, sans remettre en cause leur statut de chercheur.

On peut mesurer par cet exemple, le poids possible d'une institution publique, fut-elle en crise, dans la régulation d'un espace économique, par le contrôle qu'elle exerce encore sur la distribution des positions sociales. La privatisation de la recherche au Nigeria traduit plutôt, pour reprendre la définition proposée par Béatrice Hibou, " les processus concomitants de diffusion de l'usage d'intermédiaires privés pour un nombre croissant de fonctions antérieurement dévolues à l'Etat et de redéploiement de ce dernier " (Hibou, 1999 :13).

L'analyse de la gestion des carrières universitaires rend, me semble-t-il, bien compte de ce phénomène : en l'absence de financements publics nationaux, les instituts de recherche et les

départements ressemblent plus à des catalogues de compétences individuelles qu'à des catalyseurs capables de produire une expertise collective. Les stratégies d'accès au marché international de la recherche, seule garantie d'une reconnaissance à la fois statutaire et sociale, se déploient en ordre dispersé, au gré des rencontres de chercheurs et d'institutions de ce marché. Les universités d'Etats, nées dans les années 1980 du mode de gestion particulier des ressources de la Fédération nigériane, ont été les premières, avant même de s'être un tant soit peu émancipé de leur tutelle, à disparaître du monde de la recherche avec la crise des finances publiques. Coupés des réseaux internationaux indispensables, les chercheurs y ont été contraints de trouver sur un autre marché les ressources alternatives, nécessaires à leur survie. On peut parler de processus de déprofessionnalisation pour cette population aujourd'hui identifiée dans le champ par sa seule activité d'enseignement.

A cette marginalisation s'oppose la figure du chercheur arrimé à un réseau lui permettant de maintenir dans son institution publique, dont il utilise les infrastructures, aussi dégradées soient-elles, une activité de recherche individuelle sur un financement privé. A l'avant-garde de la communication, ce chercheur ne partage avec le premier groupe que le souci de maintenir dans la société nigériane l'image d'une communauté universitaire une et indivise.

Globalement, mesurée à l'aune de sa visibilité internationale³¹, la marginalisation de la recherche nigériane semble gagner du terrain si on la mesure sur le marché des publications académiques. On peut y voir une conséquence de la déliquescence et de la déréliction des infrastructures publiques, mais les entretiens et les observations le montrent, l'explication demeure insatisfaisante puisqu'elle ne rend pas compte de la persistance d'une activité, informelle mais réelle, dans les universités.

L'informalisation observée de la recherche universitaire ne saurait donc être départie d'une transformation de la profession sous l'effet de la mutation de l'aide internationale. Celle-ci, en instituant la consultance dans ses programmes, a, en moins de 10 ans, totalement bouleversé le coût de la recherche, ses modes d'enquêter et d'écrire (Mkandawire, 2000), en même tant qu'elle fragilisait les hiérarchies statutaires, et qu'elle renforçait la méfiance de la tutelle étatique, écartée de la négociation des contrats et de l'accès aux résultats.

³¹ Selon Avantis et. al. (2000), Le Nigeria a perdu en cinq ans, la moitié de sa production scientifique publiée (d'après la base de données PASCAL).

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Le Nigeria

Synthèse bibliométrique, 1991-1997.

Source : base bibliographique PASCAL, nettoyée; années 1991 à 1997. Les chiffres suivants ne concernent que des Articles publiés, à l'exclusion des ouvrages, thèses, notes et compte-rendus de lecture.

1. VOLUME

3802 références (moyenne : 550 par an).

Mais la moyenne est ici trompeuse. De tous les pays Africains, le Nigeria est celui qui enregistre la plus profonde **chute de sa production** publiée et répertoriée.

On pourrait croire à un artifice de PASCAL (qui s'est désabonné d'un certain nombre de journaux entre 1995 et 1997). Mais le phénomène est confirmé par d'autres grandes bases de données.

Le tableau ci-dessous montre par exemple les scores enregistrés par PASCAL et par la base de référence américaine (SCI).

	1991	1992	1993	1994	1995	1996	1997	Total
PASCAL	850	754	560	448	442	452	296 *	3802
SCI	632	592	555	455	487	464	450	3635

*Chiffre partiel, environ 40 % des références d'une année n'étant saisies que dans le CD Rom de l'année suivante. Les chiffres du SCI sont à couverture croissante (+ 25 % d'enregistrements entre 1991 et 1997).

