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THE USE OF EXPERIMENTAL SMALL-HOLDINGS
IN EXTENSION



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THE USE OF EXPERIMENTAL SMALL-HOLDINGS
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I. INTRODUCTION

The recent Visitation Committee Report on Makerere (para. 150) suggests that the Faculty of Agriculture could have a far greater extension function. If this suggestion is implemented the experimental small-holdings at Kabanyolo and Luteete (nr. Bamunanika) would become central to the Faculty's activity. They would serve as a testing ground for innovations, a training ground for Makerere students and staff and a demonstration ground for local farmers and government staff. This paper reviews our experience since the first small-holding was started in January 1968. It takes the argument beyond the analysis of one farmer's results to see where such small-holdings could contribute to agricultural development.

II. TERMINOLOGY

There are so many small farms of various types and used for various purposes that some confusion has arisen. The following types are tentatively classified and described in order to distinguish the Kabanyolo approach.

EXPERIMENTAL SMALL-HOLDINGS:-

Farms of about the model size for the area which are farmed by a tenant for his own profit with reasonably typical constraints on labour and capital but according to a laid down basic system of farming. (e.g. Kabanyolo and Luteete).

DEMONSTRATION OR MODEL FARMS:-

Farms, usually attached to a District Farm Institute or other institution, which serve primarily as a visual demonstration to farmers. Frequently labour is provided at government rates, revenue goes to the Treasury and management is by the Institute staff. (e.g. Uganda D.F.I.'s - ref. Othieno (1969)).

STUDENT FARMS:-

Small farms created with the idea of giving agricultural students practical experience in peasant-scale farming. Some

extension use may be made of the holdings. (e.g. Bukalasa Agricultural College - ref. Kasenge (1960)).

Most of the small farms currently in use could be placed in one or other of these classes. Other terms which have been used from time to time are:- Unit Farms, Pilot Farms, Costings Farms, etc. The Unit and Pilot Farm could be classed together with the experimental small-holding. Costings Farms (e.g. Kawanda) have usually failed where they have not been based on a tenant who retains the proceeds of the farm.

All these farms have one thing in common. Ultimate control of the farm is vested outside the farm either in a Committee, Lecturer in Farm Management or Staff of a College. To that extent all are atypical of farming in the area. The experimental small-holding gets nearest to simulating an actual farm situation. As such it is thought to be the most suited to use for extension purposes. This paper outlines the experience gained with small-holdings since January 1968 and discusses possible uses for such small-holdings.

III. THE HISTORY OF EXPERIMENTAL SMALL-HOLDING

The idea of a controlled farm situation for use in extension has been tried in many countries with singularly little success. Boss and Pond report that at the turn of the century in 1902 demonstration farms were tried by the new office of Farm Management in the U.S. Dept. of Agriculture. One of the first examples in East Africa was started in 1931 at the Scott Agricultural Laboratories in Nairobi (ref. - Dept. of Agric.).

The Nairobi experimental small-holding was selected on the basis of what a man and his wife could cultivate and on the average area available. The chosen size was 4 acres and crops included Maize, beans, wattle and lucerne. Livestock included 2 cows and 2 donkeys. Mechanisation included a ceres plough and a donkey cart. Net profit in 1931 = Shs 650 or 53 Shs per month compared with a labourers wage at that time of 15 Shs. There was no attempt to introduce high value enterprises such as coffee or dairy cattle.

The objects of the Nairobi small-holding were stated to be:-

- a) To find out if a living could be found from a 4-acre holding.

- b) To show farming as a desirable means of livelihood,
- & c) To demonstrate improved methods.

Object a) could possibly be said to be experimental but there was no clear indication of any intention to achieve an optimum income. However there was a clear attempt to be realistic in terms of capital costs. The house and buildings cost 997 Shs, implements 402 and livestock 390 Shs. No evaluation has been found of this small-holding nor any indication of why or when it was closed down.

