



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

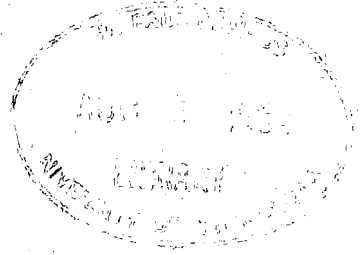
AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Tagboard

**INTERNATIONAL  
JOURNAL OF  
AGRARIAN AFFAIRS**

Vol. IV, No. 4, June 1964



**1. Prospects for Indian  
Tea Exports**

**2. Agricultural  
Economics in some  
African Countries**

*Produced by the  
University of Oxford Institute of Agrarian Affairs  
in conjunction with the International Association  
of Agricultural Economists*

Price 10s. 6d. net

**OXFORD UNIVERSITY PRESS**

**LONDON**

By DEREK T. HEALEY<sup>1</sup>

## AGRICULTURAL ECONOMICS IN SOME AFRICAN COUNTRIES

### *Introduction*

THIS report developed as a by-product of a UNESCO mission to Africa in the summer of 1962 on which I was engaged. The UNESCO project concerned the needs for and availabilities of middle-level manpower in the fields of economics, statistics and accountancy and the opportunity was taken to make some supplementary investigations in the field of agricultural economics. The report, therefore, should by no means be regarded as a complete statement of what is going on in the agricultural economic world of Africa. That there are many gaps in the picture herein presented is all too obvious, but I would hope that it will at least serve the purpose of drawing together some of the strands of information and of encouraging those in Africa working on the subject to fill the empty boxes and discuss their common problems among themselves.

<sup>1</sup> Mr. Healey is at present working with the Economic Development Institute of the International Bank for Reconstruction and Development in Washington, D.C., U.S.A.

The author wishes to thank the following, *inter alia*, who kindly provided him with information during his tour:

Ghana: Mr. J. A. Dadson, Lecturer in Agricultural Economics, The University, Lagon, Accra.

Mr. E. N. Afful, Economics Division, Ministry of Agriculture, Accra.

Nigeria: Mr. H. A. Oluwasanmi, Senior Lecturer in Agricultural Economics, University of Ibadan.

Uganda: Mr. D. Belshaw, Lecturer in Agricultural Economics, University College of Makerere.

Federation of Rhodesia and Nyasaland: Mr. R. W. M. Johnson, Lecturer in Agricultural Economics, University College of Rhodesia and Nyasaland, Salisbury, Southern Rhodesia.

Sudan: Mr. J. A. Baptista, Ministry of Agriculture, Statistical Department.

Mr. M. U. T. Wakil, Assistant Director of Agricultural Economics, Ministry of Agriculture.

Mr. J. H. Sayed, Chief Economist, Ministry of Agriculture.

Ethiopia: Mr. G. Bridger, Agricultural Economist, Joint Division ECA/FAO, Addis Ababa.

Dr. Watson, FAO Expert, Ministry of Agriculture, Addis Ababa.

Madagascar: Mr. N. Heseltine, Representative of FAO and Agricultural Adviser to the Commissariat Général au Plan, Tananarive.

M. A. Mullier, Administrator of the National Institute of Statistics and Economic Studies, Tananarive.

*Ghana*

'The most certain way to promote industrialization in the Gold Coast is to lay the foundation it requires by taking vigorous measures to raise food production per person engaged in agriculture. This is the surest way of producing the large and ever-increasing demand for manufactures without which there can be little industrialization.'<sup>1</sup> This advice, given by Professor Arthur Lewis in his ill-received 1953 Report, has, unfortunately, not been followed. Neither in Ghana nor in the rest of Africa has the suggestion that agricultural development be given a vital role in the process of general economic development been readily accepted. To many Africans the implication implicit in emphasis on agriculture is that Africans should be 'hewers of wood and drawers of water' for ever.

But recently there has been a partial reversal of this neglect of agriculture. *The Times* reported in January 1963<sup>2</sup> from its Accra correspondent that:

Ghana stands on the threshold of its agrarian revolution. Recognition last year of the priority of agriculture in the national economy was a political decision of fundamental importance. In taking it, the Government publicly accepted that successful industrialization must depend on the efficient harnessing of the vast potential of primary production, and on the diversification of crops to reduce the degree of dependence on cocoa.

To implement the new agricultural programme the dynamic Mr. Edusei was appointed Minister of Agriculture and a radical shake-up of the Department is promised. The Minister, in implementing his plans, has the assistance of several semi-autonomous and party organizations: the State Farms Corporation, the Ghana Farmers' Council Co-operatives, the agricultural section of the Workers' Brigade and the Ghana Fishing Corporation.

The mechanization of agriculture is the stated goal and for this purpose large numbers of tractors have already been bought. The observer, however, has difficulty in discovering the *economic* basis of the plans for the large-scale mechanization. It is to be hoped that Ghana will not imitate the mistakes of, for example, Turkey, with its wasteful introduction over too short a period of vast quantities of tractors, or of Pakistan, where many unforeseen difficulties had to be coped with before tractors could usefully be used.

Agricultural engineers of all kinds are in short supply in Ghana and students are being sent to Russia, Czechoslovakia, Holland and

<sup>1</sup> *Industrialization in the Gold Coast.*

<sup>2</sup> 29 January 1963, p. 7.

Germany. The Kwame Nkrumah University of Science and Technology at Kumasi will soon establish a Faculty of Agricultural Engineering. Also, three schools are to be established for training mechanics.

In the higher academic sphere proposals have recently been made for the merging of the faculties of agriculture at the University of Ghana and Kumasi and the Agricultural Research Institute and for the establishment of an agricultural extra-mural department at the College of Agriculture or within the Ministry.

Agricultural economics at present forms part of the Agricultural Degree course at the University of Ghana.<sup>1</sup> Thus if the proposed transfer to Kumasi takes place (and the indications are that, despite opposition, it will), agricultural economics will stand to lose from its divorcement from the Faculty of Economics. The tendency will probably be for the agricultural economics side of the course to lose ground at the expense of the technical side of the course.

In 1962 the break-down of the total time devoted to various aspects of the 3-year Agricultural Degree course was as follows:

Animal Production . . . .	250	hours
Animal Health . . . .	200	"
Animal Nutrition . . . .	80	"
Total Animal . . . .	<u>530</u>	"
Grassland . . . .	48	"
Crop Production . . . .	260	"
Crop Protection . . . .	138	"
Soil Science . . . .	104	"
Soil Conservation . . . .	32	"
Total Crops . . . .	<u>582</u>	"
Engineering . . . .	140	"
Agricultural Economics . . . .	<u>100</u>	"
Total . . . .	<u>1,352</u>	"

The papers in the final examinations were divided as follows:

- (a) *Crop Production*: 3 papers plus 3 practicals
- (b) *Animal Production*: 3 papers plus 3 practicals
- (c) *Agricultural Organisation and Economy (including engineering)*: 2 papers, no practicals.

The University of Ghana in 1962 contained some 700 students, of whom about 200 took one or more courses in economics. Of this smaller number, about one-quarter specialized in economics. In 1963 it is expected that the University intake will be about 550, so that it can

<sup>1</sup> For a full description of this course see the new syllabus for agricultural economics published by the Faculty of Agriculture of the University of Ghana.

be assumed that perhaps 300 will be reading some courses in economics. As for agricultural economics, the subject, as mentioned earlier, is included in the Agricultural Degree course. The numbers in this school in 1962 were: 12 in the final year, 16 in the second year and 5 in the first year, making a total of 33. Over 60 applied to enter the Faculty for the 1962/3 session, of whom some 30 were accepted.

The government is doing its best to attract agricultural economists into its service: at present it has two officers abroad studying the subject and two others who are about to go. Two of the young recruits of the Ministry of Agriculture have been sent by the Ministry to the University of Ghana. There is no regular training programme in the Ministry itself, but if necessary recourse can be had in the statistical field to the UN-established Statistical Training Centre in Accra.

The most useful report on the situation so far as training and future manpower needs is concerned is the 1960 Survey of High-Level Manpower in Ghana. Some of the data, those which relate to economics, agriculture and statistics, are summarized in the table below:

TABLE I. *Ghana. Present numbers and projected requirements for 1965 in various occupations*

	No. in March 1960	Projected July 1965	Additional Positions	Replacements		Additional Personnel Requirements
				Wastage	Expatriates	
<i>Senior Salaried Group:</i>						
Occupations with University Degree:						
Economists . . . . .	10	12	2	3	2	7
Statisticians . . . . .	9	29	20	2	9	31
Agriculture, forestry, fisheries	167	317	150	20	57	227
<i>Second Salaried Group:</i>						
Occupations not requiring University Degree:						
Agricultural Technicians .	385	1,000	615	46	24	685

The expansion envisaged in the number of senior posts in agriculture gives some indication of the importance being attached to agriculture. The Ministry in 1960 reported 30 per cent. vacancy in the professional Agricultural Officer grade with 66 actually at post. Its

estimated additional requirement, 1960-5, of about 50 professional Agricultural Officers represents 75 per cent. of 1960 strength. In addition, the Ministry will need about 20 agricultural scientists.

Attempts are being made in Ghana and elsewhere in West Africa to interest a wide circle in the role of agriculture in the economy and to this end a West African Association of Agricultural Economists has been formed which intends publishing a bi-monthly journal. There is in existence also a Ghana Economic Association (and one with a similar title exists in Nigeria).

The subject of African Common Markets often comes up for discussion: realistic opinion in Ghana, however, adopts a healthily sceptical attitude towards such proposals.

### *Nigeria*

In a hard-hitting section of Sir Eric Ashby's Report, *Investment in Education*,<sup>1</sup> there occurs this statement:

With one veterinarian to 120,000 head of cattle, Nigeria cannot afford the niceties of a veterinary education so much directed to providing private practitioners whose main preoccupation is with pet dogs and cats.

