DEVELOPMENT IN ZIMBABWE

'Education is the hammer of skill'

The Role of the University

A Lecture Series at the University of Oslo
June 1 st — June 8 th, 1983

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FOREWORD

This is a compilation of a series of lectures given at the University of Oslo in June 1983 by staff members of the University of Zimbabwe. They participated in a delegation to the University of Oslo to explore the opportunities for building academic contacts between individuals and departments at the two Universities. Their visit constituted one important step in a long process of developing the content and format of a collaborative program between the University of Oslo and the University of Zimbabwe, the first "case" in the general efforts of the University of Oslo to establish new forms of academic cooperation with the third world.

It was felt natural at the time of this first extended visit from Zimbabwe that the 9 members of the delegation should provide information about the current activities and plans of their respective departments/faculties. The lectures were given over five consecutive days and were open to anyone interested. All contributors agreed to the proposal of having the lectures distributed afterwards, first and foremost at the University of Oslo as a contribution to the mutual exchange of information among staff and students.

Due to logistic and administrative reasons it took much longer that intended to get the various papers ready for presentation. In the period that has passed, many developments have taken place at the rapidly expanding University of Zimbabwe. The papers should therefore not be taken as reflecting the situation today in all aspects. Nevertheless, the broad lines of the basic philosophy of and challenges to the University of Zimbabwe are well reflected in the papers even if certain specific informations may be somewhat outdated.

Agriculture and Development

Mr. D.H.Hale, lecturer, Faculty of Agriculture

I would like to use this opportunity to thank RIU for bringing me here to the University of Oslo. I think this is a very altruistic action considering the lack of any agricultural faculty at this University. I have been left to do my own thing, so to speak - and it has been a really magnificent opportunity. I have met many people in a wide range of organisations and institutions. My visit has been constructive, instructive, interesting and enjoyable and I have met many delightful, hospitable and helpful people. I am very grateful for the opportunity.

My present brief is to discuss the role of the Faculty of Agriculture at the University of Zimbabwe in the development of the country. To a certain extent this role is self-evident. No development can take place in any country unless there is development of agriculture. Agriculture is one of the primary producing sectors of the economy. Its secondary and tertiary sectors cannot develop without a firm foundation in its primary areas. Unless Zimbabwe produces adequate food to feed its people and enough agricultural products to export and generate income in the form of foreign exchange, the country's development will falter.

The importance of agriculture has not been recognised long at the University of Zimbabwe. To illustrate this point I shall outline the history of the development of the Faculty of Agriculture. The University College of Rhodesia and Nyasaland opened its doors in 1957. The college was formed through a special aggreement with the University of London. A London degree in agriculture was offered,

based on a degree offered at Wye College. This was a three year honours degree with no specialisation, aimed at producing general agriculturalists. There was no practical farming component in the degree structure. It was assumed that students already had an adequate practical background, upon which the theoretical lectures could be based.

At that time agriculture was taught at a Department of Agriculture - a single department within the Faculty of Science. This indicates the minor importance attached to agriculture. As a single department within a large faculty, the ability of Agriculture to bid for funds and staff increases was severely limited.

This situation prevailed until the special aggreement between the University of Zimbabwe and the University of London was broken off. This took place in 1970, when substantial changes were made in the curriculum of the University of Zimbabwe. Some specialisation was provided for in the new degree structure. Graduates were still general agriculturalists, but would in addition also specialise in the fields of animal production, crop production, soil science or agricultural economics. A general degree in agricultural production was also retained as an option.

Inspite of these changes and much discussion, agriculture remained a small department within the Faculty of Science, with very limited resources for teaching and research.

The major reason for these restrictions was the small number of students. Only between five and eight students registered to study agriculture each year. To a considerable extent this was because many of our potential students of agriculture were the sons of commercial farmers. Their parents were well off, and they wanted to travel and see the world. Most of them went to South Africa for training, or overseas to universities in Britain or the U.S.A. Few wanted to attend a local institution with very much lower prestige.

However, with the increase in the number of graduates from schools in Zimbabwe, interest in agricultural studies grew among aspiring university students. The number of students increased to fifteen a year between 1976 and 1979. This strengthened the case of agri-

culture in its bid for recognition as an independent discipline of vital importance for the country.

Initially a School of Agriculture was formed, still within the Faculty of Science. This rapidly developed into an autonomous Faculty of Agriculture, comprising three departments, which was founded in 1980.