In Uganda demonstration farms are now usually found on District Farm Institutes. In some cases these are much larger than the average for the area. A small-holding was run for many years at Kawanda but was recently abandoned. According to Othieno (1969) "no significant impact upon local agricultural practice was noticed". Staples (1940) describes small-holdings started at Serere in 1933 and Bukalasa in 1927. Those at Serere were operated either by students and their wives or by groups of students. The Bukalasa 3 acre holding started in 1927 was designed primarily to test whether a settled agriculture was possible in terms of maintaining fertility. This was found to be quite possible and no decline in fertility nor economic returns was apparent after seven years. There was more attention to cash crops such as coffee and cotton than in the Kenya example.

Factors in the "failure" of small-holdings

There is little evidence that small-holdings have been greatly used either in actual extension or in planning extension strategies. They have been perhaps of greatest use in educating agricultural officers about the problems of peasants. In the case of the Kawanda Costings Farm the following factors seem to have contributed to the apparent "failure" of the small-holding:-

- a) The size (10½ acres) was well above the mean size of the area and so was somewhat a typical,
- b) 3 high grade Friesians worth about Shs 4500 plus an expensive permanent cowshed and dairy raised the capital costs unrealistically in view of the limited credit facilities in Uganda,
- c) The Labour Policy of 1 permanent man and 1 labourer and 1 recorder plus up to 13 other labourers on a casual basis made the farm economically non-viable,

- d) The farm was never truly separate from the main farm and was managed by the Farm Manager. This led to an unreal decision making pattern,
- e) Charging labour at government rates made it virtually impossible to make a profit. 1964 figures show heavy losses on cotton, groundnuts, sweet potatoes and even on matoke.. Elephant Grass fed to the cows was by far the most profitable crop (513 Shs/acre compared with 76 Shs/acre for a 5 year old plot of robusta),
- f) The main extension point of the farm, that high profits/acre can be made from a stall-fed unit, was never seriously put across in the area. For widespread adoption it would have needed a credit programme and arrangements for supplying cattle. In any case the work was conducted by the wrong Ministry for this to be tackled comprehensively.

It must however be noted that the Kawanda Farm provided many ideas for the Kabanyolo No. 1 small-holding. It had proved the technical feasibility of the stall-fed system and achieved a milk production figure of 405 galls/acre/year. Moreover it showed clearly some of the pitfalls that such small-holdings are prone to.

The early idea (see Staples 1940) of using small-holdings for training purposes has been modified somewhat. Todd (1967) who pioneered some 4-6 acre holdings at Bukalasa had each farm run by a group of 10 students. Each student took turns at being executive officer and the objectives were entirely to improve the practical training of students. No extension function was claimed for the holdings by Todd although Kasenge (1969) mentions that students invite farmers to open days on their farms. At a similar institution in Tanzania (Ukiriguru) extension and practical training are combined by sending students to local farmers once a week to operate demonstration plots. Ref. Shiisandumi (1970).

IV. THE EXTENSION AIMS OF EXPERIMENTAL SMALL-HOLDINGS.

The original aims of the Kabanyolo and Lutete Small-holdings were laid down in a policy statement (Dept. of Rural Economy (1968)). The aims were grouped under 4 headings covering Extension, Student training, Staff practice and experience and record keeping. The direct extension aims were as follows:-

"1. To serve as a visual aid to farmers in the area of:-

- (a) The potential for expansion of output with limited resources,
- (b) A number of possible approaches to farming in Buganda which could be combined in different ways in other circumstances (when other small-holdings started),
- (c) The way in which small areas of valley soil could be used profitably for dry season vegetable production."

The extension aims of experimental small-holdings could be divided into two main sections. First there is the visual aid use as indicated above where farmers or extension staff actually visit the holding. Secondly there are the more experimental aims of testing, recording and evaluating potential farming systems or innovations. From the national point of view the second section is probably the more important. The question that arises is "why use an experimental small-holding rather than a local farmer?" This is probably the main criticism that could be made of the concept and one that needs detailed consideration.

Experimental small-holdings versus
adopted farms.

