

# The Impact of Higher Agricultural Education on Food and Agriculture

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## Introduction

I wish to congratulate the faculty of Agriculture for inaugurating an annual Faculty Lecture during which attention will be focused on an important topic in the vast field of agriculture. I thank you for inviting me to deliver this year's lecture which is the first in the series.

I, intend within the short period at my disposal to examine the impact which higher agricultural education has made on food production and agricultural and rural development generally. I shall limit myself to Nigeria.

## The Role of Higher Agricultural Education

Any academic unit within a university derives its role from the goals, functions, and roles laid down in the laws and statutes which establish the university as well as from universally accepted traditions and conventions of universities. Teaching, research, and the dissemination of knowledge are the traditional functions of a university. It is my contention that if a university has adequate material and human resources with which to prosecute these traditional functions of teaching, research and extension it is bound to make a significant impact on the overall development of its society.

Let us phrase the question differently and perhaps somewhat negatively. If you starve a university of funds and for that reason make it impossible for it to purchase essential teaching materials or hire high-calibre teachers and scientists, it is obvious that the university will not produce ade-

quately trained corps of teacher, doctors, engineers, agriculturists, etc. which a society requires in the various sectors of its economy; by the same token underfunding will impair the ability of the institution to produce sound research results which is essential for harnessing the resources of society for development. The current notion of a university as a developmental institution is subsumed or inherent in its three major traditional functions. It is the mission of a university and all its component units to assist in the development of its society and to contribute to general human development.

The Faculty or College of Agriculture is the unit through which a university pursues its functions of educating and training agricultural scientists and workers, of conducting researches into the various aspects of the agricultural industry, and of carrying the results of research to farmers in their efforts at producing food and fibre for the consumption and use of the population.

It is the impact of these efforts of our Faculties of Agriculture on food and agriculture that will be examined in this lecture.

### **Barriers to Development**

As we have now come to accept, food is an important factor in economic development. Food is essential to life. Abundant food supply is the life-blood of smooth, orderly development. Consequently, when we consider the role or impact of higher agricultural education on food production we are dealing with the relationship which exists between Faculties of Agriculture and economic development.

Man is the focal point of all development. A developing country which makes a small ruling elite, or what J.K. Galbraith calls the non-functional group, the centre-point of development, soon discovers that it confronts three major barriers to rapid economic and social change. These are the barriers of hunger, illiteracy, and ill-health. It is these three major frontiers that science, technology, capital, and management skills must first confront and traverse before any meaningful change can occur in the economic and social conditions of the masses of people.

### **Hunger**

The least developed countries of Africa, Asia, and Latin America harbour the largest numbers of malnourished people on our earth. In the Convocation Lecture which was delivered in this University on December 11,

1980 (Oluwasnmi 1980) the problem of hunger as regards Africa was put in the following terms: "Of the major races of the world, ours is about the only one that has so far failed to harness the powers of science and technology to solving the basic problems that we have, such as the problem of adequate supply of food. The Africans are about the "hungriest" people on earth. This continent with its vast resources of rich and fertile land depends upon the industrialized world for food handouts to stave off starvation among its African masses. Even this so-called most powerful, most populous and wealthiest of African nations (Nigeria) cannot feed itself from domestic agricultural production. We depend, in this country, on the United States of America and Europe not only for the supply of the simplest of technologies but also for the supply of rice, meat, and poultry products to feed our people."<sup>1</sup> There has been no dramatic change in the food situation since that statement was made.

In the decade between 1969 and 1979 food production per capita in Sub-Saharan or Black Africa showed a general decline. In Nigeria, for example, food production per capita in 1977-79 was 81% of what it was in 1969-71. The corresponding figure was 87% for Mali, 88% for Ghana, 89% for Niger, 85% for Angola, 90% for Zaire and 84% for Ethiopia. Malawi maintained per capita food output at the same level for the period. It was only in the Cameroun, Ivory Coast, Burundi, Rwanda and the Sudan that food production registered marginal increase during the 1969-79 period.