On peut donc dire que les deux bases s'accordent sur :

- la perte par le Nigeria de sa capacité contributive à la science mondiale (en tous cas sa forte dégradation dans les années 1992-1994. La production s'est depuis stabilisée en valeur absolue, ce qui implique encore une dégradation relative : car les autres pays du monde, et même pour partie du Continent, sont en nette croissance).
- l'ampleur de la chute : elle est de 30 % à 50 % de la production depuis 1991.
- le recul du pays dans le classement Africain. Troisième et intouchable naguère (dans les années 1980), il était largement en tête de "l'Afrique noire". Il pouvait seul se comparer aux deux premiers "géants" : l'Afrique du Sud (40% de la production du Continent) et l'Egypte (20%), parce qu'il couvrait toutes les disciplines, s'attachait à des études de terrain, mais n'en publiait pas moins intensément dans les revues internationales répertoriées³². Aujourd'hui, par un effet de ciseau (lui-même chutant tandis que les autres prennent leur essor), le "Colosse aux pieds d'argile" a été absorbé dans le peloton des poursuivants des 2 toujours géants. Il y est même dépassé, régressant au 5^o rang après le Maroc et la Tunisie (selon PASCAL), ou au 6^o (après aussi le Kenya, selon le SCI). Il produisait pourtant deux fois plus que chacun d'entre eux il y a dix ans.

La **répartition par grands domaines** est la suivante :

³² Voir Y. Chatelin et R. Arvanitis, *Stratégies scientifiques et Développement*, Editions de l'Orstom, Paris, (1988), 142p., passim. Voir aussi Y. Chatelin, *L'Afrique scientifique (1987-1990)*, inédit, chez l'auteur; et Y. Chatelin, J. Gaillard et AS Keller, *The Nigerian scientific community : Colossus with feet of clay*, in J. Gaillard, VV. Krishna & R. Waast éd. *Scientific Communities in the Developing World*, Sage, London-New Delhi-Thousand Oaks, 1997, p. 129-154.

- 29 % relève des sciences agricoles
- 38 % relève des sciences médicales
- 33 % relève des sciences exactes, expérimentales ou du génie industriel.

Le profil est bien celui d'un pays d'Afrique anglophone de la région. Il est même accentué, dans la mesure où les sciences agricoles ont un poids exceptionnel.

(A titre comparatif, la production se répartit comme suit entre ces trois domaines selon les régions d'Afrique:)

Régions	Agriculture	Santé	Autres sciences
Afrique au nord du Sahara	9%	29%	62%
Rép d'Afrique du Sud	8%	36%	56%
Afrique francophone au sud du Sahara	15%	63%	22%
<i>Afrique anglophone au sud du Sahara, sauf Rép d'Afr du Sud</i>	<i>21%</i>	<i>48%</i>	<i>31%</i>
Nigeria	29 %	38 %	33 %

Reste à vérifier dans quels domaines la chute de production s'est le plus manifestée.

Le nombre des références enregistrées par PASCAL figure au tableau suivant.

Années	1991	1992	1993	1994	1995	1996	1997	Total
Agriculture	196	203	177	141	142	148	84 *	1091
Médecine	352	303	182	164	176	168	123 *	1468
Autres Sc	302	248	201	143	124	136	89 *	1243

*Chiffre partiel; le CD Rom 1998 comprendra des données relatives à 1997.

Sur une base 100 en 1991, *l'indice de production* évolue donc comme suit :

Années	1991	1992	1993	1994	1995	1996	1997
Agricult	100	104	90	72	72	75	*
Médecine	100	86	52	47	50	48	*
Autres Sc	100	82	67	47	41	45	*

*Chiffre partiel; le CD Rom 1998 comprendra des données relatives à 1997.

La crise touche les sciences agricoles plus lentement et un peu moins profondément (mais tout de même : 30% de perte de production en 5 ans !)³³. Elle est la plus brutale en Médecine, et finalement toute aussi profonde en Sciences (50 % de perte de production dans les deux cas).

Le SCI ne permet pas d'identifier les sciences agricoles aussi clairement. Pour le reste, il confirme de même tendances, qu'il saisit un peu atténuées.

