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DECENTRALIZATION OF DECISION-MAKING PROCESSES:
ITS IMPLICATIONS FOR THE IMPLEMENTATION OF THE
CROPS IMPROVEMENT PROGRAMME IN
KAKAMEGA DISTRICT, KENYA //

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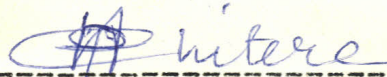
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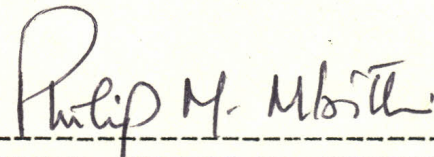
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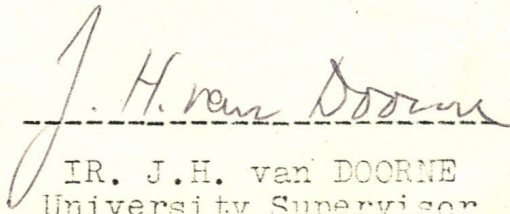


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This Thesis has been submitted for examination with
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ABSTRACT

This study examines the reasons for low agricultural productivity among the majority of farm units in smallholder areas in this country. Available data indicated that low productivity might result from the fact that authority was not adequately delegated to field staff of the Agricultural Extension Service and of other agencies involved in agricultural programmes. The underlying argument of decentralization and hence of this study is that there should be division of responsibilities between headquarters and the field administration. The former should make broad policy decisions related to allocation of scarce resources, recruitment and training of staff, research, and so on, while the field administration should shoulder responsibilities for implementation of programmes. Where there is such division of responsibilities decisions made at the local level are likely to be adaptable to local conditions. This could permit effective realization of objectives of agricultural programmes which include more food, incomes and employment opportunities for rural farm families.

Following this orientation the study examined:

- a) the extent to which farm units were productive and the factors influencing such productivity; b) the capacity of the Agricultural Extension Service to implement its programmes; and c) the extent to which extension activities of credit administration,

marketing of farm produce, and cooperative development were liaised with those of extension education and hence adaptable to local community conditions.

We concentrated on the Crops Improvement Programme and collected data in Ikolomani and Lugari divisions of Kakamega district, Kenya. The latter division is the only settlement area in Kakamega district. We interviewed farmers, agricultural extension staff and staff of other agencies involved in this programme. We additionally collected data from official documents and by the direct observation method.

We found agricultural productivity to be low on the majority of farm units (65%) in Ikolomani area partly due to failure of farmers in this area to follow extension recommendations in improved crop farming. Farm productivity was relatively high on 90% of the farm units in Lugari area partly due to farmers' observation of extension recommendations. This in effect meant that while extension objectives cited above were being met in Lugari area they were rarely met in Ikolomani area. The age of farmers, their economic position or their level of education could not help to explain the vast differences in quality of husbandry of crops between the two areas. Farmers in Lugari area did better largely because they were well knowledgeable about improved crop farming. They did not seem to have acquired this knowledge from the then extension education efforts; they had largely acquired

such knowledge by virtue of having been progressive in farming prior to settling in Lugari area or having been farm workers on European farms in this area. The Agricultural Extension Service had further at the time of settlement (during 1960s) educated and assisted almost each and every settler to adopt agricultural innovations.

We found capacity of the Agricultural Extension Service as measured in terms of density of staffing, occupational competence of junior staff and transportation arrangements to be low. The density of staffing was average compared to that of other parts of the country. However, junior agricultural workers who shouldered the implementation of the Crops Programme were largely of low educational status and less trained; two thirds of them were less competent. The few of them who were competent tended to have attended school for more years; quality of training and length of service had no significant effect on competence of junior extensionists. Conditions of work, such as training and promotion prospects, allowances and transportation arrangements were unsatisfactory. This fact together with the fact that senior extension staff played a leading role in the making of decisions related to farmer education activities tended to reduce the motivation of junior staff and made them exert less effort in their work. The latter fact further made extension education activities to be less adaptable to local community conditions and led to low attendance of

agricultural courses and farm demonstrations by farmers.

Likewise, the fact that senior staff of other agencies played a leading role in the making of decisions related to credit administration, marketing of farm produce and cooperative development activities made it difficult for these activities to be effectively liaised with those of extension education and for these activities to be adapted to local conditions. This led to problems of low rate of repayment of farm credit, dominance of businessmen in marketing of certain farm products and failure of nearly 75% of rural farm cooperatives in the study areas.

This unadaptability of extension activities accounted for low productivity of majority of farm units in Ikolomani area. The historical situation in Lugari area rather than the then current extension efforts accounted for the relatively high productivity of most farm units in this area.

ABBREVIATIONS

AA	Agricultural Assistant
AAO	Assistant Agricultural Officer
AFC	Agricultural Finance Corporation
DDT	Dichlor-Diphenyle-Trichloroethane, a pesticide used for killing insects
FTC	Farmer Training Centre
GMR	Guaranteed Minimum Return
ILO	International Labour Organization
JAA	Junior Agricultural Assistant
KFA	Kenya Farmers Association
MOA	Ministry of Agriculture
MOS	Ministry of Settlement
SAAO	Senior Assistant Agricultural Officer
SRDP	Special Rural Development Programme

CHAPTER ONE

THE RESEARCH PROBLEM AND ORIENTATION

1.1 The Research Problem

This study examines the processes of decentralization of decision-making in this country's Agricultural Extension Service and the impact of these processes on the implementation of agricultural development programmes at the local community level. The term decentralization refers to the two processes of: deconcentration which is the delegation of authority to the staff of a central Government Ministry posted outside headquarters for discharge of specified functions; and devolution which is the delegation of authority to formally constituted local Government bodies for discharge of specified or residual functions (Collins P., 1970:61). The study examines both types of processes.¹

The need for deconcentration of authority to field staff of a central Government Ministry like that of Agriculture arises from the fact that the rate of adoption of agricultural innovations by many small scale farmers in this country is very low (Schonherr, S. and Mbugua, E.S., 1973:2-4). The main factors cited by the Kenya Development Plan (1974-1978, Part I:18) for this low rate of adoption of agricultural innovations and the consequent

low productivity of the majority of small scale farms in this country are: lack of knowledge, lack of capital and lack of appropriate technology. This low productivity of the majority of small scale farm units as Mbithi, P.M. (1974:41, 73-74) has noted leads to food shortages especially in the marginal areas of this country, to low farm incomes and to rapid migration of younger persons to urban areas in search of income earning opportunities. These cited problems make it evident that there is an urgent need to reach, educate and assist most of the small scale farmers in this country to adopt agricultural innovations. This task of education of farmers and of assisting them with support services so as to facilitate their adoption of agricultural innovations cannot be done by the staff in the headquarters of the Ministry of Agriculture. Maddick, H. (1963:31) has noted that headquarters staff should concern themselves with broad issues of policy formulation which entail planning for the entire country, setting priorities, allocation of scarce resources, etc. and that field staff should be entrusted with the task of implementation of programmes. He notes further that delegation of authority to field staff to make decisions regarding various activities of the programmes they are required to undertake will permit them to tailor these activities to needs of communities and individual farmers.

Further as agricultural programmes are usually implemented by many agencies at the same time, there is need for similar delegation of authority to staff of these agencies to permit them interpret and adapt decisions made at higher levels of these agencies to local community conditions. This should permit effective coordination of activities of these agencies and those of the Extension Service and facilitate adoption of innovations by most farmers in small scale farming areas.

In Kenya, however, planning of extension activities is done at higher levels of the Extension Service, a fact which leaves little or no room for these activities to be tailored to needs and constraints of local communities. Leonard D.K. (1973:144) noted that information only passed downward in Government hierarchies and that a large status gap between senior and junior staff in the Ministry of Agriculture made informal contact between these officials almost non-existent. Roling N. and Ascroft, J. (1971:15) also indicate that where decision making is centralised little attention is paid to the huge communication effort needed to motivate, coordinate and instruct field staff responsible for implementation of programmes; instead this task is left to senior

staff who send a few stencilled directives 'down the line'.

It is evident from these observations that field staff of the Ministry of Agriculture in this country have not been delegated with sufficient authority to participate effectively in the making of decisions about activities of programmes which they are required to implement. They are not even consulted about what it is they are required to do in the field. The situation that prevails is one in which plans are formulated at headquarters with set targets and passed down to field staff to implement, a fact which as Mbithi, P.M. (1974:57-59) has noted makes it difficult for field staff to identify real farmer priorities and hence to adapt such central plans to local conditions. He further cites the following problems with regard to the Agricultural Extension Service in this country:

- (a) Extension effort and support services are concentrated in high potential areas and to large scale farms. Low potential areas receive fewer loans and fewer extension staff; they have limited alternatives for cash crop farming and face frequent famines.

