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AGRICULTURAL SYSTEMS AND THE PROBLEMS
OF DIFFUSION OF NEW METHODS/IDEAS:
A CASE STUDY OF SUBSISTENCE
FARMING IN UGANDA.

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ABSTRACT

The failures of the traditional "Imported Transfer of Technology" have become common place. This project attempts to understand agricultural systems and the inherent problems of diffusion of new methods and ideas in rural Uganda with a view to suggesting new approaches for improvement.

Chapter one gives the background information about Uganda in terms of location, climate, hydrology, population, physical features, vegetation and agricultural production base.

The main problem of the project is defined as it relates to the "silent people" who are the rural poor subsistence farmers, hence have low income and are disadvantaged.

The main objectives of the study are:

- a) To examine problems associated with diffusing new and proven ideas into reality in the present day rural Uganda.
- b) To determine methods which facilitate rural farmers to take up these ideas.

Specific objectives, the methodology used in the study and the statement of the significance of the study concludes Chapter one.

The reader in Chapter two finds a detailed account of agricultural systems in Uganda. The objective here is to appreciate the political, economic, social, technical and historical aspects that have been part and parcel of agricultural development. The broad government policy on agriculture is reported. The obstacles to agricultural progress are identified to include broad and vague recommendations, incorrect or only "temporarily correct" and subject to frequent change recommendations, socio-economic factors, marketing systems, pricing systems, market supply and demand, lack of storage facilities and insufficient market information.

The body of the study is in Chapter three where diffusion methods are explored. Different aspects of extension are reviewed namely:

- Definition of extension.
- Problems that can be overcome through extension.
- Extension education.
- Questions that can be answered by extension education.
- Interaction of extension with other services.

The second part of the chapter deals with diffusion and adoption of innovations theory and practices. The causes of failure in adoption of innovations are explained from different angles.

Chapter four which is the final chapter covers suggestions and conclusions. Specific differences between extension approaches and extension methods are clarified as part of the conclusion, i.e. broad based approaches and specific methods.

ACKNOWLEDGEMENTS

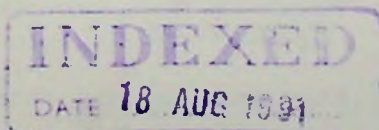
I would like to express my unqualified gratitude to the Kulika Charitable Trust for granting me the fellowship and the Ministry of Agriculture for providing me with an air ticket and releasing me to come to Silsoe College.

I am also very thankful to Professor Roy Hill, my supervisor, for his guidance and advice in preparing this report.

My thanks to all staff in the Marketing and Business Management Department for their assistance and contribution towards my studies during the difficult times. Thanks to Carol and Linda for their kindness and motherly love.

Thanks also to my personal tutor, Mr T Yiberta and Mr James Tupper who acted as my personal tutor while Mr Yiberta was away. Mr Tupper helped me a great deal in guiding and encouraging me in preparation for the final exams.

Above all, many thanks to all my friends in Silsoe who helped me with compiling information, and to Sarah Anness who typed this thesis.



REPORT ON THE POSTGRADUATE DIPLOMA: MARKETING AND PR
MANAGEMENT COURSE, ATTENDED AT THE CRANFIELD INSTITUTE
TECHNOLOGY, SILSOE COLLEGE BEDFORDSHIRE. UNITED KINGDOM .FROM
1990 TO 17th JULY 1991 .

1. INTRODUCTION:

I undertook the above course from 8th October 1990 to 17th 1991 at the Cranfield Institute of technology . Silsoe College U.K. The College offers a variety of courses covering undergraduate and Postgraduate courses in the application of technology and management to agriculture and food production. Other courses include:

- short updating and professional development courses:
- product innovation and market development through research and development;
- agricultural and rural development. particularly overseas through consultancies.

1.2 Specific Courses offered by the College are:

- Bachelor of science (B.sc.) engineering in agricultural engineering and Rural Environment Engineering.
- B.sc. in Rural Resources, Rural environment management, and Marketing and Distribution.
- Master of science (M.sc.) in Agricultural Engineering.
- M.sc. Land and Water Management.
- M.sc. Marketing and Product Management.
- M.sc. Applied Remote Sensing.
- M.sc. Manufacturing for Agricultural and Industrial Development.
- M.sc. Rural Engineering.
- M.sc. Plantation Management.
- Postgraduate Diploma in Agricultural Engineering.
- Postgraduate Diploma in Land and Water Management.
- Postgraduate Diploma in Marketing and Product Management.

The details about these courses are in the University Prospectus which I will be happy to avail to anybody interested.

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CHAPTER 1

INTRODUCTION

1.1 Geographical Background

1.1.1 Location

Uganda is a land locked country in East Africa. It lies between latitudes 2 degrees south and 4 degrees north of the Equator, and longitude 29 degrees and 35 degrees east of the Meridian. It is about 241, 138 sq km in size and it borders with Kenya in the east, Sudan in the north, Zaire in the west and Tanzania and Rwanda in the south.

1.1.2 Climatic Conditions

Uganda's climate is influenced by altitude and its location on the Equator and because of these factors, Uganda enjoys a good, reliable climate. Temperatures range between 15°C and 28°C. Rainfall is evenly distributed throughout the year, although much of it falls during the months of March, April, May, September, October and November. The driest area is in the north-east of the country, with rainfall of 914.4 mm and the wettest areas are found in the south of the country with rainfall of more than 1400 mm.

1.1.3 Hydrology

There are many swamps, lakes and rivers, the biggest river being the River Nile which cuts from the south to north and then through Sudan and Egypt and ends up in the Mediterranean sea. The biggest lakes are Lake Victoria (second biggest in the world), Albert, George, Edward and Lake Kyoga.

1.1.4 Population

The last census was held in 1980, with a population of 12.6 million people. With an estimated population growth rate of 3.4 p.a., the population is currently estimated to be 17 million people. The languages commonly spoken in Uganda are English, Swahili and Luganda, although more than 14 other languages are present.

1.1.5 Physical Features and Vegetation

Uganda is described as a plateau, with all areas over 3000 ft above sea level. There are three important mountains, mainly Mt. Muhavura in the south west, The Ruwenzori in the west and Mt. Elgon in the east of the country. All of them stand at more than 14000 ft above sea level. The vegetation is mainly savanna woodland in the south of the country, with patches of natural forests in the north west and savannah grassland in the north. Swamps occur mainly in the south and central parts of the country.

1.1.6 Agricultural Production

Agriculture is the backbone of Uganda's economy. It accounts for about 65% of its domestic product income (NDP). Over 90% of the population live in the rural areas, with about 80-85% employed in subsistence agricultural practices. Uganda's varied climate allows the growth of a wide range of agricultural crops and an important livestock sector. The many rivers, lakes and swamps do support an important fishing industry. Timber and wood products are also important, although there is fear of deforestation.

The following are some of the crops grown: plantains (matoke), maize, sorghum, groundnuts, sweet potatoes, cassava, simsim and a wide range of vegetables like cabbage, tomatoes, onions and a variety of local green leafy vegetables. In addition the following remain the most important export crops: coffee, cotton, tea, tobacco, cocoa and cashew nuts.

1.2 The Problem

The rural poor have been called "the silent people". They are the subsistence farmers, peasant cultivators and small scale fish folk whose harvest failed, whose boat sank, or whose crops were flooded out. Often qualified in economic terms as "low income" or "disadvantaged", the rural poor are isolated, vulnerable and powerless (FAO, 1990). The average Ugandan rural farmer owns not more than three hectares of land, and the agricultural practice is mainly subsistence. The society is mainly traditional and the agricultural practice is concentrated around the farming families. The level of

literacy is generally very low (between 5-10%), see Table 1, and thus very difficult to communicate new ideas to, especially when such ideas are being brought by an "outsider". The government has been trying in principle to avail the rural farmers with such implements as hand hoes, tractors, ox-ploughs, seeds and agro-chemicals, but feeder road improvements are yet to commence. Extension education is still being hampered by lack of equipment and materials.

Table 1. Distribution of Household Populations (5 years and above) by Education and Sex in Uganda (%).

Serial No. (1)	Educational Level (2)	All Uganda Total		
		Male (3)	Female (4)	Total (5)
1	Illiterate	26.29	40.13	33.19
2	Literate but no formal Education	2.06	2.16	2.11
3	Primary Education	59.16	50.99	56.09
4	Secondary Education	9.72	5.87	7.80
5	Higher Education	0.33	0.17	0.25
6	Vocational Education	2.44	0.68	1.56
7	All classes	100.00	100.00	100.00

Source: Uganda National Household Budget Survey (1989-90).

There is lack of motivation on the part of extension staff, and problems caused over the years by political instability has lead to near collapse of the extension services. The sum total of all these facts mentioned above is that the rural population and their living standards has remained very low.

1.3 Aims and Objectives

1.3.1 Main Objectives

The main objective of this study would therefore include:

- a) To examine problems associated with diffusing new and proven ideas into reality in the present day rural Uganda.
- b) To determine methods which facilitate rural farmers to take up these ideas.

1.3.2 Specific Objectives

The specific objectives include:

- a) To identify the existing farming systems in Uganda.
- b) To examine subsistence farming as the main system of agriculture in the rural areas of Uganda.
- c) To identify the existing methods used in diffusing these innovations to the rural areas and their associated problems.
- d) To identify new methods and ideas that are available to the rural farmers.
- e) To suggest alternative methods, where necessary, on how these innovations can be taken up by the rural farmers in Uganda.

1.4 The Methodology

- a) Baseline information on Uganda was obtained from the Ministry of Agriculture in Uganda.

- b) Interview schedules were carried out amongst students from other developing countries like Pakistan, Sri Lanka and especially from the east and southern African countries of Kenya, Zimbabwe, Zambia and Tanzania.
- c) Various literature was also reviewed on the subject of extension methods, as well as diffusion of innovations in developing countries.
- d) The author also has had several years of first hand experience of working in the Ministry, related to the subject of investigation in Uganda.

1.5 Significance of the Study

Since 1986, Uganda has been experiencing a fairly peaceful economy. In essence, one could say that the country is going through a rehabilitation and reconstruction after so many years of civil wars. The study hopes to add to the information derived for a better understanding, i.e. post 1986 Uganda.

The significance of the study therefore would include:

- a) A better understanding of the problems of diffusion of innovations to the farmers of Uganda.
- b) Suggestions on the options available for the translation of the new ideas into reality.

The aim of this study therefore is to provoke new scientific research into diffusion of innovations among rural farmers in developing countries in general and Uganda in particular.