He urges, therefore, for this field and for all fields where the requirements of a British Certification have dominated, that a 'spring-cleaning' be made so as to fit the requirements of Nigerian students to Nigerian conditions.

It was for the reason of 'relevance', too, that the Report recommended that vocational agriculture should be taught in the primary schools in rural areas and that ultimately it be taught at some secondary schools.<sup>2</sup> One of the reasons for this suggestion is that Nigeria might expect to need some 5,000 agricultural extension officers if the ratio of extension workers to farm population were 1:5,000<sup>3</sup> and that it would be quite impossible to train this number of assistants in specialized institutes.

It is possible, too, that some stress laid on the importance of agriculture in the Nigerian economy in the primary and secondary schools curricula might induce more young people to consider agriculture as a career. For the problems of securing a change in attitude towards such a career are indeed formidable. As the Ashby Report said:<sup>4</sup>

Investment in agriculture is inadequate and rarely in the public eye. Publicity

<sup>1</sup> Lagos, 1960, p. 24.

<sup>2</sup> Op. cit., p. 104.

<sup>3</sup> The Illinois ratio.

<sup>4</sup> Ashby, op. cit., p. 21.

goes to industrialization, construction, and the like. . . . But we are in a dilemma when we come to make recommendations about agricultural education, because the chief weakness in the present system is not the agricultural schools but the reluctance of students to go into them. It is scarcely an exaggeration to say that the effect of education, from primary school to university, is to draw boys away from the farms to the towns and cities. We feel bound to say, therefore, that only a combination of higher salaries and better living conditions, coupled with persistent propaganda about the importance of agriculture to the nation, will ensure the [necessary] annual output.

The Nigerian Government itself in its 1961 proposals for *Educational Development 1961-70*<sup>1</sup> recognized that the *content* of primary and secondary school education was of particular interest to it. In addition to 'manual training and handicraft lessons' in the primary schools, the intention was to increase vocational training in secondary schools. And 'agricultural education must be expanded in all secondary schools except in Lagos'. It is clear that the recommendations of the Ashby Report on agricultural education have had considerable impact on the government's proposed policy. Thus the government states<sup>2</sup> that it

is perturbed about the existing state of agricultural education in the country and the dearth of Nigerian recruits into the agricultural services. It recognises that the terms of service of agricultural assistants and superintendents must be made more attractive if the mainstay of the national economy is to remain sound, and the training of these assistants must be increased in number to about 600 per annum. Efforts will also be made to see that all administrative, research and field posts in the departments of Agriculture have Nigerian deputies who, with the substantive holders, will carry complete responsibility. There will be consultation between the Federal Government and the Regions to devise means of making agricultural careers attractive and bringing to bear on the day to day practice of the farmers the fruits of agricultural research.

At present in Nigeria agricultural economics is included in the courses for the Degrees of B.Sc. (Agriculture) (pass and honours) in the Faculty of Agriculture and Veterinary Science at the University College of Ibadan. Other universities have been proposed for each of the Regions and already the University of Nigeria at Nsukka in the Eastern Region has opened its doors. It was recommended by the Ashby Commission that agriculture should form a basic discipline of the new universities and in the case of the University of Nigeria the Commission stated:<sup>3</sup>

We should press unreservedly the urgency of the inclusion of agriculture as

<sup>1</sup> Sessional Paper 153 of 1961, Lagos, p. 5.

<sup>2</sup> *Ibid.*, p. 7.

<sup>3</sup> *Op. cit.*, p. 118.



a field of study, teaching and research among the earliest subjects to be planned and undertaken.

Furthermore,

Of immediate value will be the organisation of a combined research and extension programme.

Through this policy, the Report continued,

the University of Nigeria will be able to exercise a healthy progressive leadership in the development of agriculture in the Eastern Region.

That this 'healthy progressive leadership' is urgently necessary was indicated by the advisers appointed to consider the setting up of an Eastern Region University, who reported that while

agriculture is the chief occupation in Nigeria,<sup>1</sup> yet there are few indications in the Eastern Region that scientific findings are being used to improve production and marketing of agricultural commodities.

It might well be that something like the Land Grant College system of the United States could be developed with the new universities in Nigeria so that there could be a direct relationship between the research work of the universities and the practical needs of the extension workers. The problem of the transmission of research results to the farm population in Africa is difficult to solve. Dr. V. A. Oyenuga in his 1959 Lugard Lectures<sup>2</sup> suggested that

There should be close co-ordination and liaison between the Federal and Regional research, education and extension services. Results of research should be passed on to the farmers as soon as possible. The practical problems and difficulties of the farmers should reach the research laboratories constantly and agricultural teachings at the University level should be so orientated as to put emphasis on current problems. Professors and lecturers should keep in touch and reorientate their research and teachings to requirements.

The question of research in agriculture was more recently touched upon in the Nigerian Development Plan 1962-8 where, for instance, it is stated that in addition to a continuation of work on the staple food crops 'a major effort is being made to expand in particular rice production and the production of other domestic foodstuffs of high

<sup>1</sup> Some 75 per cent. of the working population are engaged in the industry. It provides at least 50 per cent. of the gross national product and from it is derived the bulk of the government's revenue. At least 85 per cent. of the country's exports are agricultural (yet food grown and consumed locally constitutes 80 per cent. of total agricultural production).

<sup>2</sup> Dr. V. A. Oyenuga, Senior Lecturer in Animal Nutrition in the Faculty of Agriculture and Veterinary Science at the University College of Ibadan, *Our Needs and Resources in Food and Agriculture*, p. 37.

nutritional value, such as potatoes and legumes.<sup>1</sup> The Plan also provides for more fertilizer studies which will form the basis for an increase in fertilizer production. An interesting feature is the involvement of the FAO in the Plan; the FAO is already organizing field work on fertilizers and is about to undertake a major survey of agricultural possibilities in the Federation.

The increasing importance of the 'primary production' sector in the government's Plan for the country is seen in the following table:

TABLE 2. *Nigeria. Federal capital expenditures in the main sectors of the economy, 1955-61 and 1962-8*

	1955-61 Plan		1962-8 Plan	
	Expenditure	% of Total Plan Expenditure	Expenditure	% of Total Plan Expenditure
	£ million	%	£ million	%
Primary production . . .	8.7	3.7	91.8	13.6
Trade and industry . . .	6.9	2.9	90.3	13.4
Education . . . . .	18.8	8.0	69.8	10.3

Source: Op. cit., chap. 6, p. 3.

The total capital expenditure over the six-year period 1962-8 amounts to £675.7 million. Thus the two sectors in the Plan which have been given top priority will account for over 25 per cent. of the total capital expenditure. It is also worth noting that over 70 per cent. of the entire investment programme is being devoted to the sectors which are more important *directly* for economic growth, viz. primary production, trade and industry, electricity, transport, communications, irrigation and industrial water supplies.

The following table gives a break-down of expenditures in the Plan in the agricultural and allied sectors:

*Planned expenditures, 1962-8*

	£'000
Agricultural Research . . . . .	1,462
Agricultural Loans and Grants to Regions	10,000
Agricultural Credit . . . . .	3,000
Forestry . . . . .	498
Fisheries . . . . .	885
Veterinary . . . . .	322
Total	<u>16,167</u>

<sup>1</sup> Op. cit., chap. 6, p. 11.

In introducing the Development Plan to the House of Representatives in Lagos in 1962 the Hon. Waziri Ibrahim, Minister of Economic Development, declared:<sup>1</sup>

All [Regional] Governments recognise that it is upon raising the productivity of our agriculture that, for many years to come, the economic growth of the country will largely depend.

It will be generally agreed that the Nigerian Plan is setting its sights on the right target.

As far as Nigeria's attitude towards the prospect of a Common Market in Africa is concerned one notices that the country is undoubtedly aware of the desirability for a broadening of Nigeria's export markets. The Federal Minister of Finance, the Hon. Festus Sam Okotie-Eboh, in his 1962 Budget Speech,<sup>2</sup> said:

We do not visualise Nigerian industry as catering only for the domestic market; it will increasingly become the supplier of manufactured goods throughout Africa.

And the Minister appeared confident that ultimately an African Common Market, or at least a West African one, would emerge. It is worth while quoting him extensively on this topic:

Nigeria attaches the greatest importance to the closest possible economic co-operation with our African States and particularly, initially, with the other West African States. This will doubtless in time lead to the establishment of at least a West African Common Market comparable in concept to the present European Common Market. It would be idle to under-estimate the magnitude of the difficulties which must be resolved before this can come to pass. First is the complexity of the manifold problems involved in reconciling the interests of the nations which formerly belonged respectively to the British and French spheres of influence in Africa. Secondly, is the fact that, unlike the countries which go to make up the European Common Market, whose economies are broadly complementary to each other in that by far the greater volume of trade takes place between the member countries themselves, almost all the trade of the African countries is with the outside world, frequently in competition with each other. Before a Common Market can become a reality there must be far greater industrialisation. I look forward to the day when Nigeria will become the industrial heart of an African Common Market, as a result of conscious planning and co-operation by the African States in unison. West African Free Trade Area is a greater immediate possibility, but even here the problems are immense. The important thing is that the principle of co-operation has been accepted by all the States and active steps are being taken to match words by deeds. Progress has already been made in some fields, notably the co-ordination of customs

<sup>1</sup> Speech delivered in the House of Representatives in connexion with the Development Plan, p. 6.

<sup>2</sup> *The Mobilisation Budget*, 29 March 1962, p. 22.

administration and plans for international highways to facilitate trade and commerce between all the West African States. I am confident that, given patience and mutual understanding, all the present difficulties will speedily be resolved.

One looks in vain, however, for significant concrete manifestations of such harmony.