- (b) Research for the small peasant farm which has a strong subsistence base and a small or non-existent cash crop base has been missing. Research on major food crops, such as sweet-potatoes, pigeon peas, finger millet and small scale cash crops like green grams, castor, miraa, and so on has received low priority. Research findings have been tailored for the large rather than small scale farmer.
- (c) Senior staff have more staff under them and spend most of their time on administrative matters rather than on farmer education activities. Junior staff meanwhile who do the bulk of field work are not well trained to interpret research findings nor to effectively communicate ideas to farmers. Being members of the elite these change agents interact more with their counterparts the rural elites (politicians, progressive farmers, school teachers and businessmen). They recruit these progressive members of rural communities for courses, demonstrations and field days; they also visit them often and assist them with credit and other support services. This form of extension contact benefits only 10% of farmers in smallholder areas in this country.

Research done by Leonard, D.K. (1973), Mbindyo, J. (1974), Moris, J.R. (1973) and Chambers, R. (1971) show agricultural administration in this country to be characterized by: lack of vehicles, fuel, or both creating severe problems of transportation for field staff; strict control by headquarters of resources allocated for agricultural development; low staff morale due to poor conditions of work, inflexible planning, etc. These various organizational problems help us to understand why most small scale farmers in this country have not participated effectively in agricultural development.

Two additional issues which show why productivity is low on the majority of farm units in smallholder areas in this country are: first, the history of small scale farming which has been noted by Alila P.O. (1977: 8-15, 39) to have entailed:

- (a) Concentration of extension staff, credit facilities and support services to European settled areas (White Highlands). Agricultural production in these areas was commercialized and meant to satisfy overseas markets. Policies were formulated to prevent Africans in small scale farming areas (Native Reserves) from growing cash crops like coffee and tea or keeping exotic breeds of livestock; there were imposed measures for soil conservation and destocking of indigeneous livestock; while

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fewer extension staff, less credit and other support services were provided. There was no stated policy for development of the agriculture of these areas, although there was reliance on a few progressive farmers who were willing and with the necessary resources during the later part of colonial period.

- (b) The Swynnerton Plan of 1954 aimed at developing the agriculture of areas in which Africans lived; it provided for registration of land, growing of cash crops, keeping of exotic livestock, and increases in extension staff and facilities in these areas. However, the extension strategy of contacting and assisting progressives was maintained.

The second factor is the nature of small scale farming itself; a large number of small scale farmers in this country still grow indigenous crops - manioc, sweet-potatoes, pigeon peas, local maize, etc. and keep indigenous livestock. These crops are grown and cattle kept in accordance with traditional methods of husbandry; crops may be broadcast instead of being planted in lines, early planting may be resisted for certain consequences (real or imagined explained by tradition), and so on. It is clear from P.M. Mbithi's (1974:98-100) discussion of individualization of land in this country that customary modes of land tenure infiltrate into current ones of individual ownership making it difficult for land to have a market value or even

to be used as security for acquisition of farm credit. Traditional modes of division of labour still prevail and make it difficult for labour on most small scale farms to be freely exploited in these farm units; men are found to work more where cash crops are grown and to leave the growing of pure subsistence crops to women (Monsted, M., 1976: 7). In many cases community functions, such as funerals, market attendance, visits, etc., draw upon the already available labour and make it unavailable to the farm for many hours in any given year (Mbithi, P.M., 1974:21). As peasant farmers elsewhere, small scale farmers in this country adhere to community and kinship obligations; many of them are concerned largely with security and survival of their families rather than with risky ventures such as adoption of farm innovations. They have many other priorities, such as education of their children, health of their family members, and so on, a fact which makes agricultural messages which compete with these concerns for limited farm resources to appear to be less valuable to them.

These various organizational, historical and community problems make it difficult for extension planners to understand the real nature and problems of small scale farmers, a fact which accounts for the inability of these planners to adapt agricultural programmes to needs and priorities of individual farmers and farming communities. The small scale farmers being on the other hand preoccupied with their concerns fail to appreciate the worth of agricultural

messages which do not reinforce their individual and community situations and thereby fail to appreciate the benefits of agricultural programmes. These various arguments show why agricultural programmes have not benefited the average small scale farmers in this country. Rasmus, R. (1975) reinforces these arguments in his comments below:

"....for many farmers in Kenya, agricultural development is not perceived as attractive..Government sponsored cash crop programmes have failed to cater for the communal spirit....the result has been that locally perceived development programmes are seen as more attractive than agricultural programmes.....". (p. 273).

These comments show that the Agricultural Extension Service in this country has not been able to reach and involve the majority of rural farm families in its programmes of change largely due to the reasons cited above. This failure of extension to reach and involve the majority of rural farm households in adoption of agricultural innovations is appalling when we consider the fact that this country's population which was 10.9 million in 1969 was shown by the Kenya Statistical Digest (1978:1) to have been 14.8 million in 1978. ILO Report (1972:33-38) indicates that 90% of the people of this country live in rural areas and that by mid-1972 the Kenyan rural population of 11 million people already numbered 750,000 more than at the time of

the census three years earlier. The report gives the following information with regard to the small scale farming sector:

- (a) 225,000 households or nearly one-fifth of rural households in this country are progressive found largely in high potential areas; that is, in settlement schemes and in areas where land has been registered. Their incomes are derived largely from sale of coffee, tea, livestock and their products, pyrethrum, maize and other cash crops; labour is usually hired to assist in farm operations.
- (b) 250,000 households which have commercialized their operations but due to insufficient or poor land, lack of knowledge, or lack of capital receive low incomes of K.£. 60-110 per year; most of them cannot afford to hire permanent labour.
- (c) 620,000 households in the medium potential areas or with very small plots in the high potential areas who receive low incomes below K.£. 60 per year including the value of food crops; most of them live in extreme poverty and are incapable of increasing the productivity of their holdings. Some

obtain income by seeking work in rural areas or in towns or rely on remittances from members of their households in towns. Some have no additional incomes, or are squatters on land they do not own, or are completely landless.

However, with the continuing increase of population as indicated above, the number of households in each of the above specified categories have also been increasing. This in effect means that: first, the already small farm units (average size of farm units is below 2.8 hectares in most of the smallholder areas - see Schonherr, S. and Mbugua, E.S., 1973:2) in these areas are continuously being fragmented to accommodate the large number of households that come into being each year, a fact which is likely to lead to further decline of the already low productivity of these farm units; and second, some persons are likely to fail to find livelihood in these areas and to migrate to other areas, especially to towns in search of income earning opportunities. This latter problem as Mbithi, P.M. (1974:83) has noted has been developing at a very fast rate and is made worse by the fact that the labour market in towns is already saturated, a fact which leads to unemployment, pressure on limited urban facilities, crime and to development of slums in these urban areas.

The Kenya Development Plan 1974-1978 (Part I:1, 197) expresses concern over this problem of rural-urban migration and indicates that the problem could be overcome or minimized through intensification of rural development efforts to help bring about improvements in incomes, employment opportunities, etc. The Plan indicates that a large component of these rural development efforts will be devoted to agricultural development whose objectives are cited as follows:

- (a) To increase market production.
 - (b) To increase opportunities for employment.
 - (c) To ensure equitable distribution of incomes by bringing more farmers in the production of cash crops.
 - (d) To more than double expenditure in agriculture as compared to the previous plan period.
- The expenditures are to be channelled to agricultural extension, training, research, farm credit, input supply, disease control, etc.

The Plan seems silent on the question of self-sufficiency in food supplies although as Mbithi, P.M. (1974:41) has noted marginal areas of this country usually suffer from constant food shortages which necessitate famine relief supplies.

Schönherr, S. and Mbugua, E.S. (1973:2-4) indicate that these problems of insufficient incomes, lack of employment opportunities and insufficient food could be overcome in one of the following ways:

- (a) Through change in the reproductive behaviour of the nation leading to smaller families than the current ones. They, however, indicate that this is a long-term solution and that the population pressure will increase for another generation due to the large number of children already born.
- (b) Through major expansion in the employment capacity of the urban and rural industrial sector. They indicate however that the current population increase of 3.5% per annum is far in excess of the rate of growth in wage employment of 1.9% per annum. The disparity in these two growth rates which is continuing results in unemployment.
- (c) Through major growth in incomes resulting from increased adoption of farm innovations. They argue that traditional agricultural practices which rely on indigenous crops and livestock (local maize, zebu cattle etc.) still prevail in smallholder areas

in this country and account for low productivity of smallholder farm units. They show that farm productivity (measured in terms of gross margins or returns) would increase by 56% at average level of husbandry if farmers switched from local to hybrid maize (i.e. from K.shs. 503/- to K.shs. 783/- per hectare). With intensification of husbandry, farm productivity could double or even triple.