Map 1. Political Map (showing all major place-names)

CHAPTER 2

AGRICULTURAL SYSTEMS IN UGANDA

2.1 Review of Agricultural Development in Uganda

2.1.1 Development of Agriculture in Uganda

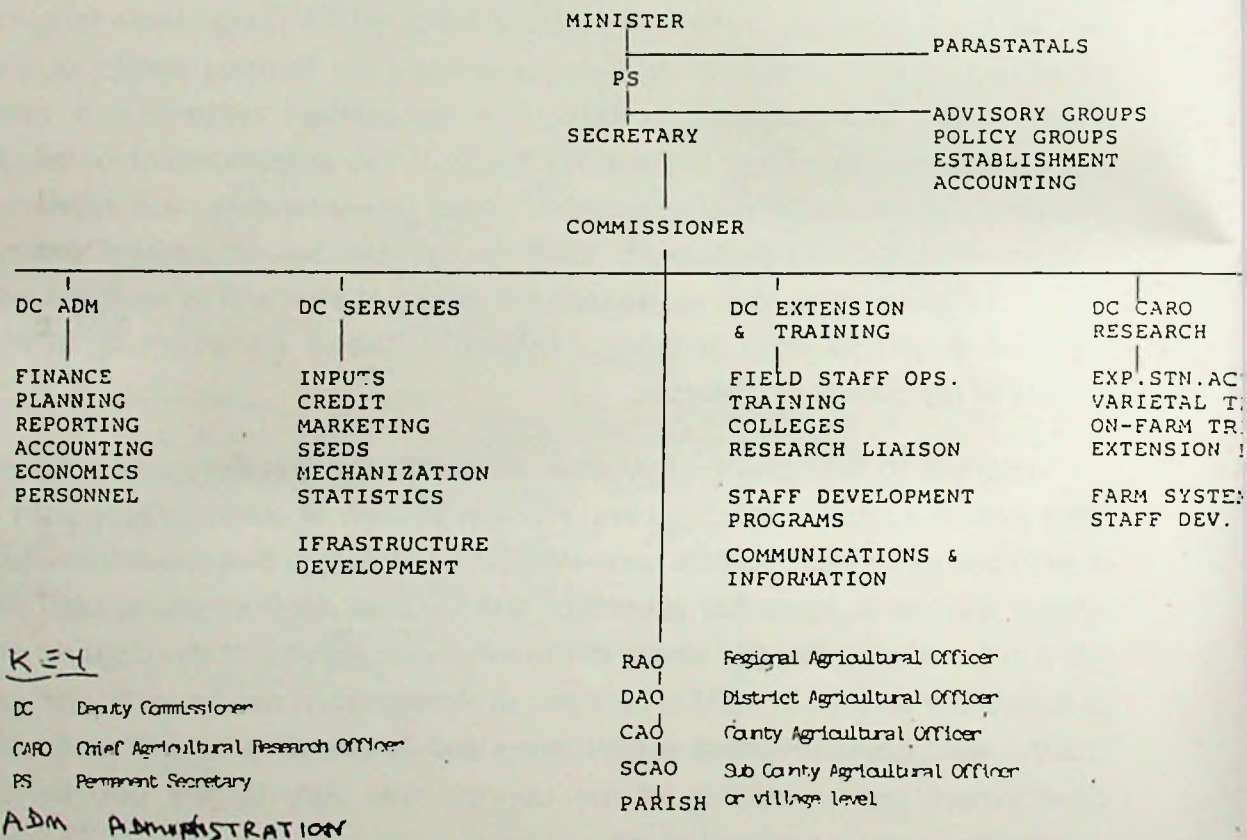
Agricultural development started in Uganda effectively in the 1960s. Initiatives such as the agricultural credit and subsidy schemes for progressive farmers introduced in 1961 made an appreciable impact on farming habits of the people. After independence in 1962, the government undertook a bold mechanisation programme, comprising firstly of the establishment of large, planned co-operative farming enterprises called group farmers, and secondly a consolidated tractor hire service. Each group farm helped farmers assess their loan requirements, to ensure loans are repaid in time and to keep the co-operative society working properly. (Figure 1 shows the structure of the Ministry of Agriculture in Uganda).

It is important to note that in Uganda even before the first European arrived, there existed a highly organised and efficient system of administration with a chief in charge of each political unit. What is important is that this established system was never materially altered by the colonial administrators, and it is this firm foundation that the whole of the extension service of the Department of Agriculture created in 1924 is built on. In retrospect, it can be justly claimed that the rapid development of export crops and its overwhelming effect on the development and prosperity of the country was very largely due to the assistance given by the local chiefs.

Also the creation of the leading farmer animators has been shown to be a successful extension technique and since 1930 short courses have been held for schoolmasters and since 1935 for chiefs. At the same time, farmers have

not been neglected. Experience over the years has shown that the most useful course under Ugandan conditions is one of seven to ten days duration, as farmers can conveniently leave their farms for this short period. There are now twelve District Farm Institutes (DFI).

Figure 1. Organisational Structure of the Ministry of Agriculture in Uganda.



An evaluation of the benefit which farmers derive after attending these courses at the farm institutes has proved a very effective way of improving the standards of farming.

Mention needs to be made of the excellent work done by the prison farms. All the prisons have the farms to provide employment for the prisoners and many a good farmer has confessed that he learnt how to farm when he was in prison. Originally, these farmers were laid out and supervised by officers of the Department for Agriculture, but in the early 1970's most of them were taken over by the local government, which provided their own agricultural staff. The Department of Agriculture continues to run the courses for the training of the prison warders in agriculture.

So, with the assistance of the chiefs and clan leaders, the propaganda of the Department reached the majority of the farmers, and with the increased production of cotton and coffee, Uganda prospered in the 1960's decade.

2.2 A Brief Background of the Social-Economic Development of Uganda

Uganda's socio-economic dynamics can be divided into three phases, namely decline, stagnation and recovery.

2.2.1 Decline Phase

The economy of Uganda which had been one of the best in black Africa in the 1960's, suffered a sharp decline due to what has come to be known as "mismanagement" and "misrule" which characterised the Amin regime from 1971-1979 (Ministry of Agriculture Annual Report, 1989).

During this period, agricultural production inputs disappeared, leading to sharp declines in production. Farmers were so frustrated that most of them abandoned production of crops. Such things as coffee, tea factories and cotton ginneries which had been placed under management of unskilled personnel also broke down. This further frustrated the farmers who could not

find an outlet for their crops. This left the country with a very small crop export and hence very little foreign exchange earnings.

2.2.2 Stagnation Phase

In 1980 Obote took over what was effectively a destroyed economy. Most of the infrastructure for proper functioning of an economy has been destroyed. Production inputs were lacking and production was therefore very low. The morale of the workers and the farmers was at its lowest, mainly due to the killings which characterised the Amin regime. Peace and sanity were a prerequisite for restoration of any meaningful economy and social development in the country.

Unfortunately, contrary to everyone's expectations, Obote's rule from 1980-1985 only experienced civil war and unrest. There was insecurity in most of the major crop growing areas. Thus, the government in power could not reverse the declining economy. Instead, the economy stagnated and the government depended on external borrowing to sustain its services to the population (see Table 2).

2.2.3 Recovery Phase

The coming in power of Museveni's government in January 1986 marked the start of the recovery phase of the economy. With peace and stability established in the greater part of the country, the government set out to revive the economy. On the production it availed agricultural inputs. An attempt was initiated for the rehabilitation of tea and coffee factories and cotton ginneries. Efforts have been made to improve marketing through the provision of crop finance and transport to the co-operative unions involved in produce marketing. Rehabilitation work on major and feeder roads is going on throughout the country. The government recognises the importance of social infrastructure as a necessary tool for sustaining development, and especially as a means of improving the standards of all Ugandans. In this connection, particular efforts are being focused on the rehabilitation of the existing social infrastructure through repair, re-equipping of facilities,

retraining of manpower and the provision of the logistics and supplies to improve the quality and coverage of the social services.

Transport has been provided to sectors involved in agricultural production, particularly to the staff of the Ministry of Agriculture. The above facilities have been mainly effective in the economic recovery programme in the coffee, tea and tobacco growing areas of central, southern, western and north western Uganda. Insecurity in the main cotton growing areas of the north and north east of the country from 1986-1989 has continued to keep production low. However, now that the whole of this region has been pacified, the production of cotton, simsim, groundnuts and other crops is carefully going to increase (see Table 2).

2.3 Principles of the Government

Uganda is an agricultural country and the policy has been to conserve and develop the natural resources with which it is so well endowed. One of the first objectives examples is to ensure the basic food supplies of the country. Uganda not only feeds itself but in most years exports food to Kenya, Tanzania and Rwanda. At the same time, the need to conserve the natural resources for prosperity has never been forgotten. The Department of Agriculture has always fostered an awareness of the need to adopt systems of farming which will not deplete the soil, but rather increase fertility, and has introduced and encouraged the adoption of soil conservation measures in arable cultivation (Towards Food Strategy, Vol. 1, 1984).

The present government's policy for agricultural export development as such focuses on the increasing food production for self sufficiency and diversification of the agricultural exports in order to broaden the base of exports. These include maize, beans, soya beans, simsim, passion fruit, pineapples, bananas and ginger.

Table 2. Area planted and production of selected food crops: 1980-1988.

AREA PLANTED ('000 HECTARES)	CEREALS										ROOT CROPS				PULSES				OIL SEEDS			
	PLANTAIN																					
	Bananas	Finger Millet	Maize	Sorghum	Rice	Wheat	TOTAL	Sheet Potatoes	Irish Potatoes	Cassava	TOTAL	Beans	Field Peas	Cow Peas	Pigeon Peas	TOTAL	Ground Nuts	Soya Beans	Sesame	TOTAL		
1980	1,173	279	258	167	11	8	723	231	24	302	557	224	17	38	50	379	95	4	45	144		
1981	1,180	300	260	170	12	4	746	350	25	310	685	299	18	41	55	413	110	5	70	185		
1982	1,199	330	285	200	15	5	835	372	28	311	731	344	20	45	60	489	120	6	80	206		
1983	1,209	341	295	207	17	5	865	457	30	372	857	388	32	46	62	538	124	6	85	225		
1984	1,209	332	347	206	17	4	906	387	17	401	895	385	16	49	64	522	124	11	86	249		
1985	1,210	300	289	199	14	5	798	359	23	300	694	334	17	44	60	455	124	10	76	210		
1986	1,210	342	382	207	19	5	879	397	19	362	788	397	18	50	67	537	127	12	80	242		
1987	1,336	374	307	203	18	5	855	398	26	345	769	375	22	42	64	497	126	13	74	210		
1988 (estimate)	1,396	372	393	256	18	5	1,044	417	27	361	805	445	23	46	64	578	270	14	81	236		
PRODUCTION ('000 TONNES)																						
1980	5,697	459	286	299	17	17	1,078	1,200	166	2,072	3,438	133	7	16	26	182	70	3	28	93		
1981	5,900	480	342	358	15	8	1,465	1,300	173	3,000	4,475	240	8	18	26	291	80	3	28	110		
1982	6,596	528	393	358	19	10	1,308	1,487	196	3,127	4,810	300	10	20	29	358	99	4	35	131		
1983	6,647	545	413	407	22	12	1,399	1,843	223	3,239	5,305	314	17	37	37	397	108	4	42	148		
1984	6,461	223	281	144	20	11	695	1,791	78	1,881	3,750	265	13	39	39	342	118	9	37	164		
1985	6,655	480	343	310	19	11	1,643	1,524	168	2,700	4,392	267	10	35	37	338	124	8	35	125		
1986	6,660	350	286	280	21	8	945	1,645	98	1,871	3,834	262	10	37	37	344	118	10	35	145		
1987	7,398	518	363	315	20	12	1,225	1,674	185	1,871	4,960	299	11	37	37	374	118	10	45	164		
1988 (estimate)	7,784	626	560	378	23	12	1,599	1,716	190	1,921	5,177	352	12	38	42	444	176	14	45	215		

SOURCE: Planning Unit, Ministry of Agriculture.