### *East Africa*

The recently acquired independent status of Tanganyika and Uganda has not destroyed the system of common services which these countries enjoyed jointly with Kenya. It would indeed be a sad and ironic fact if, at the same time as Common Markets are being mooted throughout Africa, the long-standing (since 1927) economic links between the territories of the former British East Africa were to disappear. Yet there are many adverse criticisms of the *de facto* Customs Union in Tanganyika and Uganda and the undoubted *disadvantages* are stressed far more than the less obvious advantages.

The East Africa High Commission, with its headquarters at Nairobi, concerns itself with the East African Railways and Harbours and East African Posts and Telecommunications and also some common research facilities. From the point of view of the region as a whole there is a larger inducement to invest so long as the larger market is retained. It is true that Kenya has been the focal point for growth in East Africa, but it would be a difficult matter to prove that this has been *at the expense* of Uganda or Tanganyika. The World Bank Report on Tanganyika, summing up the pros and cons of the Customs Union, stated that

The Mission strongly believes that economic co-operation, and the prevention of the growth of barriers, between the three East African territories is in the best interests of the long-run development of the area as a whole.<sup>1</sup>

Higher Education in East Africa is a joint responsibility of the governments of the three countries. They contribute practically the whole of the operating costs of the University Colleges of Makerere in Uganda, the Royal College in Kenya and, the newest, the University College of Dar-es-Salaam, Tanganyika.<sup>2</sup> The universities are conducted on a non-racial inter-territorial basis and student costs, already subsidized, are supplemented where necessary by government grants.

To Makerere has fallen the task of training East Africa's agriculturalists. The situation which has had to be tackled in the

<sup>1</sup> IBRD, *The Economic Development of Tanganyika*, p. 238.

<sup>2</sup> At present only for Law. (Surely a remarkable priority in a poor country!)

agricultural-education sphere may be judged from the fact that in 1953 there was one Kenya student taking the Agriculture course at the University College. By 1961 the number had expanded to 11 Kenyans taking the B.Sc. (Agriculture) course and 5 taking the Diploma in Agriculture. In the same year, 1 Kenyan completed the former course and 5 the latter. But East Africa, like West Africa, suffers from a reluctance of the African to work in the field of agriculture. On this topic the Swynnerton Report<sup>1</sup> commented:

Trained African Assistant Agricultural Officers and Agricultural Officers have a most important part to play in the development of African agriculture both in the field and in the training institutions and every effort and incentive must be offered to get Africans to study agriculture. At present agricultural training is not popular with Africans because they do not like field work and consider it *infra dig*. In fact they prefer to take the ordinary B.A. degree course which is two years shorter than the agricultural course, at the same time securing themselves lucrative jobs. While the new and progressive agricultural course being initiated at Makerere should attract more candidates, trained African agricultural staff, so important to the future of Kenya, must be paid higher salaries in relation to the more attractive forms of employment.

Thus it is that although Makerere has a capacity for some 25 students in the Agricultural School (with about one-third being allocated to each of the three countries) the total intake has never exceeded 16.<sup>2</sup>

### *Kenya*

Agriculture and animal husbandry accounted for over 36 per cent. of Kenya's gross domestic product in 1961, i.e. £81.2 million out of a total gross domestic product of £224.8. (In 1954 the proportion of the gross domestic product originating in agriculture and livestock had been 44 per cent.)<sup>3</sup> Kenya's export trade depends on agricultural products for about threequarters of the total. However, of exports consigned to countries outside East Africa, agricultural exports constitute nearer nine-tenths of the total. (In 1961 total exports amounted to £35.3 million.) Yet of the three East African countries Kenya is the least dependent on agriculture; 10 per cent. of the gross domestic product is derived from industry and a

<sup>1</sup> *A Plan to Intensify the Development of African Agriculture in Kenya*, compiled by R. J. M. Swynnerton, Nairobi, 1954. (The Plan aimed at increasing the net output of 600,000 families from around £10 per annum to £100 or more.)

<sup>2</sup> The implementation of the Swynnerton Plan would have been impossible without the use of European extension officers, many of whom are now about to leave Kenya.

<sup>3</sup> Colony and Protectorate of Kenya *Economic Survey 1962*.

considerable proportion of the remainder arises out of Kenya's predominance in the service trades.

Most of the agricultural production in Kenya has emanated from the European (now 'scheduled') farms, but African farmers with their rapidly increasing production of coffee, tea and other crops under the Swynnerton Plan are becoming ever more important in the domestic and export economy.<sup>1</sup> There is, however, one unfortunate weakness in the Swynnerton Plan—there is practically no discussion in it of the problem of marketing (domestically or abroad) the increased production of crops and livestock which the Plan was designed to bring forth. The omission of this important part of the production process from the Plan points up the fallacy of *expecting present conditions to continue*; for when the Plan was conceived in 1953 world prices were high for the products being promoted and it appears that these abnormally favourable prices were expected to continue. Since the middle fifties, however, export prices of agricultural products have fallen considerably and the assumption that increased production of cash export crops will automatically be economic must be abandoned.

In this situation, and also because more information was needed concerning the European farming areas (in view of the African resettlement programme in the 'White Highlands') the government obtained funds under the D.C. and W. Acts and in 1960 established the Farm Economic Survey Unit within the Department of Agriculture. Since then, a large amount of research has been undertaken on the economics of African farming.<sup>2</sup> The preliminary work has been so successful that by the middle of 1963 it is expected that

the collected data [will] be in such a state that it can be used and applied to the purposes of the original plans. This will of itself involve a certain amount of experimentation in methods of presentation and application, but we can look forward to the day in the relatively near future when full budgets for African farms can be drawn up, tested against the recorded data of existing studied farms and then applied to new situations.<sup>3</sup>

As for the training of agriculturalists and agricultural economists in Kenya, in addition to the Degree courses in Agriculture to which Kenyans have access at Makerere there are also two-year Diploma

<sup>1</sup> Detailed statistics on the Kenyan Agricultural Sector are contained in *Kenya European and Asian Agricultural Census 1960* and a similar volume for *African Agriculture*.

<sup>2</sup> For a summary of the programme of activities of the Unit see J. D. MacArthur, 'The Development of Research into the Production Economies of African Peasant Farms in Kenya', *The East African Economics Review*, vol. 9, no. 2, December 1962.

<sup>3</sup> J. D. MacArthur, art. cit., p. 107.

courses at the Siriba Training College (conducted by the Education Department) and at Egerton Agricultural College. Most of the graduates of these colleges go into government service in the Agricultural Department although, when first formed, Egerton existed primarily to train Europeans in the practices of Kenyan farming.

Finally, at a lower level, the Department of Agriculture operates the Embu Agricultural Training School with an annual intake of about 50 boys with the School Certificate.

### *Uganda*

In 1962 the forecast gross domestic product was £153.4 million, of which £110 million came from the 'monetary economy' and £43.4 million from the subsistence economy (i.e. African agriculture). It is interesting to note, however, that *total sales* of agricultural products have now exceeded the imputed value of output in the subsistence sector. Cash crops are mainly produced for export; only a small (but growing) proportion consists of food for sale in the towns. Of total exports to overseas countries (trade with Kenya and Tanganyika is not included)<sup>1</sup> of £41.6 million in 1960, agricultural produce accounted for just over £36 million. The most important categories were coffee at £17 million and cotton at £15 million.

Thus Uganda's entire economy is peculiarly dependent on agricultural exports—and to a large extent on products (coffee and cotton) whose prices are especially vulnerable to price fluctuations. Diversification and development of agriculture would appear to be a prime need and the World Bank Survey Mission, emphasizing this, stated:

the chief opportunities for economic development in Uganda for some years to come lie in agriculture and our principal recommendations reflect this view . . . the best route to eventual industrialisation lies in increasing agricultural incomes and so providing a large enough market to justify building industrial plants.<sup>2</sup>

The IBRD's Plan aims at an annual increase of 3-4 per cent. in gross domestic product. Between 1954 and 1960 GDP grew at an average compound rate of 3 per cent. per annum and exceeded, therefore, the annual rate of growth of population of 2½ per cent. But the Mission's Report pointed out that most of the total growth of GDP had occurred in the beginning years of the period and that in the later

<sup>1</sup> Prior to 1956 Uganda normally had a net credit balance with the other two East African countries, but subsequently, apart from 1960, there has been a small annual net debit balance.

<sup>2</sup> IBRD, *Economic Development of Uganda*.

years it was probable that product per head had actually declined. Noting this ominous development, the Report comments:

because population growth has speeded up, at least in the last ten years, the same rate of growth in total production as earlier now means a much slower rate of growth in the per capita standard of living. In the early 1950's the especially rapid advance in GDP from the boom prices for cotton and coffee was more than sufficient to offset the great population increase; since 1957, however, this has no longer been true.

For the agricultural sector the Bank's Report recommended a capital expenditure of £5.8 million (11 per cent. of the total) over the period 1961/2 to 1965/6. Irrigation, Water Development and Reclamation were to get a further half-million pounds. The Uganda Government's Plan increased the Bank's recommended total from £52 million to £54.2 million but otherwise the Plan now being followed is about the same.

Perhaps one of the bluntest statements to have appeared in an annual report of a Department of Agriculture was the one made by the Uganda Department in its 1960 Report. An extract is worth quoting:

Despite the efforts of the Department over the past 40 years the general level of farming is still at the subsistence level and the problem in front of us is so urgent that we can no longer afford to dissipate our forces, limited as they are, in an attempt to help those who will not help themselves. Concentration of effort is essential and it was, therefore, decided to give the maximum assistance to the progressive or emergent farmer in order to develop a class of yeoman farmer. This is not to say that other farmers are being neglected, as they all need guidance, particularly in such routine matters as the early planting and spacing of cotton, and the timely uprooting and burning of the old cotton plants, which affect the well-being of all farmers.

The bulk of the cultivating is still done with the hoe, and an all-out effort is being made to replace the hoe by the plough and to make the farmers ox-cultivation minded in those areas where cattle can be kept and to encourage tractor cultivation where this is not possible.