The Faculty of Agriculture is thus fairly young, though agricultural education at a university level has been long established. At the moment, it is a small faculty, with an establishment of 24 members of staff, 8 within each department. There is a department of Animal Science, which is my particular interest; a Department of Crop Science; and a third Department of Land Management. The Department of Land Management comprises the disciplines of Agricultural Economics, Soil Science and Agricultural Engineering. Any further development will probably involve the seperation of these three disciplines into independent departments.

The student intake of the Faculty of Agriculture has increased at an explosive rate. Whereas in 1979 we admitted fifteen students, this year (1983) we had a target of 50 students as an annual intake. The faculty was forced to accept 60 students, because of tremendous pressure for places within agricultural studies. This represents a four-fold increase in student numbers inside of three years. Of course, this strains our resources, particularly as many of our courses have extensive practical components. This imposes great pressures upon staff involved in teaching agriculture.

The Faculty of Agriculture has always been conscious of its need to remain in tune with the requirements of the country. Last year, at the request of the Faculty of Agriculture, the Vice-Chancellor of the University, Professor Kamba, established a Faculty Review Committee, which comprised a team of international experts - authorities in the fields of Animal Science, Crop Science, Soil Science and Economics, drawn from all continents. The Committee was briefed to advise and discuss the proposed programmes of development of the Faculty of Agriculture, to discuss our teaching programmes, to discuss linkages with other organisations in the country. The Committee provided us with some very solid recommendations.

This year we hope to acquire and develop our own university farm which will provide a resource base for our teaching and research.

At present we have an annual intake of 60 students, whose specialisation options tend to be distributed fairly evenly between our three departments. Our degree structure is as follows:

It is a three year degree, offering the following options: Animal Science, Crop Science, Soil Science and Economics. Within each option we offer a number of biases. For example, the option of Animal Science includes a Production or Research bias, for students who will be engaged in agricultural production in the field, or in agricultural research at research stations. There is also a Commerce bias, designed for students going into food trade and food sciences.

Within Crop Sciences there are two options: The Agronomy option, which is production oriented and intended for people going out into the field to advise on procedures for crop production. In addition there is a more specialised Research option.

The Land Management students studying Soil Science have their own course. They specialise early in their university degree, receiving a very high input of chemistry in their first year. In fact, Soil Science relies heavily on both the Faculty of Science and the Faculty of Agriculture for teaching inputs.

Economics is an area of growing interest, involved in close co-operation with government organisations, and often called upon to carry out investigations of agricultural policy. It also relies heavily on teaching inputs from the Economics department within the Faculty of Social Studies.

As far as actual course content goes, I shall illustrate one particular option, Animal Science. All Crop Science and Animal Science students do the same course in their first year. This encompases Soil Fertility, Crop Science and Genetics, Agricultural Microbiology and Entomology, Animal Science, Agricultural Biochemistry, and Economic Principles.

These are the basic courses of agriculture. To provide a well rounded graduate, we believe that exposure to all these disciplines is absolutely vital.

In the second year, our students take courses which are more applied to the Animal Science option. These are still very basic courses in Animal Science and crop Production. We teach Animal Microbiology, Nutritional Biochemistry, Animal Physiology, and ours students also take Crop Production, Grassland Science and Biometry. This course structure provides our students with a solid base in biology, which we consider absolutely essential for them - whatever their career is going to be when they leave the university: Whether they are going to research, extension, food industry.

In the third year we allow the students a degree of choice. Up to the end of the second year in Animal Science we allow no choice at all, because we consider that the students as yet lack adequate experience in agriculture to have a clear idea of what the subjects are about. We have had programmes in the past where choice was allowed at the beginning of part II, and our experience is that the students tend to make their choices for the totally wrong reasons. This is why we have changed the degree structure so that choice of courses now is confined to the third year.

In the third year we have a core of four courses: Animal Production, Farm Management, Livestock Improvement and Animal Health. These are taken by all Animal Science students. Additionally, there is a wide range of courses among which the students must elect to do two. The courses are Agricultural Economics, Food Microbiology, a further Crop Production course, a further Animal Production course, Animal Experimentation, Agricultural Engineering and Mechanisation and Extension and Communication. Two other courses are offered. These are project courses, which include only project work involving advanced studies, and the use of techniques and proceedures which students have acquired during their previous training. We recommend these to students who are likely to go in for research after graduating. This gives them experience in experimental procedures, in the acquisition, treatment and interpretation of data.

Thus the degree structure in the first two years is fairly rigid but there is a wide range of choice in the final year. Our objective is to produce a well rounded student. We are in the business of producing agriculturalists first, and animal and crop scientists second. We consider this to be the kind of graduate that the country needs. It is all very well to produce somebody who is a highly specialised animal scientist, but the first problem he is going to meet in his work is sure to be a problem of crop production. It is absolutely vital that we produce agriculturalists who are versatile and able to stand on their own two feet.

