

THE EFFECT OF DFI COURSES ON IMPROVED  
FARMING PRACTICES AND INNOVATIONS

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DECLARATION

I, David Boniface Kayondo, hereby declare that the work presented in this thesis is my original work and was done in the year 1975 A.D. and to the best of my knowledge the same piece of work has not been presented for any degree in any other University

.....DBKayondo.....

Signed

This thesis has been submitted for examination with our approval as University Supervisors

.....Miderstüde.....

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## ABSTRACT

This study was carried out as a partial fulfilment for the Master of Science in Agricultural Economics during the University academic year 1974/75. The study is entitled, "The Effect of District Farm Institute (DFI)<sup>(1)</sup> courses on Improved Farming Practices and Innovations." Thus the purpose of the research was to compare efforts made by the DFI with the results from the farmers who have attended the courses. In order to be able to do this an attempt was made to look into the following:-

- (a) Curriculum development and time of the year the courses are supposed to be held.
- (b) Staffing procedures and teaching facilities.
- (c) The criterion and method employed for farmer selection for DFI courses and how the follow-up is carried out.

A sample of 56 ex-DFI farmers was visited and interviewed to find out the extent to which their awareness to new methods of farming had been increased by attendance of DFI courses.

An observation was also made to find out what changes in practice resulted from having attended a farm institute course. The ex-DFI farmers were also asked in such a way as to obtain their opinion as to whether their earnings had increased because of DFI course attendance. In order to determine whether farmers who have been to DFI are practicing what they were taught at the DFI a group of 28 farmers who have not had DFI courses were interviewed as a control group. The study was centred on farmers who have been to Mukono DFI and living in Mengo District.

The results of the study show a significant benefit for those farmers who had attended DFI courses. The study

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1. Throughout the thesis, DFI stands for DISTRICT FARM INSTITUTE.



indicates that the rate of adoption has been stepped up considerably by the training course. It was observed that the use of modern techniques such as fertilisers, insecticides and practices such as optimum planting time, proper spacing, adequate weeding, was significantly higher among ex-DFI farmers. Most of the ex-DFI farmers interviewed, indicated that they were planning to make more changes in the future. It was also noted that there were many instances of neighbours adopting practices because of the results obtained by the farmers who attended the course.

A substantial number of ex-DFI farmers felt that they had gained both technically by enlarging their technical knowledge and financially by using the knowledge they had acquired to increase their earnings by means of an increased agricultural output.

In the study it was also observed that there are measures which could be taken by the Uganda Government in order to increase the effectiveness of DFI courses. These measures could be on DFI course content, DFI teachers and their recruitment, recruitment of farmers to DFI courses and the follow-up.

The study reveals the scope for inducing the technical knowledge of farmers by means of DFI courses tends to be constrained by the infrastructure of markets, input supplies, transport, lack of capital and labour constraints. Measures to alleviate or remove these constraints would contribute significantly towards increasing the effectiveness of DFI courses. In this respect the availability of credits, creation of new market outlets, improved village road network system and improved availability and efficient distribution of inputs would contribute a lot towards the effectiveness of DFI courses.

## CHAPTER I

### INTRODUCTION

It is now a well known fact that food production in developing countries as a whole is lagging behind the growing demand resulting from their rapidly rising population and to a lesser extent from higher incomes. A large number of developing countries are increasingly dependent on imported food stuffs, including imports under special terms and to some extent this influences their economic stability and even their political independence.

In the light of this problem, the starting point in agricultural development should be to make an effort to increase both total agricultural output and output per person employed in agriculture.<sup>(1)</sup> Experts have agreed that by a fuller use of improved methods, farm production in most developing countries could be expanded more rapidly. It should be noted that any change in farming methods performance brings with it changes in the farmer's way of life. The introduction of biological or technological innovations must therefore be adopted not only to natural and economic conditions but perhaps even more to the attitudes, values and abilities of the mass of producers, who must understand the suggested changes, must be willing to accept them and must be capable of carrying them out.<sup>(2)</sup>

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1. RAANAN WEITZ, from Peasant to Farmer, A revolutionary strategy for development, (Columbia University Press, New York and London 1971) Page 4.
  2. Ibid., Page 5.

Uganda like many other developing countries is conscious of the need to raise agricultural production by employing modern farming techniques and teaching farmers how to apply them through extension service. The population growth of Uganda is at 3% per annum according to 1969 population census in Uganda. This, therefore, means that production in agriculture must be stepped up at even a faster rate in order to supply food to maintain this rising trend in population growth if the shortage of food in future is to be avoided. Also agricultural development in Uganda is considered to be a base for over all economic development since the majority of the national population lives in rural areas and earn their living through agricultural production. For example, according to 1969 population census of Uganda, 93 percent of the population lived in rural areas and only 10 percent of the rural tax-payers are employed in secondary and tertiary economic sectors but still a large number of this 10 percent is at least engaged in agricultural production.

The history of development of extension shows that it has been born out of the need to develop agriculture as a long term objective. In his book "Guide to Extension Training" D.J. Bradfield says that "extension has been developed as the only logical, scientific and successful way of bringing knowledge to farmers to help them farm their lands more efficiently."<sup>(3)</sup> By developing agriculture, extension serves the economic objectives of the nation. Extension work, by developing agricultural skills and knowledge of farmers, enables them to make more productive use of the country's natural resources. In extension an attempt is made to convince the people of the value of new and better practices.

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3. Cited by: A.E.G. Markham; A Study of Farmer Training in some English Speaking Countries of Africa. (FAO Publications, Rome, Italy 1967) Page 2.

Definition of Extension:

Extension is defined by D.J. Bradfield, in his book "Guide to Extension Training", as "an informal educational process which aims to teach rural people how to improve their level of living by their own efforts, through making wise use of natural resources at their disposal in better systems of farming and home making, for the benefit of the individual, the family, the community and the nation".<sup>(4)</sup> In other words extension is an integral part of the educational continuum, strengthening and reinforcing the formal education.

Objectives of Extension

1. To persuade farmers of the benefits of innovations and improved farming practices.
2. To give new knowledge to farmers about the new improved farming practices.

Through adoption of improved farming practices or innovations by the farmers, governments hope to achieve the following:-

1. To increase the output and quality of cash-crops and animal production.
2. To increase the production of food crops to sustain local consumption with a possible surplus of produce marketable for additional cash earnings for rural industrial and other developments.
3. To improve the health and general welfare of farm families by advising and encouraging them to grow some crops which would improve their nutrition.
4. To reduce the risk elements in farming. Farmers are advised on how to plan their farm operations and on which crops are suitable for their areas.

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4. D.J. BRADFIELD, Guide to Extension Training (FAO Publication Rome, Italy, 1966). Page 11.

## Introduction of District Farm Institutes (DFIs)

There is an acute shortage, throughout the developing countries, of experienced extension staff in terms of field workers per farm family. In developed countries one extension worker operates with a number of farm families measured in hundreds, in developing countries the families are measured by thousands. The level of training of extension workers also varies greatly, for the officer in contact with the farmer is usually trained to certificate level, and in fact the majority may not even reach that standard. In developed countries the extension worker is normally of degree or high level diploma status. (5)

In view of the paucity of staff, the limitations of their training, and the immense number (and distances) of farmers to be served, the dilution of effort becomes serious. It is within this context that farmers training centres have been developed so as to make the best use of the few trained extension workers available to give farming residential courses to farmers with a hope that these trained farmers would act as an inspiration to their home areas.

The main purposes that the farmers training sets out to accomplish are as follows: (6)

1. to bring to the attention of the farmer that there could be a better life for himself and his family;
2. that this higher standard of living is preferable and desirable, and is attained by improved agriculture;
3. to provide him with the training skills, and introduce him to the use of new factors, by which he can realise this improvement.

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5. Ibid., Page 5.

6. Ibid., Page 10.

The concentration of efforts provided by a farmers' training centre with teaching practical instruction, demonstration on the farm, living with some of the amenities proposed, both for himself and often later for his wife, is capable of affecting real change both in thought and action. The farmer to accept new techniques he has to be convinced:-

1. that the promised increased yields represent a real increase on his overall production;
2. that the techniques really work in his own environment and within the limitations imposed by his own circumstances such as labour, cash and management capability.

#### The Role of District Farm Institutes (DFIs) as an Extension Method\*

District Farm Institute programmes are one of the extension methodologies used in teaching farmers. DFI courses give support to extension programmes and give superior quality of instruction and offer opportunity to farmers to exchange views and share similar experiences. Through conversations and exchange of views on the innovations among themselves, some farmers may convince their friends to adopt the innovations or practices. In their efforts to educate and train farmers, in order to propagate selected farming practices and innovations, the DFI programmes compliment and support the activities of extension service. Thus, in general the fundamental aim of DFI programmes is essentially the same as that pursued by the extension service.

The ultimate objective of DFI courses is to create exposure, awareness, interest and action among farmers who have attended DFI courses and to try and overcome the shortage of extension worker. Therefore, in setting up DFI courses one seeks an immediate effect

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\* In Kenya and Tanzania, District Farm Institutes (DFI) are known as Farmers Training Centres (FTC).

of the course on the farmers who have attended. But the action from the farmers has also to depend on whether other variables such as land, capital, labour, and market are available to the farmer and whether the farmer is a risk-taker. All these factors affect his willingness or ability to adopt given innovations. He is likely to respond quickly to measures which pay visible returns and which are compatible with his recourse status.

In over-all DFI courses are supposed to be formulated in such a way as to change these farmers who attend them and in the long run if they adopt the practices taught at the DFI to influence other farmers in their community. The influence, however, of these farmers in their communities depend on how popular they are within their communities. This is why recruitment procedures are necessary. In other words recruiting methods should take account of the quantitative and qualitative factors that influence the training programmes that are offered by the DFIs.

### Theme of the Research

Extension is necessary to transfer knowledge from one point to another. It is, therefore, the aim of extension education to influence people to make desirable changes in their behaviour that will contribute to the better farming and home making, to better the family and community living. It is hoped that through extension efforts people's skills, practices and attitudes will change. Evaluation is necessary to assess the efforts and results of extension and to measure the extent to which the results achieved justify the amount of resources involved in extension. As there are various or several extension methods, it becomes necessary to evaluate the effectiveness of each method. The present study attempts to evaluate DFIs as an extension method.

### Objectives of the Research

To compare the efforts of the DFI with the results one has to find out the facilities offered by the DFI to farmers and to find out how

many farmers have adopted what they have been taught at the DFI. In other words, the purpose of the research was to compare the efforts made by the DFI with the results from the farmers who have attended the courses. In order to be able to do this an attempt was made to look into the following:-

- (a) curriculum development and the time of the year the courses are supposed to be held.
- (b) staffing procedures and teaching facilities.
- (c) the criterion and method employed for farmer selection for DFI courses and how the follow-up is carried out.

Uganda Government has made efforts to train teachers and build DFIs as teaching centres for the farmers. The main reason for building these centres, as said before, is that there are very few field extension agents to reach a good number of farmers. For example, one extension worker in Uganda is in charge of about 2,000 farmers or more. In view of this, it was hoped that through the DFI courses a sizeable number of farmers would be trained and then they would go and spread the knowledge to other farmers who have not been to the DFI courses. A lot of public money is spent by the Government in running these centres. Evaluation, therefore, becomes necessary to find out the extent to which the results achieved justify these efforts and expenditure.

#### LITERATURE REVIEW:

##### History of DFIs in Uganda

The importance of DFIs as part of extension service was realised by the then Colonial Government in 1954 when it appointed an agricultural committee to find out ways and means of increasing the productivity and standard of the rural sector. The committee recommended that District Farm Institutes be established throughout Uganda. Each of these Institutes was to serve two adjoining districts



which were ecologically and agriculturally similar.<sup>(7)</sup>

In 1959 the first DFI was built and the number had increased to six by 1960. In 1960 it had become clear to the government that it was not financially feasible to have one DFI serving two districts as it became too expensive to transport farmers to and from over long distances. Hence the policy was changed to one DFI per district or more in larger or more productive areas.<sup>(8)</sup>

At present there are 15 DFIs in operation. In 1970 a request for financial assistance to build three more DFIs was made to the World Bank. In 1971 the World Bank approved a scheme which was supposed to start in October the same year and be completed in 1975.<sup>(9)</sup>

The sites selected by the government were Mpigi, Pakelle and Kaburoron for Mengo, Madi and Sebei districts respectively. These sites were selected because they are centrally situated within the respective districts. The three sites were surveyed and compensations assessed but no construction had started by the end of 1972 due to the departure of non-citizen Asians who had undertaken the contract. The Government has appointed a new firm of architects and it is hoped that the three DFIs will be completed by the end of 1976.<sup>(10)</sup>

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7. S.J.B. OTIM, An Evaluation of Lango D.F.I. Programmes, (unpublished project presented as a partial fulfilment of B.Sc. (Agric.) at Makerere University in 1974) Page 6.
  8. E.R. KAAHWA, ed., District Farm Institute Annual Reports 1970-1971-1972, (Department of Agriculture, Entebbe) Page 2.
  9. Ibid., Page 2.
  10. S.J.B. OTIM, OP. cit., Page 10.

All District Farm Institutes were formerly under the following Ministries:-

1. The Ministry of Agriculture, Forestry and Cooperatives.
2. The Ministry of Planning and Community Development.
3. The Ministry of Animal Industry, Games and Fisheries.

At present they are jointly run by the following ministries:

1. Ministry of Agriculture, Forestry and Veterinary Services.
2. Ministry of Cooperatives and Marketing.
3. Ministry of Planning and Economic Planning.

In the policy behind the establishment of DFIs, it was envisaged that these DFIs would provide for residential short courses for farmers, wives, chiefs, youth, local leaders and staff refresher courses.<sup>(11)</sup> The objectives for setting up these DFIs as stipulated in the first 5 year Developing Plan (1961-1966) were as follows:-

1. To offer short residential and day courses to practicing farmers, their wives and children in various aspects of improved farming.<sup>(12)</sup>
2. To stimulate farmers to change their attitudes towards recommended crop and animal husbandry practices and adopt modern and economic agricultural methods.
3. To teach farmers new agricultural skills and practices.
4. To serve as a living example for the improved farming practices recommended by the Department of Agriculture.
5. To bulk seed and multiply the recommended breeds of livestock and poultry for sale to farmers.
6. To offer facilities for in-service training courses, conferences, seminars, workshops and meetings for

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11. Ibid., Page 1

12. (Name of the Editor not Given) District Farm Institute Policy, (Ministry of Agriculture, Forestry and Cooperatives) Page 1.

6. departmental staff and those from other ministries.
7. To offer facilities for adult education activities by other government departments, institutions and organisations.

Previous Evaluation Work done on DFI Programmes in Uganda

In Uganda the first evaluation of DFIs was carried out by Dusenberry in 1963. It has been impossible to get the original copies of his work. Quoted below are the extracts of his work from S.J.B. Otim's special project. Dusenberry evaluated eight DFIs using a series of field investigations in order to assess the efforts of these DFIs in making farmers adopt new and improved farming practices. In summary form his results were as table 1 shows. <sup>(13)</sup>

TABLE 1: Rate of Adoption of New Farm Practices by Farmers Before and After Attending DFI Courses.

Level of Adoption	Practices Adopted by Farmers * <sup>1</sup>			
	Before Attending DFI Courses		After Attending DFI Courses	
	No.	%	No.	%
Start only	574	65	1,188	62
Good showing	273	31	674	35
Established	31	4	55	3
Total	878	100	1,917	100

\*<sup>1</sup> 165 Farmers were surveyed and 20-30 practices evaluated.