The African farmer is under-capitalised and in many instances has neither the incentive nor the means to improve his standard of farming. To break through this level of subsistence agriculture it was therefore decided that he must be given the 'tools with which to do the job'. To this end it was decided to make loans freely available to those who really need them, and who show they have the will to progress, and, at the same time, to subsidise where necessary the price of essential equipment to bring it within the means of the Progressive Farmer to purchase.

The Department hopes that its long-standing policy 'will now come to fruition'; the results will be awaited with interest.



One of the main tasks now engaging the attention of the Uganda Government is 'Africanization'. The Report of the Commissioners for Africanization, published in 1962, stated:

We envisage that if the measures we advocate . . . are vigorously pursued, it should be possible to Africanise all but a few scientific, technical and teaching posts in five years, and the rest within ten years.<sup>1</sup>

This programme will undoubtedly have a considerable impact on agricultural direction and training. For instance the Report states: 'no further overseas recruitment of expatriates at the Agricultural Officer level is necessary'.<sup>2</sup> At the Diploma level, the Department is short of 21 Assistant Agricultural Officers; for this grade overseas recruitment is recommended until local candidates are available. Once again we observe in Uganda the evident difficulty of attracting men into senior agricultural posts; the Commissioners' statement is that

urgent consideration should be given to sponsoring suitable undergraduates to become Research Officers. If efforts in this direction are to be successful it is necessary to make the jobs attractive vis-à-vis other fields of employment.<sup>3</sup>

### *Tanganyika*

Agriculture and livestock products account for about 80 per cent. of Tanganyika's export earnings and about 70 per cent. of the total physical product of the country (or 56 per cent. of total monetary plus subsistence gross domestic product). Sisal, coffee and cotton are the main exports and in the aggregate constitute about 60 per cent. of the total. In 1961 the World Bank Survey Mission<sup>4</sup> reported that the main development effort should be concentrated in the agricultural sector. The Report continues:

Estates owned and managed by Europeans or Indians are at present major producers of export crops. . . . But the estates occupy only one per cent. of the land area of Tanganyika, and latterly the alienation of land for non-African agricultural use has been on a very limited scale. African peasant producers account for around 55% of Tanganyika's exports of crops and about 65% of the value of all marketed crops. Of total crop production, including a fair valuation of subsistence, African peasant producers contribute over 80%. Live-stock are almost entirely African owned.

<sup>1</sup> Op. cit., Part 1, p. 17.

<sup>2</sup> Ibid., p. 101.

<sup>3</sup> Ibid., p. 102.

<sup>4</sup> IBRD, *The Economic Development of Tanganyika*, p. 16. The Report was criticized on a number of points by I. Livingstone in the *East African Economics Review*, June 1961, and replied to by J. P. Hayes, Chief Economist of the Mission, in the December 1962 issue of that Review.

It is clear, then, that the peasant farmer is a major factor in the economy—he is already past the stage of being merely a subsistence cultivator. And it is towards the improvement within existing techniques of the African farmer that the recommendations of the Mission are directed.

The first objective to be attained is that of improved research facilities. In the past the major research effort has been concentrated on cotton, sisal and coffee and little attempt was made to develop other crops or develop new systems of land use and cultivation. In the new research plan, however, there are four regional research stations responsible for the development of the scientific aspects of agriculture. They, together with the Coffee Research Centre, are directed by the Chief Research Officer in Dar-es-Salaam. The Sisal Research Centre continues to be managed by the industry. Unfortunately the usual difficulty of attracting research staff of the right calibre makes the full staffing of the government research effort unrealizable. One helpful line of approach would be to ensure that the *joint* research facilities of the East African Agricultural and Forestry Research Organization are fully utilized.

There is obviously going to be an increasing need for farm economics studies in Tanganyika since it will be necessary to experiment from an *economic* point of view with the technological advances that are made. There are, too, some farmers who have already abandoned shifting cultivation, enclosed their lands and have started to mechanize; economic studies are necessary so that the Department can advise them along optimum economic lines. The World Bank Mission reports, however, that

at present there is no one in the Department of Agriculture with experience of such work, and a number of difficulties and problems are likely to be involved in the design of such inquiries, the sampling techniques involved, and their general organisation.

The World Bank Mission recommended therefore that

outside assistance should be sought for the provision of an agricultural economist experienced in the work [and] with the aid of one or two local agricultural officers (preferably Africans) this agricultural economist should initiate economic studies.

What makes the difficulty so acute in initiating a programme of this sort is the degree of Africanization which has taken place in Tanganyika—the country is already as far along this road as Uganda plans to be in five years. With the rapid departure of expatriates, training

sufficient high-level recruits becomes a major task and much effort is being devoted to this in Tanganyika in all ministries. It is true that 'outside assistance' does play an important role in filling the gap between the departure of the expatriates and the emergence of adequately trained Africans but even at an international level such experts are becoming scarcer. He would be sanguine, too, who did not imagine that the introduction of 'outside assistance' was not fraught with difficulties.<sup>1</sup>

In the educational field Tanganyika shines as a beacon of sanity in Africa. For only in this country has it been declared as public policy that, at present, universal elementary education is *not* the aim. Emphasis will be on secondary education.<sup>2</sup> The Tanganyika Development Plan, 1961/2 to 1963/4, has this to say on the subject (p. 79):

The Government considers that, at this stage of the country's development, the greatest need is for a considerable expansion of secondary education. This view is so widely shared and accepted both inside Tanganyika and overseas that it is unnecessary to justify here the priority which has been given in the Ministry's plans to secondary and post-secondary development. These plans will, in four years, increase the number of School Certificate candidates nearly three-fold (in rural boarding schools the increase will be five-fold) and will, in the same period, increase the number of Higher School Certificate candidates almost six-fold. But their adoption has made it necessary to reduce to a total of £60,000 p.a. the proposed recurrent provision for increased subventions to local authorities for rural and urban primary expansion. This means that the central government will be unable to give subventions towards more than 400 to 500 additional classes

<sup>1</sup> The Tanganyika Government, in an effort to avoid some of the conflicts which often occur with the temporary employment of overseas specialists, has drawn up a 'Standard Technical Assistance Personnel Agreement'. A summary of this, written by F. E. Mangelsdorf, appeared in the March 1963 issue of *International Development Review*.

<sup>2</sup> Julius Nyerere, the President, is reputed to have lamented, 'My realm for six shorthand typists!' The unfortunate results of a misdirected education policy have been lucidly pointed out by Professor Arthur Lewis (in, *inter alia*, *Reflections on the Economic Problem*, Oxford Conference on Tensions in Development, New College, Oxford, 1962). He states that the primary-school teacher in the U.K. or the U.S. is paid  $1\frac{1}{2}$  times the *per caput* national income in their respective countries, 3 times in Jamaica, 5 times in Ghana and 7 times in Nigeria. Again, a young graduate receives a salary equal to that of a miner in the U.K.; in Africa his salary is at least 7 times that of a miner. This has the effect of making the public services very costly so that while to give 8 years of primary education to all children costs only 0.6 per cent. of the national income of the U.S.A., it costs 4 per cent. of the national income in Nigeria (3.2 per cent. if the ratio of children to adults were the same in Nigeria as in the U.S.A.).

In Africa now there is a growing surplus of the primary-school leavers for whom there is no immediate possibility of absorption into an occupation for which they feel themselves fitted. The wage of an unskilled labourer (i.e. the youth after 6 years of primary education) is normally one-third of the average income per occupied person. Yet in Africa, primary-school leavers expect *twice* the income of the average occupied person. Clearly this will soon be a mathematical impossibility if primary education extends further!

Footnote 2 continued opposite

a year and that further expansion will depend upon the extent to which local authorities are ready and able to increase their own contributions to primary education.

The place of agricultural education in the whole system of education at levels lower than university is a matter of dispute. (It will be remembered that Tanganyikans share the Degree facilities for agriculture at Makerere, Uganda.) Agriculture is not a popular subject at the Middle-School level yet, as the World Bank Mission correctly points out, 'the fact remains that the greatest part of the African population will continue to live by agriculture and animal husbandry'. The recommendation in consequence is that 'the link between pupils in Standards V-VIII and the land should be maintained'. It is suggested, however, that this should be done

not so much by emphasis on the dissemination of modern agricultural techniques as by applying arithmetic, science and even the use of English to topics related to agriculture, animal husbandry, co-operative membership, etc.

The suggestion deserves the attention and the comments of the educational specialists.

The following table gives an indication of the growth of education that is being planned in Africa:

TABLE 3. *Educational Development Programme\* in Africa, 1961-80*  
(According to the 20-year Plan)

	1960/1	1965/6	1970/1	1980/1
	(in thousands)			
<i>a</i> Estimated enrolment:				
Primary education	11,187·0	15,279·0	20,378·0	32,808·0
Secondary education	816·6	1,833·5	3,390·0	5,905·0
High-level education	25·0	30·3	55·0	328·0
<i>b</i> Educational pyramid (as percentage of estimated age group):				
Primary education	40	51	71	100
Secondary education	3	9	15	23
High-level education	0·2	0·2	0·4	2
<i>c</i> Estimated costs (U.S. \$ millions):				
Primary education		399	537	730
Secondary education		652	949	1,177
High-level education		49	306	562
Other programmes		55	90	124
Total costs		1,155	1,882	2,593

\* Source: *Final Report of the Conference of African States on the Development of Education in Africa*, May 1961.

The Plan for Tanganyika is a detailed document and is based on the World Bank Mission's Report. This section concludes with a brief summary of the proposals for agriculture.

The stage for the whole Plan is set by the statement that it is a plain fact that increases in the national revenues on which better education, more hospitals and improved social services so largely depend, as well as increased prosperity and a better way of life for the people of Tanganyika, must and can only be found in an expansion of her agricultural production.