As we have seen, Sub-Saharan Africa managed to stave off mass starvation through food imports and massive food aids from the more developed and highly industrialized countries of the West.

That we in Nigeria spend a substantial part of our foreign exchange earnings to import food is a fact that has been well dramatized in recent months. Our expenditure on food imports rose from ₦47.8 million in 1969 to ₦681.7 million in 1977. In each of the years 1980 and 1981 expenditure on food imports was well over ₦1 billion. The issue is not just that of spending earnings from our export on food imports to keep our people from dying of starvation. The real problem for food and agriculture in our country is that we now import basic food items we once grew and for which we still have abundant resources to produce.

1. See References on p. 120.

## Illiteracy

It is now generally accepted that a literate population is as crucial to rapid economic development as a well-fed and healthy work-force and that investment in education is as important to the general development of the resources of a society as investment in iron and steel or in breweries.

When we turn to the field of education, we find that Sub-Saharan Africa exhibits all the signs normally associated with backward societies. For example, adult literacy rate in the region varies between 8% of the adult population in Mali to 66% in Tanzania. We have no figure for Nigeria but it is reckoned that the overall adult literacy rate for the country will not exceed 30%, although there will be wide variations from State to State. The literacy rate is however being improved from the bottom by the increasing enrolment of children in the primary school age-group. In Nigeria 62% of children in this age-group are enrolled in primary schools in 1978. The corresponding figures are 41% for Senegal, 90% for Zaire and 99% for Kenya. The picture of enrolment in the secondary and tertiary sectors of education appears rather dismal. The proportion of children in the secondary school age-group enrolled in schools in 1978 varied between 2% in Upper Volta to 25% in Togo. The average for Nigeria was 13%. In no country of Sub-Saharan Africa was enrolment in 1977 higher than 2% of the age group who should be in higher education.

## Ill-Health

“Health is Wealth” is a trite but appropriate cliché with which to underscore the strong link which exists between labour productivity and a healthy work-force. A number of measures has been evolved to determine the conditions of health of a society. For this brief discussion the ratio of doctor to population is as good an index of the quality of health care within a community as any. In Sub-Saharan Africa, this ratio varies from 1 doctor to 9,260 persons in Liberia to 1 doctor to 75,320 persons in Ethiopia. In Nigeria the ratio is 1 doctor to 15,740 persons. Corresponding figures for the developed countries show a ratio of 1 doctor to less than 1,000 persons. When we consider other health factors — hospital beds per population, children mortality rate, life expectancy, etc. — the quality of health care in Black Africa will be seen to be much below internationally recommended standards.

It may be argued that by emphasizing the human and social aspects of development we are ignoring or underplaying the important roles which

capital, science, technology, and management and administrative skills play in development. It is known that these factors are not only important, they are the indispensable tools of development. But without the active intervention of the human agent and the “purposive application of the exertions of his mind and body” to their use and exploitation, these indispensable factors of production cannot by themselves produce the goods and services which a society needs to satisfy the wants of its members.

With all the financial assistance which the banking system may be prepared to put at its disposal, a group of ignorant and malnourished farmers will be unable to make intelligent and productive use of tractors, combine harvesters, and various combinations of fertilizers in raising the level of food production. Nor can a collection of disease-ridden peasant farmers or urban workers be the successful agents for the transformation of a backward agriculture or the building of stable industrial structures.

Man is the most important factor of production. “Therefore, other things being equal, the healthier his body and the more educated his mind, the greater will be his morale and the more efficient and economical he becomes as a producer and consumer.”<sup>2</sup>

### **Role and Impact of Faculties of Agriculture**

Our Faculties of Agriculture are in a unique position to assist the nation in solving the manpower, scientific, technological, and educational (extension) problems which confront us as we attempt to raise the level of agricultural production. As we have seen, Faculties of Agriculture have three major functions:

- (1) resident education, that is, the training of high-level agricultural manpower within the walls of a university;
- (2) research, meaning the production of new agricultural knowledge through investigation and inquiry for use in the training of agricultural manpower and in raising productivity on the farms; and
- (3) extension, that is, the dissemination of new agricultural knowledge among farmers and the education of these farmers to adopt and incorporate modern agricultural tools and technique in their farming practices.