Années	1991	1992	1993	1994	1995	1996	1997
SCI Méd	100	91	87	69	71	66	74
SCI Sc div	100	104	85	75	78	92	72

³³ On lira avec intérêt l'opuscule de l'ISNAR, dans lequel Idachaba documente la récente crise des Instituts de recherche agricoles au Nigeria : budgets sinistrés, salaires misérables, plans de carrière tassés entraînent tant de départs (si possible vers de jeunes Universités, où la carrière est meilleure, mais où il faut renoncer à la recherche pour enseigner à de vastes cohortes) que le turn-over est en moyenne de 1 à 2 ans : moins que la durée d'un projet de recherche. Il devient tout à fait impossible de planifier les activités. En outre; les encadreurs manquent, et la mémoire des Instituts se perd, les "anciens" (parfois seulement de 4 à 5 ans) étant partis depuis longtemps.

Le SCI montre en outre que depuis 1995 la production devient erratique (cette caractéristique est habituellement celle des pays où la science n'est pas ou plus institutionnalisée, et dépend de quelques talents, figures locales ou scientifiques de passage).

Le SCI repère enfin que la chute est plus accentuée en biologie médicale qu'en médecine clinique (mais celle-ci prend un rythme de production à éclipses); et qu'elle est la plus profonde dans les sciences applicables (chimie, sciences de l'ingénieur, géologie géophysique et sciences de l'environnement, où la chute enregistrée dépasse les 50 %). La physique, les mathématiques, développées par une poignée d'académiques, restent à niveau constant.

2. AUTEURS

5615 noms d'auteurs différents figurent sur les publications.

Ratio Auteurs/articles :

en moyenne : **1,5**

2,9 en sciences médicales

1,25 en sciences agricoles

1,1 en sciences physiques et de l'ingénieur

Figures de la science : certains noms reviennent (**voir Annexe I**).

On notera que les références datant de 1990-1997, *les auteurs qui apparaissent le mieux* sont ceux qui ont fait des travaux marquants (ou/et des contributions régulières et significatives), entre 1987 et 1995 environ.

Le contexte Nigerian rend l'interprétation délicate :

- nombre de chercheurs performants peuvent s'être *retirés* du métier ou du pays en cours de période. On est surpris par exemple du faible nombre de producteurs dépassant les 20 articles en sciences médicales (3 contre 53 en Tunisie, dans un domaine où la taille des communautés scientifiques est comparable), ou produisant plus de 10 articles en sciences exactes (2 contre 11 en Tunisie, dont la communauté devrait être plus petite).
- d'autres chercheurs intéressants peuvent être faiblement apparents notamment :
 - de jeunes chercheurs fraîchement recrutés (le turn-over dans les institutions entraînant des renouvellements fréquents de personnel).
 - des chercheurs actifs mais qui se préoccupent peu de publier (soit parce qu'ils se consacrent à la recherche-action, à la recherche didactique, ou à des activités de *bureaux d'études*; soit parce qu'ils appartiennent à des disciplines dont le style fait moindre place aux écrits en Revues : sciences agricoles par exemple, notamment pratiquées dans les Instituts gouvernementaux).
 - certains chercheurs brillants de passage, enfin.

L'identification des figures ici présentées a toutefois une triple importance :

- il s'agit des auteurs qui ont récemment produit une science influente, utile pour le pays, où celui-ci peut opportunément puiser.
- l'examen de leur stabilité ou de leur turn-over, et de leur "postérité", permet de qualifier le degré et les pôles de structuration d'une communauté scientifique nationale (ou de milieux de spécialistes).
- l'examen de leurs relations scientifiques, et de leurs sujets de recherche, permet de qualifier l'espace scientifique où s'inscrit le pays.

En outre, le degré de concentration de la production, qu'il est possible de calculer à partir de ces données, est un indicateur important et stable de l'état des sciences dans le pays (domaine par domaine). On retiendra notamment les chiffres suivants.

En sciences médicales , sur **2 930** noms d'auteur,

Nbe	auteurs signent chacun	Nbe de publications	% des auteurs	% des participations	% cumulé des auteurs	% cumulé des participations
3		20 et plus	0,1	1,5		
22		de 10 à 19	0,9	5,4	1,0	6,9
137		de 5 à 9	4,5	16,2	5,5	23,1
287		3 ou 4	9,5	18,7	15,0	41,8
571		2 publications	19,5	21,8	34,5	63,6
1910		1 seule publication	65,5	36,4	100	100
2930			100	100		

soit : 1 % des auteurs participe pour 7 % à la production

6 % d° 25 % d°

15 % d° 40 % d°

35 % d° 66 % d°

et : plus de 1/3 des auteurs ne publie qu'une fois en 7 ans.