SOURCE: Planning Unit, Ministry of Agriculture.

AREA PLANTED AND PRODUCTION OF SELECTED FOOD CROPS, 1980-1988

The complimentary policy of barter trade is expected to overcome the critical bottleneck of lack of foreign exchange. Foreign exchange severely limits the country's ability to satisfy its import needs, including agricultural inputs, a shortage of which could translate into decreased agricultural inputs, especially now that more and more farmers are using agricultural chemicals. Efforts continue to be made to achieve higher performance, especially the crop production target. In setting up these targets, the government is guided in a sense to what it can achieve, especially by its ability to decisively overcome technical, economic and a host of other constraints that have hindered agricultural development in the past.

Further still, if the marketing system improved, emphasis could be put on rural road development and maintenance. Availability of better information on crop prices will enhance production tremendously. Crop production, however, is not dealt with by the Ministry of Agriculture alone. Other ministries, non-governmental organisations, resistance committees and chiefs are called upon to participate in stimulating public interest in agricultural production. The Ministry of Co-operatives and the Ministry of Marketing co-ordinate the activities for the co-operatives sub-sector by supervision of marketing systems and handling better trade matters in liaison with marketing boards, private entrepreneurs, co-operatives and parastatal organisations. The activities include agricultural marketing and processing, consumer co-operatives, livestock and dairy farming, fishing, transport, supply of inputs, savings, credit, education and banking and many other activities. The individual is called upon not to work for himself alone and his family, but to recognise that he has an obligation to concern himself with those less fortunate than himself and the revival of his country's economy as a sign of prosperity.

In an effort to improve the situation of women and integrate them fully in the development, the government created the new Ministry for Women in Development in March 1988. Through this Ministry, the government is striving to develop their ability by a co-ordinated approach. To emancipate

themselves from the positions of dependency and inferiority to being respected individuals and groups, economically independent and politically mature. The Ministry's staff members, although still limited in numbers and with logistical support constraints, have managed to move to the rural areas to visit various womens' projects and advise them on how to improve their management skills.

Arrangements are underway to strengthen the Communication Information Department to enable it to gather and disseminate the information on womens activities, produce newsletters and radio and television programmes.

The government also accords priority to promotion of community participation, self help projects and adult and informal education. In the rehabilitation and development plan, 40 district rural training centres, 50 community centres and 9 vocational rehabilitation centres are proposed to be rehabilitated and equipped. No work has been started as there were no funds. The adult literacy programme has also not begun due to inadequate funding from the government. (Background to the Budget, 1989/90).

The implementation of the government's policies and programmes for agricultural development as we can see is therefore conducted by several ministries. The other separate ministries are mainly the Ministry of Agriculture (MOA), the Ministry Animal Industry and Fisheries (MAIF), the Ministry of Co-operatives and Marketing (MCM) and the Forestry Department in the Ministry of Environmental Protection.

2.4 Agricultural Systems

The differing agricultural systems to be found in Uganda are a product of the fusion of various factors governing land use. A broad division is made between the systems in the so called long grass and the short grass. This ecological division serves to separate the part of the country with equable rainfall and that with a pronounced dry season, based on perennial crops with largely planted annual crops and those based on the production of annual crops. The long grass ecological regions are equated with the production of

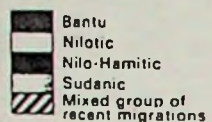
bananas and coffee, while the short grass areas support agriculture based on millet and cotton (Jameson, 1970).

These systems are modified further by differences based on rainfall and altitude. Thus, in the higher areas, arabica coffee and tea replace the robusta coffee grown in the lower parts of the country. The limited rainfall received in some parts of the grain and cotton growing areas has led to the replacement of the finger millet by sorghum towards the eastern boundaries and cassava towards the west. In the extreme cases as in the Karamoja and parts of the Ankole, agriculture as a means of subsistence and nomadic pastoralism exists. The tendency for the rainfall to be monomodally distributed in the north leads to the growing of crops such as long duration sorghum and pigeon peas and in contrast, to the short term grain crops and pulses designed to fit shorter rainfall areas to the south.

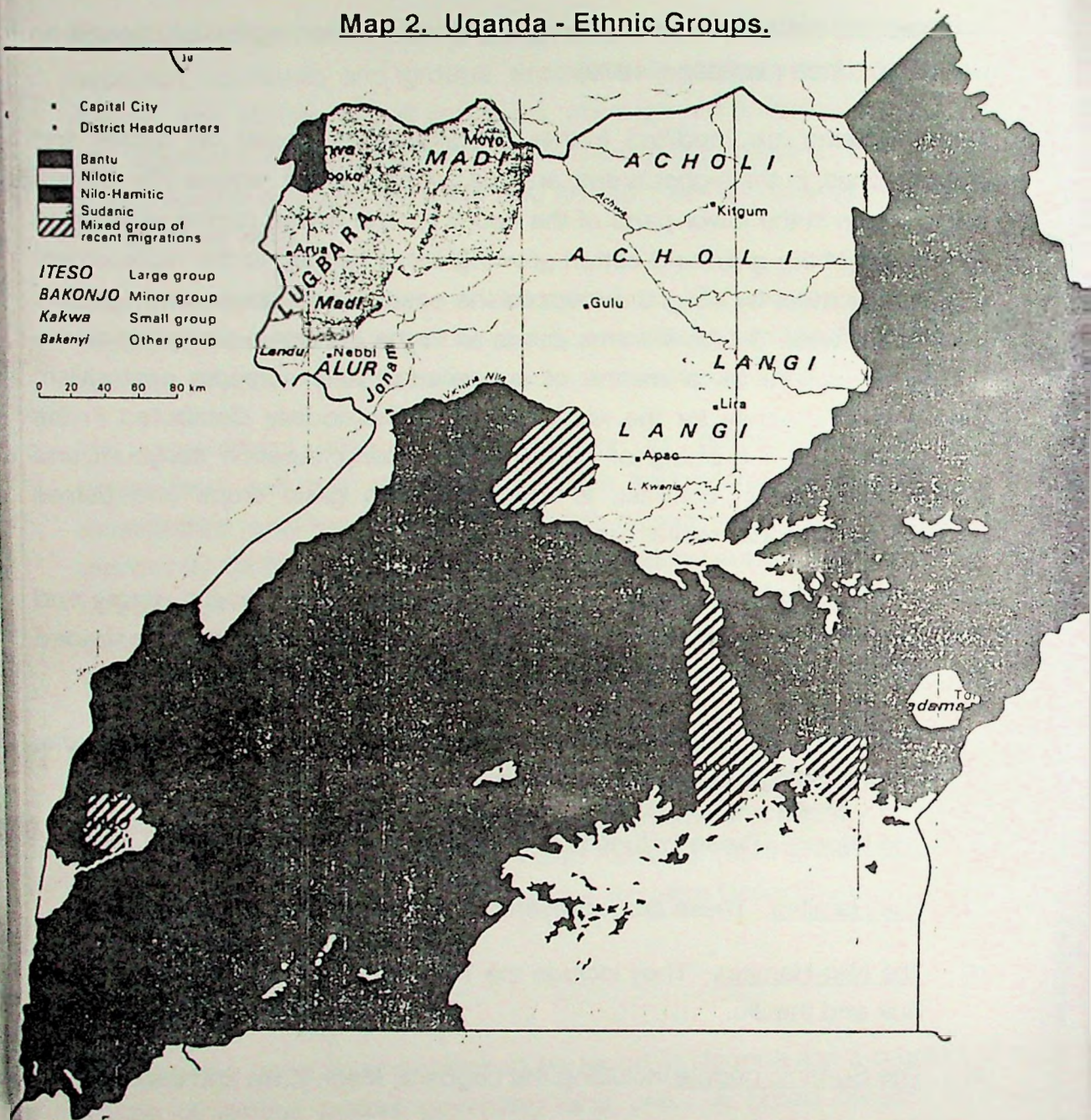
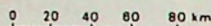
The other major factor affecting agricultural systems is the social history and background of the people in the area. The people in Uganda are divided primarily on the basis of language, into the following major divisions:

- a) The Bantu. This division comprises the Baganda, Basoga, Banyankole, Batoro, Bakiga, Bagisu and various other smaller groups.
- b) The Nilotes. These include the Acholi, Alur, Japadhola and the Langi.
- c) The Hamites. These are represented by the Bahima.
- d) The Nilo-Hamites. They include the Teso, Karamojong, Kawikwa, Sebei, Suk and the Jie.
- e) The Sudanic people including the Lugbara, Madi, Kuku and Lendu.

- Capital City
- District Headquarters



<i>ITESO</i>	Large group
<i>BAKONJO</i>	Minor group
<i>Kakwa</i>	Small group
<i>Bakenyi</i>	Other group



There are some further local variations in the main systems caused by such factors as prevalence of Tsetse fly limiting the keeping of livestock.

Access to markets limit some forms of production as communications and population densities decline away from the main centres. Population density itself has a marked modifying influence on basically similar systems. The use of animal draught power in cultivation also causes a major change in the systems of farm layout and in recent years has been a catalyst for much advance in agricultural practices and production.

As a result of these factors, five main systems of agriculture can be designated. They are:

- a) The Teso system.
- b) The banana and Robusta coffee systems in southern Uganda and their modification in the banana, millet and cotton areas.
- c) The northern systems, including the West Nile system.
- d) The Montane system.
- e) The pastoral system.

The extent of each of these systems can be seen in Table 3. It should be realised that these areas are generally not clear cut, but the systems tend to merge gradually into one another as the ecology and other controlling factors change. (Towards Food Strategy, Vol. 1, 1984).

2.4.1 Subsistence Farming

Uganda is primarily a land of small farms and has retained its traditional subsistence pattern of farming (Jamieson, 1970). The lack of farming progress in a period of comparative prosperity has been one of the great puzzles of recent years, and there is still no generally accepted explanation. Looking at the agricultural equipment for example, despite the fact that the first school of teaching ploughing with oxen started in Kumi, Teso district in 1910, ploughing has made real progress in a few areas such as Teso district where in 1969 they had over 640,000 herd of cattle and over 50,000 ploughs. Over the greater part of Uganda the hoe is still in general use. In recent years

there has been a realisation that it is the inadequacy of farmers traditional tools and the limit which this can place on the amount which he can achieve, which is a factor militating against the adoption of better farming methods.