Source: Extracted from S.J.B. Otim's special project presented at Makerere University in 1974 as a partial fulfilment of B.Sc.(Agric.).

The results show that roughly the total increase in adoption of new and improved farming practices was 1,039 or a percentage increase of 118%. The increase in number of practices with "good showing" was 110%. Dusenberry also found out that the average number of recommended practices per farm adopted as a result of general extension before the DFI course was 5.3; average number after DFI course was 11.6 for an increase per farm of 6.3 practices. In conclusion Dusenberry says "basing on figures above, it could be said that the one week's course was more effective in changing practices than all of the field extension work which had gone on before."<sup>(14)</sup>

In 1969 P.A.S. Odongo evaluated the impact of Lango DFI's training on practice adoption. He compared the percentage adoptions of six practices among 23 farmers who had attended DFI courses with the percentage adoptions of the same practices among 23 other farmers who had not attended the DFI courses. He concluded that the DFI course attendance of one week caused a percentage increase of 389% in the adoptions of the evaluated.<sup>(15)</sup>

Dusenberry and P.A.S. Odongo, claimed that the difference in practice adoptions would have been greater had the DFIs not tried to force onto the farmers innovations which were beyond their economic resources.

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14. Ibid., Page 16.

15. P.A.S. Odongo op. cit. Page 20.

Another attempt to evaluate DFI programmes in Uganda has been carried out on five DFIs by third year Agricultural Students at Makerere University, Kampala in 1973/74 academic year.\* These students interviewed samples of farmers who had been to the DFI courses and those who had never been to the DFI courses. They all came to a conclusion that farmers who attended DFI courses were farming better than those farmers who had not been to these courses. They, therefore, considered DFI programmes to be effective in training farmers on how to farm better.

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\* The names of the students and the DFI evaluated are:

<u>Student</u>	<u>DFI</u>	<u>District</u>
1. Banyendera J.N.	Kachwekano DFI	Kigezi District
2. Kabuka F.L.	Bulindi DFI	Bunyoro District
3. Lubega D.	Masaka DFI	Masaka District
4. Opiyo W.W.	Kitgum DFI	West Acholi District
5. Otim S.J.B.	Lango DFI	Lango District

## CHAPTER II

### METHODOLOGY

#### 1. Choice of Mukono DFI

This research study is centred on Mukono District Farm Institute. It would have been very ideal to evaluate all the 15 DFI programmes in Uganda, but lack of funds and time in which the research was supposed to be completed made the task insurmountable.\* It was realised that there are limitations of choice of a single DFI as a representative of the DFIs in Uganda, but the constraints indicated above, made it inevitable. Under these circumstances, Mukono DFI was considered ideal for a number of reasons. First, it caters for two major agricultural districts,<sup>2\*</sup> which form the centre of Uganda's main agricultural zone (region) i.e. the Coffee-Banana Zone. Second, the farmers in these districts are to a large extent, representative of the southern half of the country which forms the Coffee-Banana Zone. Third, the farming enterprises, both in terms of cash and food crops and dairy enterprises found in these districts are widely distributed in the whole zone and some especially grains are found in all parts of the country. Fourth, this area is representative of the areas in transition from predominantly subsistence agriculture to

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\* Data collection was supposed to take between four and five months and with the present transport constraints in Uganda it could have been impossible to do all the 15 DFIs.

2\* The 2 districts have been divided into 3 districts namely Kyagwe, Bulemezi and Mengo districts respectively and Kampala area has been made a province under the new administrative system set up in 1973.

commercial or semi-commercial agriculture. Over the years sedentary agriculture has progressively established itself. Fifth, farming techniques and systems, as found in these districts can to a large extent approximate to those prevailing in most parts of the country. Sixth, the author had a good knowledge of Luganda, the local language spoken by the farmers in the two districts. Therefore, it was not necessary for the author to employ an interpreter as he would have done in some other districts which would have made the research expensive.

The respondents came from Mengo district. There was no special reason for choosing it except that there was not enough time and money to cover the two districts. Since the two districts are in the same ecological zone, as mentioned before, and the farmers are predominantly of one tribe (Baganda) they are considered to have the same sociological background and the same ideas on agriculture. Therefore, the author did not envisage any bias in his findings.

## 2. Selection of Samples

### (a) Selection of Ex-DFI Students

The sample of ex-DFI students to be interviewed was drawn from those farmers who attended general agriculture courses at Mukono DFI in 1971. That year was chosen because it was thought that the period between 1971 and 1974 (when this research was carried out) gave these farmers ample time to apply the practices taught at the DFI. The period was considered by the author to be short enough for the farmers not to have forgotten what they had been taught, although they might not have applied it owing to some constraints such as lack of money to buy the necessary in-puts or equipment.

In 1971 a total number of 112 farmers, from Mengo district, attended a course on general agriculture at Mukono DFI. These farmers were from five counties which make up Mengo district. The

counties are Busiro, Butambala, Gomba, Kyaddondo and Mawokota. The number of farmers recruited from each county in 1971 were as follows:

<u>Location</u>	<u>No. of Farmers</u>
Busiro	20
Butambala	20
Gomba	12
Kyaddondo	38
Mawokota	22
Total	<u>112</u>

To select the farmers to be interviewed, simple random sampling method was employed. A half of the total number of farmers who attended the course at the DFI from each county was selected randomly to be interviewed. The random selection was done by writing the name of each farmer from the county on a piece of paper. These pieces of paper on which the names of the farmers were written were cut identically and had the same size (1 cm. width x 8 cm. length). They were folded identically, after writing the name of the farmer on each, and placed in a receptacle which in this case was a small bowl with a cover. These pieces of paper were thoroughly mixed by shaking the bowl. One folded piece of paper was then drawn without replacement from the bowl. The whole process of mixing and drawing without replacement was repeated until the required number of farmers to be interviewed from each county was drawn.

Each sample from each county was selected separately but using a similar method of simple random sampling. The following was the



size of the sample from each country which was selected for interviewing:

<u>Location</u>	<u>No. of Farmers</u>
Busiro	10
Butambala	10
Gomba	6
Kyaddondo	19
Mawokota	<u>11</u>
Total	<u>56</u>

Thus, a total number of 56 ex-DFI students were selected as respondents. This meant that each farmer selected had to be traced and located and interviewed by means of a questionnaire.\* If the selected farmer was not located, an alternative name was selected using the same simple random sampling method as described before.

(b) Selection of Control Group

In order to determine whether farmers who have been to DFI are practicing what they were taught at the DFI a group of farmers who have not had DFI courses were interviewed as a control group. The control group sample was selected by choosing a farmer whose home was on the right side of the ex-DFI farmer but not further than 3 kilometres from the ex-DFI farmer's home. A total number of 28 non-DFI farmers was interviewed.

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\* See appendix 1 for ex-DFI students questionnaire.

The following is the number and distribution of non-DFI farmers who were interviewed:

<u>Location</u>	<u>No. of Farmers</u>
Busiro	5
Butambala	5
Gomba	3
Kyaddondo	9
Mawokota	<u>6</u>
Total	<u>28</u>

There was no special criterion for choosing only 28 non-DFI farmers for interview.

Given the time constraint it was thought that this number of farmers would be sufficient to show whether ex-DFI farmers farm better than the non-DFI farmer or not.

### 3. Methods of Comparison

In order to compare the farming performance of the ex-DFI farmers and the non-DFI farmers two questionnaires were formulated. Questions in the two questionnaires were formulated in such a way as to establish whether ex-DFI farmers and if so to find out whether the farming displayed by the ex-DFI farmers can be attributed to the DFI courses they had had or to the close supervision given to them by the field extension agents before the DFI courses. To clarify this, a question on their farming activities before the DFI course was included in the ex-DFI farmers questionnaire. (See appendix 1). At the same time a question on the farmer's present farming situation was included. In otherwords, it was thought that information on the farmer's farming situation before the DFI course and his present farming situation after the DFI course in comparison with the present farming activities of the non-DFI farmer would give a clear picture on the effect of the DFI course on farmers who go there. If a farmer was carrying out some of the improved farming practices before going to the DFI

he was asked to elaborate on what the DFI course attendance has benefited him.

Another comparison method which would have been an ideal one is to compare the incomes of the two types of farmers. This is difficult since it is a well known fact that farmers do not give correct information on their incomes. This is because they are suspicious of being overtaxed or because they do not keep records of their incomes and expenditures although they are always advised to do so. A question, however, on income was included in both questionnaires to give a rough idea on the incomes of the two different types of farmers.

THE FUTURE OF THE DFI COURSE

The Director has done a lot of work in the past few years in the development of the DFI course and in the past few years. This has been done in the following manner: The first step was to establish the DFI course in the Department of Agriculture, which was done in 1954. The second step was to establish the DFI course in the Department of Agriculture, which was done in 1955. The third step was to establish the DFI course in the Department of Agriculture, which was done in 1956. The fourth step was to establish the DFI course in the Department of Agriculture, which was done in 1957. The fifth step was to establish the DFI course in the Department of Agriculture, which was done in 1958. The sixth step was to establish the DFI course in the Department of Agriculture, which was done in 1959. The seventh step was to establish the DFI course in the Department of Agriculture, which was done in 1960. 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The seventy-fifth step was to establish the DFI course in the Department of Agriculture, which was done in 2028. The seventy-sixth step was to establish the DFI course in the Department of Agriculture, which was done in 2029. The seventy-seventh step was to establish the DFI course in the Department of Agriculture, which was done in 2030.

## CHAPTER III

### FINDINGS:

#### Part - One

#### 1. Mukono District Farm Institute

##### (a) General Background

Mukono DFI serves as a farmer training centre as well as a rural training centre. It is situated within a radius of 15 miles north of Kampala in what is now called Kyaggwe District. When going to the institute one takes Kampala - Nairobi road and turns on his left at 10 miles from Kampala and goes inside for about three miles. The Institute first operated in 1960. It has 100 acres (40 hectares) of land which is divided into two major sections. One section is for teaching purposes and on it one finds institutional buildings\* vegetable gardens, an orchard, method and result demonstration plots. The other portion of the land is taken up by a commercial farm whose purpose is to earn revenue for the institute and for producing improved seed and livestock. As mentioned before, in Chapter Two, at the time of this research study the institute was serving three districts namely, Bulemezi, Kyaggwe and Mengo district pending the completion of Mpigi DFI to serve Mengo District.

##### (b) Teaching Facilities

The Institute has four classrooms and three dormitories. The boarding capacity of each dormitory is 30 students. This makes the total boarding capacity 90 students. The Rural Community Centre wing has one dormitory with a capacity of

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\* Institutional buildings consist of dormitories, classrooms, offices, and staff quarters.

twenty students and this dormitory is sometimes utilised by the farmer's training wing if there are more than ninety farmers attending a course in agriculture. In other words, the Institute can accommodate 110 farmers at one time.

The Institute offers residential courses which last for five days. The courses usually start on Sunday evenings and end on the following Saturday morning. The DFI bus collects the farmers on Sunday afternoon at a pre-arranged collecting point and takes them back when the course is over. Accommodation and food at the DFI are free. The government spends fifteen shillings on each farmer, to maintain him at the DFI, per day. (16) With the increase in the cost of living this amount is likely to go up. The DFI teachers realise that one week course duration is a short time to teach all what one would like the farmers to know on improved agriculture but then it is considered that this length of time is what the farmer can afford to spend out of his home.

Most of the courses offered by the institute are on general agriculture but a few specialised courses for large scale farmers\* are given. The specialised courses are on cocoa, poultry, piggery, rice and dairy management. The reason, given by the DFI Principal as to why most of the courses are on general agriculture is that most of the farmers are subsistence farmers and the government wants to uplift the general standard of agriculture. Thus the emphasis is put on how to improve their traditional crops and animals using up-to-date crop and animal husbandry methods. In general

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16. Mukono DFI Annual Report of 1973.

\* These are the farmers who specialise in one of the above enterprises on a large scale or are applying intensive management skills.

agriculture an attempt is made to make the farmers aware of the improved farming practices which they could apply on their traditional crops such as bananas so as to improve their yields. This is done with the hope that if the farmers adopted these practices higher yields would be obtained which would provide a surplus for the farmer to sell. This would in the long run meet the basic objective of the department of agriculture which is to ensure adequate supplies of foodstuffs to the rural populations and to the steadily expanding urban population. It is also thought that starting on the crops which the farmer knows and showing him a living example through result demonstrations, that if improved practices were applied on the crop the results would be obtained, then one could go ahead and introduce new crops.

At the time of the research the Institute had four teaching members of staff as the following table illustrates:

TABLE 2: Teaching Staff and their Qualifications

<u>Title</u>	<u>Qualification</u>	<u>Job Description</u>
1. Senior Assistant Agricultural Officer (S.A.A. in Agriculture O)	Diploma	Principal
2. Assistant Agricultural Officer (A.A.O.)	Diploma in Agriculture	Deputy Principal
3. Assistant Agricultural Officer (A.A.O.) Female	Diploma in Agriculture	Teaches Home Economics
4. Agricultural Assistant ( A.A)	Certificate in Agriculture	Farm Manager, teaches Farm Management
5. Agricultural Assistant (A.A.) Female	Certificate in Agriculture	Teaches Home Economics.

Source: Mukono DFI, 1973 annual report.

All the teachers had been transferred to the Institute from the field during the period of 1973 and 1974.

In other words, no teacher had been at the institute for more than three years. None of the teachers had had any training in adult education or training in educational methodologies with probably the exception of the Principal who had had a study tour in the United States of America for six months. The government takes it for granted that anybody who has studied agriculture should be able to teach it to any farmer whether young or adult. Thus the department of agriculture fails to recognise the importance of teaching techniques approaches to different types of farmers. The author thinks that it is a high time the department of agriculture recognized the importance of adult teaching methods and took steps in training the teachers, at the Farmer's Training Institutes, in adult teaching techniques. The Ministry should realize that it is necessary to exercise great care when teaching adult farmers if the farmers are to adopt what they are taught. It is a recognized fact that the techniques used in teaching adults should differ from those of school education for young children, since some of the farmers have never been to school and others may have left school long ago and have forgotten how to study. This is not to suggest that these adult farmers are necessarily ignorant or stupid but their experience of life and maturity make up for the slower rate of learning.

Therefore, in view of this, it is not ideal for the department of agriculture to just pick somebody to come and teach at the institute without pre-training him on different educational methodologies. Thus since the life-blood of a farmer training institution is its staff, when the department is selecting the teachers, it should make sure that the teacher selected has at least

the following:

- (a) Knowledge of farming.
- (b) Experience of extension problems.
- (c) Ability to teach.
- (d) Knowledge about adult education methods.
- (e) Knowledge about extension methods.

## 2. Curriculum

In drawing up the curriculum the first principle to observe is to decide what the courses to be held are meant to achieve. This requires close cooperation between the field extension and the District Farm Institute teachers to determine what courses are necessary to specific farmers from a particular area.

Extension field agents working within their planned programs of work as laid down by agricultural development policies are supposed to undertake the task to define the main problems to be solved in their areas in priority order. Suitable courses are then drawn up in detail by the Principal of the District Farm Institute and his staff and are submitted to the District Agricultural Officer for final approval.

In drawing up the curriculum the farmer to be affected by the course is considered so as to suit his ability to learn. For example, if the course is for adult farmers it is taken into account that most of these farmers are likely to have received some primary education twenty or thirty years ago or have never gone to school at all.

The most important factor then with such type of participants, particularly, in early stages, is to effect a change of attitude. After their one week's stay at the DFI, they should leave realising that by changing present practices,



or by incorporating new techniques in their farms, they can increase their income and improve standard of living. They must leave with the conviction that the centre's staff and the extension staff of the Ministry are their friends and that continued contact with them will assist them in improving their conditions of living.