These cited scholars conclude that this third alternative is the most feasible in overcoming the current national problems of providing the majority of rural farm families with more food, more incomes and more employment opportunities. However, as we have already shown, agricultural programmes have not succeeded in attaining these aims. This in effect means that there is urgent need for more research into agricultural administrative practices and farmers' responses to these practices with a view to identifying factors that have inhibited the rapid adoption of agricultural innovations by the majority of farmers in this country. This study is one of the many studies called for in agricultural administrative practice and the response of farmers to such practice. The study specifically addresses itself to identification of various organizational, and socio-economic factors responsible for low productivity of most small

scale farm units. Factors identified will be made known to development agencies concerned with these programmes so as to guide them in their current and future agricultural development efforts.

1.2 The Research Orientation

Considerable research in agricultural administration has been done in this and other countries of Africa as well as elsewhere. A brief examination of some of the basic thrusts of these studies should permit us to point out which of them are identical to our study and which ones are not. This should permit pointing out certain perspectives in agricultural administration research which even if important cannot be taken into account by this study due to problems of time, insufficient financial resources, etc. We, therefore, intend to delimit and indicate those perspectives of agricultural administration that this study is going to concern itself with.

In his studies of problems of stagnation of Nigerian agriculture, Martin Igbozurike (1976:13-28) attributes this stagnation to the colonial false start in Nigerian economic growth and development, to intended and unintended structural distortions inherent in her history, and in her interactions with the contemporary world economic and political systems. He disagrees with other studies which see

Nigeria's agricultural problems as stemming largely from traditionalism which leads to resistance to change and innovation and to the use of traditional techniques and tools where modern ones would have been efficient. Mbithi, P.M. and Chitere, P. (1976:3-4) reinforce these arguments by pointing out that the capitalistic economy which had been designed to monetize and modernize peasant economies was dominated by the morality of the free market economy and its generous mechanisms for rewarding the entrepreneur. In pursuing this goal of creating entrepreneurs and a viable export economy, rational systems for introducing European settler and plantation economy were developed.

Nigeria like Kenya, has up to 80% of her population in rural areas - a large proportion of her people derive their livelihood from farming. Both countries were ruled by the British and have an almost similar historical background in their agricultural development. Whereas an approach like the one explained above could help us to considerably understand some of the weaknesses in our agricultural extension service, it will for reasons of limited time and finances not be included in this study.

Mbithi, P.M. (1974:55-59) has been concerned with the enormous research findings which do not find their way to small scale farms, or which are often

distorted and ill-adopted by small scale farmers. The reason is that agricultural research findings are too technical meant for headquarters and scientific journals, or due to lack of liaison between the Extension Service and research stations, most research findings never get to the farming communities. Similarly the channel through which these research findings are transmitted, the Extension Service, is not adequately equipped to interpret these research findings and adapt them to prevailing conditions in farming communities.

Problems of liaison between research stations and the Extension Service, or those of technicalities of research findings and who their major consumers are will not concern this study. Problems related to adaptation of research findings to needs and priorities of farming communities will be investigated at the lower levels of the Extension Service and at the farm level.

Watts, E.R. (1970:396-403) has argued that agricultural extension is most effective when concentrated in limited areas which are ripe for innovation, such as Ujamaa villages in Tanzania. He indicates that posting of extension workers to these villages has made it easy for these workers to reach farmers individually or in groups. It was also shown by the Second Special Rural Development

Programme (SRDP) Report (1975:Ch.8:13) that in Migori and Kisii areas where farmers were approached in groups, there was increased motivation not only among farmers but also among field staff to participate in agricultural projects that were introduced in the area - farmers approached in groups had higher yields and put larger acreages under crops than those who were approached individually; there was also a saving in effort, time and other resources by the Extension Service than in the case where farmers were approached individually.

This group approach which is now advocated by researchers for agricultural development cannot be meaningfully investigated due to the fact that there was very little evidence of the presence of such an approach in the geographic areas where we collected data in this study. Save for a few instances where farmers were brought together in barazas (public meetings), demonstrations, courses, etc. and where they could be taught as a group, the bulk of extension effort was based on the individual approach.

Anthropological studies such as those of Peter Rigby (1968:1-25) about 'Cattle Complex' among pastoral peoples in East Africa; Oscar Lewis (1959) about the 'Culture of Poverty' among Mexican families and many similar ones have advocated consideration of local conditions due to the fact

that benefits of a programme as perceived by change agencies may not be perceived in the same way by the recipients, a fact which has led to failure of many development programmes. This study like these anthropological studies examines micro-level factors in the community and at the farm level which when ignored inhibit rapid adoption of improved farm practices. But unlike these studies it goes a step further to examine administrative factors in the agencies concerned with agricultural development which might cause such local conditions to be ignored. The study has three dimensions as follows:

- (a) Examination of internal organizational processes at the lower level of the Extension Service. Similar studies have been done by Leonard, D.K. (1973); Mbindyo, J. (1974), Kenya Dairy Production Improvement Programme Report (1976), Chambers, R. (1971) and other scholars in agricultural administration. These studies discuss at length issues related to competence and motivation of field staff, transportation problems, extent of authority delegated to field staff, etc. within the Kenyan agricultural Extension Service. We study these same issues and in addition examine extension education activities and the extent to which these

activities are adaptive to community ✓
and farm level conditions. The examination
of this additional issue will help us to
get to grips with the extent of authority
delegated to junior extension staff to
make decisions about activities of
programmes that they are required to
undertake.

- (b) Study of issues related to inter-agency
relations in agricultural programmes.
This is crucial due to the fact that many
agencies are often involved in agricultural
programmes - Extension Service, Agricultural
Finance Corporation (AFC), Cooperative
societies, Marketing agencies, etc. Services
of these agencies have to be coordinated to
ensure success of agricultural programmes.
Research by Mbithi (1974), Moris, J.R.
(1973), Maddick, H. (1963) and others point
to the need for coordination of activities of
various agencies involved in development pro-
grammes to help overcome: conflict in priorities
of these agencies or of their sub-units,

wastage of scarce resources such as overlapping of staff, confusion of farming communities, etc. We study these same issues with a view to finding out whether cooperation exists and if it exists what form does it assume and how far does it contribute to the smooth implementation of agricultural programmes. We further examine the problems that emerge in situations where there is no cooperation. In the case of cooperative societies where there may be increased dominance of Government in the affairs of these cooperatives we find out the extent to which such Government dominance influences the operation of these cooperatives.

(c)

A study of the extent to which extension education received by farmers through various methods (farm visits, demonstrations, courses, etc.) is being utilized. Mbithi P.M. (1974), Roling, N. et.al. (1973), Schonherr, S. and Mbugua, E.S. (1973) and others have been concerned with the adoption of improved farm practices in smallholder areas in this country. They argue that the Extension Service relies on individual methods of farmer education rather than on group approaches and also

that there is reliance on a few progressive farmers in the hope that innovations will 'trickle down' to the majority of the less progressives. We study these similar issues related to adoption of agricultural innovations. Unlike the above cited studies which are content with mere adoption of innovations, we examine the extent to which farmers' adoption and management of agricultural innovations approximate the standard recommended by the Extension Service. We further examine the influence of a few socio-economic status factors on farmers' crop husbandry practices.

In sum, this study is concerned with the two interrelated problems of: ineffectiveness of the Agricultural Extension Service; and the consequent low productivity of the majority of farm units in small scale farming areas in this country.

Footnote to Chapter One

1. The definition of decentralization offered does not seem broad enough to cover parastatal organizations like AFC. It is also not broad enough to cover rural farm cooperatives involved in agricultural programmes. This study extends the definition of both processes of deconcentration and devolution to cover parastatal organizations and that of the process of devolution to cover rural farm cooperatives.

CHAPTER TWO

THEORY, LITERATURE REVIEW AND HYPOTHESES

2.1 INTRODUCTION

The research problem as posed necessitates a review of: first, some issues within a large scale or bureaucratic organization concerned with a public service programme; second, some issues entailed in the relationships between various agencies involved in the implementation of a given programme; and finally, farm performance and the extent to which it is influenced by farmers' socio-economic status factors and strategies and methods used in dissemination of extension education messages. Such a review will provide further insights into the research problem and show strengths and weaknesses as well as challenges of agricultural extension work. It will further help to show gaps in available levels of knowledge in smallholder agricultural development and permit formulation of more realistic hypotheses for the study.