Table 3. Agro-Ecological Zones of Uganda.

Zone	Districts		Agricultural farming system
Zone I	Busoga/Bukedi		Banana, millet and cotton system with outliers of the main coffee-banana system.
Zone II	Bugisu/Sebei		Montana systems: Arabica coffee, bananas (wheat and maize in Sebei).
Zone III	Teso		Teso systems: fingermillet, cotton and cattle keeping (mixed agriculture).
Zone IV	Karamoja		Pastoral system - cattle keeping
Zone V	Lango/Acholi		Northern systems: fingermillet, cotton, tobacco, (some mixed agriculture also).
Zone VI	West Nile/Madi		West Nile systems: basic agriculture like Zone V but with predominance of cassava as staple food.
Zone VII	Bunyoro/Toro		Arabica and Robusta coffee and banana system, Montana systems: heterogenous agriculture, but basically bananas, coffee and tea.
Zone VIII	Ankole		Montana systems in the west and pastoral to the east. Arabica and Robusta coffee, tea, bananas, cattle.
Zone IX	Kigezi		Montana systems but with larger annual crop acreage than other Montane systems. Sorghum is major staple. Arabica coffee, tea.
Zone X	Lake Victoria Crescent		Main Robusta coffee and banana system: Robusta, coffee, bananas, tea, cocoa, sugar
Zone XI	Northern Buganda		Western extension of the banana-millet-cotton system, but now largely taken up by big ranching project

Source: Planning Cell, Ministry of Agriculture (MAF).

Other major factors include improved efficiency in farming which are considered to have been the pre-occupation with a multiplicity of food crops which may no longer be profitable under his conditions and in some cases,

the absence of a market for his produce. This is particularly true in the predominantly food grown areas. Unlike the situation which existed in the case of exported crops, the distribution, storage and marketing of food for local consumption had not been modernised to meet changed conditions.

To overcome these difficulties, the policy of the Department of Agriculture has been given a new slant and the old cries of for example "plant your cotton early" and "plant at three feet by one foot" are being replaced with the slogan "give farmers the tools they need to do the job".

2.5 Obstacles to Agricultural Progress

The Ugandan cultivator is little, if at all different from the European in responding to a direct short term cash incentive. Two factors which have in the past prevented the adoption of government recommendations have been: first the recommendations were to benefit the country as a whole and not the individual himself, for example soil conservation, and secondly, the recommendations were sometimes incorrect or only "temporarily correct" and subject to frequent change.

Thus, the cultivator is naturally sceptical of government advice. In the western region there is a proverb "Okwikiriza tikuhinda Okwanga" meaning "agreeing does not hinder you from refusing". Agriculturalists are often prone to seeing the solution for every problem in the giving of advice without thinking of how that advice is put into effect and of whether that advice is likely to prove acceptable or not.

There are also a number of social reasons why the Ugandan cultivator does not respond as rapidly to new opportunities and new methods as his advisers could wish. Let us look at a summary of the social factors which seem to be important obstacles to progress. However, this does not imply that all aspects of social background impede progress, nor does it imply the value judgement that a factor which does impede change is therefore "bad".

Cultivation methods depend largely on what has been learnt from the father and mother (not from the agricultural college), and in consequence incline

towards caution; with diversity of cropping, repetitive cropping, inter-cropping and planting in what experience suggests to be "safe" periods. The individual has to conform to the tribal system and respond to social and economic pressure, especially in areas where annual crops are grown with peak labour requirements at certain periods.

In the past, famines were frequent and although they have been largely overcome by better communications, locust control and government promoted planting of root crops (cassava and potatoes), the cultivators still plant sufficient food crops to ensure against a bad year, frequently neglecting the surplus in a good year, attend only later to cash crops and are loathed to specialise. The intention behind agricultural production in Uganda is to minimise risks rather than to ensure maximum productivity. Today, food supply is relatively plentiful and regular in the banana areas.

The mixture of peoples and many different languages in Uganda make for disunity and the pattern of dispersed settlement emphasises the individualism of the cultivators, so that the mass propaganda is unlikely to succeed and instead, the individual agricultural extensionist may be expected to bicycle many miles to meet an individual farmer.

The government can not afford to employ the number of extensionists needed to serve even a fraction of the farming community by such an approach.

The influences of custom and of the close-knit family relationships restrain the innovator, for he must often have to obtain the approval of the other members of his family before making a change and even if this is obtained and the change succeeds, he may fear enmity of his neighbours if he is more successful than them. The incentive to acquire wealth is further diminished by the frequency of armed robbery, especially in the rural areas of Baganda and Bagisu and raiding in the Karamoja and Teso. These factors also encourage the rich man to spend and not invest his wealth, nor to save only, to have to use his savings to help a relative.

The traditional division of labour is outdated, for now that the man has no responsibilities for defence, he often has a distinctly leisurely life for most of the year while his wife is overworked.

Illiteracy, especially of the women, is widespread and even among men who can read, write and count to some extent, the level of education is not sophisticated enough to permit them to appreciate the points made by the extension workers with simple diagrams and leaflets. Also, although the men attend the meetings, it is the women who do much of the agricultural work. The subordinate position of women hinders improvement.

Most young men wish to escape from the land. The main reason for this seems to be the desire for money or things money will buy. The young cultivator thus probably tends to be the man who has failed to find a better job elsewhere, less educated, less intelligent or less able than his fellows in town.

Attempts to supply the cultivator with capital have also met with difficulties. Thus, the first loans made to individual "progressive farmers" were sometimes regarded by the recipients as gifts rather than debts which had to be repaid with interest, and subsidy schemes have resulted in the serious anomaly of the poorer tax payers subsidising the richer farmer. It seems that the extension staff must give very detailed help if expenditure is to be planned, the farming system modified and new equipment used properly.

2.6 Marketing of Agricultural Products in Uganda

Traditionally, food crop production in Uganda is and has been primarily for own subsistence and local market sales with less than 10% entering the market for urban consumption (Towards Food Strategy, Vol. 1, 1984). Three types of marketing channels exist in the marketing of food crops:

- The Produce Marketing Board.
- The Co-operative Movement.

- The private trader.

The Produce Marketing Board (PMB) covers only 10-15 per cent of the food market and mainly deals in maize, beans, simsim and millet. The PMB is considered capable of dealing with maize export. Its main activity consists of the procurement and export of cereals and legumes, maize mainly and beans to Tanzania, Cuba and other countries.

Few primary or co-operative societies are engaged in the marketing of food crops. They are strongly orientated towards traditional cash crops such as cotton, coffee and tea. Hence it is largely organised by the private sector. Unfortunately, no market hierarchy exists of wholesale and retail traders. The absence of wholesale traders prevents the build-up of security and market stabilisation stocks necessary for efficient price and market stabilisation to avoid supply disruptions as occurred in 1980.

Private food trade takes place in two ways:

- a) The small-scale urban trader collects small volumes of food crops at the road side markets and transports them directly to the major market outlets. This system is not efficient as it involves the collection of a large number of small quantities. It is seldom specialised and it only reaches a small number of road-side producers.
- b) Food crops are collected through assembly markets at the village level. In this case, traders or their agents usually store their products in rented depots until sufficient quantities allow fully loaded lorry transport. Only in major surplus areas do large traders employ agents on a permanent basis and use their own storage facilities.

Other principle products and marketing procedures include:

A. Beef Marketing

It is conducted by some licensed cattle traders and butchers. They can be divided into two main groups:

- a) The local trader, who usually buys one or two heads of cattle directly from the farmer, or from local county or sub-county cattle markets. He sells the meat in his butchery.
- b) The inter-district cattle trader who trades large volumes of cattle throughout the country. Terminal markets in major urban areas receive cattle from county markets. Itinerant butchers go from farm to farm collecting 15-20 animals and transporting them to terminal markets such as Mukono and Nalukolongo in the greater Kampala area.

B. Marketing of Fresh Milk

The rural population uses fresh whole milk, either home produced or purchased. The semi-urban population buys its milk mainly from retailers. This reaches the consumers without any form of quality control or packaging. Also milk collection centres act as distribution centres for raw milk. Demand for processed milk is limited to urban centres.

C. Fish Marketing

This has substantially suffered from large catch education, poor infrastructure and deteriorated cold storage facilities, both at loading sites and in urban markets. Fish is principally marketed in two ways:

- a) The licensed fish trader buys and sells throughout the country. Mainly smoked and dried fish is traded. Fresh fish is hardly marketed in urban areas as a result of poor transport and lack of refrigeration facilities. Fish traders sometimes sell to fishmongers.
- b) The fishmonger (licensed by the local administration) buys at certain authorised landings. He confines his operations usually to villages and to neighbouring landings.

D. Poultry

It is also traded in livestock markets. For transporting poultry, traders make use of public transport services. On average, 60-80 chickens are transported per journey. In addition, there is a regular trade in eggs per journey, 2000-3000 eggs are transported. The spoilage of eggs during transportation is extremely high due to poor packaging. The Nakesero market in Kampala serves as the major wholesale/retail market.

2.6.1 The Pricing System

With the exception of the five main cash crops, i.e. coffee, cotton, tea, tobacco and cocoa, producer prices from all other agricultural commodities are determined by market forces at the open market. For milk, official producer and consumer prices are only applied to milk produced by dairy corporations.

Another exception is made for marketing parastatals which sell sugar, rice and beef. Ex-factory prices are officially determined on the basis of cost of production including processing, transport and a profit margin. Producer prices in Uganda have been notoriously low, both for cash and food crops. Due to depressed prices, marketed production gradually declined. The price set by PMB and the tender system is used as a guideline by the other private traders in rural and urban markets.

2.6.2 Market Supply and Demand

Based on agro-ecological conditions in Uganda, it is estimated that 80% of the country is almost continuously supplied with staple foods throughout the year. In 1981, the country produced a market surplus for basic cereals (maize, sorghum and millet) of 483,000 tonnes (Food Strategy, Vol. 1).

Based on the market demand in deficit regions in that year (459,000 tonnes), the net market surplus available was estimated at 24,000 tonnes. Present instabilities in market supplies have a direct effect on market prices. Only sufficiently attractive producer prices will stimulate farmers in surplus areas to reliable increased production.

2.7 Storage

There is a considerable shortage of efficient storage space at all levels of the economy. Storage in Uganda traditionally occurs at three levels: farm, village and regional/national levels. Although storage practices and management are generally of poor quality, losses are assessed to be remarkably low. This largely results from a very fast turnover and limited pest and disease problems. However, serious drying problems may arise when the dry period between the two rainy seasons is short.