The Plan provides for expenditures amounting to £5½ million over a period of three years, allocated as follows:

	£'000
Agriculture . . . . .	2,313
Co-operative Development . . . . .	265
Veterinary Services . . . . .	319
Water Development and Irrigation . . . . .	2,291
Tanganyika Agricultural Corporation . . . . .	507
Miscellaneous . . . . .	42
	<u>£5,737</u>

With regard to training (education, training, research, survey and investigation take 25 per cent. of the total expenditure) the Plan states that

To achieve the objectives the Agricultural Division has before it, a proper balance and relationship must be maintained between education and training, the extension, specialist and research services and subsidization of agricultural production. Moreover, there must be flexibility and room to reinforce success or make changes when changes are necessary. Quite clearly, improved and more extensive training facilities must come before any large-scale expansion of the extension and research services. As the better and more experienced farmer emerges, he requires the advice and services of the better-educated and better-trained Field Assistant. Technicians and specialist staff for the research centres must be trained in increasing numbers and facilities for education up to the diploma and degree standards and qualifications must be created or improved.

A break-down of the expenditure on the agricultural aspect of the Plan is as follows:

	£'000
Agricultural Training . . . . .	137
Extension Services . . . . .	1,414
Specialist Services (e.g., land planning) . . . . .	180
Research . . . . .	221
Subsidies on production . . . . .	88
Farm Institutes . . . . .	116
Agricultural College . . . . .	407
— adjustment . . . . .	250
Net total	<u>£2,813</u>

Perhaps the most important proposal in the Agricultural Training sphere is that the Agricultural Training Centre, Ukiriguru, should have its facilities increased so that 250 trainees per annum at the Field Assistant level can be absorbed. It is suggested that this intake will need to be maintained for 'at least ten years'. The objective is 'to provide the services of at least one Field Assistant for every 1,000 farmers (as opposed to one Field Assistant to every 2,500 farmers at the present time)'.

As the Introduction to the Plan document states,

The reality of economic planning in the hustle and bustle of a fast developing African country bears little or no relation to the theoretical work on elegant models constructed in statistical laboratories of more developed countries.

This is true, yet the authors of the Plan are being too modest, the Plan *does* bear the hall-mark of a soundly conceived programme.

#### *Federation of Rhodesia and Nyasaland*<sup>1</sup>

The total population of the Federation is about 8½ million, of whom 317,000 are Europeans.<sup>2</sup> About 85 per cent. of the population is rural. Over one-seventh of the African population is part of the wage-earning labour force and nearly half of these are in manufacturing, mining, transport and government. Southern Rhodesia is the largest agricultural producer of the three territories; it produces half the maize and most of the tobacco. Northern Rhodesia, providing some 60 per cent. of the mineral exports of the Federation, is the source of about the same proportion of the Federation's exports. Nyasaland, with about three-fifths the combined population of the two Rhodesias has about one-twelfth the area and produces only about 11 per cent. of the Rhodesias' total gross domestic product.<sup>3</sup>

European land holdings in Northern and Southern Rhodesia are usually large in area—from 2,000 to 4,000 acres for the average mixed farm producing maize, tobacco, dairy products and beef. Some individual range livestock holdings may contain from 30,000 to 500,000 acres. European holdings in Southern Rhodesia comprise nearly 31 million acres, but at present a large part of it is suitable only for large-scale ranching. About 825,000 acres are under crops.

<sup>1</sup> This section was written before the end of the Federation.

<sup>2</sup> Northern Rhodesia: 73,000 Europeans; 2,360,000 Africans. Southern Rhodesia: 235,000 Europeans; 2,860,000 Africans. Nyasaland: 9,000 Europeans; 2,770,000 Africans.

<sup>3</sup> *Economic Report*, 1962.

Of the Federation's total domestic exports of just over £200 million in 1961, agricultural exports accounted for £57 million, or 28.7 per cent. (It is interesting to note that this dependence on agricultural exports has increased since 1954 when the proportion was 21.9 per cent.) Tobacco stands out as the Federation's most important export crop; in 1961 the value was almost £42 million.

The Federation is largely self-sufficient in food production and the future policy is to become increasingly self-sufficient in most basic food requirements. The following table shows a break-down of agricultural and livestock production by country and type of farming for 1954 and 1961:

TABLE 4. *Federation of Rhodesia and Nyasaland. Gross value of agricultural and livestock production, 1954 and 1961*  
(£ million)

	Southern Rhodesia		Northern Rhodesia		Nyasaland		Federation				
							Totals		Percentages		Index 1961
	1954	1961	1954	1961	1954	1961	1954	1961	1954	1961	(1954 = 100)
European production . . .	31.7	57.4	3.6	7.4	4.0	6.0	39.3	70.8	42.2	52.3	180.2
African sales . . .	4.8	4.8	1.9	2.9	2.5	3.7	9.2	11.4	9.9	8.4	123.9
African subsistence . . .	14.9	18.0	16.9	18.1	13.0	16.0	44.8	53.0	48.0	39.2	118.3
	51.4	81.1	22.4	28.4	19.5	25.7	93.3	135.2	100	100	144.9*

Source: Op. cit., p. 75.

\* Using the 8 per cent. increase in the price level of gross domestic product as deflator 1954-61, the index becomes 134.2.

As can be seen from the table the growth in the value of output from the African sector has not kept pace with European production increase. Subsistence production has merely kept pace with the growth of the subsistence population and its proportion of total production has decreased from 48 per cent. in 1954 to 39 per cent. in 1961.

In the Report entitled *Federal Government Economic Policy: Principles*<sup>1</sup> it was stated that

the fact that the production (and consumption) of three-quarters of the population takes place under 'subsistence' conditions and amounts in value, even in a good agricultural year, to less than one-fifth of the total, constitutes one of the most serious aspects of the general problem of increasing wealth per head of the population in the Federation.

<sup>1</sup> Presented to the Federal Assembly in 1962.

And it is believed that while the real gross national income per head since 1954 has risen by 15 per cent. the whole of the increase has been in the money economy. On the other hand, the real domestic product per head has probably fallen. In view of this fact, the 'Principles' Report declares that the most important objective must be the transformation of the subsistence economy into a cash economy.

Following the 'Principles' the government presented to the Federal Assembly the 'Development Plan 1962-65',<sup>1</sup> the forecasts of which appear to be rather optimistic in view of the current disturbed political situation.

The following table gives some of the basic data and forecasts:

TABLE 5. *Federation of Rhodesia and Nyasaland  
Development Plan, 1962-5*

	Unit	1954	1960	1961	Simple growth rate 1960-1 %	Average compound growth rate 1954-61 %	Forecast average annual compound growth rate 1961-5 %
		Current Prices					1961 Prices
Contribution to GDP by agriculture:							
Non-African . . . . .	£ million	30.9	44.3	53.3	20.0	8.0	5
African . . . . .	£ million	48.9	56.6	60.4	6.5	3.0	5
Total GDP at factor cost . . . . .	£ million	362.2	552.9	561.7	1.5	6.5	
Index of GDP at constant prices . . . . .	1954 = 100	100	142.0	146.8	3.0	6.0	
Index of gross national income at constant prices, adjusted for changes in external terms of trade . . . . .	1954 = 100	100	135.5	135.6	0.0	4.5	4.5
<i>De facto</i> population . . . . .	'000	7,160	8,320	8,520	2.5	2.5	2.5
Index of gross national income <i>per caput</i> at constant prices, adjusted for changes in the external terms of trade . . . . .	1954 = 100	100	116.7	114.0	-2.5	2.0	2.0

Source: Op. cit., p. 34.

### *Agricultural training*<sup>2</sup>

The University College of Rhodesia and Nyasaland conducts a course in agricultural economics within the Agricultural Degree course. A note on the content of the course appears as Appendix II at the end of this paper.

<sup>1</sup> Ministry of Economic Affairs, Salisbury, 1962.

<sup>2</sup> See especially, Government of Rhodesia and Nyasaland, *Farming in Rhodesia and Nyasaland*.



In addition to this advanced academic level of training there is the course offered by the Gwebi College of Agriculture, situated 18 miles from Salisbury. The College, opened in 1950, can now accommodate 70 students in the two-year Diploma course in Agriculture. The students are Europeans from the three countries of the Federation, of 18-19 years of age. The College also admits some young men from the U.K. who wish to take up farming in the Federation. It is considered desirable that students should have had some experience in agriculture before taking the Diploma course, since the diploma is orientated towards the practical needs of a man who intends making farming his career.

In the research field there is the Federal Department of Research in the Ministry of Agriculture. This concerns itself with *European* agriculture throughout the Federation and with *European and African* in Southern Rhodesia. In Southern Rhodesia there are three main regional research stations and some six supplementary ones (of which Gwebi Agricultural College is one). In Northern Rhodesia there is a modern and well-equipped research station at Mount Makulu, near Lusaka. The station, begun in 1951 with C. D. and W. funds, has facilities for soil, plant, pasture, &c., research and operates on a 2,000-acre farm.

In Northern Rhodesia, too, is the Central Research Station at Mazabuka. This concentrates on veterinary research.

There are also several research stations in Nyasaland dealing with tea, tung and tobacco.

### *Sudan*

The Sudan is almost exclusively an agricultural country with over 90 per cent. of its nearly 12 million inhabitants engaged in agriculture or animal husbandry. Some 90-95 per cent. of the value of exports is composed of exports of agricultural products and of these, cotton is of outstanding importance. In 1960, out of total exports of £S60.7 million, cotton accounted for £S32.1 million (52.9 per cent.); in 1961, with a total of £S50.1 million, cotton was valued at £S28.9 million (57.7 per cent.). (*Economic Survey 1961.*)

The increase in the gross domestic product from 1955/6 to 1960/1 in the 'traditional' and 'modern' sectors is shown in the following table:

TABLE 6. *Sudan. Gross domestic product and population*

<i>Gross domestic product</i>	1955/6	1960/1
Traditional sector (£S million) . . . . .	160.7	187.2
Modern sector (£S million) . . . . .	123.5	170.0
Total	284.2	357.2
Population ('000) . . . . .	10,365	11,928
Gross domestic product per head (£S) . . . . .	27.4	30.0

Source: *Economic Survey 1961*, pp. 16, 17.