Il s'agit d'une concentration modérée (et peut-être écrêtée). En outre, le potentiel actif peu paraître étroit, comparé à celui de pays (d'Afrique du nord par exemple) plus petits, et qui n'ont pas de prédilection particulière pour les sciences de la santé³⁴. Le faible taux de co-signature (pour des sciences médicales) surprend de même. Reste à savoir s'il s'agit de traits structurels; ou si les communautés scientifiques se sont dissoutes; en ce cas, que sont devenus les spécialistes ?

En sciences agricoles, sur **1 361** auteurs :

Nbe	auteurs signent chacun	Nbe de publications	% des auteurs	% des participations	% cumulé des auteurs	% cumulé des participations
10		10 et plus	0,7	5,2		
52		5 à 9 articles	3,8	13,3	4,5	18,5
153		3 ou 4 articles	11,2	21,3	15,7	39,8
282		2 publications	20,8	23,8	36,5	63,6
864		1 seule publication	63,5	36,4	100	100
1361			100	100		

soit : 1 % des auteurs participe pour 6 % à la production

4,5 % d° 20 % d°

8 % d° 25 % d°

15 % d° 40 % d°

33 % d° 60 % d°

et : 2/3 des auteurs ne publie qu'une fois en 7 ans.

La production n'est pas plus concentrée qu'en sciences médicales; mais elle joue sur plus de figures, et sur un vivier large. Sachant que les professionnels de ces domaines publient généralement peu, on peut considérer que les milieux de spécialistes sont ici résistants (et d'ailleurs de bien plus grande amplitude que partout ailleurs en Afrique - sauf au Kenya et en Afrique du Sud).

³⁴ Rappelons la comparaison avec la Tunisie (qui peut compter sur une pléiade de figures, et des phalanstères autour d'elles, cherchant à intéresser et puiser dans un large vivier alentour). Voir la synthèse concernant ce pays.

En sciences exactes et de l'ingénieur, sur 1323 auteurs :

Nbe	auteurs signent chacun	Nbe de publications	% des auteurs	% des participations	% cumulé des auteurs	% cumulé des participations
4		10 et plus	0,3	2,1		
43		de 5 à 9	3,3	11,3	3,6	13,4
143		3 ou 4	10,8	21,2	14,4	34,6
323		2 publications	24,4	29,0	38,8	63,6
810		1 seule publication	61,2	36,4	100	100
1323			100	100		

soit : 0,5 % des auteurs participe pour 6 % à la production

3,5 % d° 15 % d°

17 % d° 40 % d°

40 % d° 66 % d°

et : près de 2/3 des auteurs ne publie qu'une fois en 7 ans.

La situation ne serait pas si différente de celle des sciences agricoles, n'étaient l'écrêtage inquiétant des grands producteurs, le faible taux de co-signatures, et une pyramide surtout large à la base. Le vivier est d'ailleurs à peine plus vaste que celui des sciences agricoles - ce qui surprend d'un pays réputé naguère en Afrique pour ses sciences "dures" et industrielles.

ANNEXE I. Les tableaux suivants mentionnent les noms des **auteurs** les plus productifs, en chaque domaine.