All course programs are planned by the Principal with the help of his teaching staff, as mentioned before, well in advance on a half - yearly basis i.e. January - June and July - December. After the course program has been decided upon by the DFI Principal it is sent to the District Agricultural Officer (DAO) informing him on how many courses have been allocated to his district. The dates during which these courses would be run are indicated in the proforma sent to him.\* The DAO then, in cooperation with his field staff selects the county (Division) from which the farmers will be recruited and courses in general agriculture they should receive. The total number of courses allocated to each district depends upon the population of that district. If some of the topics chosen by the DAO can not be taught by the regular teaching staff at the DFI, the Principal contacts various bodies to provide him with competent persons on the topics.

The courses are usually planned in such a way as to fit in the agricultural calendar. This is done with a view that the farmers can learn a technique immediately before or at a time when it is most capable of giving the expected results. It is considered not feasible to expect a large number of farmers to attend the course at the peak period of activity

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\* See Appendix 4 for the proforma sent to DAO.

at home, for example, at the time of planting or harvesting.

In the policy laid down by the agricultural department, (17) agricultural courses are supposed to be essentially practical in nature, project oriented and with emphasis on improved methods of farming. They should also be designed to stress farming as a business that requires managerial and agricultural skills.

In order to try and meet the requirements of this policy, in general agriculture the farmers are introduced to a range of improved agricultural practices which may be employed in their areas.

A weekly time-table is devised by the Principal and his teaching staff.\* The general agriculture course content is divided into perennial crops, annual crops, animal husbandry, crop storage, soil and water conservation, ox-cultivation, nutrition and farm management.

In perennial crops the crops covered are coffee, bananas and cotton. On coffee the topics covered are the importance of coffee in the country as a foreign exchange generating crop and its importance in the world market. The farmers are taught on how to establish a coffee plantation. The parameters covered in the establishment of coffee are choice of site, digging holes, constructing bunds, spacing, how to fill up the holes and

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17. Ministry of Agriculture, Forestry and Cooperatives, DFI. o.p. cot. Page 16.

\* See Appendix 3 for a sample of a weekly time-table.

how to plant the seedlings. In addition to this the farmers are taught how to manage young and old coffee. On the management side the topics covered are weeding, maintaining bunds, pruning, how to apply fertilisers and manure and their importance. Information on what type of fertilisers to apply and when to apply them is given to the farmers. Farmers are informed on the importance of mulching, spraying against pests and diseases, right way of picking, drying and storing. They are advised to market their coffee through the primary cooperative societies. Method demonstrations on digging of holes, planting, pruning, mulching and how to apply fertilisers and manures and picking are held for the farmers.

On bananas farmers are informed on the importance of bananas as a food crop and how they can earn money by selling it to urban areas. The farmers are also shown different varieties which are suitable to the farmers' areas and their yielding capacity. Climatical conditions suitable for banana growth and factors affecting their growth are elaborated upon. Through method demonstrations farmers are shown how to prepare the land and how to choose the planting materials. Farmers are taught how to manage a newly planted banana plantation and an old one as well. The importance of pests and disease control is emphasised to the farmers. Method and result demonstrations to illustrate to the farmers the importance of pruning, desuckening, proper way of harvesting, weevil control and application of manures and fertilisers are held. The language of instruction is Luganda in all subjects. Handouts are given to farmers for future reference.

It is stated in 1971/2 - 1975/6 Development Plan that the Uganda Government is anxious to see cotton production

expanded considerably. Cotton, unlike coffee to which it is the second in rank as a foreign exchange earning crop, has no market limitations. Hence, the Government through double production campaign is encouraging farmers to double their cotton production. Incentives such as subsidised spray-pumps, insecticides, fungicides and remunerative farmer prices on high quality of cotton are being offered by the Government.\* To meet this the department of agriculture has worked out a package of cultural practices on cotton to be imparted on to farmers by the extension service. At the District Farm Institute, during the course, the farmers are urged to pay careful attention to the following operations:-

1. Timely opening up of the land.
2. Early planting and proper spacing of all crops.
3. Application of recommended fertilisers.
4. Timely thinning, weeding and spraying.
5. Proper harvesting, drying, storing and marketing of the crop.

The annual crops mainly comprise of food crops such as beans, sweet potatoes, cassava, ground-nuts, maize and various types of vegetables. It is one of the objectives of the department of agriculture to ensure that cultivators produce enough food for themselves, and for the consuming public, of a type and quality to meet their nutritional needs. DFI is an immediate medium to get across to farmers the information on the importance of increased food crop production and good nutrition. Food crop production and nutrition are taught together at Mukono DFI. Farmers are introduced to a new

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\* The high quality cotton is known as "Safi" and the price offered to the farmer is Shs. 1.55 per Kilogram while the low quality cotton known as "Fifi" has a price of cts. 65 per Kilogram.

package of practices which substantially increase yields of food crops. They are also made aware of the different nutritive value of various food crops. Their attention is drawn to new varieties of food crops such as beans, groundnuts and maize which, under good husbandry conditions, give higher yields than local varieties. Farmers are shown how to raise vegetable through method demonstration.

To ensure continuous even supply of food, farmers have to be urged to store food in a proper way. At the DFI farmers are taught about the importance of crop storage and ways through which losses are incurred in stores. The losses could arise due to wet heating, insect damage and rodent damage. They are informed about the factors favouring insect infestation, rodent damage and how these can be controlled in order to minimise losses.

The department of agriculture aims at improving the quality and productivity of livestock and to integrate animals into the farming system where appropriate. In the general agriculture courses farmers are taught animal husbandry. They are encouraged to keep dairy cattle, pigs and poultry so that they can improve their protein intake value and earn money from them. In animal husbandry farmers are taught improved practices in feeding, housing and breeding of the livestock. The institute keeps exotic and upgraded dairy cattle, pigs, poultry and rabbits to act as living visual aids to the farmers. Through method demonstrations the farmers are shown how to manage them.

In general agriculture the farmers are made aware of the advantages of using ox-cultivation without going into details. The farmers are just shown ox-cultivation in operation. Ox-cultivation is taken as a specialised subject and specific farmers receive a residential training

course on it separately. In order to arouse the interest of farmers in ox-cultivation method demonstrations on farm operations by oxen, training of oxen and machinery maintenance are held. The farmers are also told where to get the tools and are informed about the free training offered to any farmer who is interested.

In order to maintain the fertility of the soil the farmers have to be informed about the benefits of soil and water conservation. Under this topic farmers are made aware of the causes of the soil erosion and its consequences. They are then taught how to control it by the use of bunds, strip cropping, mulching and row cropping. They are advised to carry out crop rotation so as to maintain the fertility of the soil.

In farm management the farmers are informed about the factors of production (i.e. capital, labour land). They are then taught to utilise the factors of production through decision making. They are advised to relate their decision making in farming to prices of the farm products and costs of inputs as this would help them to decide whether a practice, operation, or an enterprise is economically feasible and whether it will contribute to maximum net income of the entire farm business. Budgeting and record keeping of farm operations is emphasised to them.

From the above information collected from the institute authorities on the curriculum and course content one develops an impression that some of the courses are grossly overloaded. There is a likelihood of arousing the enthusiasm of the farmer at the beginning of the course and then sending him home in a state of confusion resulting from the large number of problems he has to tackle at the

same time, often without the necessary resources. Indeed it is agreed that some general courses are still desirable particularly in the early stages of farmer training but the content should be limited to a few subjects only and these should be related to the farmers' ability.

### 3. Recruitment of Farmers

The recruitment of the farmers to the DFI courses is supposed to be a joint effort between the DFI and the field staff of the department of agriculture. However, the information got from the Principal of Mukono DFI was that the DFI staff has no say over who is to come for the course. Thus there is no specific criterion worked out jointly, by the DFI staff and field extension staff on how to select the farmers. The field extension staff and the local chiefs are the ones responsible for recruiting farmers to the DFI courses without using any criteria.

Faulty recruitment is cited in the 1970, 1971 and 1972 annual report on DFI as a major course of not enough farmers attending courses or some farmers attending the same course more than once. The Mukono DFI Principal said that in some cases information on DFI courses never reaches the prospective students and that in fact there is insufficient publicity given to the farmers that DFI courses are free and open to any farmer. He suggested this to be one of the reasons why on several occasions DFI vehicles went to collect farmers for the course only to return without any. He attributed this to the field staff who sometimes forget to contact the farmers in time and when the time comes they just go to those farmers they communicate with easily and these in most cases are progressive farmers. The Principal cited some incidents where the DFI bus returned with only 5 - 6 farmers. He finally attributed the failure of the field extension staff

to put an effort in recruiting farmers to their low morale towards their job. Their low morale is attributed to their low salaries, lack of transport and lack of promotion incentives. Most of the field extension agents are regarding their work as part-time, devoting most of their time on trading to keep up with the steadily increasing cost of living.

#### 4. Follow-up

The commonest means of getting a feed-back from adult farmers is by visits to check on new and improved practices which have been recommended at the courses. At Mukono DFI the author was informed that the follow-up is done during the peak seasons. A member of staff goes out and he visits the farmers with a questionnaire for the farmers to answer and the visiting member of staff makes remarks at the end of each questionnaire on whether he thinks that the farmer is carrying out the practice properly or not and the general impression he has got from the farm. All the ex-DFI farmers interviewed were supposed to have been visited according to the DFI register but the unfortunate thing was that there was not even a single follow-up report available at the DFI to refer to. It was thought that association of staff of the training centre with follow-up gives them an opportunity to keep in touch with field problems and encourages feed back into the teaching program. The follow-up also maintains interest in farmers who have been trained, for short periods, reinforces the training given and acts as continuing stimulus to the trainee.

### Part - Two

#### Findings on Farmers

In this sub-section of chapter three attempts are being made to analyse the data collected and see whether there is



any strong relationship between farmers' attendance of DFI courses and their final performance in farming; or to see whether there is a significant difference in the farming performance of the ex-DFI farmers and non-DFI farmers. In this connection variables which were considered to have an influence on the farming of the two types of farmers were looked into. The variables were farm-size, farmers' educational level, size of the families, age of the farmers, frequency of visits in a year by the extension agents to the farmers, social status of the farmer in his local area (village) and the number of attendance of DFI courses by the farmer. The variables were also thought to indicate why some of the ex-DFI farmers were recruited. In other words, some of the mentioned variables could have been used by the recruiting agents as a criteria in selecting farmers to the DFI courses. This could result in either good recruitment or bad recruitment of the farmers for the courses.

In order to determine whether there is any significant difference between the farming of the ex-DFI and non-DFI farmers two possible indicators were considered. The indicators are enterprises and their acreages owned by the farmer and their estimated incomes. In both cases the situation of the farmer before DFI and after DFI courses were considered so as to try and eliminate other factors besides DFI courses which could have affected the farmers' farming performance. The present farming situation of ex-DFI farmers was then compared with that of the non-DFI farmers.

A. Factors Influencing Farmers' Farming Performance

1. Farm size of ex-DFI and non-DFI Farmers

In considering the characteristics of a farmer the size of croplable land, the educational level of the farmer as well as the literacy position in the family as a whole, and the farmer's social economic status are usually taken to have a great influence on the farmer's speed of response to innovation. It was therefore, appropriate to find out the farm sizes of both types of farmers for it could be possible that a farmer was selected to go to the DFI because of his farm size. He could have been regarded by the recruiting agents as a good farmer because of the amount of enterprises he could have had on his farm. The size of the croplable land could affect the amount of crop enterprises the farmer could carry out on his land if labour and capital are not limiting. If a farmer with a very small size of land goes to the DFI he is likely to have few acreages of certain crops or he may not grow certain crops at all as land would be a limiting factor. He is, however, likely to have a better crop husbandry or animal husbandry than a farmer who has not had any farm training but with a large size of land. This is because of the know-how the ex-DFI farmer has acquired from the DFI courses. These are, of course, assumptions for there are other means open to all farmers through which they can get information on how they can improve their farming, for example, through the field extension service. Nevertheless District Farm Institutes are known to provide superior farm training to farmers.

The information on the size of the farms was given by the farmers verbally. In other words, there was no systematic measurement of the farm size as time and finance were limiting. Therefore, the farmers could have either over-estimated or

under-estimated their farm-sizes. As a check, however, the farmer was asked to enumerate the acreage of each crop and after this he was asked to say the total acreage of the cropped land and uncropped land. The two totals were added up to find out whether their sum corresponded with the total acreage given by the farmer. This, of course, was not the most accurate way of measuring farm-sizes, but in view of the mentioned constraints this was regarded as sufficient to indicate the differences between the farm-sizes of ex-DFI farmers and non-DFI farmers. Table 3 shows the farm-sizes in acreage and their distribution among the two types of farmers.

TABLE 3: Farm-Size of ex-DFI and non-DFI Farmers in acres.

Acres	Ex-DFI Farmers		Non-DFI Farmers	
	Number	Percent	Number	Percent
0 - 3.0	2	3.6	4	14.3
3.1 - 6.0	13	23.2	10	35.7
6.1 - 9.0	30	53.6	10	35.7
9.1 - 12.0	10	17.8	4	14.3
over 12 0	1	1.8	0	0
Total	56	100	28	100
Average Farm-size in acres	7.8		6.5	

Source: Own Investigation

The average farm-size of ex-DFI farmers is 7.8 acres and that of non-DFI farmers is 6.5 acres. It could be deduced that information given, on farm-size, by the farmers is correct since it favourably agrees with the results from the National Census carried out in 1969 which gave the mean farm-size in the banana coffee zone to be 6.4 acres. (18)

The difference between the farm-size means (averages) of the ex-DFI farmers and non-DFI farmers is not statistically significant. Therefore, basing on the difference between the two means as one of the criterion for recruiting farmers would be ruled out. But if one considers the individual cases as table 3 shows it could be safely said that some ex-DFI farmers were selected because of their relatively large plot of holdings. This could be if the recruiting agent is a local chief who, in most cases, is aware of the size of the holdings owned by the farmers in his area as this is one of the factors which the local chief bases, when assessing the farmers' poll-tax. If the recruiting agent is the field extension agent within the area then the farm-size as a criterion for selecting farmers for DFI courses does not hold. The results show that most of the interviewed farmers are small holding farmers as their range of holdings falls within the definition of a "small-farmer" which is between five acres to fifteen acres.

## 2. Educational Level of ex-DFI and non-DFI Farmers

Education is supposed to create attitudes which inspire and expose individuals towards change and concurrently providing the necessary participating skills. It is widely

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18. MALCOM HALL, abstracted from a Thesis submitted for the degree of Doctor of Philosophy in the University of E. Africa 1970; Vol. II: page 114.

part and parcel of social, political and economic development. This is why the formal education of ex-DFI farmers had to be compared as table 4 illustrates.

TABLE 4: Educational Level of Ex-DFI and Non-DFI Farmers

Education	Ex-DFI Farmers		Non-DFI Farmers	
	Number of Farmers	Percent	Number of Farmers	Percentage
Secondary 1 and 2	3	5.4	0	0
Primary 7 and 8	12	21.4	3	10.7
Primary 5 and 6	29	51.8	11	39.3
Primary 3 and 4	9	16.0	8	28.6
Primary 1 and 2	3	5.4	6	21.4
Total	56	100.0	28	100.0
Average years of school	7.0		4.3	

Source: Own Investigation

Table 4 indicates that ex-DFI farmers have a higher formal education than non-DFI farmers. It is observed from the table that there are three ex-DFI farmers who have attained an educational level of between secondary one and secondary two compared to none among the non-DFI farmers. Table 4 shows that there are twelve ex-DFI farmers with a formal education of between primary seven and primary eight compared to only three non-DFI farmers. The table further shows that the majority number of both types of farmers falls between primary five and primary six. It is also noted from the table that none of the farmers interviewed, has zero formal education. The average formal educational level for the ex-DFI and non-DFI farmers is 7.0 and 4.3 years of school respectively.