The first Nigerian Faculty of Agriculture was established in Ibadan over three decades ago. Today, there are eight such Faculties scattered throughout the country. Four of these – Ibadan, Nsukka, ABU, and Ife – have been

in existence for twenty years and more. The other four, Calabar, Maiduguri, Sokoto, and Port Harcourt were brought into being within the last ten years.

Given the functions for which these Faculties were established to perform, the question which arises is this: what has been their impact on the country's effort at agricultural development? The knowledgeable man in the street confronted with rising food prices will probably put the question differently and ask: why, with these formidable faculties, has our agriculture remained backward and food production in a state of decline? An examination of each of the three roles assigned to our Faculties of Agriculture and their formal and structural relation to other agricultural agencies will provide answers to these relevant questions.

In the field of manpower development our Faculties of Agriculture have made significant contributions to the agricultural development of our country. Their graduates man almost all the major positions in our ministries of agriculture, agricultural research institutions, university faculties of agriculture, state extension services, and private agricultural businesses.

In the fields of research and extension it must be admitted that the impact of our Faculties of Agriculture on food production and agricultural development generally has not been as significant as it might have been under a more favourable set of circumstances.

The funding of university research in agriculture has been too parsimonious to permit these faculties to make important scientific breakthroughs that will lead to revolutionary changes in agricultural production. This is not to say that individual faculty members are not engaged in important investigations. But more often, such investigations are on a scale that only allows the researcher to publish results that advance his case for promotion in the academic hierarchy.

Of greater importance for the quality of their contribution to the national agricultural effort is the relationship which exists between the Faculties of Agriculture and the other agencies that are responsible for agricultural change. For all practical purposes the Faculties and these agencies work in splendid isolation from one another. For example, higher agricultural education is located in the universities which are financed through the National Universities Commission and which is in turn under the supervision of the Federal Ministry of Education. In all practical terms agricultural extension is the exclusive responsibility of State ministries of agriculture which have no formal or legal relationship with the Faculties of Agriculture. The major agricultural research institutes are based in the

Federal Ministry of Science and Technology; these research institutes have no formal links with the Faculties of Agriculture or with the State Extension Services.

The almost complete absence of effective coordination of resident agricultural education, research, and extension constitutes a major constraint on orderly and rapid agricultural development in our country. It inhibits our Faculties of Agriculture in making their fullest contribution to the national agricultural effort. Until we evolve a structure of agricultural organisation which enables the three components of the agricultural industry to work in close harmony the revolution we seek in agricultural production may take a very long time to materialise.

Dr. Matanmi of this Faculty dealt with the issue of coordination of the three elements of the agricultural system in an article he published in a 1968 issue of the *Planisoil*. In a brilliant summary statement he showed how these elements reinforce each other. Said he:

“Increased agricultural production can only be brought about through the adoption of new, efficient farming techniques, and the provision of better management, all other things being equal. The specialized knowledge needed in matters relating to crop husbandry, crop protection, plant breeding etc. can only be got through research. It is the findings of research that are taught to students of agriculture and this knowledge is in turn disseminated to rural farmers through the extension agents. The extension agent, in performing his duties gets in close contact with the farm people and identifies their problems. Attempts of the Research Institutes and Universities are then directed towards finding solutions to these problems. Thus a cycle is established, and any omission thereof renders the system ineffective. For information to be of value, it must be disseminated, and used. It will be no use wasting time, energy and money on research, the results of which do not get to the farmers. Also, the Research Institutes and Universities must work in close harmony because they can be of help to each other, they can organize joint research, and by working together, research efforts are not duplicated. One tries to fill the gap left by the other, rather than engage in the same thing at the same time.