By using this heading it is not suggested that the above are necessarily alternatives. In the writer's view both are essential to a viable and comprehensive programme. In fact in countries where there is already a very full range of innovations amongst farmers there may be comparatively little case for the experimental holding. The main reasons for advocating the use of experimental small-holdings in Uganda are:-

- a) The urgent need to develop new and more remunerative systems of farming makes it necessary to attempt to reduce the time normally taken to develop a new farming system. In countries with low farm incomes as in Uganda the rate of innovation is reduced severely because of the proportionately high element of risk involved.
- b) The intensive use that would be made of a local "adopted farm" by students, staff, local visitors and overseas visitors would make it almost as atypical as an experimental small-holding.

- c) Many of the farms that have been used by the Faculty in the past for this sort of purpose have been grossly atypical of the area due to their size, fertility or the large non-farm income of the owner. This reflects the fact that it would be extremely difficult to adopt a local farmer who was typical and yet at the same time who was in a position to innovate sufficiently rapidly.
- d) Where, as at Kabanyolo, there is a considerable training function the experimental small-holding has the great advantage of accessibility. This is not just a matter of proximity but it is also possible to dispense with some of the traditional protocol which makes a visit to a local farm so time consuming.
- e) Where innovations are developed outside the farming community (as at Kabanyolo) there is a need to test them under conditions approximating to those of local farmers. In the case of universities in the States or Europe university farms will probably be of approximately the same acreage, etc. as local farms. This is not true of the University Farm at Kabanyolo (The size of which is approximately 100 times that of the Median for Buganda which Hall (1969) gives as 4.6 acres).
- f) Extension services in countries where large-scale farms pre-dominate are tailored to giving individual on the farm advice by highly trained staff. In countries where incomes are low and farms are small such an approach is not feasible. Advice must often be "blanket advice" for mass adoption and extension by relatively untrained staff. For this purpose it is essential to thoroughly test farming systems before extending them. Probably the Kenya systems of agriculture as described by Brown (1957) would have stood the test of time better if they had been subjected to such testing.

"Unit" Farms in Farm Management.

Jolly (1957) advocates the use of "Unit farms" in farm management research as an economists "laboratory". He sees the main task of the Farm Management Economist as the study of "the repercussions of technical innovations on farm organisation" (page 741). He stresses the importance of control over tech-

niques, labour, capital, enterprise combination and intensity of application of resources. This rather seems to leave out the crucial human and risk elements which have been found critical in the Kabanyolo Small-holdings. One wonders whether the degree of control stressed by Jolly is either feasible or desirable.

Experimental Small-holdings & Extension

It must however be admitted that for purposes of demonstrating new techniques or systems the adopted farm approach is preferable. As soon as a visiting farmer hears of a connection with Makerere, Government and/or some other organisation he is inclined to discount what he sees as "not possible for me". The Kabanyolo small-holdings are particularly suspect on this account due to the proximity of the capital intensive University Farm. The Luteete Small-holding, which is attached to a Family Health Centre 30 miles from Kampala, is much better sited from the direct extension point of view. But the ideal is to complement experimental small-holdings with a network of local farmer innovators who are testing the system for themselves.

V. THE POTENTIAL FOR USE IN EXTENSION

Obviously, during the initial phase of developing an experimental small-holding, there will be comparatively little to teach. But, assuming the system adopted isn't a complete failure, there should be an increasing potential. To date the following extension uses of the small-holdings at Kabanyolo and Luteete have been tried:-

- a) Kabanyolo Open Day - an estimated 3-400 out of a total of 2000 visitors visited small-holding No. 1 at the 1969 Open Day,
- b) Visits by local farmers and their families - mainly at Luteete,
- c) Newspaper articles on either the whole farm or on one particular innovation (e.g. the automatic water supply at Kabanyolo),
- d) Television films - of both Luteete and Kabanyolo Small-holdings.

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Potential adoption of stall-feeding units

At this stage any positive adoption of either the system or detailed innovations is extremely difficult to evaluate. In fact the capital cost of starting a stall feeding unit means that immediate adaption is unlikely without a credit scheme geared to the small-scale farmer. There is the further problem of obtaining exotic cattle.