Thus it may be seen that over the period the 'modern' part of the economy has been growing at an annual rate of  $6\frac{1}{2}$  per cent. while the 'traditional' sector has been growing at the much smaller rate of 3 per cent. per annum. As a result, total gross domestic product has been increasing at 4.7 per cent. per annum,<sup>1</sup> which, combined with a population increase of 2.8 per cent. per annum, represents an annual increase of 2 per cent. in gross domestic product per head. The relative share of agriculture, livestock, forestry and fisheries in the gross domestic product, while still dominant, has declined from 61 per cent. of the total in 1955/6 to 57 per cent. in 1960/1.

There is still room for considerable improvement in the collection of statistical information about agriculture in the Sudan and the 1961 Survey, commenting on this, stated:

In view of the dominant role of agriculture in the Sudan economy various steps towards the improvement of agricultural statistics have been taken, but the availability of reliable country-wide data would greatly depend on a national census of agriculture.<sup>2</sup>

A national census will in turn depend on there being available sufficient enumerators and statisticians in the Ministry of Agriculture and in recent years considerable efforts have been made to train the required numbers. There is at present in Khartoum a training programme for Assistant Statisticians organized by the U.S. AID Administration and training in the field is being arranged for enumerators. Until recently trainee Assistant Statisticians were sent to the Institute of Statistics at Beirut, but with the opening of the Statistical Training Centre at Addis Ababa by the U.S. Economic Commission for Africa, it is the ultimate intention that trainees should be sent to Addis Ababa exclusively. In 1961 three trainees were sent

<sup>1</sup> *The Economic Survey 1961* does not make it clear whether constant or current prices are being used, but it is believed that the *former* are in fact implied.

<sup>2</sup> *Ibid.*, p. 27.

to Beirut and the same number to the ECA Centre; in 1962 three more went to Beirut and four took the ELA course. At the present time there are three professional Statisticians in the Ministry. In addition, there is one expatriate Statistician in the Research Statistics Section of the Ministry and two trainees in the section are studying abroad.

There are some 2,500 government elementary and secondary schools in the country including 137 junior secondary and 17 secondary, but few Sudanese farmers have any formal education. At least 90 per cent. of the population over 15 years of age is illiterate, but about 17 per cent. of the children of school age are now at school, with the proportion of boys in the elementary schools considerably higher. As far as education in the agricultural field is concerned, training is provided at one secondary school and at two farm-training centres in the Gezira. There are 22 Technical Intermediate Schools with over 3,000 pupils in the Sudan, but it is not thought that agriculture forms an important part of the syllabus in any of them. At the Technical Institute in Khartoum there are 678 pupils, but there are no courses associated with agriculture. In the 'New Plan' prepared for Education in 1961 a Panel for Practical Subjects is to be set up. As the constitution of this panel is largely orientated towards agriculture it may be expected that agricultural training will play a larger role in education in the future.

The Agricultural Institute of the Ministry of Agriculture at Shambat (designed to produce a more practically-orientated product than the university graduate) offers higher education in various agricultural subjects. The institute is for technical agricultural studies, which are conducted at a rather lower level than the university—it could be considered a high technical school. A two-year course is given to secondary-school leavers and the intake is 60 boys a year. It is now proposed that the duration of the course should be increased to three years so that more subjects may be included. In that event the annual intake would be reduced to 40.

The University of Khartoum has courses for the Degree of B.Sc. (Agriculture) and B.Sc. (Veterinary Science). The number of students and graduates is as shown in Table 7 (there are no women students in these subjects).

In Agriculture, during the period 1958/9 to 1960/1, a total of 27 graduate students went abroad for post-graduate work; in the same period, 11 graduates in Veterinary Science also travelled abroad for further study.

TABLE 7. *Sudan. University of Khartoum—Agriculture and Veterinary Science students*

	1955/6	1956/7	1957/8	1958/9	1959/60	1960/1	Graduates 1960
Agriculture . . . . .	33	41	44	62	67	53	15
Veterinary Science . . . . .	16	22	22	30	42	51	9
Total . . . . .	49	63	66	92	109	104	24
Total all subjects . . . . .	722	802	839	952	1216	1375	124

Source: *Education Statistics*, pp. 64-65.

The government maintains three research stations and it is anticipated that a fourth will soon be in operation. The most important one, that at Wad Medani in the Gezira, is the headquarters of the Research Division of the Ministry of Agriculture. It conducts research not only on the Gezira project but on problems relating to increased production in other parts of the country.

#### *Future agricultural development*

The largest project in recent years has been the Managil Extension to the existing Gezira Scheme. Over one-half of the 1957/8 budget was allocated for this project. When it is completed (it is now in its final stages), nearly one million additional acres will have been added to the Sudan's irrigated area.

Other programmes include experiments for the production of grain by mechanized farming in the Kassala Province and the use of farm machinery in the wetter south.

A major project<sup>1</sup> for the future is the construction of the Roseires Dam which would store three times the volume of water in the Sennar Dam. The water from Roseires would irrigate some 1½ million acres in an extension to the Southern Gezira.

The efforts being made in the Sudan to improve agriculture substantiate the remarks of a Development Officer:

The Sudanese are alive to the need for diversification of their economy; the country is bountifully endowed by nature and has great potentials for rapid economic growth. None the less, the people are fully determined to win an uphill struggle for economic viability.<sup>2</sup>

The observer sees encouraging signs that the struggle will in fact be won.

<sup>1</sup> For an outline of future plans see *The Agricultural Economy of the Sudan*, Economic Research Service, U.S. Department of Agriculture, April 1962.

<sup>2</sup> Taha El Jack Taha, 'An Appraisal of the Sudan's Agricultural Economy', in the *Sudan Daily*, Khartoum, 5 August 1962.

*Ethiopia*

To obtain detailed statistical information on agriculture in Ethiopia is difficult—much primary research is waiting to be done.<sup>1</sup> It hardly needs saying that Ethiopia's economy depends upon agricultural production for the major part of its employment and income; for this reason it is unfortunate that excessive attention appears to be paid to the small manufacturing sector. However, in what follows an attempt is made to draw together some of the strands of the agricultural situation.

The important part played by agriculture in Ethiopia's exports is evident from the fact that out of total domestic exports of Eth. \$189.3<sup>2</sup> million in 1960, food, drink and tobacco accounted for Eth. \$138.6. Coffee is overwhelmingly important; in 1960 exports of this crop amounted to Eth. \$104.8 million.

*Education and training*

Education on a mass scale has always been and still is the by-word of the nation. Until recently, however, no special or decisive emphasis was laid on the kind of education that could best answer to the country's most immediate problems or requirements. It can still be said, nevertheless, that the general pattern of the education formerly given in our schools was to a major extent strictly academic for the mass production of clerks and similar administrative executives. . . . What the Ethiopia of today and that of tomorrow needs most acutely is not an ever growing army of clerks and other white-collar city desk-job-seekers but professionally trained hands, ready and willing to go out into the deep interior and build the country on a firm footing. . . . It is civil and mechanical engineers, doctors, physicians, architects, building engineers, agriculturalists and people of this calibre . . . that we need. . . .<sup>3</sup>

Perhaps it is an indication of the regard in which agriculture is held that it should be placed last in the list. . . . But what the writer has to say about the past tendencies of Ethiopian education is correct;

<sup>1</sup> In a summary of the 'Results of an Agricultural Sample Survey in Shoa Province' (published in *Ethiopian Economic Review*, August 1961) the authors stated: 'For an initial coverage of Ethiopia a plan was drawn up to select 149 sub-districts out of a total of 1,142. Because of the lack of a special budget, personnel and equipment, the work was limited to Shoa only. . . .' Again, a paper on 'Statistical Services in Ethiopia', presented to the Conference of African Statisticians organized by UNECA in Addis Ababa in 1959, complained that: 'although agriculture plays the predominant role in the national economy, data on land utilization, crop area and yields, livestock and agricultural households in general are lacking. Only tentative estimates of agricultural production and livestock population are available' (*Ethiopian Economic Review*, December 1959, p. 20). One of the best sources of information is FAO, *Agriculture in Ethiopia*.

<sup>2</sup> The rate of exchange is approximately Eth. \$7 = £1 and Eth. \$2.5 = U.S. \$1.

<sup>3</sup> Teshome Adera, 'Time for a Better Outlook in our Educational System', in the *Ethiopian Herald*, 2 August 1962.

throughout its eleven years of existence as a separate institution the University College of Addis Ababa, for instance, ignored agriculture completely.

But there *are* signs that a greater realization of the importance of agriculture is dawning and perhaps one of the initial indications of this was the stress laid upon agriculture by the Emperor on his return from journeying at the end of 1959. The Emperor's requirements from the people are paraphrased by the Editor of the *Ethiopian Economic Review*:<sup>1</sup>

The main directives for the people are clearly given in the charges laid upon them by His Imperial Majesty. They are that the people, in pursuit of the aim of satisfying their material needs, must invigorate their energy, eradicate idleness, generate an increasing desire for more and better things, and so to elevate their standard of living that it will rise to that of other peoples, eventually providing enough to be able to spare for others. In this pursuit it is necessary for the people to struggle and to make sacrifices, to brace themselves for hard work, to eschew idleness and to pool their resources so as to enable them to take a competitive part in the commercial and economic activities of the Empire. Included in the practical measures to be employed towards fulfilment of these directives are efficiency of cultivation, irrigation of the land, the planting of oil seeds, re-forestation of denuded hills and mountains, the proper tending of livestock, the exercise of thrift, co-operation one with another, and profitable use of the products of labour.