Coordination between the three areas enables researchers to be pre-advised where necessary as to what their ultimate goals should be. The extensioner, through his knowledge of Rural Sociology know the changes that can possibly be brought about in certain communities

and those which may be impossible. A timely advice given to the researcher thus prevents him from "wasting his energy, time and money on something which will be untenable to farmers."<sup>3</sup>

### **The American Model**

An examination of the American method of handling federal and state responsibilities for agriculture and the roles which colleges of agriculture of the U.S. Land-Grant Universities play in agricultural research, education, and extension may provide us with a useful example in designing a workable mechanism for coordinating the work of the three elements in our agricultural system. The following passage from a recent publication on U.S. Land-Grant Universities summarizes the American model:

"The colleges of agriculture within the land-grant system encompass the agricultural experiment stations, resident education, and the cooperative extension service. A series of acts provided the enabling legislation for appropriations to carry out the missions of these three components.

The first of these acts (Hatch Act of 1887) established the agricultural experiment stations and provided federal grant to states for agricultural research in cooperation with colleges established by the Morrill Act of 1862. The research output provided the basic knowledge without which there would have been no resident instruction programs and no initiation of the science of agriculture. Experiment stations and resident instruction were complemented by the addition of the agricultural extension service (Smith-Lever Act of 1914), which aided in dissemination and application of research.

In the relatively short span of time since the passage of the Hatch Act, the colleges of agriculture in the Land Grant Universities have achieved tripartite integration of curriculum, research, and extension unique in the land-grant university. In addition, these colleges have led the evolution of a complex operation of food and fiber production, and processing and marketing so sophisticated that it reaches into the total life of man and accomplishes what has been called the Green Revolution.

These achievements have been possible because of strong internal control and cooperation among the three components of the agricultural colleges and because of federal support. During the 110 years of cooperation and service with USDA, a unique and workable system has

evolved. The scope of this operation can be clearly defined by examining the experiment station, resident education, and extension components of the colleges of agriculture.”<sup>4</sup>

Each American State has a Land-Grant University with a strong College of Agriculture. There is at least one experiment station in each of the 51 States and “designated Stations in Puerto Rico, Guam, the Virgin Island, — and the District of Columbia.” The experiment station in each state is a comprehensive research establishment which is required by law to inquire and find solutions to all the agricultural problems - be it soil, animal, crop, storage, marketing, management, etc. — confronting farmers in the state.

“The backbone of control in each of the state stations derives from systematic procedures to identify priorities, develop projects, and maintain a competent research staff. Several administrative arms coordinate all efforts: the four regional associations of experiment station directors meet three times a year to consider problems of mutual concern, including coordination of research efforts and development of effective research policies and procedures; the Experiment Station Committee on Organization and Policy (ESCOP), proposed and organized in 1905, disseminates general policies and procedures; the Experiment Station section of the National Association of State Universities and Land-Grant Colleges (NASULGC) provides the connecting link between the regional associations and the governing board of NASULGC. As the federal agency charged with carrying out the legislative mandate of the Hatch Act, the Cooperative State Research Service (CSRS—USDA) aids in approving and improving research proposals, planning and coordinating research, and providing a buffer against pressures by various forces to misdirect, if not misuse, federal and state funds appropriated for agricultural research.”<sup>5</sup>

Although the experiment stations are autonomous in their functions and administration and are precluded by law from diverting their funds, which are exclusively for research, to the general uses of the colleges of agriculture with which they are closely affiliated, a close and beneficial relationship has nevertheless evolved over the last 100 years between college and experiment station. “In fact the majority of scientists on experiment station staffs devote assigned portions of their time to teaching duties...”

What is worthy of note in the American model is the fact that the three legs of the pivot upon which the highly productive American Agriculture

rests are created by three great legislations of the United States Congress – the Morrill Act (Land-Grant Act) of 1862 which established the Land-Grant Colleges, now Universities; the Hatch Act of 1887 which created the State Experiment Stations; and the Smith-Lever Act of 1914 which established the Cooperative Extension Services. These Acts of Congress in effect made agriculture the joint and cooperative responsibility of federal and state authorities both of which appropriate funds in support of the three components of the system.