The capital cost of a Two-cow Stall Feeding Unit to date is as follows:-

Table I CAPITAL COST OF A TWO-COW-STALL FEEDING UNIT

	Shs
a) Cowshed and crush	630
b) Fencing of yard and one boundary	400
c) Removing couch grass	400
d) Automatic water tank	575
e) Jersey x Nganda cow	700
f) High grade Friesian (imported)	2000
g) Equipment	330
Total	<u>5035</u>

This assumes that the unit is started over a time span of about 6 months. In fact aspiring dairy farmer^s could considerably reduce these costs by spreading the expenditure over a longer period. Thus by using 3 Nganda cattle and crossing by artificial insemination from a Friesian bull, one could (with good luck over sex of calves) obtain 2-3 half-bred heifers within a period of about 3 years. There would thus be a considerable saving on initial capital. The time span for achieving the present annual income of small-holding No. 1 would be as follows:-

Table III. TIME SPAN FOR ACHIEVEMENT OF AN ANNUAL INCOME OF SHS 5000 FROM A 2-ACRE STALL FEEDING UNIT WITH MINIMUM CAPITAL COST

Year	Items	Stage	Capital Expenditure Shs
1	Buy 3 Nganda cows @ 300 shs each	Local cows inseminated	900
	Inseminations (4)		20
	Crush		50
	Fence boundary		200
2	Build simple building	First set of calves - sell bulls	300
	Remove couch and plant elephant grass		200
	Inseminations		20
	Fence yard		200
3	Build Automatic water trough	Second set of calves - sell bulls	575
	Inseminations		20
4	Build dairy and modify first building	First heifer calves inseminated. sell cows	300
	Inseminations		20
5	Equipment	First calf/ calves start to give milk	330
	Inseminations		20
6	Inseminations	Second calf/ calves start to give milk	20
			3175

Thus not only has the total capital cost been substantially reduced but it has also been possible to spread it so that the maximum capital cost in any one year is 1170 Shs. The most likely people to be able to undertake such a long-term development are those with secondary incomes or with very low demands on existing income from other enterprises. In this latter case one might put ambitious young farmers who are unmarried. The prospect of a farmer with a family being able to undertake such a development without a loan are remote.

Potential adoption of Horticultural Small-holdings

It is clear then from the above that the widespread adoption of the stall feeding unit system is unlikely unless a credit

programme is introduced. Small-holding No. 2 has been deliberately started with a view to reducing the capital involved in developing a 5 acre holding. Actual costs have been higher than planned because of the high cost of labour in the area and the difficulty of supervision from a distance. Further some of the drainage cost was un-necessary because the area was overdrained and certain drains had to be filled in. The following is an estimate of the capital cost involved in developing a 5-acre horticultural holding.

Table III CAPITAL COST OF A FIVE-ACRE HORTICULTURAL
SMALL-HOLDING

	Shs
a) Ploughing 3 acres with Govt. Tractor Hire Service	330
b) Cleaning 2 acres of swamp using own labour and 1 hired labourer (spread over 2-3 years)	500
c) Solo Combi Engine, Pump, Pipe and Sprinklers	2205
d) Sprayer, tools and seeds for first year	500
e) Planting material and poles, wire, etc. for Passion Fruit ($\frac{1}{4}$ acre)	450
Total	<u>3985</u>

Again it is not essential to incur all this expense at once. In the case of an actual 5-acre farmer, with limited access to capital, expenditure could be staggered as in the case of the stall feeding unit. It has been shown that reasonable yields can be obtained without irrigation so that the solo pump is not essential in the first instance. Such a holding would seem to be a much more viable subject for extension if no credit programme is forthcoming.

The main concern over extending horticultural small-holdings is over markets. Several of the more profitable crops being grown at present (Lettuce, Cucumbers, etc.) have very limited markets. Before expanding production it would be essential to ensure adequate outlets. Green Peppers, Pineapples and Paw Paws have some air-freight export potential. Passion Fruit has an outlet at the Allied Food Products Factory at Kawempe.