Formal education alone cannot show any significant difference in farming performance of these two different types of farmers. Other variables have to come in, but high formal education can enable the farmers to understand more and easily what they are taught than the farmers with low formal education. This suggests that if one compares the farming abilities of the ex-DFI farmers, there could be some variations. These variations could arise as a result of the difference in the degree of understanding during the courses due to the difference in the farmers' formal educational level. Techniques like farm planning and farm records could require a relatively high formal education, of at least primary five, to be able to understand them.

A farmer with high formal education is likely to have a high social status among his community because he is considered knowledgeable. He is likely to be known by the extension agents and local chiefs. This would result into more personal contacts between him and the field extension agent than the farmer with a low education. This, in return, would mean more farming advice from the extension personnel than the farmer with low education. This could result in better farming by the comparatively high educated farmer. Also when the time for selecting farmers for DFI courses comes the farmer with a high formal education would be selected first. Since the ex-DFI farmers are relatively more educated than the non-DFI farmers, one could attribute their selection to the DFI courses to their high formal educational level other things remaining the same.

3. The Family size of Ex-DFI and Non-DFI Farmers.

TABLE 5: Family size of Ex-DFI and Non-DFI Farmers.

No. of Family members	Ex-DFI Farmers		Non-DFI Farmers	
	Number of Farmers	Percent	Number of Farmers	Percent
11 - 20	6	10.7	1	3.6
9 - 10	8	14.3	3	10.7
7 - 8	9	16.1	5	17.9
5 - 6	15	26.8	10	35.7
3 - 4	11	19.6	6	21.4
1 - 2	7	12.5	3	10.7
Total	56	100.0	28	100.0
Average Family size - members	6.6		5.8	

Source: Own Investigation

Table 5 indicates that on the whole ex-DFI farmers had bigger family sizes than the non-DFI farmers interviewed. The average family size of the ex-DFI farmers is 6.6 family members while that of the non-DFI farmers is 5.8 family members. This is contrary to what had been expected. At the DFI it had been understood that some farmers refused to come to the DFI courses because they did not want to leave their families behind. During the conversation with the Principal, an impression was created that non-DFI farmers have larger family sizes.

Most of the farmers interviewed had one wife. Only ten farmers out of the total of 84 farmers had more than one wife. Seven ex-DFI farmers had more than one wife.

This was mainly in Butambara county which is predominantly a Muslim county. Since the sample of the ex-DFI farmers was mainly of polygamist farmers, the average family was bound to be high. Generally, men with more than one wife are supposed to have more children than those with one. Besides, the husband and the wife the family size was composed of mainly young people in their teen-ages with an average age of 15 years old.

The farmers were asked whether it was easier for a farmer with a large family to be recruited than the farmer with a small family size. Farmers had various views on this. Some of them said that naturally a farmer with a large number of children above twelve years old is likely to be recruited since he could be a better farmer, due to family labour supply than the farmer with a small family. This could give an impression that recruiting agents approach those farmers whose farming performance is considered to be above average. Most of the farmers interviewed derive their labour from their family since hired labour is becoming more costly than they can afford. Therefore, farmers with large family sizes of mature people have a comparative advantage over those with small sizes in terms of labour supply. However, those farmers with large families mainly composed of small children cannot contribute to the farm labour. Also farmers said that a farmer with a large family of small children would not be willing to go to the DFI courses since this would mean neglecting his much needed responsibilities at home. Therefore, this means that not only the family size should be considered, but also the age variations within the families, when recruiting farmers for DFI courses.

#### 4. Ex-DFI and non-DFI Farmers' Age

It was originally thought, before the study was carried



out, that the age of the farmer, his family size and farm size could have some influence on the farmer's innovative behaviour and could also give an indication to why a farmer was selected for the DFI courses. This is why these variables were looked into in this research study.

It was thought that a farmer who is above sixty years old would not be selected for the DFI courses since his life expectation would be too short to expect him to adopt agricultural innovations and to carry out improved farming practices. He would also be considered to be too old to farm and to spread the knowledge he has obtained from the DFI courses among other farmers.

**TABLE 6: Ex-DFI and Non-DFI Farmers' Age**

Age	Ex-DFI Farmers		Non-DFI Farmers	
	Number of Farmers	Percent	Number of Farmers	Percent
18-22	10	17.8	3	10.7
23-27	3	5.4	3	10.7
28-32	9	16.1	6	21.4
33-37	10	17.9	0	-
38-42	7	12.5	4	14.3
43-47	13	23.2	2	7.2
48-52	4	7.1	10	35.7
Total	56	100.0	28	100.0
Average Age in Years	34.8		38.4	

Source: Own Investigation

Table 6 shows the age-groups of ex-DFI and non-DFI farmers interviewed. It is observed from table 6 that there are ten ex-DFI farmers who are in the age-group of between eighteen and twenty two years old compared to only three non-DFI farmers as table 6 shows. It was noted that farmers in this age-group had left school not more than six years ago but at different educational levels. Three of the ex-DFI farmers had gone up to between secondary one and two and had to drop out of school because of financial problems. The remaining seven ex-DFI farmers had either stopped in primary seven or primary eight. These ex-DFI farmers could have been selected to go for the DFI courses because they showed willingness towards farming as it could probably have been the only good alternative occupation open to them. In Uganda, it is becoming exceedingly difficult for school leavers without any technical training qualification of some kind to get employment in the non-agricultural section. The non-DFI farmers might not have been selected because they were not known by the recruiting agents or they did not approach the recruiting agents at the time of selection.

The average age for the ex-DFI and non-DFI farmers is 34.8 and 38.4 years old respectively. Both age averages fall in the age when a farmer is still expected to be young enough to farm. Therefore, according to these age averages all the interviewed non-DFI farmers can be selected for the DFI courses other things remaining the same. If individual age-groups are considered, it is observed that non-DFI farmers are relatively older than the ex-DFI farmers as table 6 shows. There are only three ex-DFI farmers who were in the age-group of forty-eight and fifty-two years old compared to ten non-DFI farmers in the same age-group. But still these ten non-DFI farmers can be taken to DFI courses since they are less than sixty years old which is considered

to be a limit for carrying on productive work on the farm. The results show that there is no significant difference between the ages of ex-DFI and non-DFI farmers, interviewed, on which one could conclusively state that ex-DFI farmers were recruited because of their age.

5. Number of Visits by Extension Agents per Year to ex-DFI and non-DFI Farmers

Farmers are supposed to get farming advice from the field extension agents. DFI courses would then supplement what the farmer has been taught by the extension agents. Therefore, the number of personal contacts between the farmer and the extension agents is likely to influence the farmer's farming performance. If a farmer is visited more by the field extension agent in his area, he could develop a positive attitude towards improved farming practice and probably farm better than that farmer who is never visited. This farmer who gets frequent personal contacts with the local extension agent could also become commercial oriented and responsive to innovations. He also has high chances of being selected to the DFI courses. This is the main reason which necessitated the identification of personal visits paid by extension agents to the ex-DFI and non-DFI farmers per year and this is illustrated by table 7.

TABLE 7: Farm Visits by Extension Agents

Number of Visits	Ex-DFI Farmers Visited		Non-DFI Farmers Visited	
	Number of Farmers	Percent	Number of Farmers	Percent
None	4	7.1	13	46.4
1	6	10.7	12	42.9
2	18	32.2	3	10.7
3	15	26.8	0	0
4	13	23.2	0	0
Total	56	100.0	28	100.0
Average Visits per Year	2.5		0.6	

Source: Own Investigation

Table 7 indicates that generally ex-DFI farmers get more personal visits from the extension agents compared to the non-DFI farmers. Most of the non-DFI farmers, as table 7 shows, said that they have never been visited by the extension agents. Those who have been visited, have been visited once in a year. This could have been during the double cotton production campaign. The difference in the number of visits which the two types of farmers get is further widened by the calculated average visits. The average visits received by the ex-DFI farmers from the extension agents is 2.5 compared to 0.6 received by the non-DFI farmers.

There are a number of reasons to why some farmers like the ex-DFI farmers get more extension agents' visits than other farmers. One of the reasons could be the differences

between the socio-economic status of the farmers. For instance, if a farmer is a local chief in his area he is bound to have a high social status. He will naturally get more visits from the extension agent than other farmers. If a farmer is considered to have a higher income than others he will be taken as a rich farmer in the area. He will, therefore, have a high socio-economic status. Another reason is that if the farmer's educational level is high, he is likely to be visited by the extension agent more than these farmers with low education. This could be because the extension agent finds it easy to talk to him. A farmer could be in the same age-group as the extension agent and this could mean that the two find no social differences between themselves and can communicate easily. The average age for the extension agents in the areas where the study was done was thirty one years old. This compared well with the average age of the ex-DFI farmers. All the extension agents said that they were willing and they always attempt to visit every farmer in their areas but transport problems limit them. They also claimed that their areas were too big to cover.

#### 6. Social Status of the Ex-DFI Farmers

In order to attempt and examine further the criteria used by the extension agents and the local chiefs in selecting farmers to the DFI courses, the social status (social position or occupation) of the farmers was identified. Table 8 indicates the number of ex-DFI farmers falling in each social status group.

**TABLE 8: Social Position or Occupation of Ex-DFI Farmers**

Social Position or Occupation	Ex-DFI Farmers	
	Number	Percent
Muruka chief (sub-parish chiefs)	4	7.1
Committee member of a cooperative Society	5	8.9
Treasurer of a cooperative society	3	5.4
Secretary of a cooperative society	4	7.1
Chairman of a cooperative society	2	3.6
Primary Teacher	2	3.6
Chairman of Women Club Society	3	5.4
Formerly in Young Farmers' society	3	5.4
Formerly a volunteer Leader to the Young Farmers' Society	2	3.6
Cooperative Society Member	9	16.0
No distinguished status	19	33.9
<b>Total</b>	<b>56</b>	<b>100.0</b>

Source: Own Investigation

The above table 8 indicates that 66.1 percent of the ex-DFI farmers, interviewed, have some sort of social position (social status) in their areas. This could suggest that these ex-DFI farmers were recruited to the DFI courses because of their higher social status compared to other farmers in their local areas. The remaining 33.9 percent of ex-DFI farmers might have been recruited because of their high formal education or because they were taken by the recruiting agents

to be active farmers.

It is a good idea to recruit a sub-parish chief (Muruka Chief) to the DFI courses as he could play an important role in influencing other farmers to improve their farming. Sub-parish chiefs take part in the selection of farmers from their areas of control. In order to be able to assess the farming ability of other farmers they should have had some training in farming. It is, therefore, appropriate that sub-parish chiefs are also taken to the DFI courses.

A cooperative society is a good medium for recruiting farmers to the DFI course. Some courses are said to have been cancelled because not enough farmers turned up. Recruiting farmers through the cooperative societies would ensure that enough farmers are recruited. Credit and subsidy facilities on inputs could be channeled through the cooperative society. This means that a lot has to be done to encourage farmers to join cooperative societies. The cooperative society could also supplement government's expenditures towards the collecting points could be at the cooperative society's headquarters. This would cut down the expenses incurred on transport and time spent going around various villages to collect farmers.

#### 7. Number of Attendance of ex-DFI Farmers

The Principal of Mukono DFI alleged that some farmers attend the same course for more than once. This indicated a deficiency in the recruitment of farmers to the DFI courses. It also means that farmers who have not been to these courses are not given chances to go there since they might not be approached by the recruiting agent. It could also mean that the people concerned with the selection of farmers to the DFI courses could not raise enough farmers and so resorted to those farmers who have been to the DFI

courses and are willing to go back. It was decided to find out from the ex-DFI farmers how many times they have been to the DFI for the same courses. This is illustrated by table 9.

TABLE 9: Number of Attendance of Ex-DFI Farmers.

Number of Attendance of the same course	Farmers	
	Number	Percent
1	33	58.9
2	15	26.8
3	8	14.3
Total	56	100.0
Average Attendance	1.4	

Source: Own Investigation

Table 9 shows that the majority of ex-DFI farmers have been to the DFI course once. It goes on to show that quite a good number of ex-DFI farmers have been to the same courses more than once. For instance, 27 percent of the ex-DFI farmers have been to the same course twice and 14 percent have attended the same courses three times. One of the reasons why farmers are willing to attend the same course more than once could be that some farmers are attracted by the good living facilities offered at the DFI. Another reason could be that some farmers think that attending the course more than once would help them to "grasp" in their minds what they are taught. These ex-DFI farmers who have attended the same courses more than once have utilised the chances which those non-DFI farmers who would have been



probably willing to go there. This was evidenced by seventeen non-DFI farmer respondents who said that they would have liked to go to the DFI but that they have never been approached by any of the recruiting agents. This suggests that there is a need to revise the recruiting procedures of farmers to the DFI courses.

## B. Indicators of the Farmers' Farming Performance

### 1. Enterprise ownership and Agricultural Practices of Ex-DFI and Non-DFI Farmers

We cannot completely say that before ex-DFI farmers attended DFI courses were not carrying out certain farming practices because, as we know, there is autonomous adoption prevailing among farmers but can be improved by induced adoption which can be imparted on the farmers during the DFI courses. Because of this autonomous adoption of among farmers, it necessitated the evaluation of before and after DFI situations of the ex-DFI farmers. In other words, it was thought that the effect of DFI courses could be measured by identifying the number of ex-DFI farmers growing the crop or keeping a certain animal and carrying out the improved farming practices after DFI courses in comparison to their farming situation before DFI courses. The farming situation of non-DFI farmers was considered to show the difference between them and ex-DFI farmers in their farming activities and hence help in pointing out why ex-DFI farmers were recruited to DFI courses.

If the number of farmers carrying out the practice or growing the crop or keeping a certain type of animals after DFI courses exceeds the one before the DFI courses, then the effect of the DFI courses on the ex-DFI farmers would be regarded positive and successful. Similarly the change in acreage of crop or in number of livestock owned by the farmer after the DFI courses could indicate whether the DFI

program is successful or not. The change effect could be as a result of the farmer developing preferential interests in some crops and practices over the other during the DFI general agricultural courses.