It is not a question of the American Federal Government engaging in direct agricultural production, or appropriating money to State Governors to spend on their agricultural programmes, or giving Federal money to party functionaries to distribute to farmers, or buying fertilizers to sell at subsidized rates to farmers. State and Federal funds are channelled to three major institutions – the colleges of agriculture in the land-grant universities, the state experiment stations, and the extension services – to carry out approved agricultural programmes under the control and supervision of USDA and State Departments of Agriculture through designated agencies of both governments.

### **Proposals for Effective Coordination of Major Agricultural Institutions**

This rather prolonged discussion of the American practice is not an advocacy of a wholesale adoption of the U.S. model of coordinating the three major components of the agricultural system. It is believed that an insight into the working of the American and other models may prove useful in modifying the rigid separation which characterizes agricultural education, research and extension in our country. Such a modification is an imperative necessity if our Faculties of Agriculture, Research Institutes, and Extension Services are to make their fullest contributions to improved agricultural productivity. For an effective coordination of the three components of the agricultural system I propose that:

1. All Institutes and Agencies concerned with agricultural research should come under the Federal Ministry of Agriculture.
2. **An all-purpose Agricultural Research Institute** should be established in each State or Zone to be jointly financed by the Federal Government and the State or States concerned. Such State or Zonal Research Institute will be responsible for conducting investigations into all agricultural problems – crop, animal, soil, marketing, management, etc. – in the State or Zone.

3. Each Research Institute should be closely linked with a Faculty of Agriculture in the State or Zone.
4. The State Extension Service should become a component unit of Faculty of Agriculture in the State.
5. All Institutions responsible for the training of medium-level agricultural manpower in a State should be affiliated to a Faculty of Agriculture in the State; the Faculty of Agriculture will have responsibility for the syllabi and examinations of the schools and for the admission of students into them.
6. The Faculty of Agriculture should become a semi-autonomous unit of the University and be presided over by a Provost.

The University of Ife should take the initiative and appoint a joint committee of its Faculty of Agriculture and Faculty of Law to study the legal and technical implications of these proposals and draft a legislation that will give effect to them. It will be necessary for this Committee to have effective communication with the Federal Minister of Agriculture and his senior officials, with the Deans or Provosts of the other Faculties of Agriculture, with the State Commissioners of Agriculture, and with interested Senators and Representatives in the National Assembly, a couple of whom may be persuaded to sponsor and give their names to the resulting Agricultural Act.

This suggestion boils down to the creation by our Faculties of Agriculture of an effective Agricultural Lobby in the National Assembly and in the Executive branches of our governments, notably the Federal and State Ministries of Agriculture. The time has come when in addition to purely academic pursuits we must take political actions in realizing our goals of agricultural revolution. Honestly, we can no longer sit resplendent in our ivory towers and hope that money will simply flow like manna from heaven into our laboratories, classrooms, and experimental farms.

In conclusion, it is necessary to reiterate the central theme of this lecture: Until we evolve a structure of agricultural organization which permits the three major components of the agriculture system – teaching, research, and extension – to operate in very close collaboration, the impact of higher agricultural education on food production will remain peripheral and the revolution we seek in agricultural production may take a very long time to materialise.

## References

1. H. A. Oluwasanmi, *University of Ife in the 21st Century*, 1980 Convocation Lecture (University of Ife, Ile-Ife, 1980) p. 10.
2. O. Awolowo, *Voice of Courage, Selected Speeches*, Vol. 2 (Akure: Fagbamigbe Publishers, 1981) pp. 69 – 70.
3. Jide Matanmi, "Coordinating Research, Extension and University Teaching in the Absence of a Land-Grant College System in Nigeria, *The Planisoil*, Vol. 11 No. 2 (April, 1968) pp. 43 – 44.
4. Henry R. Fortmann, et al., "Colleges of Agriculture Revisited", *Land-Grant Universities and Their Continuing Challenge*, ed., G. Lester Anderson (Michigan State University Press, 1976) p. 50.
5. Henry R. Fortmann, et. al. *Ibid.*, p. 51.