VI. SMALLHOLDINGS AND THE COMMUNITY

The experimental small-holdings have been designed as far as possible to simulate the conditions of farmers in the area. As Hall points out (page 4) it is virtually impossible to do this and at the same time show a rapid improvement. However from an extension point of view it is essential to keep this aspect constantly in mind.

A survey of 2 villages near Kabanyolo and a group of farmers that had attended the Mukono DFI was conducted in 1967. The results give an impression of farming conditions in the area:-

Table IV. FARMING CONDITIONS IN THE KABANYOLO AREA - 1967.

	Nalyamagonja	Kimwanyilo	DFI Farmers
Tribe: % Baganda	60	85	97
Average Age	48	48	42
Busulu Tenants (%)	77	72	75
Education: % with no formal education	46	30	3
% speak English	22	22	47
Housing: % having house costing over 5000 Shs	1	8	17
Self-sufficiency: % self sufficient in matoke	26	19	52
Mean Farm size (farmers own estimate) - acres	5.4	9.0	13.9
Mean Size of Adult Labour Force	2.1	2.4	3.0
Permanent Labourers:			
% employing 1 or more	9	15	19
% using casual labour	47	52	73
Couch: % farms badly affected			
coffee	30	34	41
School Fees: mean total (Shs)	148	363	963

On many of these counts the small-holding farmers can be said to be reasonably typical. They are all Baganda, there tenancy agreement gives them similar security to a Busulu tenant, farm sizes are typical at least for Nalyamagonja. The adult

labour force on all three small-holdings is in the range of 2-4. The two Kabanyolo small-holdings were both severely affected with couch and this still presents one of the most intractable problems.

The small-holding farmers ages at present are 32 and 23. They have received 9 and 11 years of education. Thus they could be said to be younger and more educated than the average farmer. However none of the present group have received any formal training in agriculture. Mr. Nkata, the farmer at Luteete until March 31st 1970, had been trained at Busoga Farm School.

The house provided for small-holding No. 2 could be said to be a typical on grounds of cost (7000 Shs) plus. However small-holding No. 1 has the same house as the previous busulu tenant of the land. - Improvements costing approximately Shs 970 were made to this house and the total value is estimated at 2500 Shs. One of the aims of the small-holdings is to demonstrate a range of improvements with a range of costs for extension purposes.

Constraints on the Small-holdings

One of the justifications for having Small-holdings at Kabanyolo is that they provide a testing ground for the innovations developed on the main farm. During the testing of innovations the constraints of a small-holder should become apparent. The main constraints that have come to our attention so far are shown in the following table of innovations. It is clear that comparatively few of the innovations have been proved as suitable for widespread adoption in the area. In most cases further detailed experimentation is required or a completely different approach needs to be tried.

Table V. CONSTRAINTS ON INNOVATIONS USED ON SMALL-HOLDING NO. 1

Innovations introduced	Constraints experienced	Notes
Spraying with Dowpon for couch control in coffee	Timing problem - has to be applied at exactly right stage.	Could be overcome with further training and experience
	Heavy cost (110 Shs/acre) with little immediate return & probability that repeat treatment will be needed	May be best to uproot coffee and extend grass

<p>Hybrid Grass (Elephant G. X Bulrush Millet)</p>	<p>Plants supplied very variable with tendency to go to seed. May not be suited to growing in swamp</p>	<p>Innovation intro- duced too soon. More testing needed</p>
<p>Automatic water trough and 1000 gallon tank (Cost 575 Shs)</p>	<p>Worked well but tank dry after approx. 21 days without rain. Capital cost may be unrealistic until after 1-2 years.</p>	<p>Further experiment needed -? larger tanks. Limited use could be made of this by local farmers</p>
<p>Artificial In- semination</p>	<p>Considerable problem with recognising start of heat and obtaining Inseminator in good time (at Lutete only)</p>	<p>Very important effect on Farm In- come - must be stressed very strongly in training</p>
<p>2-exotic cow unit (Cost = 2700 Shs for 1 pure and 1 half-bred)</p>	<p>Very difficult to ensure steady production, and thus steady income and satisfied customers with only 2 cows. Risk element due to disease (e.g. Anaplasmosis) & Abortion found to be too high.</p>	<p>Should increase units to 3 half-bred cows (cost = 2100 Shs) Insurance not avail- able in Uganda.</p>
<p>Wheel barrow for carrying grass</p>	<p>Clear that cutting and carrying up to 300 lbs grass/day is very time consuming. A special wheelbarrow was de- veloped (cost 25 Shs) but proved too heavy to push uphill. Sling system may be prefer- able or a barrow with bicycle wheels.</p>	<p>Wheel barrow used for carrying manure and un-used grass down-hill Further experimenta- tion needed</p>