Crops cultivated by	DFI Farmers Activities				DFI Farmers Interest	
	DFI Farmers		DFI Courses		Number of Farmers	DFI Interest
	Number of Farmers	DFI Interest	Number of Farmers	DFI Interest		
Grains	10	42	56	106	17	44
Oilseed	24	61	31	31	88	31
Cereals	22	61	16	20	6	14
Beans	26	51	52	54	14	39
Maize	28	60	44	82	8	22
Root Products	37	66	11	109	12	61
Cereals	20	34	18	31	17	61
Vegetable	12	21	14	21	7	16
Peas	4	-	21	17	-	-
Cereals	26	30	16	82	14	34

TABLE 10: Comparison of Cultivating certain Crops by Ex-DFI Farmers and non-DFI Farmers

Crops Cultivated by	Ex-DFI Farmers Interviewed				Non-DFI Farmers Interviewed	
	Before DFI courses		After DFI courses		Number of Farmers	Percent
	Number of Farmers	Percent	Number of Farmers	Percent		
Banana	46	82	56	100	19	68
Coffee	51	91	51	91	20	71
Cotton	23	41	16	29	4	14
Beans	28	50	53	95	11	39
Maize	28	50	46	82	9	32
Sweet Potatoes	37	66	56	100	17	61
Cassava	28	50	51	91	17	61
Vegetable	12	21	51	91	4	14
Pastures	-	-	21	37	-	-
Groundnuts	28	50	46	82	11	39

Source: Own Investigation

TABLE 11: Comparison of Acreage under certain crops of Ex-DFI Farmers and Non-DFI Farmers

Crops by Cultivated by	Ex-DFI Farmers				Non-DFI Farmers	
	Before DFI courses		After DFI courses		Acres	Percent
	Acres	Percent	Acres	Percent		
Banana	65	27.2	100	29.5	29	30.5
Coffee	85	35.6	76	22.5	36	37.8
Cotton	28	11.7	9	2.7	4	4.2
Beans	7	2.9	20	5.9	4	4.2
Maize	8	3.3	30	8.9	3	3.2
Sweet Potatoes	19	7.9	33	9.8	7	7.4
Cassava	9	3.8	23	6.8	6	6.3
Vegetables	4	1.7	13	3.9	1	1.1
Pastures	0	0	9	2.7	-	-
Groundnuts	14	5.9	20	5.9	5	5.3
Total	239	100	338	100	95	100
Total	239	100	338	100	95	100

Source C.V.N.  
Investigation

TABLE 11: Comparison of Acreage under certain crops of Ex-DFI Farmers

Crops by Cultivated by	Ex-DFI Farmers			
	Before DFI courses		After DFI courses	
	Acres	Percent	Acres	Percent
Banana	65	27.2	100	29.5
Coffee	85	35.6	76	22.5
Cotton	28	11.7	9	2.7
Beans	7	2.9	20	5.9
Maize	8	3.3	30	8.9
Sweet Potatoes	19	7.9	33	9.8
Cassava	9	3.8	23	6.8
Vegetables	4	1.7	18	5.3
Pastures	0	0	9	2.7
Groundnuts	14	5.9	20	5.9
Total	239	100	338	100

e: Own  
tigation

**TABLE 12: Comparison of Keeping Livestock by Ex-DFI Farmers**

Animals Kept by	Ex-DFI Farmers Interviewed			
	Before DFI Courses		After DFI Courses	
	Number of Farmers	Percent	Number of Farmers	Percent
Indigenous Cattle	19	34	28	5
Grade Cattle	-	-	7	1
Goats	21	37	19	3
Sheep	10	18	10	1
Pigs	-	-	12	2
Poultry	10	18	35	6

Source: Own Investigation

**TABLE 13: Comparison of Before and After DFI Course attendance  
Ex-DFI Farmers in owning various types of**

Animals Owned	Number of Animals Before DFI Course	Number of Animals After DFI Course
Indigenous Cattle	24	88
Upgraded Cattle	0	9
Goats	14	57
Sheep	18	20
Pigs	0	24
Poultry	85	375

Source: Own Investigation

**TABLE 14: Comparison of Farming Methods Practiced by Ex-DFI Farmers**

Method Practiced By	Ex-DFI Farmers Interviewed			
	Before DFI Course Attendance		After DFI Course Attendance	
	Number of Farmers	Percent	Number of Farmers	Percent
<u>Pruning</u>				
a) Coffee	16	29	46	82
b) Banana	12	21	51	91
<u>Mulching</u>				
a) Coffee	-	-	10	18
b) Banana	3	5	35	62
<u>Spraying</u>				
a) Animals	-	-	21	37
b) Crops	3	5	33	59
<u>Fertiliser application</u>				
a) Banana	-	-	19	34
b) Coffee	-	-	14	25
c) Food crop	10	18	30	54
Manuring	7	12	4	19
Possession of Spray pump	-	-	28	50

Source: Own Investigation



Table 10 shows that there has been, on the whole, a change in the number of farmers growing certain crops. For example, the table shows that the number of ex-DFI farmers growing cotton has gone down after the DFI courses while the number of ex-DFI farmers growing bananas has gone up. There has been, also, a change in crop acreage and number of animals owned by ex-DFI farmers as table 11 illustrates. Similarly table 14 indicates that a good number of ex-DFI farmers have adopted improved agricultural practices after DFI courses. Generally non-DFI farmers are observed to display a low degree of crop acreage, animal ownership, and improved farming practices compared to ex-DFI farmers.

An attempt was made to work out the gross margin of the crops in order to relate their profitability to their being chosen or preferred by the farmers to other crops. The information obtained from the farmers was rough estimates as most of the farmers did not keep proper records of their farming activities. But still these estimated gross margins indicated the effect of DFI courses in enabling the farmers to choose profitable enterprises.

#### Bananas:

The number of farmers growing bananas is observed to have gone up by 22%. Similarly table 11 shows that there has been an increase of 53.8% in the total acreage of bananas. One of the reasons why there is an increase in banana acreage and number of farmers growing it is that at the DFI, farmers are shown how to plant bananas properly and shown what varieties are suitable in their local areas and how to manage them. All the ex-DFI farmers interviewed claimed not to have had the skills, before DFI courses of planting bananas properly and that they did not really know that

application of fertilisers on bananas would increase the yields. Some ex-DFI farmers testified that before DFI courses they used to mulch and prune their banana shambas at random without knowing the importance of these two practices. Therefore, DFI courses have introduced the farmer to better banana management practices.

Another reason which has contributed to the increase in banana acreage and the number of farmers growing it is that bananas have a higher gross margin than other crops such as coffee and cotton. The average gross margin quoted by the farmers for bananas is Shs.500.00 per acre per year compared to Shs.180.00 and Shs.90.00 for coffee and cotton respectively.

Another possible reason why bananas have gained a commercial role is the rapid growth of the urban population combined with a high degree of preference for bananas as opposed to other starchy alternatives. This combined with the demand for bananas falling short of supply due to exhaustion of the supply of rich banana land cleared from virgin forest have caused a rapid rise of banana prices. The recent steep inputs for banana production have contributed higher gross margins but at the same time the banana price rises have caused a market switch from this traditional staple food to sweet potatoes and cassava which were hitherto regarded, in banana - coffee zone, as food for only the poor immigrants. This is one of the reasons why table 11 shows a high increase in the acreage of sweet potatoes by 74% and cassava by 156%. However, technological improvement in banana production and their adoption by the farmers as evidenced by ex-DFI farmers will increase the banana fields. During the research, rejuvenation of banana plots with mulch and fertiliser application by a good number of ex-DFI farmers was observed.

Only 19 farmers out of a total number of 28 non-DFI farmers

as table 10 shows grow bananas. This is a surprise because it is taken for granted that even if maize, beans and cassava are becoming economic crops among farmers because of their steady demand, no cultivator, however commercially minded, would dream of dispensing with the banana plantation as banana is a traditional food crop of the banana - coffee zone. One of the reasons which could be attributed to this is that some non-DFI farmers have too small land holdings to afford a perennial crop like banana which is not doing well due to soil fertility exhaustion.<sup>1\*</sup> These farmers lack the know-how of rejuvenating the soil as the ex-DFI farmers are doing.

#### Coffee:

Table 10 shows that there has not been any change in the number of farmers growing coffee. Thus all the ex-DFI farmers interviewed are still having coffee. Table 11 shows that there has been a reduction in total acreage of coffee of 10.6%. This suggests that some ex-DFI farmers have uprooted some of their coffee trees to replace them with other crops. It was in fact observed during the study that the uprooted coffee trees were replaced with banana trees. This confirms the popularity bananas are gaining among ex-DFI farmers who pointed out that, in comparison to cotton and coffee a banana garden pays something every month and that the price for bananas tends to be more favourable than, for example, coffee. A few ex-DFI farmers have replaced coffee trees with grass for their dairy animals.

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1\* This is observed in a large part of Gombolola Mutuba II in Kyaddondo county where farmers are resorting to growing sweet potatoes and cassava instead of bananas which are not doing well in this area.

The acreage of coffee is not being reduced rapidly as that one of cotton as indicated in table 11. In table 10, it is further shown that the total number of farmers growing cotton has gone down while in case of coffee the number of ex-DFI farmers with coffee has remained the same. Table 10 shows that the number of non-DFI farmers with coffee is much higher than that one with cotton. One of the reasons why coffee acreage is not being reduced at the same rate as cotton acreage is that coffee is a perennial crop and once it is established its production costs are less than marginal profits. For example, a farmer can neglect his coffee shamba on the side of pruning, spraying, weeding and yet still continue to derive some income from his neglected coffee shamba. Of course the quality of his coffee will go down. This suggests that farmer's decisions to maintain high quality particularly with cash crops like coffee depends to a large extent on the net returns he gets from it compared to alternatives open to him. From the farmer's point of view farm-labour can be put to many other alternative crops which are foregone. The crop he reallocates his labour resources to must of course have high returns. Coffee prices keep on fluctuating and cotton requires high labour input compared to other crops like bananas, maize and sweet potatoes. Therefore, farmers may have to shift most of their productive resources from coffee or cotton to the relatively high paying crops. In other words, positive opportunity costs exist among whether non-DFI or ex-DFI farmers. It is important to note that farmers have not shifted their productive resources from coffee to other crops to such an extent as they have done with cotton. The main reason could be that the gross margin of coffee is relatively higher than the cotton gross margins. The average coffee gross margin given by the ex-DFI farmers is Shs.180 per acre per year. The reason why coffee gross margins are higher than that of cotton is because coffee, as stated before, is a perennial crop and once it i

established its production costs tend to be less than the marginal profits.

Cotton:

In Uganda cotton is second to coffee as a foreign exchange generating crop. Unlike coffee cotton has no market limitations and hence the Government is encouraging farmers to double their cotton acreage and carry out the recommended package practices on it. To try and achieve the increase in cotton production, the Government has been launching double cotton production campaigns every year since 1971. General extension service in the Department of Agriculture and the District Farm Institutes all over the country have combined effort in ensuring the success of this campaign. The Government has offered remunerative prices to farmers as an incentive to increase the quantity of cotton. The price of "safi" which is the highest quality of seed cotton was increased in November 1974 from one shilling twenty cents to one shilling and fifty five cents per kilogram. In addition to the price increase there are prizes offered to the district with the highest cotton production.

In spite of the effort made by the Government, the results show that farmers have not responded to the double campaign. This is because of its low gross margins compared to other alternative crops such as maize, sweet-potatoes, bananas and even coffee. The average gross margin for cotton quoted by the ex-DFI farmers is Shs.90 per acre per year compared to Shs. 230, Shs.200, Shs.500 and Shs.180 for maize, sweet-potatoes, bananas and coffee respectively. It would be advisable for the Government to study the constraints the farmer has to overcome in cotton production and how these could economically be solved. In order to maintain or increase the amount of foreign exchange derived from this

crop the Government could set up large scale cotton state farms. The management of these farms has to be good in order to meet the quantity and quality targets. Another solution is to diversify the cash crop production by putting emphasis on crops like kenaf, tea, cocoa and others.

### Subsistence Crops:

Table 10 shows that the number of ex-DFI farmers growing beans, maize, sweet-potatoes, cassava, vegetables, pastures and ground nuts has gone up. Similarly the acreage of these crops has increased as table 11 indicates. According to table 10 all farmers were growing all mentioned crops with the exception of pastures before the DFI courses. The explanation to this increase could be that during the DFI courses these farmers were motivated and developed an interest in these crops and reacted positively. One of the DFI course objectives which is initiating immediate action among farmers, who attend them, has in this case been fulfilled according to the results illustrated in table 10 and 11.

All the DFI farmers were impressed on protein content found in beans, ground nuts and vegetables. They were shown on how to raise vegetables like carrots, cabbages, onions and tomatoes and their proper management. Various varieties of beans and ground nuts suitable for the farmers' local environment were shown and told where to obtain them. They were also informed on how these crops could earn them income by selling them to urban areas. Many ex-DFI farmers testified that before the DFI courses they regarded beans as a vegetable food crop which should be produced for home consumption rather than for marketing purposes as well. In otherwords before the DFI course these farmers did not attach any commercial value to beans. They were also not

aware of the nutritive value of vegetables. Non-DFI farmers produce beans, ground nuts, maize and vegetables at subsistence level compared to the ex-DFI farmers. Sweet potatoes and cassava are grown by a good number of non-DFI farmers. This could be attributed to autonomous adoption among the non-DFI farmers necessitated by the scarcity of bananas. These farmers produce sweet potatoes and cassava for home consumption but they can sell the surplus.

#### Farm Planning:

Simple farm planning techniques are taught to farmers during the general agricultural courses at the DFI. Emphasis is put on the advantages of improved management practices, correct times of planting, correct spacing and correct timing and frequency of weeding. They are also made aware of what they should expect if they carried on their farm operations too early or too late on the overall performance of the holding. In the farm planning lessons they are taught on how to allocate their scarce resources such as labour and capital. It is unfortunate that during this study there was no ex-DFI farmer who could be found with comprehensive farm records. If it were not the budgetary and time limitations to complete the study a survey on labour and capital profits would have been carried out among ex-DFI farmers and non-DFI farmers. This information on their labour and capital profits would have been compared with the recommended ones. This would have enabled one to have a clear picture on the allocation of scarce resources by the two types of farmers.

The majority of ex-DFI farmers, however, claimed farm planning lessons at the DFI have enabled them to set priorities in their farming operations. They said that it is market profitability and importance of the crop as either a cash crop or food crop in the society that guides them when

setting out their priority in allocating their scarce resources. Thus DFI courses have facilitated ex-DFI farmers to set out clearly defined objectives in choosing what to plant and how much of it to plant.

On the increase of beans and maize acreages ex-DFI farmers had a number of reasons for doing so. They said that the two crops require little labour compared to a crop like cotton and that their gross margins are relatively higher than that of cotton. The average gross margins given by the ex-DFI farmers for maize and beans are Shs.230.00 and Shs.150.00 per acre per year compared to a gross margin of Shs. 90.00 for cotton. The farmers also said that unlike cotton, maize and beans can be consumed at home when there is no market for them. They also said that beans and maize when well dried can be stored until the market conditions improve. They went on to say that they were made aware of the beans' importance as a rotational crop which can restore the fertility of the soil. Ex-DFI farmers said that they had to increase the acreage of sweet potatoes and cassava because of their prevailing commercial importance. A number of institutions such as schools, hospitals and urban people purchase these crops readily. This with the decrease in supply of bananas have enhanced the two crops' demand. Ground nuts used to give low yields due to bad husbandry practiced by farmers. For instance, they did not know that close spacing and early planting was a cultural prevention of rosette disease which can attribute a lot to the low yields. Because of the low yields most farmers had abandoned growing ground nuts but with the knowledge they acquired from the DFI they can grow them profitably.

#### Diary Cattle:

Table 12 points out that seven farmers out of 56



interviewed ex-DFI farmers have adopted grade dairy cattle. This is because at the DFI the farmers were shown the comparative advantage a grade cow has over an indigenous dairy cow. They were taught how to carry out proper management of grade cows. The ex-DFI farmers who adopted grade dairy cows had also to adopt pasture growing as table 10 and 11 show. Farmers who adopted grade dairy cows testified that they are getting more milk than they used to get before when they were only keeping indigenous cows. Those who have not adopted grade cows say that they are willing to cross-breed their indigenous cows, but that it is the lack of artificial insemination service in their areas which has delayed them.

Tables 12 and 13 show that both the number of indigenous cows and farmers keeping them has gone up. The farmers claimed that they had derived increase in their income which enable them to invest in dairy cattle. They say that they can produce milk for their families and at the same time get manure from these animals for their crops. In table 11 it is noted that 21% of the non-DFI farmers interviewed keep indigenous cattle but none of them keep grade cattle or grows pasture. This is probably because they lack the knowledge and the skills on grade cattle and how to manage them. At this point one can say that DFI courses have been effective in making ex-DFI farmers to adopt grade cattle.