At the farm level, grains are generally stored in traditional granaries. Cereals are stored unthreshed and groundnuts and cowpeas in the pods. Beans, peas and simsim are threshed in various containers, sometimes mixed with ash for control of insects. Commercial farmers may use store rooms. Traders generally rent storage space for a short period only in stores of limited capacity and low quality. PMB operates a number of warehouses with a total effective capacity of 49,600 tonnes. Due to a lack of proper storage facilities, private institutions frequently buy small quantities.

2.8 Market Information

Apart from seasonal and annual price variations, there are important inter-regional price differences. Under an efficient marketing system, these price differences should reflect the additional costs of assembly, handling and transportation of commodities to the various markets. Produce should move from markets of low prices to those of high prices. However, the present lack of reliable market information hampers both the farmers and traders in optimising their respective production and trade decisions.

CHAPTER 3

DIFFUSION METHODS

3.1 Agricultural Extension Education in Uganda

3.1.1 Extension Services Defined

Extension can be defined as "the conscious use of communication of information to help people form sound opinions and make good decisions about resources, inputs and methods made available by development change agents" (Lecture notes, 1981). In Uganda, development change agents would be the government, donor agencies, NGOs and para-church organisations. The main task of an extension agent in agriculture is to help farmers with their decision making. In Uganda's subsistence farming, extension would involve dialogue between the target group and the development change agents through extension workers. This is because the target group know their situation better than any other person, but on the other hand, the extension agent has formal education, science, technology and methods that would be useful to the farmers. The flow of this information, both ways is the key factor in the success of any extension service.

Government may use agricultural extension to achieve two different objectives. The first is to help farmers reach their goals as effectively as possible through an improvement in the farmer's decision making capacity and second is to change farmer's behaviour in order to reach government goals.

An important point to note, however, is the fact that in extension farmers' interests should be the starting point. The farmer will often decide for himself what is important, although there are times when the extension agent will decide what is best for him.

3.1.2 Problems that can be Overcome Through Extension

Problems which extension can help farmers overcome include:

- a) The farmer's lack of adequate knowledge and insight to recognise his problem or to think of a possible solution.
- b) The farmer's lack of motivation to behave in a certain way, perhaps because the desired change in behaviour conflicts with other motives.
- c) The farmer's lack of resources.
- d) The farmer's lack of insight into how to obtain the necessary resources.
- e) The farmer's lack of power by not having insight into the potential of groups in bringing about society change.

This is by no means an exhaustive list. In view of the above, the extension agents must also analyse current situations so that they are in a sound position to give farmers timely warnings of undesirable events or changes in conditions. For example, by analysing the economic structure of a farm, the extension agent may be able to show the farmer that he is relying on a particular crop for most of his income, despite returns from that enterprise (Van den Ban and Hawkins, 1988).

3.2 Extension Education

According to Van den Ban and Hawkins (1988), extension education deals with strategic questions associated with the extension process. It collects and integrates, where possible, existing knowledge about this process from other scientific disciplines, and adds to knowledge through extension research.

Extension education can help extension managers and agents make rational decisions about their goals and methods. An extension agent wishing to give sound advice to farmers must understand not only the extension process, but also must have adequate technical knowledge of the discipline in which he

gives advice. For example, he must have a thorough knowledge of crops or animal husbandry if he is to be an agricultural extension agent.

3.2.1 Questions That Can be Answered by Extension Education

Again, this is not an exhaustive list of questions extension education can help answer, but is only a guideline to help people understand what extension education is.

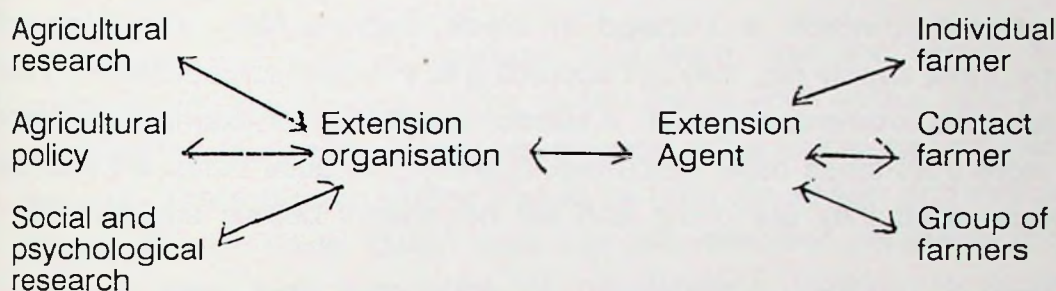
- a) How and when to decide to give or withhold extension advice.
- b) To question the objectives or goals of the extension advice.
- c) To know where the extension advice is directed to.
- d) Whether the extension attempts to give the farmer a solution to his problem or whether the agent tries to guide the farmer to solve the problem himself.
- e) The ways in which an extension organisation develops a solution to the farmer's problem.
- f) Combination of extension methods to be used.
- g) How to organise extension methods to be used.
- h) Integration with other organisations.
- i) Transfer of research knowledge to farmer level, i.e. the "extension research linkage" and
- j) How to evaluate the extension work of an organisation.

In summary, extension education builds on several conclusion orientated sciences to help extension agents with their decisions, especially psychology, sociology and anthropology (Rogers, 1969).

Other sciences which contribute to better extension work can also be used.

To summarise an extension and extension education, we can have a diagrammatic representation of the linkages as shown below:

Extension Model



(the arrows indicate a line of influence).

Modified from Van den Ban & Hawkins (1988).

Both extension and extension education play a crucial role in development and especially so in agriculture. In general terms, development has to do with:

- a) Increase in incomes.
- b) Increase in quality of life, e.g. better health, housing and education.
- c) Increase in extent to which people control their own destiny.

3.3 Interaction of Extension with Other Services

For extension services to be effective, there are other various pre-conditions that must be fulfilled, some of which include the following:

- a) Production incentives which make it profitable for farmers to produce more.

- b) Institutional and infrastructural development.
- c) Markets for products.
- d) Local availability of supplies and equipment.
- e) A constant changing technology.

An organisation which is involved in credit disbursement, marketing of produce, input supply etc. may not according to the definition of extension be involved in the extension services. A subsistence farmer for example, may not need more than these other resources, however, because these are people who know what they are doing and will not always believe any "outsider" easily.

In this connection, it may just be appropriate to focus on provision of inputs like agricultural chemicals, credit, transport, and provision of goods on demand. The extension services come in later when confidence in the development changes agent has been established.

3.4 Diffusion and Adaption of Innovations

Theoretical base

Studies in rural development have shown that human beings do not live in an ambiguous, non-defined relationship with their physical, technical and socio-cultural environment. They are always defining their environment to derive meaning and a format of action. This means that small scale farmers are constantly reviewing and rearranging all signals emanating from their surroundings to present a unified "definition of the situation" which they use as a frame of reference for decision making, conditioning value responses and interpersonal situation (Mbithi, 1978).

Bell (1961) found that all human learnings take place only when the individual wants to achieve something (value aspirational base, notices something (awareness is governed by a set of unwritten rules of reciprocity and ego; every interaction situation, therefore, has a meaning.

The notions of knowledge base, of meaning; definition of the situation incentives and value - aspiration base are the basis to the discussions of problem identification, solutions and better approaches in rural Uganda.

Uganda's extension service has been relying on persuasion, but there is still insufficient emphasis on the need to convert it gradually into a means for two-way communication with the farmer.

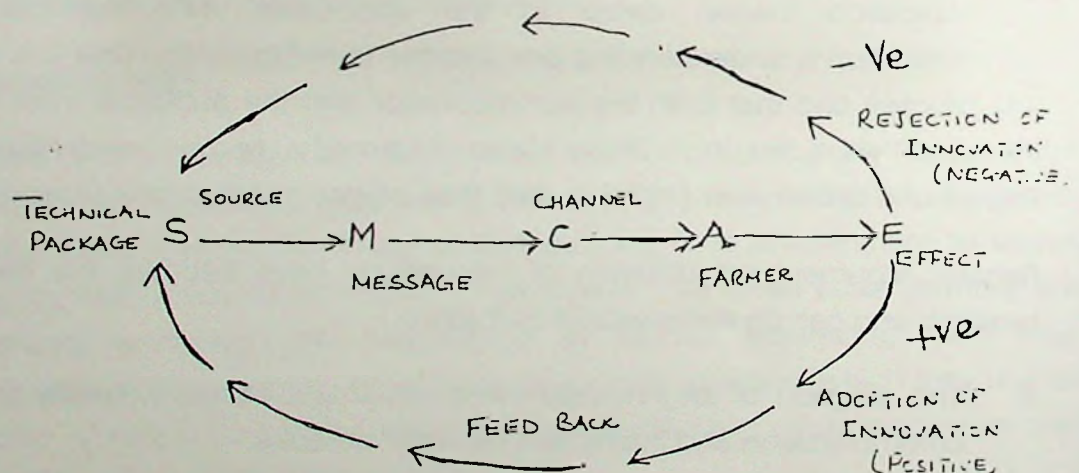
In principle, the extension service must learn from the farmer what his problems are, why he does not do certain things, what labour, land and other means of production he has at his disposal, what ambitions and desires he has, etc. The extension worker should be both the adviser and interpreter of the farmer. De Wilder (1967) says that "the extension personnel should be able to relay their knowledge of the farmer's thinking, problems and requirements so that those in government concerned with research, credit, requisites of production and marketing can effectively tailor their proposals for improvement of agriculture to the farmer's needs and limitations". The above leads one to the central issue of agriculture extension, namely the communication of ideas. Daniel Lerner (1961) in discussing the communication theory, came to the conclusion that the basis of communication is understanding one another (see Figure 2). That it is a two-way process and that both the communicator and the audience must be on the same "wave length". These ideas of Lerner were borrowed heavily by Rogers and Shoemaker (1971) in their discussions of adoption of innovations.

Rogers' argument on diffusion of innovations have become the basis of research and can be summarised as follows:

- a) The diffusion of an innovation in a social unit occurs primarily through communication and interaction between persons.
- b) Many technologists think that advantageous innovations will sell themselves, that the obvious benefits of a new idea will be widely realised by potential adoptors and that the innovation will therefore

diffuse rapidly. Unfortunately, this is not the case. Most innovations in fact, diffuse at surprisingly slow rates.

- c) An innovation is at first adopted only by a few. Others follow and more are converted in a snowball effect. Thus, the spread of diffusion process increases, reaches a peak based on the number of members in the social unit and then declines until finally the last ones are reached.
- d) An innovation does not spread to different members of a group at random. People with certain psychological, social and economic characteristics are first to adopt an innovation, follow later or come last (see Figure 4).
- e) People are often divided into categories according to their scores on adoption index, Van den Ban (1988). These are shown in percentages. These percentages serve mainly to make findings from different studies comparable by using a uniform classification. It is more important for extension agents that a minority of farmers are either early adapters or laggards, and a minority of the early adapters are innovators.