<p>-High leaf yield variety of sweet potatoes- obtained from Embu, Kenya</p>	<p>No problems have been experienced except that vegetative propagation makes extensive adoption slow</p>	<p>Innovation adopted Yield trials needed</p>
<p>Stall-feeding System</p>	<p>Main constraint is labour for cutting and carrying grass</p>	<p>1 labourer (cost 60 Shs/month) does cutting grass, carrying. Also 2 x weekly spraying and distribution of milk. Occasionally milks cows.</p>
<p></p>	<p></p>	<p>Small-holding No.33 will test 5 acre paddock system</p>
<p>Spraying with Gramoxone for general weed control</p>	<p>Farmer taught by Twiga Chemicals - 1/4 gallon at 42 Shs was enough for 1 acre - for bananas and coffee. Problem is availability of cash.</p>	<p>Farmer accepts this as cheaper than employing labour. spraying = about 2 hand weedings</p>
<p>Fertilizer - use of Sulphate of Ammonia on Coffee and Elephant Grass</p>	<p>Used at rate of 1 cwt/acre. Has not been able to maintain b/c of cost.</p>	<p>Accepted when short of grass and when cows in full milk.</p>
<p>Guatemala Grass</p>	<p>Introduced as an alternative to elephant grass with no experimental data. Main constraint time taken to establish b/c of vegetative propagation</p>	<p>Farmer prefers to Elephant Grass b/c:- persistent, higher yield(?), quick recovery, more palatable & easier to handle.</p>

The overall constraints on a 5-acre smallholder are considerable. They are mainly financial and are due to the extremely small reserves that such a farmer can maintain. A cow going sick or sickness of himself can have drastic effects on

income. A farmer with heavy commitments on school fees, etc. is in an even worse position. In the case of small-holding No. 1 the Kondo attack during October 1969 was a severe set-back both in terms of what was stolen and to the general spirit of the farmer. The preservation of law and order is crucial if agriculture is to develop in Uganda.

If the experimental small-holdings are to develop and test innovations, at a much faster than normal rate it is reasonable that some of the risks involved should be covered by the sponsors. Thus compensation was paid to the farmer for losses during the Kondo attack. The farmer has since been advised to insure his property. This additional risk is a further justification for the element of subsidy in the provision of a house, etc. The 50 Shs/month allowance paid to the farmers is designed primarily to cover the time spent on records. It may be inadequate as the number of visitors increases (as it has done recently). The policy with respect to visitors needs some urgent consideration. On the one hand the maximum use needs to be made of the holdings. On the other hand visitors take up the farmers time and may make for an increasingly atypical use of labour.

The small-holding farmers obviously are more strongly motivated to maximise their income than most Ugandan farmers. Yet it cannot be said that their labour is always productive. One farmer spent ^{several} hours on cultivating a plot of beans which was then destroyed by his own hens. There seems in general a tendency to have too many small enterprises. There may indeed be a problem of too much advice since visitors and government staff often offer advice in addition to Makerere staff. There is still much that needs to be found out in the area of decision making particularly with a view to reducing unproductive labour. Edwards (1961) plea for more training in entrepreneurship both of existing farmers and potential farmers needs to be thoroughly endorsed.

THE VIABILITY OF SMALL-HOLDING NUMBER ONE

The farmer occupied his small-holding on January 1st 1968 and has thus been farming there for approximately 2½ years. Hall (1969 - Table 6) gave details of the farms performance over the first year but pointed out that this was inconclusive. This was due to the fact that the first 6 months was spent in clearing couch grass, uprooting coffee and clearing the land of ticks. Farm income only reached sizeable proportions in November and December with farm incomes of 155 Shs and 391 Shs respectively. Table V & VI gives some results for the entire period since the project started. A full assessment of the small-holding on the lines of Mr. Halls RDR No. 75 needs to be undertaken by a Farm Management Specialist.