2.2 ORGANIZATIONAL ISSUES WITHIN THE AGRICULTURAL EXTENSION SERVICE

The process of decision making and subsequent action which is the central concern of this study is pervasive in all situations and at all levels within a formal organization. Price J.L. (1968:47) notes that all activities of a formal organization ranging

from setting of goals, allocation of scarce resources, research and training, etc. necessitate decisions to be made about them. The farming community and even individual farmers similarly make decisions about their various farming activities.

Within a formal organization, however, decision-making processes may either be centralized to a few top men, or they may be decentralized in which case authority to make decisions is distributed to intermediate and even to junior staff. Maddick H. (1963:29) is very much concerned with the extent to which authority to make decisions is shared between the headquarters (centre) and field administration in public service programmes like those of the Ministry of Agriculture. Price J.L. (1968:61) notes that the headquarters should be entrusted with responsibilities for making strategic or critical decisions concerning the long-term goals of an organization, such as decisions about allocation of scarce resources, training of personnel, research, and so on while the field administration should be entrusted with responsibilities to make tactical or routine decisions necessary for efficient and smooth operation of the service. In an agricultural programme such routine decisions are made in relation to organization of courses and farm demonstrations for farmers, farm credit awards, time of planting of a particular crop, and so on.

It is noted by Olsen M. (1968:302-304) that where decision making processes are centralized

the reasons advanced for such centralization are:

- (a) It ensures overall communication, coordination, control, and planning and permits organizational members to hold together and work toward attainment of the goals of their organization. This is so due to the fact that many organizations are held together by functional rather than normative integration and that it is felt that without centralization the organization would likely split apart and not be able to attain its goals.

- (b) Centralization overcomes the tendency of sub-units and even individuals within the organization to emphasize their own selfish interests or requirements rather than those of the entire organization and permits men in top positions who represent the best interests of the entire organization to ensure discipline from members of the organization.

Counter arguments in favour of deconcentration cited by the above author are that increased centralization of decision making to top men stifles initiative and creativity of field staff and results in organizational rigidity; the organization becomes

incapable of continually and flexibly adjusting to changing internal and external environments. He indicates that under these conditions innovation is discouraged, field staff are expected to operate in accordance with rules and guidelines of their superiors. Maddick H. (1963:44-47) similarly notes that centralization leads to waste of energies and time of field staff (a very scarce resource) in struggles with headquarters for money, stores, permits and minute modifications of programmes, a fact which leads to great delays and reduces enthusiasm of field staff and recipients of a programme and simultaneously increases the cost of running the agency. Sofer C. (1972:297) further notes that centralization is effective for complex interrelated activities that require discipline and control to be exerted by a few experienced men at the top, while deconcentration is effective for loosely structured and geographically dispersed organizations dealing with activities which require specialized or local knowledge for decision making.

These observations relating to decentralization seem more pertinent to a change agency like the Ministry of Agriculture which is dispersed throughout the country. Socio-economic and physical environmental conditions vary widely from one area to another and affect the types of crops that can be grown and the type of livestock that can be kept; intimate knowledge

of these conditions could permit formulation of programmes that could be adapted to these conditions and hence easier to implement. Such intimate knowledge of these conditions could be obtained from men in the field if their views could be listened to by the few men at higher levels of the Extension Service. Further, vast geographic distances of many communities from Nairobi make it difficult for a few top men in headquarters to reach these communities, a fact which calls for delegation of authority to field staff to permit them shoulder the responsibilities of implementation of programmes. Such delegation of authority to field staff is further imperative due to the fact that means of transport to and from many of these communities are often scarce, roads are poor, while postal services and telephones are lacking in many of our villages.

Bell G.D. (1967:98-100) in discussing issues related to deconcentration is concerned more with the exercise of discretion by the intermediate and junior members of an organization in discharge of their various duties as a measure of the extent of actual authority allocated to them. He sees this exercise of discretion as influenced by the following factors:

- (a) Nature of work demands: where work demands are unpredictable the worker should utilize his judgement in carrying out tasks at his

disposal. For this to be possible lines of authority should be fairly ambiguous and flexible so as to permit subordinates to scatter their consultations among different combinations of supervisors. In such unpredictable work situations employees are expected to be skilled and competent.

He comments:

"....the uniqueness and complexities involved in unpredictable and high discretion demanding activities create a need for exchange of ideas and information between workers and supervisors...the content of supervision will be on an equal give-and-take basis rather than one in which supervisors closely regulate subordinates' activities... ..it will be a two-way rather than merely downward communication...".

- (b) Management will decide the amount of discretion a worker can exercise regardless of the extent of predictability of work demands.
- (c) Professionalization which permits increase in the amount of discretion exercised, especially where workers have acquired the necessary competence from training. Such competence frees field staff from increased supervisory control in the work setting. Professionalization helps to ensure discipline within an organization due to the fact that professional ethics acquired during

training and subsequent socialization in the organization stress the worker's responsibilities to his clients, his colleagues, and the total organization over a worker's own individual interests.

Herbert A. Simon (1952:193) maintains that training prepares an organizational member to reach satisfactory decisions without the need for constant referrals, it provides him with a frame of reference for his thinking, and teaches him approved solutions and may indoctrinate him with the values in terms of which his decisions are to be made. He adds that training has the greatest value in situations where exercise of formal authority through commands proves difficult due to the need for prompt action and yet where there is spatial dispersion of the organization or where the subject matter about which decision is to be made is complex and cannot be readily summarized in rules and regulations. Training thus permits greater deconcentration of authority as it brings the necessary competence into the very lowest levels of the organizational hierarchy.

These arguments point to the central place of professionalization in an organization; they show that where workers are professionally competent there will be less supervision, they are likely to be given more discretion in discharge of their duties. There is also likely to be less centralization as senior staff know that junior staff are

competent to do the work entrusted to them, and likely two-way flow of information as junior staff and senior staff freely consult one another or those they find most competent to offer them advice. This type of organization in which there is increased deconcentration of decision-making processes and in which more discretion is given to operative staff who are themselves more competent is what Bell G.D. (1967:102) calls a high discretion unit. He argues that in such high discretion units the supervisor motivates his subordinates by appealing to service norms and professional ideologies or by resorting to more informal constraints as opposed to rewards like pay, bonuses, or promotions which are resorted to by low-discretion units whose operations are readily predictable. He comments:

"....compliance of employees to supervisory controls (normative controls) in a high-discretion unit is easier to elicit due to the fact that when an individual exercises judgement and initiative in solving problems, he invests a good portion of his 'self' in their outcome and will be highly involved in his work...professionalization acts like an arm of management by 'building' motivation into workers and at the same time acts as a continuing motivational reference force for them...similarly when visibility of formal authority agents is low as is the case in non-predictable high-discretion units then, attitudinal commitment to one's work and informal constraints are more likely to lead to effectiveness...in these high-discretion units workers express their opinions and beliefs and are encouraged to display their emotions". (p. 103)

These comments point to the need to appropriately motivate field workers based on the nature of their field administrative activities. They also show that issues of professionalization, discretion and two-way communication are important in ensuring the effectiveness of a given development agency.

In discussing issues related to motivation of agricultural field workers in this country, Leonard D.K. (1973:144) maintains that increased control of field activities by senior extension staff leads to a tendency for information to flow only downward in the form of directives. Many of these directives cannot be readily adapted to local community conditions and consequently never get implemented in ways expected by senior extension staff. However, as Bell G.D. (1967:104) has observed where decisions are imposed on junior staff and even on recipients of a programme neither of them will be left with anything to invest their 'selves' in. This in effect means that the use of directives makes it difficult for information to freely flow from senior staff through junior staff to farmers and vice versa. This problem as Leonard D.K. (1973:137) has noted is worsened by the presence of large status gaps between different parties in an agricultural programme. Mbithi P.M. (1974:59) notes in this connection that field staff being members of the rural elite interact more with their counterparts: teachers, businessmen, progressive farmers, and so on rather than with

the average and poorer members of rural communities.

Despite this use of directives by senior staff the community situation in which these directives have to be adapted is very unpredictable; socio-economic and even physical environmental conditions of these communities and even of individual farmers are often inadequately known. Rainfall, for example, may be unpredictable being erratic in one year and fairly even and sufficient in another year. Further, as Moris J.R. (1973) has observed activities of an agricultural programme themselves may be innumerable and delicately linked as brought out in his following comments:

"....agricultural activities consist of a chain of severally linked actions performed by different departments...a slip-up in one or two points may nullify the impact of the preceding and subsequent actions and lead to diverse effects. Large programmes such as crop introduction campaigns for several areas entail innumerable activities... .. field trials, supply of seed and other inputs, preparation of advisory materials, training of farmers and junior staff, etc.". (p. 100)

Moris does not bring out the fact that certain significant activities not anticipated a priori show up during implementation and necessitate alteration of programmes to take them into account. Certain other activities, such as planting, or fertilizer application must be undertaken at an

appropriate time (inputs needed for their implementation may be unavailable) or they may never be implemented or yield will be reduced where they are implemented late.