#### Poultry:

Table 12 again points out that the number of ex-DFI farmers keeping poultry has gone up and table 13 shows that there has been a 341.2% increase in the number of poultry birds kept by the ex-DFI farmers, Most of the ex-DFI farmers had purchased exotic cocks to up-grade their local breeds. This is an innovation they obtained from the DFI courses. Some non-DFI

farmers were keeping some poultry birds but they had no specific buildings for them and they just left them to wander around in the gardens. However, some non-DFI farmers had started putting up small buildings for them, a knowledge which they claimed they got from their ex-DFI neighbours.

Pigs:

Twelve farmers out of the fifty-six ex-DFI farmers would have adopted this innovation but they say that they lack market incentives. This is because pork cannot be sold to hotels in the country due to religious reasons. It is only the willing individuals who go to farmers to purchase pigs for meat. This of course has restricted the demand for pig meat and hence the adoption of the innovation. It is, however, important to note in table 13 that the number of pigs kept by the ex-DFI farmers rose from zero to twenty-four pigs. This points out a positive change brought about by the DFI courses. It is hoped that the hotel restrictions on pork will be removed by the Government and since the ex-DFI farmers have the skills on how to manage pigs many of them will go in for this enterprise. The two non-DFI farmers who keep pigs do so as a hobby rather than for commercial purposes.

Goats:

Table 12 shows that there has been a decrease of 9.5% among the 56 ex-DFI farmers who used to keep goats. The likely reason could be that those farmers who used to keep goats switched their resources to dairy cattle enterprises as it is likely to be more paying than goats. Table 13 points out an increase in the number of goats owned by the ex-DFI farmers. This means that those ex-DFI farmers who did not switch their resources to other enterprises

increased the number of goats as an asset. They could have had little money to purchase dairy cows and so had to keep on with goats. Others could have gone in for poultry but they claim that feeds are expensive and difficult to obtain under the prevailing economic situation they might go in for dairy cattle, poultry and pig for they have the know how on managing these enterprises. Table 11 illustrates that 8 farmers out of the 28 non-DFI farmers interviewed keep goats. They do so as a tradition in Uganda if a peasant does not own sheep he owns goats which are slaughtered on special occasions. This explains why there has not been any increase in number of ex-DFI farmers keeping sheep. In otherwords, sheep owning is not regarded as a commercial business. This explains why there has not been any increase in number of ex-DFI farmers keeping sheep. In otherwords, sheep owning is not regarded as a commercial business.

Table 14 attempts to compare the number of ex-DFI farmers who are carrying out improved agricultural practices after DFI courses in contrast to the situation before DFI courses. It shows that 16 ex-DFI farmers were carrying out pruning on coffee and that 12 ex-DFI farmers were carrying out the same practice on bananas before courses. The number of ex-DFI farmers pruning coffee and bananas increased to 46 and 51 respectively after the DFI courses. These farmers say that during the DFI courses they got a concrete proof on the advantages of pruning when they were shown a result demonstration. This is a credit to the DFI courses. Table 13 shows the number of non-DFI farmers carrying on pruning on the two crops. Only 11 farmers prune their coffee and bananas. The number would have been expected to be more because pruning is supposed to be a traditional agricultural practice on both crops. With the effort of the field extension service most of the non-DFI farmers should be carrying on the

practice. As in the case of ex-DFI farmers non-DFI farmers farmers might not be aware of the comparative advantages between pruning the two crops and not pruning. This could mean that field extension agents do not reach farmers to teach them all the necessary agricultural practices the farmers are supposed to carry on their crops. This explains why there was such a big increase in number of ex-DFI farmers pruning the two crops after the DFI courses.

Table 14 shows that 10 ex-DFI farmers adopted the practice of mulching their coffee after DFI courses. It goes on to show that only three farmers out of 56 ex-DFI farmers were mulching their bananas before DFI courses. With the mulching of bananas it would have been a higher number than this because as in case of pruning coffee or bananas it is a traditional agricultural practice whose function could be enhanced by the field extension agents. This again brings out the inability of the extension agents to reach the farmers. Table 14 shows that there are 8 non-DFI farmers mulching their bananas. This number is higher than that one of the ex-DFI farmers before the DFI courses. The table goes on to show that none of the non-DFI farmers carries on mulching on his coffee. This could be lack of awareness on the advantages of mulching coffee by the non-DFI farmers compared to the ex-DFI farmers.

#### Spraying:

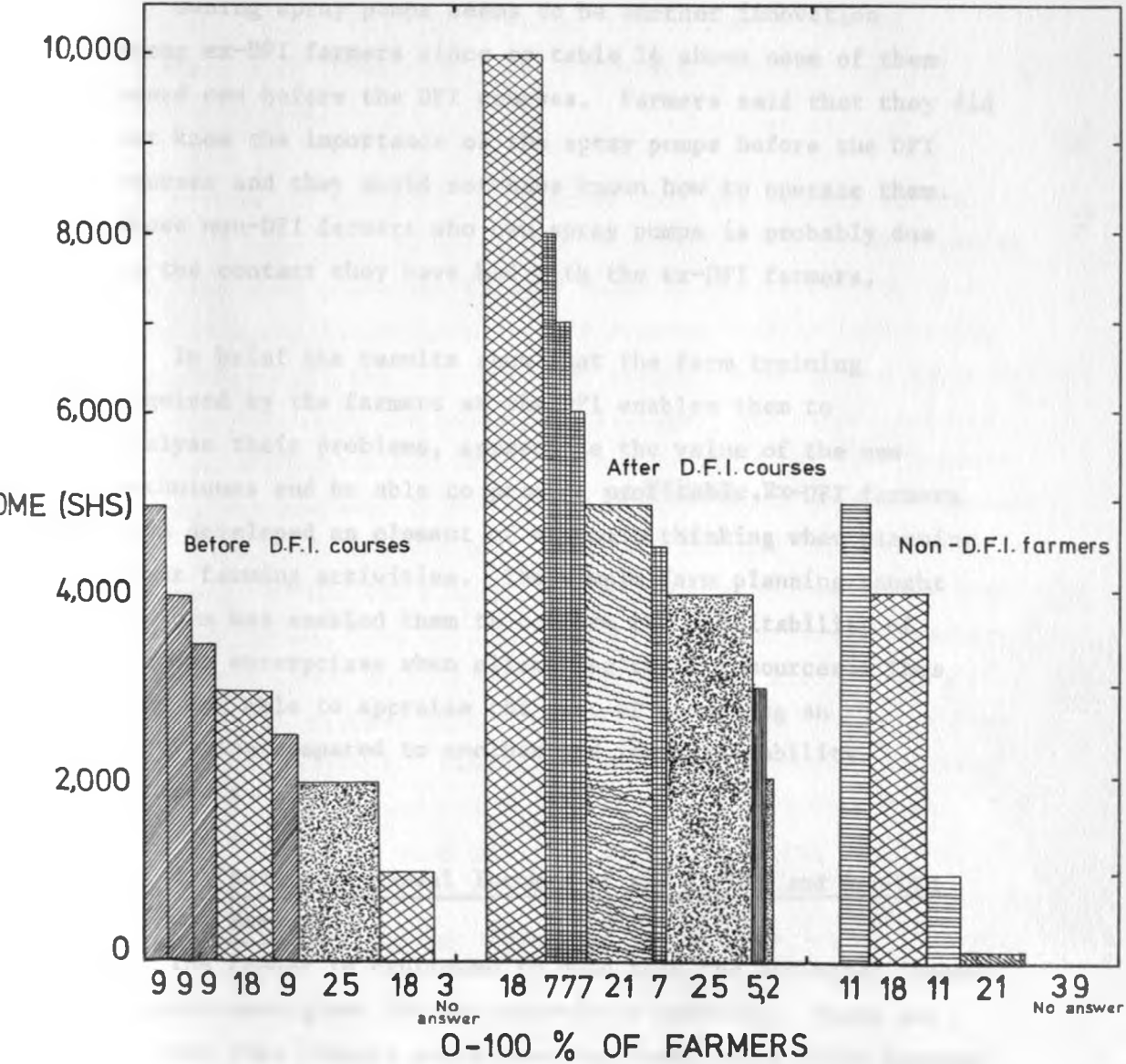
Table 14 again shows that 21 ex-DFI farmers adopted spraying of animals after DFI courses and that only 3 ex-DFI farmers were spraying their crops against diseases and pests before the DFI courses. Table 14 shows that there are 4 non-DFI farmers in each case spraying animals and crops. The presence of non-DFI farmers spraying their animals could be explained as an autonomous adoption among them. They could have got the idea of spraying animals against diseases from

the ex-DFI farmers or from the field extension agents. The adoption of spraying their animals against diseases by the ex-DFI farmers after the ex-DFI courses could be regarded as an inducement adoption caused by the DFI courses. It would, however, have been expected for this practice to have spread among farmers long ago since it is an old agricultural practice. This could be explained probably by the fact that since the banana-coffee zone used to be mainly a crop agricultural area rather than an animal agricultural area the impact of spraying animals against disease was not formerly spread among farmers by extension agents.

#### Fertiliser Application:

With fertiliser application table 14 shows that there was no fertiliser application on bananas and food crops before DFI courses. This practice was adopted by the ex-DFI farmers after their DFI courses. There was fertiliser application on coffee before the DFI courses by some farmers (10) but this number increased to 30 farmers after the DFI courses. Table 14 illustrates that some non-DFI farmers do apply fertilisers on bananas and coffee but not on food crops. Fertilisers as an input that cost money and so the farmers tend to apply it on commercial crops. This is one of the reasons why the ex-DFI farmers were applying it on coffee. Bananas had not become as a commercial enterprise as they are now. Also one can not rule out the fact that before these farmers went to the DFI courses they did not know the benefits derived from fertiliser application in maintaining soil fertility and hence high yields. There is likelihood that those non-DFI farmers who are applying fertilisers on their bananas have copied it from the ex-DFI farmers. Manure is mainly carried on bananas. Ex-DFI farmers say that manure is more expensive than chemical fertilisers because it is bulky to

## ESTIMATED ANNUAL GROSS INCOME BETWEEN THE NON-D.F.I. AND EX-D.F.I. FARMERS



transport and takes time to decompose to bring rapid result. Therefore, those farmers who do not own animals buy chemical fertiliser in preference to natural manure when they have got money.

Owning spray pumps seems to be another innovation among ex-DFI farmers since as table 14 shows none of them owned one before the DFI courses. Farmers said that they did not know the importance of the spray pumps before the DFI courses and they would not have known how to operate them. Those non-DFI farmers who own spray pumps is probably due to the contact they have had with the ex-DFI farmers.

In brief the results show that the farm training acquired by the farmers at the DFI enables them to analyse their problems, appreciate the value of the new techniques and be able to produce profitable. Ex-DFI farmers have developed an element of economic thinking when planning their farming activities. The simple farm planning taught to them has enabled them to compare the profitability of various enterprises when allocating their resources. Thus they are able to appraise the cost of producing an enterprise compared to another and its marketability prospects.

## 2. Estimated Annual Incomes of the Ex-DFI and Non-DFI Farmers

The reader is cautioned to note that the estimated income figures were given by the respondents verbally. There are chances that farmers could have under-estimated their incomes rather than over-estimated them. The reason being that farmers or any other businessman fear giving their right incomes fearing that they could be overtaxed by the Government. Thus it is difficult to collect data on

incomes from small farmers since they all claim not to keep income and expenditure records. When they are giving the income figures they always want to leave an impression that farming is a low paying business. Therefore, these income results may not be statistically significant but they can act as a guide line in comparing the incomes of ex-DFI farmers with those of non-DFI farmers as a measure of DFI course effect.

From the graph it is observed that the incomes of the farmers have gone up after the DFI courses. It is interesting to note that there are farmers whose incomes have gone up to ten thousand shillings after DFI courses. It is interesting in that before the DFI course no single farmer earned an annual income of above five thousand shillings. The ex-DFI farmers had an average annual income of two thousand and five hundred shillings compared to their mean annual income of five thousand and nine hundred shillings. They all claimed that it is as a result of the DFI courses that they have achieved this high annual income. The average annual income for non-DFI farmers is two thousand shillings. The graph shows that only 11% of the non-DFI farmers interviewed earn an annual income of five thousand shillings. Basing on the figures given by the two types of farmers one can deduce that ex-DFI farmers were better off income wise than the non-DFI farmers. However, both types of farmers have average incomes which are above the average per capita income of the country, which is about seven hundred shillings. The explanation could be that the banana - coffee zone is supposed to be richer than the other ecological zones in Uganda. Again basing one's argument on the incomes of the two types of farmers one cannot rule out the probability that the ex-DFI farmers were better farmers since they had higher average income and that this could be one of the reasons why they were recruited.



Contacts between Ex-DFI and Non-DFI Farmer Neighbours:

One of the objectives of DFI courses, as cited before, is that the ex-DFI farmers could influence their neighbours who have not been to the DFI courses to adopt innovations and improved farming practices. In other words, ex-DFI farmers could help in teaching non-DFI farmers how to carry out proper farming. It is also hoped that if non-DFI farmers could see the improvements which the ex-DFI farmer has made on his farm they could become motivated and want to go to the DFI courses. This would ease one of the recruiting problems which is that of failing to get enough farmers for the DFI courses.

The influence of ex-DFI farmers could depend on their social status and how popular they are in their local areas. If a farmer is unpopular in his village then he is likely not to be contacted by any of his neighbours. Since local chiefs are supposed to pay visits to the people in their area of control they are supposed to pay visits to the people in their area of control they are likely to meet non-DFI farmers and advise them on how to farm properly. An attempt was made to find out how many ex-DFI farmers have been approached by their neighbours for advice on improved farming methods. Thirty three ex-DFI farmers had been approached and twenty three had not been approached by their non-DFI neighbours. This indicates that there are some ex-DFI farmers who are not able to transfer their knowledge they got from DFI courses to other farmers and hence they are not effective. The reason for not being approached could mean that non-DFI farmers think that these ex-DFI farmers are beyond the socio norms of the community and that they would not get any useful advice from them. A question was asked to non-DFI farmers interviewed to find out how many of them have approached ex-DFI farmers for farming advice.

Fifteen of them said that they have approached ex-DFI farmers and thirteen non-DFI farmers had not done so. The reason they gave for not approaching ex-DFI farmers was that they considered ex-DFI farmers to be richer than them and therefore could carry out the practices. This meant that even if they got the advice they could not carry out the practices because they considered them to be beyond their economic reach. This was taken as an apathetic expression among these farmers for there are a number of improved practices which not require a lot of money. Improved practices like the proper planting of bananas, raising of vegetables, pruning of coffee and bananas may not require extra expenses from the farmer if he already has these enterprises. It is, however, important to note that the majority number of ex-DFI farmers have been approached by their neighbours for farming advice. Also a bigger number of non-DFI farmers interviewed have approached ex-DFI farmers for advice. This indicates a positive effect of the DFI courses.

Views of ex-DFI and non-DFI Farmers:

It was thought fitting to get views of farmers interviewed on the District Farm Institute courses and extension service in general. Ex-DFI farmers were asked to express their views on the DFI courses. On the whole ex-DFI farmers indicated that they enjoyed the courses and that they would welcome more advanced courses on new topics. This testifies to a certain extent the success of the DFI courses. They said that they enjoyed the teaching which involved classroom teaching and field tours. They further said that the teaching was simple for them to understand since it was conducted in Luganda which is the local language widely spoken in the banana - coffee zone. They testified that most of the teachers were friendly and willing to answer

any type of question. They said that their understanding was enhanced by result and method demonstrations and use of visual aids. This helped them to grasp what they were taught and if they did not, there were hand-outs which were issued to them for future references. This could probably suggest that although none of the DFI teachers had had any training in adult education they could nevertheless teach adult farmers to their level of understanding.