Our degree structure at present is primarily a theoretical training with very little practical agricultural input. In the third year we show students a wide range of commercial farming conditions, by taking students to farms, showing them enterprises, about which they later have to write analytical and critical reports. They have to make suggestions as to how management procedures can be improved. They have to discuss how principles are related to practice and why, in some cases, some principles are not applied. This has proved to be a very popular and effective way of relating theory to practice.

However, even with this type of input, critisism has been made of our students that they lack the basic skills of agriculture and an adequate practical background. This is something that has developed with the change in the type of students we have been getting. When our students all came from a practical farming background, there was no problem. With our rapid expansion in students numbers a large proportion of our students now come from entirely urban backgrounds. They have no real experience of agriculture. Some of our students do indeed come from rural backgrounds, but the type of agriculture they are exposed to is very limited. They might know a little about herding cattle, sheep and goats, but they know very little about modern techniques of growing crops and managing animals. They have serious conceptual difficulties in relating the theory of lectures to the practices carried out in the real world of agriculture.

Our first idea to rectify this problem was to extend our degree programme to four years. For one of those years the students would go to one of the governmental agricultural colleges for one year's

practical training. Chibero Agricultural College was identified as being a suitable base for this, and discussions went ahead, projects were put forward and everything was agreed. However, Chibero is a government training college and the government has a large need for diploma-level agriculturalists. The government proposed doubling the student intakes at Chibero. Additionally, the Faculty of apprciated that this approach would not work. We would have too many students at Chibero at any one time, all trying to get practical experience.

One of the primary conclusions of our Faculty Review Comittee was that the Universety should accept the responsebility of providing the practical training itself. We now all agree on this, and we have discussed how to do it at great lengths. We intend to have our own universety farm, and will provide practical training during the degree programme which may or may not be expanded to four years.

We also intend to place at least some of our students in approved work environments. This is of course going to involve a very substantial degree of co-ordination and we have to look for additional staff to cope.

We have identified a farm, it is available for the university to purchase, we simply need 2.5 million dollars to get it off the ground. A small problem! But I think we can crack that one.

What happens to our students? We certainly have no difficulty in finding jobs for them. They are well received in the agricultural industry with the provisio of this criticism that they are lacking in practical experience. It is estimated that there are employment opportunities for up to 75 agriculturalists every year. A large proportion of these posts are in the Ministry of Agriculture, particularly in that section of the Ministry which is concerned with extension both to the commercial sector of agriculture and the communal sector. There have been difficulties this year in that the budgetary constraints have affected that sector of employment. There has been no money to sustain their established posts. For the first six months we had a problem with our students being under-employed, being used as school teachers and so on, which is very wasteful of agricultural graduates. With the emphasis

on agricultural graduates. With the emphasis on agriculture throughout the country I think this is a short term problem, and I think we will resolve it.

So the extension services then account for a large proportion of our students. Additionally, The Department of Research and Specialist Services - that government organisation which is concerned with carrying out research to underpin the agricultural industry, absorbs many of our students. Our students have, over the decades, performed very well in this area. Many of them have come back to the university to take further degrees while still working on Government research stations and organisations. This has proved very useful in terms of research and co-operation.

Commerce has taken a substantial proportion of our students, some of them in fact have not remained in areas of commerce related to agriculture. They have gone on to other things. Our students are so broadly trained in useful disciplines that they can take on a wide range of challenges. Unfortunately, some of them are then lost to the industry because of that. Certainly, there is no problem in finding jobs for our students.

Post-graduate training. The university, having no farm, has fairly limited facilities to undertake post-graduate research, particularly in Animal Science. To a large extent, people wanting to do post-graduate qualifications through the Faculty of Agriculture have had, in the past, to find their own resources. People on government research stations have approached us with a proposal for a research project and the Department has been able to provide supervision and direction for a higher degree. This has maintained the close relationship between the universety and the research stations, and we have trained a good range of post-graduate students.

However, there is the criticism that the universety does not gain all that much from these post-graduate students. We never have them in the campus to help us with our heavy teaching loads. So the university provides the service of supervision for these degrees, which comprises a fairly heavy work load, and we have

in return joint research projects on the various research stations. We are now attempting to develop facilities on campus to allow us to bring these post-graduates into our Departments so that they can provide teaching assistance. This is very important, not only for us, but also for themselves. Teaching experience is very important for post-graduate students.