This unpredictability of agricultural extension work calls for discretion to be given to field staff in the discharge of their duties. As argued the giving of more discretion has to be accompanied by professionalization. In Kenya, however, increased control of field administrative activities by senior staff cripples field staff with the necessary professional competence as shown by Watts E.R. (1970), Mbithi P.M. (1974), Leonard D.K. (1973) and others - they point out the following: first, formal academic rather than personal qualities are emphasized in selection for agricultural training although junior staff who have been to school for more years do not seem to do better than their less educated colleagues. Second, extension training itself does not equip extension workers with skills for communicating ideas to farmers. Lack of training in communication skills makes it difficult for field staff to understand the socio-economic problems of the majority of small scale farmers and hence to communicate effectively with them. It is observed that this lack of training in communication skills leads extensionists to treat farmers as children; that is, they employ a paternalistic approach toward farmers. Further, the senior extension personnel

who are better trained spend most of their time on administrative tasks leaving the work of education of farmers to the lowly educated and ill-trained junior staff. Third, trainees from agricultural institutes which emphasize practical training do better than those from other institutes. Finally, junior staff who have served for more years do better than new entrants into the Extension Service.

These arguments show that G.D. Bell's (1967:100) observations that professionalization is attained through training and subsequent experience gained while in the organization fall short of the situation appertaining in the Extension Service in this country. Professionalization apart from being influenced by training is also influenced by the criteria of selection for training, nature and quality of such training, length of service, as well as by the inability of better qualified staff to do actual extension work (due to problems within the Extension Service, such as lack of transport). This in effect means that extension work is left to less qualified staff. Similarly, the system of appointments of staff to various cadres leads to an additional problem of gaps in privileges, responsibilities and rewards between the various cadres as Leonard D.K. (1973:137, 145-148) brings out in the following comments:

"...junior staff of the Ministry of Agriculture are acutely dissatisfied with their employment situation...the young men with secondary education and a certificate in agriculture feel particularly cheated...their contemporaries with a somewhat better pass in the School Certificate examination are given one more year of agricultural training (for diploma) and then receive twice the salary as Assistant Agricultural Officers(AAOs)...there is considerable gap in status between AAOs and Agricultural Assistants (AAs)....".

These comments show that conditions of work for the junior extension agents are not seen by them as satisfactory; the gap in status between these junior agents and their senior officers is likely to prevent the free flow of information between these extension personnel. Leonard noted further that because of these facts it was not easy for senior staff to supervise their junior staff and that the latter agents were informally organising to restrict the amount of effort put in their work. He substantiated this fact by indicating that the level of performance of these junior agents as measured by the number of farm visits they made was very low; that is, each agent visited an average of 1.75 instead of 4 to 5 farmers a day (1977:64). He found Agricultural Assistants (AAs) to be more competent than the Junior Agricultural Assistants (JAAs) but were because of directives from above and unsatisfactory conditions of work, less motivated to work.

It is implicit from these observations that apart from issues of discretion, communication, and professionalization, there have to be conducive conditions of work. It is clear that within the Ministry of Agriculture in this country there is no appeal to service norms nor to informal constraints as is done in high-discretion units as we have seen, nor is there the use of material rewards like salary increases, bonuses, and so on as is the case in low discretion units. Instead directives and other formal controls are expected to motivate field staff to work.

In sum, it is evident from this discussion that deconcentration of decision-making processes to field staff could permit them to adapt central plans to local community and individual farmers' situations. This deconcentration of decision-making necessitates professional competence which in turn is acquired through training and experience. It also entails giving field staff not just the authority to make decisions, but opportunities to actually exercise discretion in discharge of their duties. Within the Ministry of Agriculture in this country it was clear that: first, there is widespread use of directives which makes it difficult for junior staff to identify with decisions made at higher levels of the Extension Service; second, large status gaps between various cadres lead to disparities in responsibilities and rewards and erode the

possibilities of there being a two-way flow of information between senior staff and junior staff; third, there is no training offered to field staff in communication skills, a fact which leads to failure on the part of field staff to empathize with farmers' situations and to concentration on a few progressive farmers; fourth, senior staff due to transportation and other problems leave the task of implementation of agricultural programmes largely to the lowly educated and ill-trained junior staff; finally, other ill-conditions of work, such as low pay, low promotion prospects, etc. lower the motivation of field staff and make them less willing to work.

These and other problems cited help to partially explain the current low effectiveness of the Agricultural Extension Service in this country.

2.3: INTER-AGENCY RELATIONS IN AGRICULTURAL EXTENSION WORK

An agricultural development programme consists of several components often entrusted to different agencies. To facilitate the use of extension education provided by the Extension Service, support services, such as farm credit, marketing, and so on are called for and are in this country provided by different agencies. Similarly, the Extension Service itself is not a homogeneous unit, but is made up of various divisions (or departments) which in most cases

extend from the national to the district level and in a few instances to the locational and sub-locational levels. This increases the need for cooperation between the Extension Service and other agencies involved in agricultural work as well as between the various divisions of the Extension Service itself. Cooperation is equally required from the farming communities and assumes two basic forms of: co-optation where farmers choose their representatives to represent them in various activities of central Government agencies, for example, in various loan committees; and participation of rural farm families in cooperative societies concerned with farming.

Within the Extension Service agricultural activities at the lower level have been entrusted to the Assistant Agricultural Officer (AAO) with an aim of overcoming problems that are likely to arise from lack of cooperation of various extension agents at this level. We will for this reason not concern ourselves with issues of cooperation within the Extension Service but rather with issues of cooperation between the Extension Service and other agencies concerned with farm development. We also examine participation of farming communities in agricultural programmes through co-optation and through cooperative societies.

Richard Hall (1972:297-319) sees agencies involved in implementation of one programme as

constituting an 'organizational set' (i.e. a number of organizations in interaction with a focal organization). He maintains that legal requirements regulate interaction among members of an organizational set and that such interaction may range from cooperation to conflict. This fact necessitates the establishment of supra-organizational units, such as committees, councils, etc. to regularize relationships between these organizations. He argues further that decision-making of the focal organization will be affected by the size of the set and the nature of the relationship that exists between members of the set. He sees cooperation as resulting from similarities in operating principles, priorities, and structures, while the reverse situation tends to lead to conflict. He concludes that cooperative relationships although leading to greater efficiency may be harmful to the clientele or to the larger society; that is, not all cooperation is good.

Herbert Simon (1952:191) argues that cooperation is imperative due to the fact that organizational loyalties: first, prevent the organizational member from making correct decisions in cases where the restricted areas of values with which he identifies must be weighed against values outside the area, a fact which leads to inter-bureau competition which characterizes many large scale organizations; second, organizational members identify

with the bureau instead of with the overall organization and believe their bureau's welfare to be more important than the general welfare of the organization when there is conflict between the two.

Maddick H.(1963:91-92) reinforces these arguments by pointing out that ministries concerned with rural development often organize themselves independent of each other; in some cases due to differences in policies there will be friction between these different ministries or between their various sub-units, say over provision of a service which each of them claims to be its responsibility. He maintains that agricultural ministries are often divided into sub-units which have been known to function independently in the field.

These various observations show: first, that many large-scale organizations are divided into sub-units and that cooperation between these sub-units is necessary to avoid competition for scarce resources and to enhance the contribution of each of these sub-units toward attainment of the overall goals of the organization; second, that several agencies may work hand in hand for attainment of some defined overall goals of a programme and that there is need for their efforts to be equally liaised. Mbithi P.M. (1974:162) reinforces these arguments by giving an example of fish farming in Eastern Kenya where farmers

had been advised by agricultural experts to keep fish in their irrigation channels; the following month health officials sprayed DDT* in these irrigation channels to stop mosquitoes breeding; fish died. This example illustrates the sorts of conflicts that may result from a situation where efforts of various agencies are not coordinated. It also shows that such conflicts lead to confusion of the farming community and often to lack of credibility of central Government programmes.