E. E. ROGER'S MODEL OF COMMUNICATION

Figure 2. Communication Model Process.

Classification of people in these different adapter categories by definition depends on the degree to which the whole group has adopted the innovations, and on the distribution of adoption over time being normal as shown in Figure 3.

Once a certain section of a social unit (innovators and part of the early adapters) has adopted an innovation, it spreads automatically as shown in Figure 4, as long as the diffusion process is not interrupted by intervening factors, Schneherr and Mbugua (1974).

Studies done in Kenya, Mbithi (1982) suggest that the characteristics of the communication channel depend on the kind of innovation. Political innovations and religious innovations are all introduced through different types of persons to their respective social units. Agricultural innovations which are perceived by the farmers as being for their own good, do not force serious barriers from within the social system.

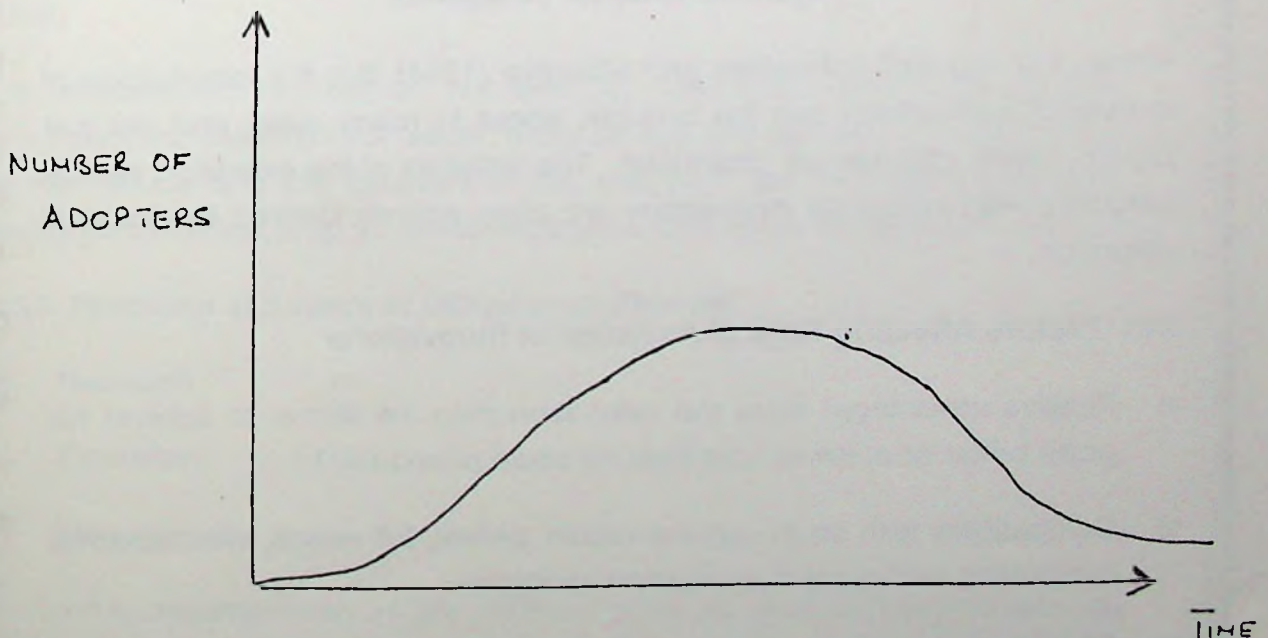
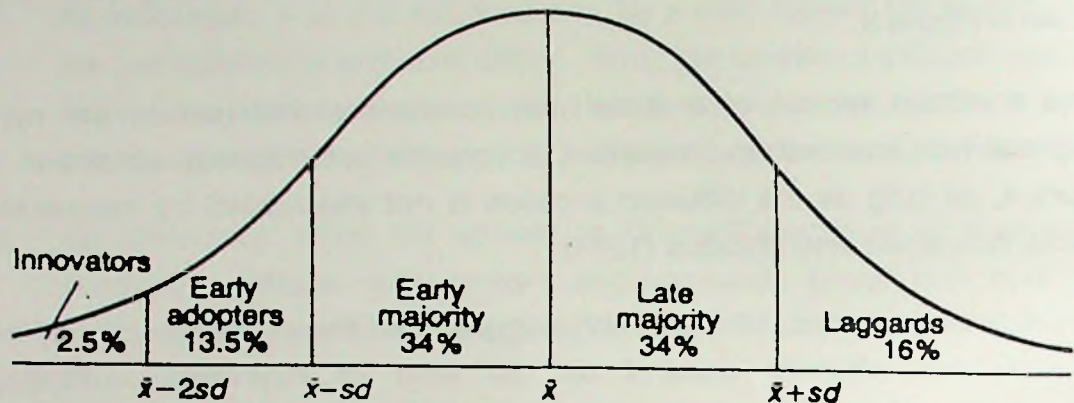


Figure 3. Diffusion of innovations.



Adopter categories. (From: Rogers, E. M. (1983) *Diffusion of Innovations* (3rd edn) (New York: Free Press), p. 247.)

Figure 4. Adapter categories.

Further, it is argued, Schonherr and Mbugwa (1974) that the introduction of agricultural innovations can be brought about in many ways and not just through "filters" and narrow "channels". The activities of the extension service instructors who introduce innovations are often actively desired by the rural population.

3.4.1 Factors Affecting Rate of Adoption of Innovations

- Relative advantage: does the innovation help the farmer to achieve his goals better or at lower cost than he could previously?
- Compatibility with socio-cultural values, beliefs, felt needs, environmental constraints and current production strategies.
- Complexity: innovations often fail because they are not implemented correctly. Some require complex knowledge or skills. The more complex it is, the less likely it is to succeed.

- d) Triability: an innovation which the farmer has tried on a small scale or has observed from a contact farmer will be readily adopted by him.
- e) Observability: farmers learn much from observing and discussing with their colleagues. Tours and informal discussions, e.g. after a field day would have great benefits.

3.5 Problems of Diffusion Methods in Uganda

Concern is expressed at the slow adoption of new ideas by the farmers as well as the wide variations between potential production levels and those which are achieved in practice. The promotion and adoption of new ideas depends as much, if not more, on the attitude of the farmer as on the validity and applicability of the new idea itself. The lack of appreciation of this, by those involved in the development and extension of new ideas contributes to the present position. The promotion and adoption of new ideas is a marketing exercise and to be successful must be treated as such and not as a further technical exercise. Ideas are being marketed and sold, Runcie (1982).

The reasons why farmers do not take up new ideas such as not being convinced, increased risk of failure, effect of age and education of the farmer on his attitude and the influence of the shepherd etc. are discussed as a background to designing an effective development and extension strategy.

3.5.1 Problems at Source of Diffusion in Uganda

- a) Research
- b) Extension
- c) Management

We tend to assume receivers are resistant when we fail to achieve behavioural change, although logically the source of the message may also be responsible.

Source credibility, reliability and relevance are very important. Credibility generally will be high if the source is considered to be expert, if he agrees with the receiver on important points and if the receiver is convinced, and he is trying to serve the receiver's interests as the receiver perceives them.

The source must be very familiar with the problems of his receiver. He should ask himself what is the best way to help solve these problems. Agricultural workers, for example, who attempt to write research reports for fellow scientists and for farmers are unlikely to reach either group successfully. Messages are not written specifically for particular audiences, using language appropriate to their level of understanding, selecting messages which interest them, and using medium they will receive and pay attention. Farmers for example rarely read scientific journals. Even if they read, they may have difficulty in understanding the technical terminology.

The following are the main sources of the problems of the adoption process:

a. Research

In the past, agricultural research and extension in Uganda has played an important role in agricultural development of the country. In many ways it was known as one of the best systems in Africa, characterised by stable found decentralised programmes with effective inter-linkage between research efforts and extension services on the one hand and the extension system and the farming community (co-operatives and primary societies) on the other. As of the mid-seventies, these services deteriorated rapidly and became largely ineffective due to institutional weakness and understandably low levels of staff motivation. Fortunately, many of the people in both public and private research, development and education in agriculture are in place and have good basic training.

Generally, at present, research programmes show a poor performance. One weakness is the application of known research knowledge at the farm level.

A major limitation of present research programmes is the near total absence of a transfer relationship between the research staff and the extension

services and issues relating to the institutional collaboration between research and extension systems. In practice, information flows easily from research stations outwards to the farmers, technology is transferred. But feedback of site specific knowledge is commonly poor, researchers rarely hearing of the farmers' specific needs. Also, research activities tend to be monodisciplinary and mainly focus on single commodities, which, important as they are, must be complimented with more integrated multi-disciplinary and research finding solutions to a variety of technical, social and agro-physical problems at the farm level.

For instance, more research is needed to develop the suitable types of intermediate farm mechanisation, which together with appropriate combinations of improved seeds and agro-chemicals, will increase productivity and reduce labour requirements during periods of high labour demand (sowing, weeding and harvesting). For the adoption of improved technology packages and to make adjustments based on the farmers' needs to on-farm farming systems, research is needed. Therefore, agricultural research must receive more reliable funding than it does at present.

However, research programmes generally should concentrate much of their efforts on the problem of representative farming systems. To make such efforts successful, close operational links have to be established and maintained with the extension service.

b) Extension

Experience from a wide range of countries is now suggesting that extension is flawed with contradictions and dilemmas. It is permeated by a belief and the "trickle-down" approach. This transfer of technology or diffusion model thinking means that new technologies are transferred to a minority group of innovator, progressive farmers, high access group of contact farmers who demand advice. Farmers who choose not to adopt are labelled as regards and non-adopters, and as having attitudinal barriers (Russel *et al*, 1989), Chambers and Childyal, 1985, Rogers, 1983). This means the extension officers dealing with farmers who have better yields, better returns, are more

wealthy and thus less likely to be constrained from adopting new, even more productive technologies. Extension messages commonly reinforce this large or wealthy farmer bias by concentrating upon an intensive input strategy. Extension agents recommend intensive application of fertiliser, pesticides and the use of hybrid seeds and provide credit.

Extension packages, for example, recommend 100 kgs urea is applied to each hectare of maize, an impossible amount for farmers remote from roads or simply too poor. The secret of success in extension work lies in the method of approach to the problems of the farmer and his family, giving priority to their wishes, teaching them how to overcome their difficulties and developing in them a sense of pride in their achievements.

c. Agricultural Extension Service/Extension Workers

Ascroft, Roling, Chege *et al* (1972) argue that agriculture extension services, instead of helping the farmers to optimise productivity is actually creating poverty and therefore frustrating farmers. This argument is strengthened by Makunda (1982) when he says that farmers are not easily persuaded to adopt innovations and that the extension agents must be ready, willing and capable of learning the social basis of aspirations and fears of the farming community. Otherwise, their efforts might not have any impact.