And in the words of the Emperor himself:<sup>2</sup>

As We have already made it clear to you in Our previous statement, capital is an essential prerequisite for initiating all under-takings, whatever their nature. We have, therefore, made credit available for you which, when properly used, would enable you to achieve your development objectives in the fields of agriculture, forestry, stock breeding, health services, and in the sphere of other development programmes.

For those of you who possess the land and labour but lack capital, We have made credit available at low interest. For those of you who have the necessary finance but do not possess land to work on, We have, in accordance with Our proclamation which entitled every Ethiopian to ownership of land, established offices in every province through which you may be able to acquire land. Those who have neither land nor money will be granted land and a financial loan at low interest. For those of you who possess land, who have financial resources and man-power—We have made experts available to furnish you with the necessary guidance and advice in your various undertakings. With the knowledge that unity and co-operation are in themselves strength, take advantage of the possibilities that We have opened to you.

The loans will be granted for a period of five years at a rate of

<sup>1</sup> No. 1, December 1959, p. 1.

<sup>2</sup> *Ibid.*, pp. 1-2.

interest of  $2\frac{1}{2}$  per cent. per annum. In each province 'a committee of twelve men, selected for their integrity, loyalty and responsibility, will arrange for the grant to, and the repayment of loans by, those for whom they are approved'.

In furtherance of the Emperor's announced intentions regarding agriculture, an Agricultural Development Board was established in 1960. A special three-man technical group to conduct the necessary surveys for the land reform scheme was also formed and a sum of Eth. \$5 million allocated for the farm credit scheme for the first operating year.<sup>1</sup> In the second year, 1961, the sum available for credits was increased to Eth. \$6 million and in the first half of the year one-third of this had actually been lent at the stipulated rate of interest of  $2\frac{1}{2}$  per cent. In addition to the three categories of persons eligible to participate in the Scheme, the Plan now provides that

those who desire to establish agricultural development companies or co-operatives or those individuals who desire to organise mechanical farming, will be given tractors and farm machinery on credit re-payable on a long term basis.<sup>2</sup>

The First Five-Year Plan of Ethiopia, 1957-61, was extended for one year and the Second Five-Year Plan was launched in September 1962. Details are not available, but it is known that special emphasis is to be laid on agricultural schemes such as the Awasa Co-operative Farm.<sup>3</sup>

It was mentioned above that the University of Addis Ababa had not included agriculture in its syllabus. However, in 1961 the College was amalgamated with, *inter alia*, the College of Agricultural and Mechanical Arts, Alemaya, to form the Haile Selassie I University.<sup>4</sup> Before the amalgamation the College of Agricultural and Mechanical Arts had provided in-service training for extension workers in the Department of Agriculture; some doubt was expressed in Ethiopia as to whether it would be possible to carry on with this training after the amalgamation.

Finally, it is of interest to note the impact of the U.S. AID Mission in the field of agriculture. Over the 10-year period 1952-61 a total of

<sup>1</sup> *Ethiopian Economic Review*, June 1960, p. 33.

<sup>2</sup> *Ibid.*, November 1960, p. 45.

<sup>3</sup> *Ibid.*, February 1962, p. 59.

<sup>4</sup> *Ibid.*, pp. 52-53. The College of Agricultural and Mechanical Arts had been founded in 1958 under an agreement between the Ethiopian and the U.S.A. Governments. The purpose of the college was to 'develop and carry out a national programme of agricultural education, research and extension work among the Ethiopian farmers'. 1961/2 enrolment was 204; by that date 188 students had graduated with a B.Sc. Degree.

almost U.S.\$100 million has been offered to Ethiopia by the United States. This includes U.S.\$7 million-worth of Agricultural Commodity Grants. The Grant Assistance has been allocated as follows:

TABLE 8. *Ethiopia. U.S. Economic Grant Assistance to Ethiopia, 1952-61*

	U.S. \$'000
Alemaya College of Agricultural and Mechanical Arts and Jimma Agricultural Technical School . . . . .	9,060
Agricultural Development . . . . .	4,937
Blue Nile River Basin Investigation . . . . .	3,190
Water Resources Development . . . . .	1,273
Mapping and Geography . . . . .	422
Surplus Agricultural Commodity Assistance (Sec. 402) . . . . .	2,608
Total for Agriculture and Associated Objectives . . . . .	<u>21,490</u>
Other Economic Grant Assistance . . . . .	23,503
Total Economic Grant Assistance . . . . .	44,993
Total Loans . . . . .	47,280
Agricultural Commodity Grants . . . . .	6,900
Total U.S. Assistance . . . . .	<u>99,173</u>

Source: *Ethiopian Economic Review*, August 1961, p. 48.

Emphasis of the Point IV programme has been on agriculture, education and public health, which together accounted for 60 per cent. of the total. In the field of training, over 600 Ethiopians participated in foreign training programmes sponsored by the two governments at a total cost of nearly U.S.\$5 million. Of the total sent abroad for training, 128 followed courses in agriculture. One criticism that is made about U.S. aid in the agricultural field (and, indeed, Czech aid also; the Yugoslavs appear to have been the most successful with their venture into co-operative farming at Awasa) is that too much of it is not appropriate to Ethiopian conditions. Some of the schemes which have been attempted (e.g. vegetables and poultry) have been failures because, while perfectly suited to the U.S.A., they were far too demanding both in capital and skill to be successful in Ethiopian conditions. It might have been better to have concentrated attention on the improvement of the existing *main* crops (e.g. coffee) and live-stock. Some consider, too, that a somewhat similar mistake has been made in sending trainees abroad to take four-year agricultural courses when what is really wanted in Ethiopia is a 'crash programme' to train large numbers of agricultural extension workers at a *lower* level than that of the professional agriculturalist. A remedial measure is now being taken by assistance being provided for the establishment of three farm institutes to train farmers at 'grass-roots' level.



A final word must be said on the vast Awasa Valley Project. Estimates have been made showing that some 400,000 hectares (1 million acres) may be suitable for irrigation and plantation. Already the construction work for the first major irrigation project at Aussa Oasis is being carried out to develop 4,000 hectares on a pilot basis which is supposed to permit the settlement of between 180,000 and 200,000 people. The settlement of this area, plus a later 100,000 acres, will be based on the cultivation of cotton and it is estimated that between one-half and two-thirds of the cotton ultimately required by Ethiopia will be produced here. With a return of Eth. \$850 to Eth. \$900 per hectare for cotton, plus anything between Eth. \$150 and Eth. \$750 per hectare from other cash crops and stock, the project is expected to add Eth. \$150 to Eth. \$200 million per annum—a gross return of 11 to 15 per cent. on the total investment in the 30-year programme. Perhaps a group of students at the Imperial Ethiopian Institute of Public Administration had some grounds for their optimism when they wrote in a seminar paper:

The country has over 55 million hectares of cultivable land of which only 7.5 million are under partial cultivation. Thus the country's potentiality is tremendous and if it is effectively utilized, it will undoubtedly provide more food to the native population, more raw materials to the manufacturing industries and a large surplus for export.

### *Madagascar*<sup>1</sup>

Madagascar, like the other countries in this report, is primarily agricultural: 85 per cent. of the population of 5.3 million earns its living from agriculture and agriculture provides 93 per cent. of total exports. In 1960 the four main exports of coffee (32 per cent.), vanilla (9 per cent.), sugar (7½ per cent.) and rice (6½ per cent.) accounted for over half the country's exports.

The growth of agricultural production followed a remarkably regular pattern from 1950 to 1958, increasing, at 1960 constant prices, by 34 per cent. Following the cyclone in 1958, however, production fell below the 1958 level, but by 1960 it had risen to 43 per cent. above 1950<sup>2</sup> and at CFA<sup>3</sup> (1960) 36,370 milliard it was CFA (1960) 10,210 milliard above 1950. The rate of growth of agricultural production

<sup>1</sup> Much of the information on which this section is based comes from *Rapport sur le Développement de Madagascar*, published by the Commissariat Général au Plan, Tananarive, October 1962. The translations are the writer's.

<sup>2</sup> Strictly speaking, the average of 1949, 1950 and 1951.

<sup>3</sup> CFA 688 = £1 and CFA 245 = \$1.

has thus been 3.7 per cent. per annum, which compares favourably with the rate of growth of population of 2.3 per cent. Fishing, on the other hand, which is about one-third as important as agriculture, has done comparatively poorly, increasing by only 7 per cent. over the period.

Yet despite the improvement in agricultural production, agricultural income remains very low; in 1960 it worked out at CFA 9,800 per head of the agricultural population (including the imputed value of subsistence consumption). There is one favourable factor—the diversity of agricultural products which are grown on the island—a factor which should be of considerable importance for the future development of the country. Rice, for instance, the basic food crop, constitutes no more than 43 per cent. of total production; then comes coffee with 14 per cent., sugar-cane with 6 per cent., manioc with 5 per cent. and more than a dozen other products each of which contributes between 1 per cent. and 3 per cent. of the total output.

Madagascar is just starting a period of planned development (1963–67–72). It appears from the information so far published that there is no tendency to underestimate the part agriculture has to play in this process. For instance, the beginning of the Plan states:

Contrary to the opinion widely held, it is through a direct complementarity between agriculture and industry and not through agriculture alone or industry alone will development be assured.<sup>1</sup>

and again:

At the present time, the most serious prospects for industrial development concern in part the transformation of agricultural products. In other words, industrial development is directly linked with agricultural development.<sup>2</sup>

Table 9 shows 1961 production of certain important agricultural commodities together with the 1972 objective.

### *Education and training*

Until recently teaching in the agricultural field has been mainly for the needs of the government administration; it neglected the needs of the country for training on a lower level. The standard of training has been low and the numbers quite insufficient for the needs. It is true to say, too, that agricultural training has fallen behind other education at an elementary or secondary level. Some of the problems are now being overcome as a result of the creation in April 1961 of the

<sup>1</sup> Op. cit., p. 5.