Médecine et Santé

Institutions	20 articles et +	15 à 19 articles	10 à 14 articles	7 à 9 articles	2 à 6
Un Ibadan	SOWUNI A (42); GUREJE O (30); SALAKO L (30); WALKER O (29) OHAERI JU (20)	ODUOLA AMJ; AKANJI AO; ADEYEMO AA; GBADEGESIN RA; LADIPO OA; OLUBUYIDE IO; OSUNTOKUN BO; SODEINDO O	<i>Akang EEU; Brieger WR; Arotiba JT; Adebamowo CA; Ademowo OG; Ajao OG; Kale OO; Odemuyiwa SO; Olaleye OD; Kadiri S; Konje JC; Ladipo JK; Ola SO</i>	Baiyewu O; Olawuyi F; George AO; Ihekwaba FN; Johnson AWB; Aliyu B; Omigdobun AO; Aderele WI; Malabu UH; Odaibo GN; Ogundahunsi OAT; Rotowa NA; Aghadiuno PU; Omokhodion SI; Osinusi K;	
Un Nigeria	GUGNANI H (23)	AKAH PA; ADIKWU MU;	<i>Asuzu IU; Udeala OK; Ozumba BC;</i>	Chukwu A; Okore VC;	
Un Ile Ife		AJAYI AA;	<i>Okonofua FE; Adejuyigbe O; Jinadu MK;</i>	Ogunbona FA; Oleyami OA; Owa JA; Adelekan DA; Adelusola KA;	
Un A. Bello	NMADOU P (21)	ABIOSE A;	<i>Babalola AE (Opht); Nok AJ (voir Agric); Okogun JI; Esievo KAN; Jones BR; Murdoch I; Yakubu A;</i>		
Un Technique					
Un Port Harcourt					
Un Benin City		ABIODUN PO;	<i>Eregie CO; Sykes RM;</i>		
Un Maiduguri	AKPEDE G (27);		<i>Sykes RM; Holcombe C;</i>	Harry TO;	
Un Lagos					
Un Calabar			<i>Ekanem EE; Antia Obong O</i>	Osim EE; Vaheri A; Asindi AA;	
Un Ilorin		ABIODUN OA			
Un Jos		OLAYINKA AO; LOT TY;	<i>Airede AI; Okoye ZSC</i>	Ekwenchi MM; Isichei CO; Obatomi DK; Okwusaba FK; Anosike JC; Uguru VE; Das SC;	
Un Agricole			<i>Igbedioh SO;</i>		
Un diverses * = Namdi				Orisakwe OE *	
Hop Divers (*= Psy)				Ndjemandze PC *	
Ecole Pol & Inst de rech Tec			<i>Olukoya DK;</i>		
Ministères (* = Santé)			<i>Nasidi A *</i>		
Entreprises					
Coop bilat & internat					

Agriculture

Institutions	+ de 10 articles	7 à 10 articles	5 ou 6 articles	4 articles	2 à 3
Un Ibadan	AKINGBALA JO ADEGOKE GO; ODERINDE RA; OGUNTIMEIN; FASIDI IO	SANNI AI; SANGODOYIN AY;	<i>Osonubi O; Aina JO; Ezeagu IE; Tairu AO;</i>	Aworh OC; Ekundayo O;	
Un Nigeria	MBAGWU JS(20); EZEUGU LI; OKOLO BN	ENE-OBONG BO; NJOKU OU; ACHI OK; OBANU ZA	<i>Nwanguma BC; Obeta JAN; Ngoddy PO;</i>	Okechukwu PE; Rao MA; Ugwuanyi JO	
Un Ile Ife		ADEWUSI SRA; OKE OL; ILORI MO; AFOLABI OA	<i>Akanbi CT; Ajayi OA; Ekanade O;</i>	Ajibola OO; Faborode MO;	
Un A. Bello		NOK AJ (voir Méd); AKPA AD; ALAWA JP; KHAN JK;	<i>Poswal MAT; Erinle ID; Lagoke STO;</i>	Aduku AO; Elegbede JA	
Un Technique	AGU RC	IWUOHA CI; OSHODI AA; FAGBENRO OA; OFUYA TI;	<i>Aletor VA; Akpapunam MA; Esuoso KO;</i>	Emebiri LC;	
Un Port Harcourt		GIAMI SY; EFFIUWWEVWERE BJ;		Abu GO; Ofuya CO	
Un Benin City	OBUEKWE CO	EJECHI BO;		Alika JE;	
Un Calabar		AREMU CY;			
Un Ilorin		JOSEPH JK; AKINYANJU JA			
Un Lagos			<i>Amund OO;</i>		
Un Maiduguri			<i>Salami LI;</i>		
Un Agricole			<i>Adetunji MT; Badifu GIO;</i>	Lasekan OO;	
Un diverses (* =Ogun; ** = Ondo, £ = Namdi)	ABEDAJO LO *; ADEYEYE EI **		<i>Ajiwe VIE (£); Etokapan OU;</i>	Yadav (Bauchi)	
IITA	ORTIZ R (17); SANGINGA N; THOTTAPILLY; MULONGOY K; TIAN G;	KANG BT;VUYLSTEKE D; DANSO SKA;	<i>Craufurd PQ; Jackai LEN; Rossel HW; Bosque-Perez NA; Brussaard L; Swennen R; Berner DK; Summerfield RJ; Akobundu IO</i>	Cardwell KF; Eggelston G; Ellis RH; Gichuru MP;	
ILRI	LARBI A; TARAWALI G;	JABBAR MA	<i>Cobbina J; Reynolds R;</i>	Tarawali SA;	
Inst de rech agricoles (* = NIFOR,)			<i>Otegbeye GO *</i>		
Ecole Pol & Inst de rech Tec		ADEYEYE A;			
Ministères, Entreprises					