The credibility of Central Government programmes to the farming communities could be enhanced not only through cooperation of central Government agencies, but also through participation of rural farm families in decision-making about activities of these programmes. The first way to achieve this is through co-optation; the need for co-optation as noted by Selznick P. (1960:121-123) usually arises from failure of authority to ensure balance of power with the community, or from a sense of lack of legitimacy, or from failure to mobilize the community for action - it usually leads to sharing of power, or the burdens of power, or both. He notes further that the need for a sense of legitimacy may require an adjustment to the people in order that a feeling of acceptance may be developed by incorporating certain community elements into the structure of the organization, a fact which helps to ensure transfer of confidence from the community through the co-opted elements to

* DDT - see Abbreviations

the organization as a whole.

Rural farm families may, secondly participate in decision-making processes through formation and management of their own Cooperative Societies. This is justified by the Kenya Development Plan (1966-70:200) which made it clear that the cooperative movement in this country was to be strengthened during the plan period to enable it play an effective role in the nation. The Kenya Development Plan (1970-74:277) similarly emphasized strengthening of the then existing cooperatives and their conversion into multi-purpose institutions offering a wide range of services to their members. Expansion of the cooperative movement was not emphasized due to the fact that cooperative societies as noted by Goran Hyden (1970:61-80) had been found to have innumerable problems. It is, however, implicit from the arguments of this cited scholar that these farmers' organizations' (rural cooperatives) objectives include: provision of farm credit, marketing of farm produce and education of their members. It is further implicit from J.P.W. McAuslan's (1970:90-104) discussions of 'cooperatives and the law in East Africa' that the Kenya 1966 Cooperative Societies Act devolved authority to cooperatives to enable them pursue the above objectives. This cited scholar indicates that the 'Act' further outlines the amount of control that is exerted by the Ministry of Cooperatives in the affairs of cooperatives,

such as inspection and auditing of Societies' books of accounts, counter-signing of all cheques issued by cooperatives, etc.

Goran Hyden (1970:63-70) has noted that control exercised by the Ministry of Cooperatives on societies is considerable and that it has made it difficult for societies to act flexibly in planning and implementation of their projects. He indicates that societies are faced with many other problems, such as ethnic rivalry financial mismanagement, and so on. These various problems have crippled many cooperative societies in this country and made it difficult for them to contribute in any meaningful way to implementation of agricultural programmes.

In sum, cooperation between agencies concerned with a development programme is crucial to avoid likely conflict in priorities, duplication of effort, and likely confusion or frustration of recipients of a given programme of change. Each agency should know what other agencies in the programme are doing as well as the needs, priorities and problems of farming communities. This helps to overcome any likely conflict between these agencies and likely frustration of each other's efforts. At the same time lack of credibility of one's programme to the farming community could be overcome through: first, incorporation of community members into the supra-organizational units of these agencies,

such as loan and other agricultural committees. However, where persons co-opted are progressive farmers as is usually the case in this country, they may never help to bring the problems of the majority of farmers to the attention of Government; the few progressive farmers who are co-opted may use these committees to their own advantage. Under these circumstances major farming problems may continue unnoticed and decisions made by Central Government agencies may remain largely irrelevant to the needs and priorities of farming communities. Second, devolution of authority to rural cooperatives to permit farmers play a leading role in agricultural development by managing their own affairs of marketing of farm produce, acquisition of farm credit, etc. The cooperative movement in this country is, however, faced by many problems which include: increased Central Government control of their activities, ethnic rivalry and financial mismanagement. These and other similar problems have crippled many cooperative societies in this country.

These arguments make it evident that the contribution to the effective implementation of agricultural programmes which could ensue from cooperation, co-optation, and farmers' cooperatives is not forthcoming in these programmes. One problem, however, with these arguments about inter-agency relations is that they

embrace the situation at the national level and in a multiplicity of development programmes. None of the studies in agricultural administration that we have come across addresses itself specifically to this topic of inter-agency relations; the topic is usually mentioned by most studies in passing. This study examines issues involved in liaison of activities of a single agricultural programme at the lower level.

2.4 AGRICULTURAL EXTENSION CONTACT WITH FARMERS

The preceding discussion about issues within the Extension Service and inter-agency relations could permit inferences to be drawn about the extent to which rural farm units are productive. Farm productivity itself in so far as it results from extension education efforts and provision of support services like farm credit to farmers is in fact the most direct measure of the effectiveness of the Extension Service.

Suchman A.E. (1967:3) indicates in this connection that the success or failure of a public service programme could be evaluated in terms of the extent to which its stipulated objectives are being met and that attainment of objectives of an agency's programme helps to justify the agency's requests for funds and other resources needed in the implementation of the programme. It is clear from these observations that the Ministry of Agriculture's success or failure may be evaluated

in terms of the extent to which objectives of its programmes which include increased incomes, employment opportunities and food are being met. These objectives are realized through increased farm production which as Schonherr S. and Mbugua E.S. (1973:3-4) indicate could result if farmers were educated and assisted to manage their crops in ways recommended by the Agricultural Extension Service. They illustrate this point by showing gross margins (returns) that could be realized by growing local and hybrid maize at three levels of management as shown in table 2.1. The table shows returns from growing of local and hybrid maize to increase considerably with improvement in husbandry while a switch-over from local to hybrid maize leads to further considerable increases in returns. These referenced scholars indicate that the 'high' production level of hybrid maize is based on 45 (90 kg.) bags per hectare and that intensification of husbandry could increase this yield to 100 bags per hectare.

Table 2.1: Gross Margins (Returns) per Hectare of
Hybrid and Local Maize at Three Production
Levels

Type of Maize Crop	Production Level		
	Low	Average	High
Local Maize (K.shs.)	161/-	503/-	846/-
Hybrid Maize (K.shs.)	476/-	783/-	1,349/-

Source: Schonherr S. and Mbugua E.S., 1973, Rapid Development for Kenya's Small Scale Farms, IDS, WP, No. 126, pp. 3-4.

These arguments show that an increase in farm productivity results largely from extension efforts of farmer education and provision of support services. Two factors, however, influence this process of farmer education and provision of support services. These factors are: the process of communication of information to farmers, and the strategies or approaches employed in contacting and involving rural farm families in agricultural programmes.

The first factor, process of communication of information to farmers, is indicated by Roling N. and Ascroft J. (1971:2-7; 14-18) to involve the following:

- (a) The model of communication process which stipulates that information is usually communicated from a given 'Source' through a 'Channel' to a 'Receiver'. The information elicits a certain 'Effect' on the receiver and is where possible followed by 'Feedback'; this is the 'SMCREF' model of communication.
- (b) The Innovation-Decision process of the Theory of Innovations which shows that mass media sources of information are much more effective in getting farmers knowledgeable at 'awareness' and 'interest' stages, while inter-

personal sources are more effective at 'persuasion', 'trial' and 'adoption' stages of this innovation-decision process.

- (c) Type of media and the target population: media may either be mass or interpersonal. The former includes: radio, television, and farm newspapers; the latter includes personal contacts and telephones and is also known as face-to-face or word-of-mouth communication. Mass media while reaching more people at a lower cost simply makes people aware of an innovation, it allows no feedback. Interpersonal media although more costly to use allows feedback and often achieves deeper effects.

In Kenya, the task of educating farmers and junior staff is the prerogative of the Ministry of Agriculture. Roling N. et.al. (1973:2) have noted that the individual farm visit method is widely used by agricultural field workers in this country. However, as we have noted earlier, the number of farm visits made by junior extension workers is very low. Farmers are also recruited for courses, demonstrations, and tours to other farming communities. They are also briefed of any new developments in farming in barazas (public meetings) and in cooperative society meetings. Farmers who own radios may further listen to radio

broadcasts in farming, some may read farm newspapers, or obtain information about improved farming from neighbours and other knowledgeable persons in the farming community.

The problem with mass media sources, especially radio and newspapers, as noted by Roling N. and Ascroft J. (1971:17) is that they cater largely for the urban elite, pay little attention to problems of small scale farmers. They indicate that in Kenya little or no space at all in the 'Daily Nation' or the 'Standard' is devoted to instructions on how to grow crops like maize or how to keep livestock, while the 'Kenya Farmer' (a farm newspaper) caters largely for the large landowners. They also indicate that radio messages may be broadcast when most farmers are away from their home while the use of parazas as Mbithi P.M. (1977/78) has noted may not be suited to education of farmers due to the heterogeneous nature of their audience and due to the fact that a lot of issues including those related to law administration are covered in these meetings.

These various points raised bring to light the following: first, the individual farm visit method which is widely used by extension staff is not effective in transmission of agricultural messages to farmers because junior staff visit only a few

farmers a month; second, mass media sources of information cater largely for the urban literate persons rather than small scale farmers. Certain other media like barazas cater for diverse interests and are not suitable for transmitting knowledge in improved farming to rural farm families. These various observations show why extension education disseminated through various media has not reached most rural farm families as is apparent from the low adoption rate of innovations and continued low productivity of the majority of small farm units.