<sup>2</sup> Op. cit., p. 38.

Ambatobe Rural College. The intention is that the College should be followed by the transformation of the schools of practical agriculture in the country into schools of *rural* studies; the end in view is the greater contact between different disciplines.

TABLE 9. *Madagascar. The Plan for Agriculture 1961 actual and 1972 objective*

	1961 Production		1972 Objective	
	Quantity ('000 metric tons)	Value (CFA million)	Quantity ('000 metric tons)	Value (CFA million)
Rice . . . . .	1,200	14,500	1,680	20,250
Coffee . . . . .	55	4,700	70	5,950
Sugar . . . . .	85	1,700	140	2,800
Manioc . . . . .	750	1,875	1,050	2,620
Other crops . . . . .		10,675		25,030
Total crops . . . . .	..	33,450	..	56,650
Livestock . . . . .	..	10,530	..	25,310
Fisheries . . . . .	..	750	..	3,860
Forestry . . . . .	..	2,850	..	3,850
Total . . . . .	..	47,570	..	89,670

Source: Op. cit., p. 39.

The following table gives a summary of the facilities available for training in agriculture at a level lower than that of the university:

TABLE 10. *Madagascar. Training in Agriculture*

	Graduate pupils in period		Following courses 1960/1
	1950-60	1950-60	1960/1
School of Practical Agriculture . . . . .	1950-60	300	96
Agricultural High School . . . . .	1950-4	17	—
College of Agriculture . . . . .	1954-60	48	—
Veterinary Assistants' School . . . . .	1957-60	69	29
Angavokely School of Forestry . . . . .	1950-5	138	—
School of Forestry . . . . .	1955-60	145	31
Barres School of Forestry . . . . .	1955-60	15	—
Total . . . . .		732	156

Source: Op. cit., Annex III.

As for the University of Madagascar, one of its associated Institutes is the National School of Agricultural Applied Science (L'École Nationale des Sciences Appliquées à l'Agriculture) which was created in July 1961 and opened in October 1962. It is not known how many

students are following courses at the Institute in its first year, but in 1960/1, 14 Malagasy students were in French universities studying agriculture and 7 studying veterinary science (all on grants). It is to be expected that in the future most of those who would in the past have gone to France will now go to the University Institute in Madagascar.

Finally a word on agricultural research. As Monsieur N. Heseltine expressed it:

Two possible solutions present themselves: (1) to preserve as long as possible the structure, orientation, the personnel and the budgetary provisions established by the former metropolitan power, or to convert these services so as to link them as directly as possible with the economic development of the country, and eventually to obtain the greatest possible participation of the Malagasy people.<sup>1</sup>

And, for a number of fairly obvious reasons, the latter solution to the problem of how research was to be conducted in the future was proposed.<sup>2</sup>

But the base is hardly yet prepared for elaborate research in Madagascar. Price surveys are being conducted for mapping and sample surveys of villages to ascertain the *facts* of production, &c. Much work remains to be done. Indeed there is unlimited scope in Madagascar for the activities of the Agricultural Economist.

<sup>1</sup> N. Heseltine, *Projet de plan intérimaire de développement agricole à Madagascar, 1961*, p. 101.

<sup>2</sup> One other useful proposal was made: that Madagascar should adopt the Marketing Board ('Offices de Commercialisation') technique as practised in Ghana, Nigeria and Kenya.

## APPENDIX I

TABLE II. *Relative Importance of Intra-African Trade*  
(absolute figures, 1960)

(percentage figures, averages, 1957-9)

	Imports		Exports	
	% of total imports obtained from African countries	Value \$ mil.	% of total exports consigned to African countries	Value \$ mil.
East Africa . . . . .	6.0	160.0	8.0	18.3
Ethiopia . . . . .	5.4	21.8	10.9	2.2
Federation of Rhodesia and Nyasaland . . . . .	36.9	192.5	1.2	46.7
Ghana . . . . .	3.3	46.6	2.2	12.7
Madagascar . . . . .	6.1	94.1	16.5	7.3
Nigeria . . . . .	6.2	9.4	1.7	5.2
Sudan . . . . .	11.6	221.5	11.3	9.3
Total . . . . .	(15.5)*	745.9	(4.8)†	101.7

Source: *UNECA Foreign Trade Newsletter*, No. 3, Dec. 1962,  
Tables 1, 2 and 3.

\* Average weighted by value of imports from African countries 1960.

† Average weighted by value of exports consigned to African countries 1960.

## APPENDIX II

*The Teaching of Agricultural Economics at the University College of Rhodesia and Nyasaland, Salisbury, Southern Rhodesia*

The London Degree of B.Sc. (Agriculture) with Honours is offered at the University College of Rhodesia and Nyasaland in Salisbury. The subjects and sequence of examinations for the degree are as follows:

<i>Part I</i>	<i>Part II</i>	<i>Part III</i>
Botany	Economics	Agric. Chemistry
Chemistry	Soil Science	Agric. Botany
Zoology		Crop Husbandry
		Animal Physiology
		Animal Husbandry
		Agric. Engineering
		Farm Organization
		Agric. Economics

The Parts indicated are examined at the end of the First, Second and Third years, respectively.

The Syllabuses for Economics papers are as follows:

Economics  
Farm Organization and Management  
Agricultural Economics  
(details appear below)

Farm visits are arranged in the last-named subject by the Department of Agriculture in the University.

The First Year course in Economics is based on the generally accepted topics of economics in English-speaking countries, with local references where pertinent. Textbooks used are Benham and Samuelson.

The Second Year course is taken as a study in Applied Economics. It includes a brief survey of the history of agriculture, prices and incomes in the U.K. and U.S.A., marketing in the Central African Federation and the problems of African agriculture. There are no special books suitable for the course, and a wide range of sources must be used.

The Farm Organization course is based on a theory background of the Iowa type plus a short course in practical book-keeping. Farm visits are then used to isolate problems, which are then written up and presented in a discussion group.

The course opened in 1958 and enrolments to date are as follows:

	<i>Part I</i>	<i>Part II</i>	<i>Part III</i>	<i>Total</i>
1958	7	..	..	7
1959	4	2	..	6
1960	5	2	2	9
1961	5	2	1	8
1962	5	4	2	11
	26	10	5	41

Details of courses are as follows:

*Economics*

Economics as a social science and its relation to the natural sciences.  
Definition of principal economic terms.  
The price mechanism. The determinants of supply and demand.  
Comparative advantages. The laws of increasing and diminishing returns.  
Elements of international trade.  
Economic characteristics of the factors of production: land, labour, capital, management and organization.  
Distribution of net outputs: wages, rent, interest and profit.  
Nature and functions of money. The problem of saving and investment.  
The concept of economic growth.  
Economic activities of the State.

*Farm Organization and Management*

Land Conservation: principles, practices and legislation in relation to land use and farm management.  
Farm Planning: policy and operation. Physical and economic efficiency.  
The Farm as a business unit. Records and accounts. Methods of analysis.  
Budgeting.

*Agricultural Economics*

Agriculture in the national economy.  
Development, structure and organization of agriculture in Central and Southern Africa.  
Economics of production and marketing of agricultural products.  
Agricultural prices.  
State policy affecting agriculture.

PRINTED IN GREAT BRITAIN  
AT THE UNIVERSITY PRESS, OXFORD  
BY VIVIAN RIDLER  
PRINTER TO THE UNIVERSITY



## *Volume II*

- No. 1. REDISTRIBUTION OF FARM LAND IN SEVEN COUNTRIES (*January 1955*)
- No. 2. (with supplement). AGRICULTURE AND FORESTRY: COMPETITION OR COEXISTENCE? (*June 1955*)
- No. 3. CAPITAL AND CREDIT IN AGRICULTURE: DENMARK, NORWAY, SWEDEN, UNITED KINGDOM (*July 1957*)
- No. 4. (with supplement). CAPITAL AND CREDIT IN AGRICULTURE:  
AUSTRALIA, W. GERMANY, GREECE, ITALY, JAPAN, YUGOSLAVIA, THE NETHERLANDS (*January 1958*)
- No. 5. THE ECONOMICS OF WATER SUPPLY AND CONTROL:  
NORWAY, PORTUGAL, U.S.A., LEBANON (*June 1959*)
- No. 6. THE ECONOMICS OF WATER SUPPLY AND CONTROL:  
JORDAN, IRAN, PERU, POLAND (*May 1960*)

## *Volume III*

- No. 1. THE ECONOMICS OF WATER SUPPLY AND CONTROL:  
CANADA, EGYPT, DENMARK (*January 1961*)
- No. 2. THE ROLE OF AGRICULTURE IN ECONOMIC DEVELOPMENT (*April 1961*)
- No. 3. CONTEMPORARY PROBLEMS IN THE ECONOMICS OF AGRICULTURE (*September 1962*)
- No. 4. THE ECONOMICS OF WATER SUPPLY AND CONTROL:  
GREECE, ITALY (*January 1963*)
- No. 5. AGRICULTURE AND THE EUROPEAN COMMON MARKET (I) (*June 1963*)
- No. 6. AGRICULTURE AND THE EUROPEAN COMMON MARKET (II) (*August 1963*)

## *Volume IV*

- No. 1. THE ECONOMICS OF WATER SUPPLY AND CONTROL:  
PAKISTAN, INDIA (*October 1963*)
- No. 2. AGRICULTURE AND THE EUROPEAN COMMON MARKET (III) (*April 1964*)
- No. 3. (Special Conference Number)  
DISPARITIES IN PACE AND FORM OF RURAL DEVELOPMENT (*May 1964*)

PRINTED IN GREAT BRITAIN.  
AT THE UNIVERSITY PRESS, OXFORD  
BY VIVIAN RIDLER  
PRINTER TO THE UNIVERSITY