Apart from that, the Department of Animal Science in conjunction with the Faculty of Science with the MSc course in Food Science, hope in the very near future to develop another MSc programme in Animal Production. We think this is an area where there is a substantial amount of interest for post-graduate training through course work.

Research in the Faculty of Agriculture as it has developed from the Department of Agriculture, has a long and very meritorious history. The Department, and subsequently the Faculty, has made substantial contributions to research in Zimbabwe, very largely through its supervision of its post-graduate students. The lack of facilities which has been a severe problem within the faculty, have been very much made up for by our ability to exploit the government research stations. We have been able to provide additional expertise to assist government research workers in their research programmes.

Research programmes in the Department of Crop Science include Plant Breeding and Genetics. There is a very active programme going on in Crop Protection and Pathology, and the development perhaps into post harvest technology is, I think, not far away. Entemology:there is extensive programmes in theexamination of pheromones and perhaps the exploitation of pheromones to control insect populations.
Crop Physiology: one of our major problems are the periodic droughts which we are facing at the moment and there are programmes going on in the Departmentof Crop Science to look at the influence of droughts on crop physiology. The importance of seed priming is another area of investigation.
Pasture Science: One research programme is the examination of species of grass which have the ability to fix atmospheric nitrogen and form it into protein. This is of immense interest to us as animal scientists, because one of the major constraints

of animal production in Zimbabwe is the protein deficiency of pastures which animals graze during winter.
Crop Production: The casava programme is a major research area within the Department.

As far as the Animal Science Department is concerned, our research interests lie in the areas of nutrition of farm animals, and in particular the nutrition of cattle, particularly of beef cattle. Some of the definitive work on the use of high energy feeds for the finishing of the beef cattle in maize producing areas have been carried out within the Department of Agriculture.

My own interests are in the endocrinology of bovine infertility. One of the major constraints of the beef industry is the number of calves produced per 100 cows per year. This is my particular avenue of interest.

Animal Feeding and Nutrition research is carried out within the department, and we are now starting to examine the potential for production from local breeds of sheep and goats. We have well established programmes of examining parasitology in sheep and goats, but the new projects are being established to have a look at just how we can use the indigenous breeds of sheep and goats, and their apparent resistance to internal and external parasites.

Climate physiology in poultry is another area of research in Animal Science.

In all these research programmes though, the close linkage with the Department of Research and Specialist Services of the Ministry of Agriculture has been of pre-eminence.

The Department of Land Management, the third department, has been called on a comission basis to examine specific development programmes and problems of the Government in the Ministry of Agriculture, and this department has involved itself very heavily in problems of the peasant sector. The Department is primarily concerned with the acquisition of information about the constraints which limit production in the peasant sector. There

are surveys looking at the effect of production of cotton on the peasant farmer economy. Then the Department is involved in studies on wage and price policy in agriculture. The Soil Science people are involved in classification of soils.

Smallholder irrigation systems have been studied. Environmental impact studies have examined the effects of dam building on the Zambezi Valley, and on all other resources within the Valley. Agricultural marketing policies are being examined.

To conclude then, what are we trying to do - where are we going? Agriculture in Zimbabwe is characterised by marked dichotomy between the fairly efficient commercial sector and the very undeveloped small scale sector. The Faculty of Agriculture has to face this dichotomy and the problems involved in it. We have to appreciate that a large part of our research impetus must be towards the small scale sector. However, I think it would be very short sighted of us if we did this to the detriment of our provision of an infrastructure to the commercial sector, because the commercial sector is so important in the national economy and the provision of the infrastructure, through which we can develop the communal sector.

This does not, in our opinion, provide too much of a conflict. We, at the level of the university, are concerned with the dissemination of knowledge about principles of agriculture. The principles of agriculture and its production systems are the same in the peasant sector as in the commercial sector. However, the applications may differ. I think we must bear this in mind and strike a balance in our teaching and research programmes.

We have in the structure of the Faculty the means to meet this apparent dichotomy. The Department of Land Management, by its very nature, will tend to get more involved in the problems of the peasant sector, the problems of application of principle to practice.

The two more production-oriented departments as they stand at the moment, I think will continue very largely to consider the more

technical aspects of agriculture and to provide more immediate answers to pressing problems of production, I don't see this as a very severe conflict.

We have the need to sustain commercial agriculture and we have this very pressing need to be heavily involved in communal agriculture and the peasant sector. We can fulfill these roles provided that our expansion plans go ahead satisfactorily and provided that we attract suitable staff to use the facilities to best effect for the interests of the Zimbabwean Agricultural Faculty.