The second factor, strategies or approaches that have been employed in contacting and involving rural farm families in agricultural programmes necessitate a review of some of the arguments of the Diffusion and Innovation theory which has guided choice of farmers to be educated and assisted in other ways by the Extension Service. The theory indicates, among other things, that in a social unit (e.g. a rural village) innovations are first received by some persons and that from these persons innovations diffuse or are communicated to other persons in the social unit (Roger E., Shoemaker F.F., 1971:98-196). These referenced scholars categorized farmers according to the time period they had taken to adopt a given innovation into: innovators, early adopters, early and late majority, and laggards and indicated that persons who are first to adopt a given innovation (innovators and early adopters) are usually

exposed to sources of information about the new idea and have substantial financial and other material resources to permit them adopt new ideas. They indicated that in the case of farming these persons are likely to have larger farms in which to try out new ideas. Rogers E. (1969:107) indicated further that these persons tend to be younger farmers rather than older ones; he found older peasants who were less modern in their attitudes and values and whose formal education was low to be less exposed to agricultural messages than did younger peasants.

Sharma D.K. and Leogans G.P. (1967:16-25) in their studies of adoption of farm practices in India noted that farmers who had been to school for more years better understood various agricultural messages communicated through different media than did illiterate farmers. They also found farmers whose economic status was high to be better exposed to various sources of farm information than those whose economic status was low. They equated exposure to sources of farm information to adoption so that those farmers who were more exposed were seen to be ahead of others in adoption of agricultural innovations.

Rogers E. and Shoemaker F.F. (1971:22-23)

further note that the adoption of an innovation could be influenced by the attributes of the innovation itself which include: relative advantage, compatibility and complexity. Relative advantage refers to the extent to which an innovation is perceived as being better than the old idea it is intended to replace and is measured in terms of economic profitability, convenience, etc. Compatibility refers to the extent to which an innovation is perceived as being consistent with values, past experiences, and needs of receivers. Complexity refers to the extent to which an innovation is perceived as being difficult to understand and use. These cited scholars indicate that innovations which are perceived as relatively advantageous, or which are consistent with values, past experiences, and needs of receivers, or those which are simple to understand are accompanied by a rapid rate of adoption.

Thus the process of adoption of innovations indicated by the Diffusion and Innovation theory is influenced by: first, socio-economic status factors - age, size of farm, level of education attained by a farmer, etc.; and second, attributes of innovations cited above.

This Diffusion and Innovation Theory as Schonherr S. and Mbugua E.S. (1973:6) have noted seems beneficial to extension agents if they can go into a given community and identify therein persons with characteristics of early adopters and introduce innovations to them and from these early adopters innovations could diffuse

or 'trickle down' to the majority of residents of a community without any additional effort from extension staff.

These cited scholars have, however, criticized this approach on grounds that in less developed rural societies the time taken for an innovation to diffuse from the most-to-less progressives is often too long and that social and economic constraints often prevent the majority of the less progressives from being reached by the diffusion process. They further comment:

"....innovation after innovation come to an area, each time the most progressives take it up..the most progressives may have adopted the tenth innovation before the first one has reached the less progressives". (p. 7)

Similar views were expressed by the Second SRDP Evaluation Report (1975:ch. 8) on the 'Master Farmer Strategy' which had been scheduled for some of the programmes' areas:

"....the assumed spill-over effect from the most-to-less progressives is unreal since various innovations and far reaching changes in social and economic behaviour are too complex and new for an average farmer..he has to be assisted by the Extension Service ..to achieve an increased diffusion effect, complex innovations should be introduced step-by-step; farmers who are slightly more innovative could function as reference persons....."

...for others since innovations spread faster from the marginally innovative than from those who are far ahead of others". (p. 10)

Watts E.R. (1970:400-403) in his studies of the Extension Service in Uganda found out that although this progressive farmer strategy had been discredited, many of the older extensionists were firmly wedded to it; most of the few loans that were being supplied then were going to farmers with large farms. He points out further that in Tanzania 'Ujamaa' policies have been critical of extension efforts and credit schemes that encourage individualism rather than cooperation. He argues further that Extension is most effective when concentrated in limited areas which are ripe for and receptive to innovation, for example, increased concentration of extension staff in Ujamaa Villages in Tanzania had led to increased contact with farmers. He concludes that in Uganda the 'Extension Saturation Projects' arose out of the realization that there was need to develop a more communal approach to Extension since a series of follow-up visits to progressive farmers showed that communal pressures had caused them to stop being progressive.

Leonard D.K. (1973) notes that although the Kenyan Agricultural Extension Service relies on visits to individual farms, a movement toward group methods, especially with the use of

demonstrations, is underway. He further comments:

"Group methods offer an additional management advantage in that they make overall extension planning feasible... permit substantial expansion in the amount and effectiveness of the authority exercised in the Ministry of Agriculture". (p. 148).

The Second SRDP Evaluation Report (1975: Ch.8:12) points out that a group approach in Extension is already in existence as evidenced by the use of barazas. The Report notes that the main problem facing field staff is that they are unaware of techniques for establishing group extension systems among farmers. In Migori and Kisii SRDP areas the group approach was tried through the agricultural village committees as follows:

"the community first selected the group leaders who later formed the area-based groups on their own. Communication between extension staff and farmers was through the groups' representatives, or with all farmers in the group, e.g., the instructor may arrange a date for a planting demonstration with the group chairman who communicates this information to his farmers. The group selects a demonstration plot and prepares to attend the demonstration on the appointed day and time. The instructor then carries out the demonstration while the group leader ensures its effective implementation".

(p. 13)

It was reported that: first, farmers who were approached in groups put larger acreages under crops

and realized higher crop yields than those who were approached individually; second, the strategy permitted rapid contact with farmers and saved time, effort, and finances of the Extension Service; third, farmers and extension staff were much more motivated to do a better job than in the case where farmers were approached individually. These observations make it evident that the group approach has greater advantages over the individual approach and could, if field staff were sufficiently trained in how to use it, be much more effective in mobilizing rural farm families and their resources for participation in agricultural programmes than the individual approach has been able to do.

In sum, it has been possible to show in this section that management of crops in accordance with the requirements of the Extension Service should permit farmers to realize higher yields which in turn could help to meet objectives of agricultural programmes cited earlier in this section. The productivity of the majority of small scale farm units in this country, however, is low due to: first, mass media sources of information being out of reach of average small scale farmers and reliance of extension staff on the individual farm visit method which does not ensure rapid transmission of innovations to rural farm families; second, reliance of extension staff on progressive farmers who tend to have large farms, more material resources, and are better educated than the majority of farmers in small scale farming areas.

2.5 CONCLUSION

Agricultural field administrative activities in this country are controlled and guided through the use of directives. Although there is some deconcentration of decision-making to all levels of the Extension Service, increased use of directives leaves little or no room for exercise of discretion by field staff in discharge of their duties. Professional competence seems associated with better occupational performance. However, there are little or almost no promotion prospects. Pay is low while opportunities for further training are almost non-existent. Senior staff as well as junior staff face severe transportation problems. These and other ill-conditions of service reduce the motivation of field staff and lead to the development of 'informal organizations' aimed at restricting the amount of effort exerted by field staff in their work. Large status gaps between senior and junior staff as well as between junior staff and the majority of farmers prevent the two-way flow of information between these various partners in an agricultural programme.

The process of inter-agency cooperation has not been studied at the local level in a single programme of change in this country. There is a possibility that there is lack of cooperation between agencies involved in an agricultural programme at the local level, or that the process of co-optation is

not effective in bringing problems of farming communities to the attention of development agencies. As indicated cooperatives are faced with many problems which make it difficult for them to contribute effectively to agricultural development.

The strategies employed by extension staff in contacting and involving farmers in agricultural programmes favour progressive farmers, a fact which helps to show why farm productivity is low on the majority of farm units in smallholder areas in this country.

This study specifically examines issues of: deconcentration and discretion, professionalization, staff morale, and inter-agency relations and how these factors influence the effective functioning of the Extension Service. It additionally examines the extent to which farmers are managing their crops in accordance with the recommendations of the Extension Service and the socio-economic factors influencing farmers' crop husbandry practices.

2.6 HYPOTHESES

Following the research problem posed and the subsequent review of theory and literature, three hypotheses have been formulated for this study. These hypotheses are as follow :

- I. The higher the farmers' socio-economic status (SES) scores, the higher their farm performance.

- II. The more centralized the process of decision-making in the Crops Improvement Programme, the less adaptable activities of this programme are likely to be to local conditions.