Table V. MILK PRODUCTION AND INCOME FROM MILK - KABANYOLO
SMALL-HOLDING NO. 1 JUNE 1968 - JULY 1970

MONTH	GALLONS PRODUCED	VALUE OF MILK CONSUMED (SHS)	TOTAL VALUE OF MILK (SHS)	NOTES
1968				
JUNE	1½	4	6	MILK FROM NGANDA
JULY	7½	15	30	COW USED FOR
AUG	7½	15	30	CLEARING TICKS
SEPT	8	15	33	
OCT	4	15	19	NGANDA X JERSEY
NOV	33	56	132	CALVED
DEC	65	44	260	
	<u>126</u>	<u>164</u>	<u>510</u>	
1969				
JAN	75	30 - 80	330 - 00	
FEB	71	26 - 40	312 - 00	
MAR	61	35 - 20	268 - 40	
APR	44	26 - 40	182 - 60	
MAY	4	17 - 60	17 - 60	NGANDA X JERSEY
JUNE	-	-	-	DRIED OFF
JULY	45	48 - 40	286 - 00	NGANDA X JERSEY
AUG	69	48 - 40	303 - 60	CALVED
SEPT	41	48 - 40	180 - 40	
OCT	84	48 - 40	363 - 60	
NOV	139	48 - 40	611 - 60	FRIESIAN CALVED
DEC	129	66 - 00	567 - 60	
	<u>762</u>	<u>444 - 40</u>	<u>3423 - 80</u>	
1970				
JAN	108	48 - 40	475 - 20	
FEB	98	48 - 40	431 - 20	
MAR	106	48 - 40	466 - 40	
APR	92	66 - 00	344 - 80	FRIESIAN SICK
MAY	47	66 - 00	206 - 80	NGANDA X JERSEY
JUNE	37	48 - 40	162 - 80	DRIED OFF
JULY	37	48 - 40	162 - 80	
AUG				NGANDA X JERSEY
SEPT				DUE TO CALVE
OCT				
NOV				
DEC				FRIESIAN DUE TO CALVE
	<u>525</u>	<u>374 - 00</u>	<u>2250 - 00</u>	

Table VI. COFFEE PRODUCTION AND INCOME

1 acre of formerly neglected Robusta Coffee - Kabanyolo
Small-holding No. 1. Jan. 1968 - July 1970.

MONTH	1968		1969		1970	
	LBS PRODUCED	SHS SOLD	LBS PRODUCED	SHS SOLD	LBS PRODUCED	SHS SOLD
Jan	212	85	260	104	100	48
Feb	-	-	-	-	74	35
March	-	-	-	-	-	-
April	-	-	-	-	-	-
May	39	15	125	55	52	11
June	-	-	63	25	120	64
July	-	-	-	-	140	75
Aug	-	-	65	26	-	-
Sept	15	6	65	26	-	-
Oct	95	38	-	-	-	-
Nov	135	54	134	60-35	-	-
Dec	250	100	240	110-40	-	-
	746	298	855	406-75		

In Table V it will be noted that the total value of milk produced in 1969 was Shs 3423-80. This is somewhat above Halls estimate of Shs 1600 per cow or Shs 3200 for the two cows. This difference is partly due to the fact that a high-grade Friesian was bought rather than an Nganda X Jersey. It will be noted that it was not possible to maintain an even production and in fact in June no milk was produced. These rapid fluctuations in income due to sickness and the natural cycle of production had not been sufficiently allowed for in planning. A 3-cow unit would be much easier to handle and would entail less risk. If 3 local half-breds were used rather than 1 imported exotic and 1 local the total capital involved would be about the same.