Autres sciences

Institutions	+ de 10 articles	7 à 10 articles	5 ou 6 articles	4 articles	2 ou 3
Un Ibadan			<i>Layi Fagbenle R;</i>		
Un Nigeria		NWEKE KMC; OKEKE CN	<i>Mbagwu JSC; Agunwamba JC, Jolayemi JK; Okagbue CO;</i>	Anyiadike RNC; Okeke PN; Onuora LI;	
Un Ile Ife	ASUBIOJO OI.	OLUWOLE AF; JEGEDE OO; ADEGBOYEGA GA; JEYNES C; ELEGBA SB; ADEDOKUN JA;	<i>Akanle OA; Adewusi VA; Akinbami JFK; Spyrou NM; Balogun EE;</i>	Adedeji AV; Adegbulugbe AO; Adejumo JA; Badejo MA; Eleruja MA; Obioh IB; Osasona O; Poggi A;	
Un A. Bello		UKOHA AI		Abaa SI; Adetunji J; Ewa IOB;	
Un Technique		EROMOSELE IC;	<i>Onwuagba BN; Ododo JC</i>	Ugbolue SCO; Uzomah TC	
Un Port Harcourt	<u>BESTMAN AR ;</u> <u>OKPOWASILIG</u>	ABAM TKS;	<i>Odokuma LO; Abbey TM; Ajenka A;</i>	Aziagba PC;	
Un Benin City	OKIEIMEN FE;		<i>Benka-Cooker MO; Taigbenu AE;</i>		
Un Lagos	OLASUPO NA;	RODMI VO;	<i>Aina A; Chendo MAC;</i>	Egonmwan RI; Oyebande L;	
Un Calabar		EDET AE; EKWUEME BN; BOLARIN DM; UDOH AE; USANGA EA;	<i>Uwah EJ; Okereke CO; Andy JJ; Ekanem AD;</i>	Akande W; Antia EE; Ese EO; Nkereuwem EE;	
Un Ilorin		AKANDE SO;	<i>Ogunsanwo O; Olorunsola R;</i>		
Un Jos			<i>Lot (voir Méd)</i>		
Un Agricole		AKINLADE O;			
Un diverses (* = Sokoto; ** = Bauchi;)	EBOATU AN *	GARBA B *; NWALI LO**	<i>Sambo AS *; Agodi-Onwumechili C; Araj S **; King JP (Uyo); Niyaz Khan M (Kano);</i>	Aque MF **; Ojo-Igbinoba ME;	
Ministères (* = Mines)				Agwu AI *;	
Entreprises					
Coop bilat & internat					

ANNEXE 3. Domaines de prédilection des principales institutions (Détail).

Domaines\Inst	Un Ibadan	Un Nigeri	Ile Ife	A. Bell o	Un Tech	Port H	Beni n	Lago s	Cala bar	Ilori n	Un Jos	Maidu guri	* Un Divers	Un Agri	IITA	Ec/R I Tec	RI Agr	Hop Div	Min & Projets	Entr epr	Bi lat	*Inte rnat
Score global	667	441	414	303	219	225	235	211	203	179	189	131	419	110	156	49	143	54	42	41	6	33
Agro/Agric	59	48	33	71	45	23	20	4	6	9		30	61	33	177		74		3	4		37
Elevage	10	2	3	8	7				1	6		2	7	3			4					8
Forêts			1		2									1					2			
IAA	75	53	34	26	49	38	21	15	22	16	10	12	83	37	7	32	12			5		
Biotech agr	17	28	10	4	14	26	13	10	3	7		2	38	3	8							
<i>AGRIC</i>																						
Bio fondam	22	22	14	5	2	5	9	15	5	6	4	4	18	3	7		3					1
Bio animal	43	12	32	24	24	19	15	25	22	9	16	3	43	9	24	4	16	1	2			3
Bio végét	17	3	5		1	3	8	2	3		3		5		12		1					1
Géologie	26	40	38	38	7	49	8	8	65	30	16	3	17	1	8	4	4		6	22		
Météo/Géophy	10	7	17	9	6	12		11	6	5	3	2	2	3					6	2		
Hydrologie	16	25	11	20	12	24	6	14	17	6	1	1	11	3	8	3	4		4			
Sc du sol	7	16	7	5	11	4	2			1		2		2	16							
Astro		9			2	7	1															
Phys géné	6	5	2		2	3	6			4			10									
Phys nucl		3	7	2	3	1	2		1				1									
Plasmas	4	5	18	2	4	2			1				6									
Chim minér	3	2	5	10	8		2	2	4		2		5	2								
Chim orga	1	5	2	2				4					7	1								
Math	4	8	1	1	1	3	4	2	1	9		2	1							1		
Info-Stat			4	1									1									
BTP	2	8	6	6	8	12	6		11		4		24			2				2		
Energie	18	26	47	10	27	58	10	20	2	10	2	2	24			6				41	4	
Comput/Télec					2	5		4	2	1												
Elec/Electron		1		1	3	1		1		1			1									
Génie chimiq	3	3		15	27	8	19	5		2	2		16	2		1	2					
Génie méca	8	3	12		14	1	7	5	4	2		10	8	10		8						
Matériaux		1	4		1		1					2										
Pollution	6	8	16	2	5	10	8		1				4	1		1	3					