Ex-DFI farmers were asked why some of them had not started carrying out what they had been taught at the DFI if the teaching was good. They said that most of them were willing to carry out the practices but lacked the capital to purchase the in-puts. They stated that practices like application of fertilisers, insecticides and fungicides required cash which most of them did not have. Some of improved farming practices and innovations required intensive labour use which most of them do not have as hired labour is expensive. They, however, said that since they have the know how and managerial skills acquired from the DFI course, they will carry out the practice when their capital situation improves. At this juncture, they appealed to the Government to offer them credit and subsidy facilities. The farmers were asked to join the cooperatives societies in their villages so that the Government can channel these facilities through their cooperative societies.

Forty three ex-DFI farmers expressed their satisfaction with the one week's course duration as being adequate. The common reason they gave was that most of the farmers have families and cannot afford to spend more than one week away from their families. Twelve ex-DFI farmers said that one week is not enough. The reason was that a lot of subjects are taught during this week's course duration and that one finds it difficult to really "digest" what he/she is taught. They therefore, suggested a minimum of at least two weeks'

duration. They still maintained that the teaching was good. Most of the farmers complained that they have never been visited by the DFI teachers as they had been promised during the courses. Only three ex-DFI farmers out of the fifty six ex-DFI farmers interviewed had been visited by the DFI teachers and yet in the DFI register, it was indicated that all these farmers had been visited.

Ex-DFI farmers were further asked to express their views on the recruitment of the farmers to DFI courses. Thirty five ex-DFI farmers said that the recruitment was properly carried out. The reason they gave was that an attempt is always made either by the sub-parish chiefs or the local extension agents to approach as many farmers as possible whenever there is a course to be held at the DFI. Any willing farmer is recruited and is informed about the date and the place where to find him for collection. The other reason is that sometimes the intended recruitment for the course is announced on the radio and any farmer who wants to be recruited can approach either his local chief or the field extension agent in the area and would then be recruited. They said that some farmers are not willing to be recruited because they feel insecure to leave their families behind and that some farmers do not have spare blankets and bedsheets to take to the DFI.

Seventeen ex-DFI farmers felt that farmers are not properly recruited for the DFI course. They said that those farmers who are selected - it is because they are either friendly to the local chief or known to be good farmers by the field extension agent in the area. In other words, the recruitment depends on the personal contacts between the local chief, and the extension agent and farmer. This implies that those farmers who are never visited by the extension agent are never recruited. They said that although the intended recruitment might be announced on the

radio some farmers might miss the announcement if they are not tuning in at that time. They also said that some farmers do not know that the courses are free. Thus in summary the seventeen ex-DFI farmers were of the view that DFI courses have not been given sufficient publicity. The other four interviewed ex-DFI farmers reserved their comments.

The non-DFI farmers interviewed were asked whether they knew anything about the DFI courses. They all said they had heard about the courses but through various channels. Fifteen non-DFI farmers said that they had heard about the courses from ex-DFI farmers. Eight non-DFI farmers had heard about the courses from the field extension agents. The remaining five non-DFI farmers had heard about the courses on the radio. The farmers were asked why they had not volunteered for recruitment. Some of them said that they could not leave their families at that time but that they would be willing to go next time if they are approached. Others felt that the course would not have improved their farming performance since they did not have the money to purchase the inputs. In other words, they were apathetic about the DFI course results which they could probably get out of through more personal contacts with the field extension agents.

## CHAPTER IV

### CONCLUSIONS AND RECOMMENDATIONS:

When discussing the findings, recommendations and suggestions were given whenever this was appropriate at the end of each relevant topic. Although this concluding chapter is intended to be a summary of these, it will re-emphasize only some of them and an attempt will be made to make more suggestions.

It will be recalled that the principle objective of the study was to assess the effectiveness of District Farm Institute courses as an extension service method. The specific objectives were firstly to contact farmers who had attended DFI courses to find out the extent to which their awareness to new methods of farming had been increased by attendance of DFI courses. The second objective was to find out what changes in practice resulted from having attended a farm institute course. The third objective was to question the farmers in such a way as to obtain their opinion as to whether earnings had increased because of DFI course attendance. The fourth objective was to find out factors that influence the effectiveness of DFIs.

The results of the study show a benefit for those farmers who had attended DFI courses. The study indicates that the rate of practice adoption has been stepped up considerably by the DFI course attendance. It was observed that the use of modern techniques such as fertilisers, insecticides and practices such as optimum planting time, proper spacing, adequate weeding, was significantly higher among the ex-DFI farmers. Most of the ex-DFI farmers interviewed indicated that they were planning to make more changes in the future. It was also interesting to note many

instances of neighbours adopting practices because of the results obtained by the farmers who attended the course. True, all the changes cannot be credited to DFI courses since the field staff were still making contacts and working with these same farmers after the course. On the other hand the field staff had also been making contacts for several years before the introduction of DFI courses and were making contacts with both the ex-DFI and non-DFI farmers. All the same, a substantial number of ex-DFI farmers felt that they had gained both technically by enlarging their technical knowledge and financially by using the knowledge they had acquired to increase their earnings by means of an increased agricultural output.

#### MEASURES TO INCREASE THE EFFECTIVENESS OF DFI

##### i. DFI Course Content:

When teaching the farmers about new improved farming practices we are not only interested in adoption but also in the improvement of the farmer's output. As observed in the results the majority of farmers trained at DFI are small plot owners. The emphasis on training must therefore be on intensive farming practices. This would entail most of the technical skills such as seed selection, fertiliser application, crop rotation, indoor feeding, farm management, artificial insemination, simple accounting and costing. During this study it was observed that there is a strong need for farmers to learn a few basic principles of farm management. Improved practices can only be beneficial when used in the context of sound farm management. The farm institute is the ideal place to teach farm management to farmers. These principles are essential in decision with respect to inputs or combination of inputs to be used, allocation of labour (largest single input) among farming and non-farming activities, combination of enterprises and crop and livestock patterns to be followed:

ii. DFI Teachers:

The results so far have indicated that education is necessary to enable farmers to analyse their problems, appreciate the value of improved farming practices and be able to produce profitably. This implies that the DFI teachers should be of high quality in terms of being able to teach farmers who go for the courses. From age analysis of the farmers it was observed that DFI training is basically for adults. This then means that adult training should conform with what adults need. Hence adult training must be seen to evoke simultaneous enthusiasm and interest. This can only happen if all information passing from the trainer is related somehow to their past experience. District Farm Institute teachers should be capable of "reaching" the farmers through reasoned simple approaches to topics. This means that they should have undergone an instructors' course covering such areas as the learning theory, lecture preparation, how to motivate adult students. In other words, in training teachers for any of instruction, the course must reflect the need for the teachers to have more knowledge than they will be required to pass to their students.

iii. Recruitment of DFI Teachers:

Principals should have a say in the staffing of the Institutes. Teachers recruited to the DFIs should be well known for their diligence, technical qualification and probably proven effectiveness in the field work. They must at least show an interest in teaching of adults. This would go along to eliminate the possibility of making DFIs a dumping grounds for ineffective and unefficient officers in the department of agriculture.

iv. Recruitment of Farmers for DFI Course

It has been observed in the results that generally farmers



who go for the DFI courses are those farmers with a high social status in their areas or they are considered to be good farmers by the recruiting agents. Some farmers as the results show, have been to the similar courses for more than once. This reflects a fault in the recruiting of farmers to the DFI courses. Ex-DFI farmers get more personal contacts with the extension agents in their areas than non-DFI farmers. This has contributed a lot for the selection of some ex-DFI farmers to DFI courses. In future DFI courses should be given wide publicity among farmers. This could be done through radios and local news papers. Many farmers get access to these two media.

In future the selection of trainees should be as far as possible comprised of farmers from one local location. This means that the selection should be based on sub-parish rather than on parish level. Some means should be devised to select a group of farmers which is homogeneous so that they can learn at the same space. There is no better method of wasting time than a class where a few trainees are far a head of the rest in basic information on the subject.

Farmers could be recruited through the primary cooperative societies which in future would sponsor the farmers by paying fees for the courses on the farmers' behalf. Members of a primary cooperative society belong to an integrated unit and could learn more rapidly as there would not be the "setting" in problem.

One of the measures of success of farmer training centres is the number of people trained and the usefulness of the training given. It is observed that DFI is an important source of agricultural information to farmers.

The method of training in the DFI has certain advantages in that it can be controlled and administered quite easily and the selection of the farmers (e.g. according to their progressiveness) can be planned and controlled.

The disadvantage of training for extension at the DFI is the very limited capacity to train many farmers. The limitations are very severe since the training proves useful only if it is done shortly before the planting season or other intended farm operations. This is because human mind has an extremely great capacity of forgetting and confusing. Practically, it means that courses can be held twice (often only once) a year within a period of six weeks before planting. Even with the greatest effort barely a thousand farmers can be trained each year which is hardly enough to be called "rapid development".

In view of these limitations one could devise a new way of taking DFI courses to the farmer. This could mean extension training for groups in the field. Selected groups of farmers could get training in their own locality (whether in the field, in schools, churches or other places). This farmer teaching approach has already received some positive support in Kenya. (19)

By this method more farmers can be reached than by the DFI since the extension field agents could be carefully prepared for this task. They could be trained at the DFI and then

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19. S. SCHONHERR and E.A. MBUGUA, Rapid Development For Kenya's small Farms, working paper No.126 (Institute for Development Studies, University of Nairobi, October 1973) Page 12 and 13.

divided into small teaching units, each reaching as many or even more farmers than one DFI. (20)

If the department of agriculture decides to take up the method of taking the extension training to the farmers it should consider combining the demonstration activities with the extension training from the very beginning. The following procedure could be taken. (21)

- (a) Approach to groups of farmers in selected localities (sub-parishes) and discuss with them the new crop improved farming practice.
- (b) Let these working groups make the decision on which farms should be selected for demonstration.
- (c) Teach these groups (or representatives of them) in the new crop growing and supervise the demonstrations which are under the management of respective groups.

The success of this procedure could mean that in the following season a large number of farmers in the selected sub-parishes could adopt the new crop or the improved farming practice.

v. Follow-up:

The commonest means of evaluation of adult farmers is by visits to check on new and improved practices which have been recommended at courses. It was unfortunate as the results showed that no follow-up has been carried out on the

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20. Ibid. Page 13.

21. Ibid. Page 13.

ex-DFI farmers interviewed although it was indicated in the DFI register that they had been visited by one of the DFI teachers. In future follow-up on the ex-DFI farm should be emphasised on by the authorities. The follow-up would help the DFI teachers to prepare courses according to what farmers are doing and to decide on what practices could be used by the farmers to the best of their advantages. At the same time the importance of a close association between farmer training programs and agricultural extension service cannot be over emphasised. The completion of a course for farmers is in fact the start of a project. Time and money will have been wasted unless the extension service conducts a careful follow-up of the techniques after a training course could be directly proportional to the follow-up provided.

vi. Extension Field Staff:

Extension field staff should get refresher courses so that when farmers ask them on new practices they are in a better position to explain. This would remove the likely friction between DFI teachers and extension staff when a farmer returning from a course has become inspired by the new ideas he has seen and the possibility opened up to him. The farmer under the DFI course influence, is likely to approach the extension agent, and would want to know why he has not been informed of these things before DFI course. He is also likely to come to the field extension agent searching for a follow-up information on what he has been taught at the DFI and he would be disappointed if he found that the extension agent did not have the information.

Therefore refresher courses both in extension methods and in new agricultural techniques should be given to extension agents. This would insure that the extension worker is always

a few steps ahead of the farmer. These refresher courses could be carried out before DFI courses for the farmers from a particular area start.

It was observed that generally extension agents in the field lack transport and yet they are in charge of large areas and many farmers. They therefore tend to concentrate on the "progressive farmers". When time for DFI courses come they select these farmers. The department of agriculture should put more effort on training extension field agents to reduce the extension agent farmer ratio. Their salaries should be increased in proportion to the increasing cost of living. Those extension field agents who are hard working should be seconded for promotion or for further studies. This in the long run would improve the morale of the field extension agents and improve the quality of their work. They should also be given loans to buy at least bicycles to reduce their transportation problems.

#### OTHER THINGS WHICH COULD ENHANCE THE EFFECTIVENESS OF DFI COURSES

The study has revealed that the scope for inducing change by enlarging the technical knowledge of farmers by means of DFI courses tends to be constrained by the infrasturcture of markets, input supplies, transport, lack of capital and labour constraints. To the extent that these constraints hamper farmers' ability or capability to put to use the technical knowledge they acquire from DFI courses, measures to alleviate or remove these constraints would contribute significantly towards increasing the effectiveness of DFI courses.

In this respect the Government could look into the improvement of credit facilities to farmers. In otherwords, the Government should make an effort to provide funds in terms

of credit through cooperative societies to farmers for the purchase of inputs necessary for the innovations and improved practices. Producer credits, tied to specific inputs as in the case, for instance with fertiliser credits, make it possible for farmers to adopt input innovations that might not fully be able to compete economically with established traditional methods. Poor farmers can adopt high yielding varieties but may fail to exploit their genetic potential, because, unlike their well-to-do colleagues, they cannot afford to apply fertilisers.<sup>22</sup>

Credit facility is not the only measure to improve the effectiveness of DFI courses but should be integrated with other measures like creation of new market outlets either by means of processing or export markets so that farmers know where to sell their increased outputs. Improvement of village network system would to a large extent reduce the transportation problem. This could be done under the self-reliance scheme which has been recently emphasised on by the Government. If credit facilities are there, there should be an improvement in availability and distribution of inputs. If the above mentioned factors are looked into by the authorities then the effectiveness of DFI courses would be enhanced and in the long run agricultural production in Uganda would increase.

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22. H. HANSEL, Input Innovations, Produce Credit social Differentiation (a paper presented during the East African Agricultural Economic Conference, May 22, 1974, Lusaka, Zambia) Page 54.

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APPENDIX 1

QUESTIONNAIRE FOR THE FARMERS WHO HAVE BEEN TO DFI

INTRODUCTION

1. Name ..... Sex .....
2. Village or Location .....
3. Sub-Parish (Muruka) .....
4. Gombolola or Parish .....
5. Country .....

ADOPTION OF THE PRACTICES

Present situation of the farmer:

1. Please can you tell me what kind of crops you are growing on your shamba,

<u>Crops</u>	<u>Tick ( )</u>	<u>Acres</u>
Banana		
Coffee		
Cotton		
Vegetables		
Grassland		
Ground nuts		
Beans		
Maize		
Sweet Potatoes		
Others		

2. Can you tell me the acreage of each crop,
3. Can you tell me the total acreage of your farm, .....acres.  
 Differs with the information above .....  
 Does not differ with the total acreage of crops given above ....
4. Are you keeping some animals? ..... Yes/No.

<u>Name of Animal</u>	<u>Tick ( )</u>	<u>Number</u>
Cattle		
Goats		
Sheep		
Pigs		
Poultry		
Others		

5. How many grade cattle do you have? .....
6. How many indigeneous cattle do you have? .....
7. Do you own oxen? ..... Yes ..... No.  
If yes, how many .....