Extension personnel, therefore, apart from being informed technically, must have a feeling of human relations, and some understanding of rural sociology, Bahemuka (1985). Above all, these people should be seen by farmers as trying to identify themselves with aspirations and speak the "language" of the farmers, Makunda (1982).

The extension agricultural workers are expected to be specialists in farming, advisers and scientists. However, studies by Leonard (1973), Chitere (1980), Mbithi (1974) and Bahemuka (1985) have found that extension workers are neither scientists nor complete experts and in most cases their knowledge tends to be lower than that of progressive farmers in the community. The following is a summary of bottlenecks:

Professionals continue to think of rural people as backward, ignorant and primitive. There is limited technical know-how of frontline extension agents and a lack of an effective interplay between expansionists and farmers. The activities of the extension service is too often limited to the collection of research results which are then made available in the form of recommendations to the farmers without differentiating between different farming systems. On farm tests are generally not conducted, except for large scale trials on fertiliser application in coffee production. Generally, too little account is taken of local variations on climatic and socio-cultural and economic conditions, under which farmers operate. The serious problems in communication, especially in communicating to low motivated farmers where there is low empathy and low ability to adopt the unique situation of the farmers, on the part of the extension worker. Creation of dependence on extension workers for advice under certain circumstances where the farmer uses his judgement and decisions in preference for those of the extension agents.

Excessive administrative and reporting tasks that often waste time should be spent in the field including inadequate support services, inadequate co-ordination among ministries, late budgetary amendments. Sometimes extension agents can give incorrect information, i.e. if he is not prepared to admit that he does not have the necessary information or if he follows his personal whims. The extension workers try to do all the work themselves instead of training local leaders. There is a lack of participation and involvement of the people in the planning.

d. Management

"We, the outsiders". The impact of outsiders in rural development is best described by Chambers (1983). Outsiders are people concerned with rural development who are themselves neither rural nor poor. Many of them are at headquarters or are regional, district and sub-district staff in government departments in administration, agriculture, animal husbandry, community development, co-operatives, education, forestry, health, land development, public works, water development and the like. They also include all others,

e.g. academic researchers, aid agencies and technical co-operation personnel, bankers, businessmen, consultants, school teachers, staff of training institutes and voluntary agencies and other professionals.

Outsiders under perceive rural poverty. They are attracted to and trapped in urban "cores" which generate and communicate their own sort of knowledge, while "peripheries" are isolated and neglected.

We the outsiders have much in common. We are relatively well-off, literate and mostly urban-based. Children go to good schools, carry no parasites, expect long life and we eat more than we need. We have been trained and educated. We read books and newspapers. We are a class. "We seek to develop a dialogue between the agent and the farmer in order to ensure that the new technologies can be focused towards solving farmers perceived problems (and not merely what the change agent may want to promote). All of us learn to recognise the central role of the farmer in development" (Kiara *et al*, 1990).

Planning is not just a question of knowing what best to do in an area, but of providing:

- a) A legitimate means of decision making at a centralised level (i.e. a framework through which the centre/local issue can be resolved).
- b) A means of co-ordination between the activities of developments, between other development agencies and between statutory and voluntary sectors.

In Uganda and many developing countries, three principles are at work at local levels of governance.

- a) Conflicting centralisation-decentralisation imperatives. At macro level, these are seen as the conflicting requirements of holding the state together versus allowing expression of local interests. Local interests include:

- Central and local politicians struggling over control of opportunities for patronage.
 - For administrators, questions of degrees of discretion or conformity.
 - For technical officers, conflicting loyalties to central ministries and local co-ordinating or planning.
- b) Parallelism of line ministries. Separate ministries represented at local levels by technical officers, each with their own budgets (great or small), lacking any interest in collaboration.
- c) In some places, plurality of Non Governmental Organisations (NGO), each exerting demands for information or permission etc.

Chambers (1983) continues that in this area there may also be other explanations. One is the simple fact of distance and that rural poverty is remote. It is even remote most of the time for those outsiders who are "working in the field", but who are urban based, like the government and other professionals in the regional, district or sub-district headquarters. There is a lack of contact between the urban based outsiders concerned with rural development and the poorer rural people. There is also a wilful element of choice. Outsiders choose what to do, where to go, what to see and whom to visit. What is perceived depends on the perceiver. Outsiders have their own interests, preferences, pre-conceptions, their own rationalisations, their own defences for excluding the discordant and the disinteresting selfishness which is a powerful force.

Putting one's family first seems natural and good, and "charity begins at home" is a great let-out. Disillusion with development failures and knowing cynicism about "where the money goes" are given as reasons for doing nothing. Outsiders are often ignorant about rural poverty, but do not want to know what they do not know. The less they have of direct and discordant contact learning, and the less they know, the easier it is for myth to mask reality. Critical self-examination is not easy.

3.5.2 Problems at Destination of Diffusion in Uganda

"I do not wish to speak to you about these things, for my situation is so miserable and I am so desperate that I cannot go on talking of them. It is not words that can change my life, but a change in my country" (in: Chambers, 1983). Interviews in Nepal were reported in Blaikie, Cameron and Seddon (1979). Outsiders' comfortable views of the poor as improvident, lazy, fatalistic, ignorant, stupid and responsible for their poverty, are reassuring by wrong. Case studies show that poor rural people are usually tough, hardworking, ingenious and resilient. They have to be able to struggle against five interlocking disadvantages which trap them in deprivation, poverty itself, physical weakness, isolation, vulnerability and lack of power (Robert Chambers, 1983). All are important, but vulnerability and powerlessness especially deserve more recognition and analysis.

Vulnerability reflects lack of buffers against contingencies and as social conventions (dowry, bride wealth, weddings and funerals), diseases, physical incapability (sickness, the child-bearing sequence and accidents), unproductive expenditure and exploitation. Contingencies often force poverty ratchets, entailing the irreversible loss or sale of assets, making people more poor and more vulnerable to becoming poorer still.

Powerlessness is reflected in the case with which rural elites act as a net to intercept benefits intended for the poor, in the way the poor are robbed and cheated and the inability of the poor people to bargain, especially women.

Outsiders' views of the poor are distorted in many ways. Lack of contact or communication permits them to form those views without inconvenience of knowledge, let alone personal exposure. Poor people are rarely met and when they are met, they often do not speak. When they speak, they are often cautious and differential, and what they say is often either not listened to or brushed aside, or intercepted in a bad light. A landless labourer in Bangladesh (BRAC, 1979) said "we have no power to talk in front of the rich, like the chairman. We are afraid of them. We are always looked down upon and scolded. We never know what they are writing and doing".

Clusters of disadvantages interlocked, variously described as the vicious circle of poverty, the syndrome of poverty and the poverty trap. People are poor because they are poor. Linking the five clusters is shown in Figure 5. Chambers gives twenty possible casual relations which in their negative forms interlock like a web to trap people in their deprivation.

Rural farmers who grow up with their problems and difficulties get used to them. They may realise the effects without appreciating the causes. Rural people in Uganda are poor and have limited access to media for several reasons. Many people are illiterate. This problem is overcome in some families with literate children who read publications and regularly pass on information to their parents. Newspapers are not distributed to rural areas and even when available, may be too expensive for most families. Television is also expensive for many, and there are no electric power supplies in the rural areas. Even in towns where it is available, there are often many blackouts or electric current fluctuations which damage the sets. Radio is available to some rural people, especially the small transistor sets. However, these are considered to be too expensive. Newspapers and television stations are located in the cities and direct information is available to urban audiences. They seldom discuss problems which interest a less educated rural audience.

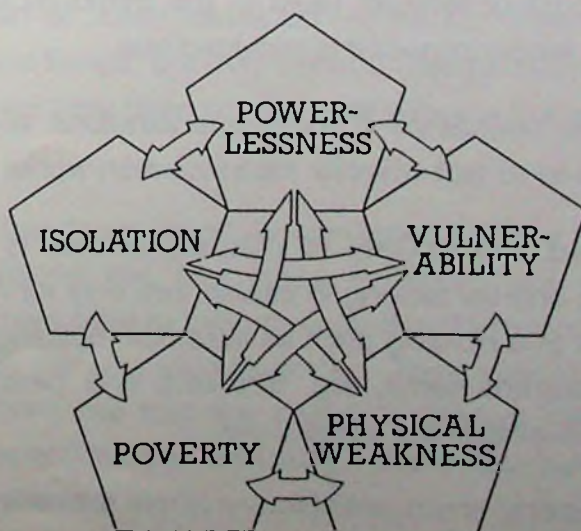


Figure 5. The deprivation trap.

There are many languages and dialects and as such languages on the radio and television have a limited hearing. Furthermore, the speed of presentation on electronic media may be too high for language comprehension or for decoding pictures. There are clearly as many differences among rural people themselves as there are between urban and rural people. There are such cases where well educated and culturally highly urbanised people live in the same village among the poor, illiterate women who have little exposure to urban culture. However, mass media plays a greater role in the process of change.

Speeches or talks are important means of transferring information in extension, but the spoken word is usually forgotten more easily than the written word. Most farmers have not been accustomed to gaining their information from informal lectures or talks. Demonstrations may stimulate farmers to try out innovations themselves or even replace a test of innovations. They can be used to compare results of traditional practices with a new practice or package of practices, effects of change in their farming system. Psychologically, difficult situations may arise with demonstrations, especially if they are called "examples". Farmers claim that the demonstrations differ from the situation because conditions are "different". For example, the cost of fertiliser used in the demonstration to have been subsidised or extra labour required is provided free.

There is much less resistance if the demonstrations are selected by the community and asked to test whether the innovation works well in their village.

As already indicated, the poverty of peasant farmers is well known. The majority are almost entirely lacking in capital, not only for major requirements in the improvement of a holding such as livestock, buildings, fencing etc., but even for small recurrent items, e.g. fertilisers and pesticides. The credit facilities at present available are inadequate.

The problem of making them satisfactory is an exceedingly difficult one in view of the vast scale on which credit is needed. The lack of security can be seen on small farms (especially where land tenure is still communal). The

hazards of agricultural investments and the difficulties of effectively supervising the proper use of credit by very large numbers of smallholders are evident.

Linked with the peasants' poverty is the limited number and generally primitive nature of the implements, viz the axe, hoe and panga (big knife). There are large areas where it is rare to see any form of wheeled transport, other than a bicycle, possessed by a peasant. The use of animal power for tillage is restricted to limited areas, the north and north eastern parts of the country.

Mechanisation so far plays a minor part in peasant agriculture. In some places limited use is made of tractors by a few large farmers and contractors, but the effect on peasant farmers as a whole is slight and there are many difficulties in the way of extending their economic use.

As a result of this lack of capital, equipment and power, an innovation would not be diffused and adopted by all members of the peasant farming system. As the farming is largely geared to hand labour, cultural operations, preparation of food and to a great extent processing of produce are carried out slowly and laboriously. Productivity per man and per acre is low. Even though he is willing and is always trying to take up the new ideas, he sometimes cannot with all these "devils on his back". Peasant farmers also would like to have good things, but they cannot. Things like these may sound trivial to mention, but yet they often have a wide effect in the wrong way to the direction desired.