Univ Divers : Ogun (73), Bauchi (49), Namdi (51), Anambra (40), Uyo (36), , International : ILRI (29), ICRISAT (3), ICIPE; Bilatéral :.Danemark, Norvège

Gras : institution principale dans le domaine. *Italiques*: domaine important de l'institution.

<i>Domaines\Inst</i>	Un Ibadan	Un Nigeri	Ile Ife	A. Bell o	Un Tech	Port H	Beni n	Lago s	Cala bar	Ilori n	Un Jos	Maidu guri	* Un Divers	Un Agri	IITA	Ec/R I Tec	RI Agr	Hop Div	Min & Projets	Entr epr	Bi lat	*Inte rnat
Score global	667	441	414	303	219	225	235	211	203	179	189	131	419	110	156	49	143	54	42	41	6	33
Parasitoses	54	19	8	16	5	2	6	4	9	4	18	6	6	3		7			1		1	
Bactérioses	13	10	8	12		5	8	10	10	5	6	10	6			1	2		7			1
Viroses/Myco s	26	9		3		1	5	1	2	3	4	7	5			1	1		2			
Méd tropicale	238	63	94	78	5	15	52	53	49	49	37	52	48	8	1	10	3		20	3	1	2
Entomo méd	2		2	1	1	2		4			5	2	7		1	3			2			
PharmacoTox	82	106	56	31	4	7	25	27	31	9	54	10	24	2		10	4	1	5	3		
Métabolisme	7	3	9	1			1		1	1	5	1	2									
Immunologie	3	3	3	1			1	3	3	1		6	1			2						
Endocrino	8		5	4			4	1	4	3	3					1						
Génétique											1		1									
Hémato	12	5	7	3		1	4	6	4	6	5	1	3									
Rhumato	3		2	2			2					2	1									
Santé publique	26	16	23	2	2	2	7	8	2	11	5	11	14	9	1	3			3	2		1
Radiologie	3	2	3		1		3	2	3	3	3	1	2			1		2				
Gynéco-Obst	34	14	23	7		2	9	14	8	12	12	6	16									
Chirurgie	<i>11</i>	<i>13</i>	7	<i>14</i>		1	3	1	3	1	2	1	6					1				
Gastro	17	1	10	8		2	5		6	1	1	6	5									
Cardio	16	3	7	3		2	15	5	1		2	1	3									
Psycho	<i>11</i>	3	<i>11</i>	5			2	7		18	5	1	1			2		2	2			
ORL	6		3	6			1	5			2											
Cancer	3			1			2	1			2											
Dermato/MST	4		5	9		1	2	5	1													
Néphro	4	1	2	2			3	2			3	2	1									
Neuro	13	6	3	1		1	4	2		2	2	2						1				
Ophtalmo	2		3	1			1				1		1									
Anesth-Réa	6		1	1		1	4	2		1	4	3										
Pneumo	8			2			1	1	1	1			1									
<i>SC. MED</i>																						

** Hopitaux Divers :

Gras : institution principale dans le domaine. *Italiques*: domaine important de l'institution.