APPLICATION OF CROP HUSBANDRY PRACTICES

8. Do you prune your: Banana Shamba?  
Coffee Shamba?
9. Do you mulch your: Banana Shamba?  
Coffee Shamba?
10. Do you apply fertilisers on your crops?  
On which crops?  
List:
11. What type of fertiliser do you use? .....
12. Do you apply manure on your crops? .....
- On which crops?  
List:

13. Do you spray your crops against pests? .....Yes/No.  
Which crops and how often? (per month or year)

<u>Crops</u>	<u>Times per Month</u>	<u>Times per Year</u>
--------------	------------------------	-----------------------

14. Do you spray your animals against ticks? ..... Yes/No.

15. What animals do you spray?

List:

16. Do you own a spray pump? ..... Yes/No.

17. How much do you think is your annual income? Shs. ....  
Do not know.

RECRUITMENT

18. Who chose you to go to the DFI?

19. Did you express your wish for attending DFI course before  
you were chosen? ..... Yes/No.

20. If not how did you feel about your recruitment? .....  
.....

21. Do you think that farmers are properly recruited? ..... Yes/No.  
If yes why?

21. Cont'd.

If no why and how would you like them to be recruited?

SITUATION BEFORE THE FARMER WENT TO THE DFI

22. Please can you tell me what kind of crops you were growing on your shamba before you went to the DFI?

<u>Crops</u>	<u>Tick ( )</u>	<u>Acres</u>
Banana		
Cotton		
Coffee		
Vegetables		
Grassland		
Ground nuts		
Beans		
Maize		
Sweet Potatoes		

23. Can you tell me what was the acreage of each crop? .....

24. Can you tell me what was the total acreage of your farm?

.....acres.

Differs with information above .....

.....

Does not differ with the total acreage of crops given above

.....

25. Were you keeping some animals? ..... Yes/No.

26. Name of Animal                      Tick ( )                      Number

Cattle

Goats

Sheep

Pigs

Poultry

Others

27. How many grade cattle did you have? .....

- 28. How many indigeneous cattle did you have? .....
- 29. Did you own oxen? Yes/No. If yes how many? .....

APPLICATION OF CROP HUSBANDRY PRACTICES

- 30. Did you prune your: Banana shamba?  
Coffee shamba?
- 31. Did you mulch your: Banana shamba?
- 32. Did you apply fertilisers on your crops? ..... Yes/No.

List:

- 33. What type of fertilisers did you use?
- 34. Did you apply manure on your crops? ..... Yes/No.  
On which crops? .....

List:

- 35. Did you spray your crops against pests? ..... Yes/No.  
Which crops and how often (Per month or year)

<u>Crops</u>	<u>Times per month</u>	<u>Times per year</u>
--------------	------------------------	-----------------------

- 36. Did you spray your animals against ticks on diseases?  
..... Yes/No.

- 37. What animals did you spray?

List:

- 38. Did you own a spray pump? ..... Yes/No.
- 39. How much do you think was your annual income before attending DFI courses? Shs. .... Do not know.....

PAST ATTENDANCE

- 40. How many times have you attended courses at the DFI? .....time
- 41. When were you last there?
  - (a) Year .....
  - (b) Month and date .....
- 42. How long did you stay at the DFI each time? ..... days.
- 43. Do you think the duration of the course was
  - (a) Too long .....
  - (b) Too short .....
  - (c) Adequate .....
 Why do you think so? .....  
 .....  
 .....
- 44. How did you find the teaching in general?

Poor	Fair	Good

If so why? .....  
 .....  
 .....

VARIOUS PROBLEMS

- 45. Did you have any problems on your farm before you went to the DFI? .....Yes/No.
- 46. If yes what problems?  
List:

47. Did the attendance of DFI help you to solve those problems?  
Yes/No. If no why? .....
48. If no do you think another attendance could help you solve  
the problems? ..... Yes/No.  
If no why? .....

EFFECTIVENESS OF DFI COURSES IN CHANGING FARMERS FARMING PRACTICES

49. How effective do you think is the DFI courses in changing  
agricultural practices?  
(a) Not effective .....  
(b) Moderately effective .....  
(c) Effective .....  
(d) Very effective .....
50. If so why do you think so? .....
51. Are there suggestions you would like to make on how to  
improve DFI courses?  
List:

52. Has any of the farmers who did not attend the course ever  
visited you to seek advice? ..... Yes/No.
53. Has any of these farmers started carrying out the practices?  
..... Yes/No.
54. If yes what practices?  
List:

FOLLOW UP VISIT

- 55. Have you ever been visited by any member of the DFI after attendance? ..... Yes/No.
- 56. If yes who initiate it? ..... yourself,.. .....DFI sta
- 57. Has the extension agent in your area ever visited you to see whether you are carrying out the practices? ..... Yes/No.
- 58. If yes who initiated it? .....Yourself, .....extension staff.
- 59. How often does he visit you? .....
- 60. Is that enough? ..... Yes/No.
- 61. If no how many times would you like him to visit you per month? ..... times.

FAMILY SITUATION

- 62. How many children do you have?

Children's Age	0 - 12	12 - 18	Over 18
Sex			
Education			

- 63. Other members of the family who attended DFI courses.

Member                      When attended                      Course attended

- 64. If none do you want any to attend DFI courses? ..... Yes/No.
- 65. If yes why?.....
- 66. If no why?.....



67. How many years of schooling do you have ..... years.
68. If no formal EDUCATION do you know how to read and write?  
..... Yes/No.
69. Did you learn it by ..... yourself, ..... religious  
teacher..... community teacher or how? .....  
.....
70. How old are you? ..... years.

APPENDIX 2

QUESTIONNAIRE FOR THE FARMERS WHO HAVE NOT BEEN TO DFI

INTRODUCTION

1. Name ..... Sex .....
2. Village or Location .....
3. Sub-Parish (Muruka) .....
4. Gombolola or Parish .....
5. Country .....

PRESENT FARMING SITUATION OF THE FARMER

1. Please can you tell me what kind of crops you are growing on your shamba?

<u>Crops</u>	<u>Tick ( )</u>	<u>Acres</u>
Banana		
Coffee		
Cotton		
Vegetables		
Grassland		
Ground nuts		
Beans		
Maize		
Sweet Potatoes		
Others		

2. Can you tell me the acreage of each crop?
3. Can you tell me the total acreage of your farm? ..... acres.  
Differs with the information above .....  
Does not differ with the total acreage of crops given above.....
4. Are you keeping some animals? ..... Yes/No.

4. Cont'd

NAME OF ANIMAL                      TICK ( )                      NUMBER

Cattle

Goats

Sheep

Pigs

Poultry

Others

5. How many grade cattle do you have? .....

6. How many indigenous cattle do you have? .....

7. Do you own oxen? ..... Yes/No. If yes how many? .....

APPLICATION OF CROP HUSBANDRY PRACTICES

8. Do you prune your: Banana shamba?

Coffee shamba?

9. Do you mulch your: Banana shamba?

Coffee shamba?

10. Do you apply fertilisers on your crops? ..... Yes/No.

On which crops?

List them:

11. What type of fertiliser do you use? .....

.....

12. Do you apply manure on your crops? ..... Yes/No.

On which crops? .....

List them:

13. Do you spray your crops against pests? ..... Yes/No.  
Which crops and how often? (per month or year)

<u>Crops</u>	<u>Times per month</u>	<u>Times per year</u>
--------------	------------------------	-----------------------

14. Do you spray your animals against ticks? ..... Yes/No.

15. What animals do you spray?

List them:

16. Do you own a spray pump? ..... Yes/No.

17. How much do you think is your annual income? Shs. ....

Do not know .....

INFORMATION ABOUT DFI

18. Have you ever heard about DFI? ..... Yes/No.

19. If yes, who told you about DFI?

- (a) DFI staff
- (b) DFI ex-students
- (c) Extension staff
- (d) None of the above

21. What new practices were you told to adopt?

List them:

22. What do you think about the new practices? .....

.....  
.....

23. What do you think are the problems of adopting new practices? .....
- .....
- .....
24. Do you think those DFI ex-students are doing better or benefiting more than those who did not attend DFI? Yes/No/Do not know
- Why? .....
- .....
25. Do you want to go to DFI? ..... Yes/No.
- If yes, why? .....
- .....
- If no, why? .....
- .....

VARIOUS PROBLEMS

26. Do you have any problems on your farm? ..... Yes/No.
27. If yes, what problems?
- List them:
- .....
28. Do you think these problems could be solved if you attended DFI courses? ..... Yes/No/Do not know
- If no, why? .....
- .....

FAMILY SITUATION

29. How many children do you have? .....

29. Cont'd

Children's Age	0 - 12	12 - 18	Over 18
Sex			
Education			

- 30. Are there members of your family who have attended DFI courses? ..... Yes/No.
- 31. How many years of schooling do you have? ..... years.
- 32. If no formal education, do you know how to read and write? Yes/No.
- 33. Did you learn it by ..... yourself, ..... religious teacher, ..... community teacher or how? .....  
.....  
.....
- 34. How old are you? ..... years.

WEEKLY TIMETABLE

COURSE: General Agriculture (W. Buganda) From 3-9-74 To 9-3-74

	8.30 a.m. - 10 a.m.		10.30 a.m. - 12.45		2 p.m. - 4 p.m.
SUNDAY		K	ARRIVAL AT DFI	H	
MONDAY	Opening of the Course Principal	Farm walk (Farm Manager)	Ox-cultivation (Mr. Rwabukye)	C	Coffee Mr. Luyiriika
TUESDAY	Nutrition (Mrs. Kaumi)	A	Bananas (Mr. Luyiriika)	N	Cotton (Principal)
WEDNESDAY	Vegetables (Mrs. Kaumi)	E	Vegetables (Mrs. Kaumi)	U	Food Crops
THURSDAY	Poultry(Mr. Lukwago) (Miss Maseembe) A.T. By Kintu	R	Mr. Mwasansimbi	L	Diary (Miss Kafeero) Pigs, M-Nsimbi
FRIDAY	Farm Management	B	Farm Management		Discussion Principal
SATURDAY		S T U D E N T S D E P A R T			

APPENDIX 4

COURSE PROGRAMME

MUKONO DISTRICT FARM INSTITUTE AND RURAL TRAINING CENTRE

JULY - DECEMBER 1974

<u>Date</u>	<u>Agric/Veterinary</u>	<u>Cooperative</u>	<u>Community Dev.</u>
July	F.U. Kyaggwe District 30/6/74 - 6/7/74		
	Gen. Agric. Seminarious 7/7/74 - 13/7/74	Secretary Managers, Bulemezi Kyaggwe	
	Tick Control Kyaggwe District 7/7/74 - 13/7/74		
	Gen. Agric. Mengo District 14/7/74 - 20/7/74	Secretary Managers, Bulemezi/Kyaggwe 14/7/74 - 20/7/74	
	Diary Farmers Bulemezi District 14/7/74 - 20/7/74		
	Gen. Agric. Mengo District 21/7/74 - 27/7/74 (Mawokota)	Treasurers Mengo District 21/7/74 - 27/7/74	
	Gen. Extension (Katikamu County) Bulemezi 28/7/74 - 3/8/74	Treasurers Mengo District 28/7/74 - 3/8/74	



Date	Agric/Veterinary	Cooperative	Community Dev.
AUGUST	Gen. Extension (Nakaseke County) Bulemezi	Managers (Mafuta Bulemezi/Kyaggwe	
	4/8/74 - 10/8/74	4/8/74 - 10/8/74	
	Poultry Farmers Bulemezi		
	4/8/74 - 17/8/74		
	Cocoa Farmers Kyaggwe District 11/8/74 - 17/8/74	Managers (Mafuta Mingi) Bulemezi Kyaggwe	
		11/8/74 - 17/8/74	
	Home Economics Bugerere/Kyaggwe	Managers (Mafuta Mingi) Bulemezi/ Kyaggwe	
	18/8/74 - 24/8/74	11/8/74 - 17/8/74	
	Pig Husbandry Kyaggwe		
	18/8/74 - 24/8/74		
	Gen. Agric. Kyaddondo Mengo District	Book-keepers Kyaggwe District	
	25/8/74 - 31/8/74	25/8/74 - 31/8/74	
	Poultry Farming Mengo District		
	25/8/74 - 31/8/74		
SEPTEMBER	Gen. Agric. Mengo District (Butambala)	Committee Members Mengo District	
	1/9/74 - 7/9/74	1/9/74 - 7/9/74	

<u>Date</u>	<u>Agric/Veterinary</u>	<u>Cooperative</u>	<u>Community Dev.</u>
SEPTEMBER	Pig Farmers Bulemezi 1/9/74 - 14/9/74		
	Gen. Agric (Nakifuma) Kyaggwe 8/9/74 - 14/9/74	Secretary Mengo Mengo District 8/9/74 - 14/9/74	
	Gen. Agric. Kyaggwe District (Buikwe) 15/9/74 - 21/9/74	Treasurers Bulemezi District 15/9/74 - 21/9/74	
	Animal Husbandry Mengo District 15/9/74 - 21/9/74		
	Rice Farmers Bulemezi District 22/9/74 - 28/9/74	Treasurers Bulemezi District 22/9/74 - 28/9/74	
OCTOBER	Y.F.U. Bulemezi District 29/9/74 - 5/10/74	Secretary Managers Mengo District 29/9/74 - 5/10/74	
	Ox-Cultivation Mengo District (Kanoni) 6/10/74 - 12/10/74	Secretary Managers Mengo District 6/10/74 - 12/10/74	
	Pig Farmers Mengo District 6/10/74 - 12/10/74		

Date	Agric/Veterinary	Cooperative	Community Dev.
OCTOBER	Y.F.U. Mengo District Kabulasoke	Chairman Bulemezi District	
	13/10/74 - 19/10/74	13/10/74 - 19/10/74	
	Diary Farmers Kyaggwe District 13/10/74 - 19/10/74		
	Gen. Agric. Kyaggwe District (Mukono) 20/10/74 - 26/10/74	Chairman Kyaggwe District 20/10/74 - 26/10/74	
	Tick Control Bulemezi 20/10/74 - 2/11/74		
	Gen. Agric. Kyaggwe District (South Bugerere) 27/10/74 - 2/11/74	Book-keepers Mengo District 27/10/74 - 2/11/74	
NOVEMBER	Home Economics Mengo District 3/11/74 - 9/11/74	Book-keepers Mengo District 3/11/74 - 9/11/74	
	Animal Husbandry Mengo District 3/11/74 - 9/11/74		
	Horticulture Mengo District (Mpigi) 10/11/74 - 10/11/74	Rural savings Kyaggwe District 10/11/74 - 16/11/74	

Date	Agric/Veterinary	Cooperative	Community Dev.
NOVEMBER	Ranching Kyaggwe District 10/11/74 - 16/11/74		
	Gen. Extension (Buruli County) Bulemezi District 17/11/74 - 23/11/74	Rural Savings Kyaggwe District 17/11/74 - 23/11/74	
	Fee Keeping Bulemezi 11/11/74 - 30/11/74		
	Y.F.U. Bulemezi District 24/11/74 - 30/11/74	Shop Managers Kyaggwe/Mengo and Bulemezi District 24/11/74 - 30/11/74	
	Bee Keeping Bulemezi 24/11/74 - 30/11/74		
DECEMBER	Credit Mengo District 1/12/74 - 7/12/74	Shop Manager Kyaggwe/Mengo and Bulemezi 1/12/74 - 7/12/74	
	Beef Production Bulemezi 1/12/74 - 14/12/74		

<u>Date</u>	<u>Agric/Veterinary</u>	<u>Cooperative</u>	<u>Community Dev.</u>
DECEMBER	Y.F.U. Mengo District	Secretary Managers Bulemezi District	
	8/12/74 - 14/12/74	8/12/74 - 14/12/74	
	Home Economics Bulemezi District	Secretary Managers Bulemezi District	
	15/12/74 - 21/12/74	15/12/74 - 21/12/74	

C.K. Luyirika  
For PRINCIPAL.