Farmers on the other hand may be easily convinced that the idea is good, but lack confidence in taking the first steps to implement it. Also worth mentioning is that farmers believe they manage their farms very efficiently and have little to learn from the so-called "experts". They may accept that expert advice is useful to them, but that the advice is always meant for another person. The word "expert" is used advisedly. Many activities undertaken by rural people and scientists are similar.

The rural people are always distinguished by name and classify entities in their environment. They observe, compare and analyse, they experiment and they attempt to predict. Some of the strengths and weaknesses of rural peoples' knowledge is embedded in their language and concepts. What is perceived affects the language evolved to describe it, and language in turn provides concepts and categories which shape perception. Finally, farmers are a problem. They can appreciate or despise, praise or undermine. They are proud, pompous and difficult when they want to be.

CHAPTER 4

SUGGESTIONS AND CONCLUDING COMMENTS

4.1 New Extension Approaches for Rural Subsistence Farming in Uganda

Basically the approaches to be adopted include the following:

a) Understanding the culture, norms and traditions.

This will enable the extension agent to know how people behave, what products they produce, how they produce them and why. The agent will also know the taboos in the community and will avoid mistakes if he understands their culture, customs and traditions. In addition, other aspects like the language barrier and even the age and tribe of the extension are crucial considerations.

b) Thorough knowledge of the current methods.

Having thorough knowledge of the methods currently being utilised is an advantage in production of a particular agricultural product, and assessing the advantages and disadvantages is a wise thing to do. There must be a reason why they do what they do.

c) Design of packages.

Design packages are built on existing ones. This is because if "imported" technology seems all too powerful, people may feel that their own efforts to improve land and better crops are futile. Thrupp (1989) mentions encounters with farmers in Costa Rica who were embarrassed when asked about their own ideas and practices, explaining apologetically in one case "I don't practice the modern technique that the experts say I should".

d) Points of entry.

The people know the points of entry. The rural population have their own culture and ways of doing things. They have their own division of labour and their own traditional institutions respected by all. If change does not follow these norms, it will often fail. It is important therefore to know the target group for a particular message. It is also important to know the power base within the community in question. The traditional influentials and successful or rich old men have a lot of power. To attempt to use a government chief in mobilising, the people would have to make sure the chief has the backing of these "power brokers".

e) Impact of extension packages.

Use of extension packages give an immediate impact and gain confidence and credibility. In doing this, the people immediately realise that it benefits them and therefore draws them closer to other extension packages. For example, the treatment of a sick animal and its subsequent recovery will open a doorway for a nomadic pastoral household to discuss range management or soil erosion control.

f) Informal methods.

Use informal methods of communication. The literacy level is very low. Very few people own radios or even read newspapers. Therefore a dialogue will mainly be through person to person contact. The use of contact farmers has a great effect in the adoption of innovations, especially if the choice of the contact farmer is that of a "power broker".

g) An integrated approach.

Farmers can be confused if too many extension agents discuss with them different aspects of their enterprise. They feel compartmentalised. For example, the Ministry of Agriculture, Ministry of Animals and Fisheries and the Ministry of Environmental Protection extension staff all talk to the farmer on soil erosion control and probably propose different control methods, which

are bound to cause confusion. Therefore, attempts should be made to have integrated approaches at farmer level.

h) Training and retraining of extension workers.

This is a big handicap but may be overlooked. The present extension taught in the training institutions focuses on theoretical studies. Even they focus mainly on modern methods rather than on traditional management systems also. The extension staff have been trained to change farms. They have learnt about plant varieties, fertilisers, etc, yet their task is to change farmers who subsequently may decide to change their farms.

i) Extension: research linkages.

Too often the links between research and extension have been pushed into the background, yet new technology is usually developed by researchers. Studies have shown that implementing agency managers will not use information, even perfect information, unless it comes from what one consultant calls the manager's coalition. The coalition here is that group that influences what the manager should listen to and attend. Although this may be the case in some instances, the bottom line between links in extension and research should aim at having farmers use new technology and information and in influencing their present production strategies.

All in all, this may not be an exhaustive list of approaches, but represents an attempt to look at the extension and its effectiveness in rural subsistence development in Uganda.

4.2 Recommendations for Sustained Agriculture in Rural Uganda

Agricultural extension was earlier defined as "the conscious use of communication" (see 3.1.1). It could as well be seen as a system which, through educational procedures, assists farms in improving farming methods and techniques, increasing income and efficiency, bettering their standard of living and lifting the social and educational standards of rural life.

Different extension approaches have been used by various extension organisations around the world, including Uganda. Alternative approaches to the existing ones are made in this study. It is the opinion of the author that the proposed extension approaches are sustainable, soft on available resources and appropriate to the current socio-economic and political situation in Uganda. For an extension approach to succeed therefore, certain conditions must prevail.

- A. a) Sustained attention must be given to the support of extension, the content of extension information and messages, and pre-service, in-service and advanced training of staff.
- b) The technical competence of staff must be monitored and selection made of individuals with the necessary personality to carry out extension.
- c) A series of viable innovations for dissemination by extension should be available.
- d) The viability of innovations, marketing facilities, price incentive and availability of inputs and credit should be assured.
- B. Input distribution networks in the country are complex and in some cases rather poorly established beyond the district level. The process of procurement and distribution of most inputs is slow.
- C. Proposed input supply system whose aim should be:
 - a) To ensure timely delivery of appropriate inputs in the right place at the right time, at an appropriate price and for reasonable cost.
 - b) Promote a viable distribution mechanism that is sustainable.

To achieve these objectives, the input delivery would be:

- c) To deliver inputs to farmers with as simple and direct a mechanism as possible.

- d) To deliver inputs through such channels as farmers groups, co-operative societies or lorry sales where the situation dictates, and proven private input dealers.
 - e) To render the input procurement and delivery mechanisms responsive to demand and streamlining procurement systems to avoid extended delays.
 - f) To support a self-sustaining, financially viable procurement and delivery system.
 - g) To support domestic input producers in preference to foreign sources of supply.
 - h) To support input purchase by farmers through credit.
- D. The distribution of inputs would be carried out by various agencies involved with agricultural inputs. These include:
- a) The Uganda co-operative central union.
 - b) The Ministry of Agriculture.
 - c) The Ministry of Animal Industry and Fisheries.
 - d) Parastatal organisations and private companies.
 - e) Private importers and traders.
 - f) Local input producers.
- E. The officers in charge of counties must be responsible for programme development, implementation and evaluation, and must supervise staff in the sub-counties within their area. The staff in charge should specifically be responsible to:
- a) Identify and organise farming groups with whom to work.

- b) Extension programme development and evaluation for parishes.
 - c) All the activities in the saturation parishes.
- F. Extension methods should be differentiated from extension approaches since extension methods refer only to the techniques used by an extension system as it functions, i.e. demonstrations, farm visits, meetings, radio, publications etc.

The methods include the types often used in extension organisations but tailored to the Uganda situation. These include:

a) The individual or interpersonal method.

This method is sometimes time consuming but is important at certain specific stages of the adopting process. Certain farmers prefer this approach who work closely with farmers who tend to be recognised as community leaders, their practices being observed and often adopted by others.

b) The group methods.

These methods offer the possibility of greater extension coverage and supportive atmosphere to individual farmers. They legitimise farming practices to be adopted and are cost effective.

The extension worker would:

- i) Organise and work with the farmer's group.
- ii) Work with on-going organisations.
- iii) Hold general community meetings.
- iv) Use method demonstrations.
- v) Prepare result demonstrations.

vi) Hold farm field days.

vii) Conduct field trips.

c) Mass media.

Mass media should include mainly well timed radio programmes to farmers and print media. Farm radio programmes for agricultural development must be broadcast at times when farmers and their families can listen, usually early in the morning before going to their fields, or in the evening after work. Broadcasts should win listeners' confidence by basing their programmes on local problems and by using languages the farmer can understand.

d) Instructional aids.

Audio-visual aids should be used extensively to enhance the learning process. Emphasis should be placed on simple but meaningful aids to increase the learner's capacity to understand and retain messages.

e) Adoptive research and on-farm demonstrations.

Very close liaison should be established with research in organising and carrying out adoptive research and on-farm trials in the saturation parishes and in generating technologies suited to the needs of the farmers in the parish. On-farm demonstrations should be used extensively, based on findings from the on-farm trials.

An analytical appraisal of the farming systems within the parishes is necessary, requiring close participation of extension and research personnel in the process.

G. Training is crucial to the effectiveness and success of extension workers. All extension staff should receive training based on established training schedules that are developed on an annual basis. Extension specialists stationed at the major research stations should have the major responsibility for organising, scheduling and providing in-service training in their subject matter fields to distinct subject matter specialists, who in

turn should work with other district staff to provide follow-up training of staff at the county and sub-county levels.

The extension information section should provide training in extension methodology, working with the technical subject matter specialist.

Finally, persuading farmers that a new method or system is credible and feasible is a crucial link in the chain. There is little doubt that seeing the method or system working under conditions with which the farmer can associate himself is vital. For farmers to adopt innovations, there should be a certain level of awareness and the farmers must be motivated. The extension workers have to stimulate and motivate farmers with new ideas. In motivating farmers, there should be logical and operational breaks from past practices, past taboos, past beliefs to present and future practices.

In conclusion, it is necessary to bear in mind the fact that development is a process. During this process mistakes are made, and people learn from these mistakes and are stronger for having learned from these mistakes. Extension services are still a developmental stage and there is no doubt that Uganda is learning.

4.3 Conclusion

Having discussed the characteristics of problems at source and destination, we are in a position to see that these peoples' environments, resources, managerial infrastructure and educational constraints limit their production systems. It is therefore important to appreciate these factors before embarking on extension services and education.

The greatest need in Uganda's rural areas at the moment is adult literacy to raise the level of awareness of the people to allow them to participate in decisions and in making issues. However, this is an expensive venture and takes a long time and benefits are always in the future. It is usually difficult to allocate scarce resources to such aspects, since many development change agents are interested in quick results.

Another aspect is the issue of utilising existing traditional production and management systems instead of establishing parallel formal institutions which the local people are sceptical about. The modification of innovations in terms of adaptability, cheapness, less complexity, affordability and relative advantages should be pursued much more vigorously.

In addition, bold attempts to have field days and tours will pave the way for future participation of farmers in innovations that they would otherwise have been reluctant to adopt.

Extension links farmers to the rest of the aspects of the national economy and may open ways for improved decision making processes and procurement of other requirement services like credit and infrastructure support. Research innovations and findings are passed on to farmers through extension agents and extension can play a very important role as the vehicle for both rural and national development as long as the extension service is not misused and made to achieve aims which are not consistent with farmers' goals and aspirations.

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