The Total Potential Gross Margin for Small-holding No. 1 given by Hall was Shs 5220. This was to be aimed at when the holding was running at full capacity. This has obviously not been achieved yet. However with 3 cows, a fully established Lusuku and rehabilitated Coffee it should be possible to achieve this. Table VII gives monthly totals of farm income and expenditure for 1969. The Gross Margin for 1969 was 3269 Shs.

Table VII. FARM INCOME AND EXPENDITURE KABANYOLO SMALL-HOLDING NO. 1 1969.

	EXPENDITURE SHS	INCOME SHS	NOTES
Jan	-	418 - 00	
Feb	-	313 - 00	
Mar	23 - 80	265 - 00	
Apr	60 - 00	269 - 00	
May	128 - 80	335 - 00	
Jun	10 - 00	231 - 00	BOTH COWS DRY
Jul	60 - 50	201 - 20	
Aug	178 - 35	361 - 00	
Sep	187 - 50	392 - 00	
Oct	94 - 00	372 - 00	
Nov	348 - 00	602 - 35	BOTH COWS IN MILK
Dec	211 - 50	712 - 00	
	<u>1202 - 45</u>	<u>4471 - 55</u>	

N.B. INCOME includes a monthly allowance which ranged from 50-200 Shs.

The basic allowance of 50 Shs paid to Mr. Lwanga was a payment for record keeping and compensation for the trouble and damage caused by visitors. An additional allowance of 50-150 Shs was paid when income was particularly low during the development phase. Thus in June, farm income, with both cows dry, dropped to 31 Shs. The total payment of these additional allowances for 1969 came to 850 Shs. If this is deducted from the Gross Margin the actual gross margin = Shs 2419 or about 200 Shs per month. This is in fact the sort of salary one of the farmers might expect in a job. It is of course well above the wage of an ordinary labourer. However repayment of loan only started in 1970 so that the 1969 expenditure figures do not reflect the full costs.

While some progress has been made further time is needed before the potential of 5-acre farm can be realised. It is clear that the risks of 5-acre dairy farming are acute from the disease angle. While a better spread of income is possible a regular monthly income is not in practice possible with only 2 cows. Major problems are couch grass which is particularly difficult in coffee and elephant grass. It is also clear that small-holding No. 1 is on below average level and has been severely

VIII. CONCLUSIONS

The experimental small-holdings have already to some extent achieved the aims of student training, staff practice and record keeping experience. The longer term extension aims have still to be realised and depend very greatly on government co-operation. It is thought that Government extension staff from both the Ministries of Agriculture and Animal Husbandry would benefit from a detailed study of the experience to date.

Already there is considerable interest in the use of the experimental small-holding idea in other parts of the country. The Department of Rural Economy already has one at Luteete which is attached to a Family Health Centre. The aim is to make this a centre for extension using all relevant government departments. It is hoped that this idea might be taken up by the Government.

Other possible sites for experimental small-holdings include District Farm Institutes, Secondary Schools, Leprosariums and Agricultural Colleges. A small-holding near the D.F.I. could serve as a focus for the whole extension service of the area. It would be a testing ground for the innovations to be emphasised in the area. In a district with diverse conditions possibly several small-holdings could be considered.

As to the use of the existing small-holdings it is suggested that approaches be made to Government on the following lines:-

- a) DVO's, DAO's and District Farm Institute Principals should, at their next Conferences visit the Kabanyolo Small-holdings. They should be invited to discuss with the staff concerned the possibility of starting similar small-holdings in their areas on the lines agreed at their 1967 Conference - See refs.
- b) During any field officer refresher courses held at Mukono DFI an opportunity should be taken to visit the Kabanyolo Small-holdings.
- c) The DVO's and DAO's Mpigi and Mukono and their staffs be invited to visit the Small-holdings with a view to studying the innovations used.

d) The Ministry of Cooperatives and Marketing should be asked to assign an economist to investigate the market for pine-apples, passion fruits, pawpaws and vegetables with a view to deciding whether an expansion of production is justified.

e) Immediate approaches be made to the Uganda Commercial Bank to see whether they would finance a small number of local farmers to start stall feeding units on similar lines to the Kabanyolo Unit.

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