- III. The less the capacity of the Extension Service to adapt the Crops Improvement Programme to local conditions, ^{the} more centralized the process of decision making is likely to be in this programme.

The operational definitions of variables entailed in these hypotheses are presented in Section 3.3 of Chapter Three. Socio-economic factors entailed in the first hypothesis intervene in the relationship between organizational factors and farm performance. It is not, however, feasible within the scope of this study to assess the direct influence of organizational factors shown in hypotheses II and III on farm performance. It is, however, possible to draw inferences about the likely effect of these organizational factors on farmers' performance in crop farming.

CHAPTER THREE

THE RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

The research problem posed in Chapter One necessitates collection of certain types of data from certain specific sources through the use of certain techniques. Chapter Two has shown some of the organizational and socio-economic factors involved. We will in this chapter show the specific factors that the study is going to concern itself with and justify the need for study of each of them. We operationally define variables shown in the hypotheses in the last chapter. Issues related to sampling and interviewing of farmers and field staff including the research design are discussed. We finally discuss how other relevant data in this study were collected as well as statistics used in analysis of these data.

3.2 JUSTIFICATION FOR DATA CALLED FOR IN THIS STUDY

Data collected in this study were intended to show the following:

- (a) The extent to which farmers were managing their crops in accordance with the requirements of the Extension Service and the socio-economic factors influencing farmers' crop husbandry practices.
- (b) The extent to which activities of farmer education, credit administration, marketing and cooperative development were adaptable to local conditions.
- (c) The capacity of the Extension Service to adapt activities in the Crops Improvement Programme to local community conditions.

Study of farmers husbandry practices was justified by Suchman A.E. (1967) and Schonherr S. and E.S. Mbugua's (1973) observations in section 2.4 of the last chapter. Further justification for study of farmers' adoption and management of innovations is provided by Roling N. et.al. (1973:3) who found that although hybrid maize had been introduced in Tetu division of Nyeri district in this country in 1964, it had by 1970 been adopted by only 30% of farmers in this area. They indicated that up to 60% of Tetu farmers by 1973 still bought maize for their home

consumption needs each year. It has, however, been indicated by Rogers E. and Shoemaker F. (1971) that decision-making process in the adoption of new ideas takes place through five stages namely: awareness, interest, evaluation, trial and adoption stages which we briefly mentioned in the last chapter. The latter stage is the one at which a new idea is used on a full scale. They, however, point out that a person who has adopted a new idea may seek further information about the idea or he may reject or discontinue using the idea after adopting it. Raikes P.L. and Meynen W.L. (1972:19, 34) have criticized these discrete stages in the adoption of new ideas on grounds that they do not permit one to go beyond adoption to consider the creative adaptation of an innovation by those who have adopted it to their community and individual situations. They note further that peasants often respond favourably to economic opportunities which they perceive as beneficial. This in effect means that peasants are likely to adopt and manage innovations which they perceive as profitable than those which are not seen as profitable. This study while not questioning the above mentioned stages, evaluates the adequacy with which agricultural innovations are managed by farmers after they have been adopted.

The need for study of the influence of socio-economic status factors, such as age, economic status, formal education, etc. on farmers' performance has been justified in chapter Two by Rogers E. and

Shoemaker F. (1971), Sharma D.K. and Leogans G.P. (1967) and Rogers E. (1969). Further justification is provided by Heyer J. et.al. (1969:72-83). in their survey of farms in 14 small scale farming districts in this country; they showed that farmers who adopted more innovations tended to be more literate, to be more exposed to radio, newspapers and to attend more demonstrations and field days. They further tended to have visited Farmer Training Centres and to have been visited by agricultural staff. They finally indicated that higher adopters had more farm holdings and other household possessions and spent more on fees, but were neither young nor old. Exposure to extension education as is implicit from Roling N. and J. Ascroft's (1971:17-18) observations should make farmers knowledgeable and to do better in crop farming.

The need for study of the extent to which extension activities were adapted to local conditions was justified in the last chapter by Price J.L. (1968), Herbert Simon (1952), Moris J.R. (1973), Bell G.D. (1967), Maddick H. (1963) and Mbithi P.M. (1974). These scholars indicated, among other things, that there was need for authority to be deconcentrated to field staff to permit them exercise discretion in interpreting and adapting decisions made at higher levels of the organization to local conditions. This study examines the extent to which extension activities of farmer education, credit administration,

marketing of farm produce and cooperative development are adapted to local community conditions.

Extension education activities relating to farmer training courses and demonstrations are studied with a view to finding out the extent of authority delegated to field staff to make decisions with regard to these activities. We also seek to find out whether decisions with regard to farmer education activities are made communally by senior staff, junior ones and farmers or if they are made by each of these parties in isolation. This is done by finding out 'who' makes 'what' decisions with regard to farmer training courses and farm demonstrations. As Bell G.D. (1967:103) has noted other parties in the programme may not be left with anything to invest their 'selves' in where decisions are made by one party in isolation. The decisions made by one party in isolation may not take into account views of other parties, a fact which may reduce the adaptability of such decisions to local conditions. This could lead to low attendance of agricultural courses and farm demonstrations. Roling N. et.al. (1973:2) have noted in this connection that Farmer Training Centres in Kenya are not able to recruit enough farmers to fill their classes and usually work at less than 50% capacity and that the majority of their trainees are not farmers but officials, traders, etc.

Heyer J. (1973:1) indicates that provision of credit could enable small scale farmers with limited financial resources to undertake farm development which they would otherwise be unable to undertake and thus it should facilitate the rate of adoption of agricultural innovations. She adds that the provision of farm credit helps to increase the amount of capital available to small scale farmers and thereby helps to generate increased incomes from their farms. The effectiveness of a credit administration programme will, in our opinion, depend on its ability to overcome not only financial bottlenecks in adoption of farm innovations, but also on its ability to take into account labour bottlenecks, availability of tractors for ploughing, issues related to transportation and marketing of farm produce as well as physical environmental factors. The administrative issues involved in marketing of farm produce should equally be taken into account to minimize costs incurred by farmers in transportation or drying of their produce. Marketing of produce is one of the most important components of the Crops Improvement Programme, especially where pure cash crops are involved. Prices of farm produce have to be declared early enough by government to permit farmers make more accurate decisions regarding their crop farming activities. It is probable that where these constraints are not taken into account, credit administration and marketing activities will

not contribute effectively to the implementation of the Crops Improvement Programme.

We further study the extent to which cooperative societies are assisting their members (farmers) in their various farming activities. Goran Hyden (1970), and J.P.W. McAuslan's (1970) observations cited in chapter Two show that most cooperative societies in this country do not contribute effectively to agricultural development due to excessive government control of their activities, ethnic rivalry and financial mismanagement.

The need for study of Capacity of the Extension Service as measured in terms of occupational competence of field staff, density of staffing and transportation arrangements was justified by the discussion in the last chapter. Price J.L. (1968), Herbert Simon (1952), Bell G.D. (1967), Leonard D.K. (1973) and Mbithi P.M. (1974) have discussed at length issues related to occupational competence of field staff and indicated that such competence could be influenced by many factors which include length of service, training in agriculture and formal educational qualifications of field workers.

Watts E.R. (1969:66) has indicated that in any small scale farming district in this country, the District Agricultural Officer has a large number

of workers under him and spends most of his time on administrative matters; Agricultural Officers at the district level and Assistant Agricultural Officers at both the district and divisional levels are equally loaded with supervisory duties, and that it is Agricultural Assistants and Junior Agricultural Assistants who shoulder the real responsibilities of farmer education. Leonard D.K. (1977:9) has indicated in this connection that Agricultural Officers hold university degrees, Assistant Agricultural Officers hold diplomas in agriculture, most Agricultural Assistants have obtained certificates in agriculture after 1 to 2 years training while most of the Junior Agricultural Assistants have not undergone any training in agriculture. He indicates that this latter cadre including veterinary staff number 3,800 (or 60%) of the total Ministry of Agriculture's extension workers. He noted that junior field workers who were trained in the pre-independence period had usually attained a good primary certificate while those who have been trained in the post-independence period (since 1963) have usually had a good secondary education. He indicates further that in pre-independence period those hired directly as Junior Agricultural Assistants were Std.IV school leavers while in the post-independence period they are required to have a Kenya Junior Secondary Examination (KJSE) certificate. These points raised show that most of the junior field workers who shoulder

extension work are lowly educated and trained.

Leonard D.K. (1973:134-137) gave the following additional information on recruitment and competence of junior agricultural workers: first, recruitment to the Junior Agricultural Assistant cadre had been stopped by 1970. This in effect means that the two year certificate course given to secondary school leavers is currently the only means of entry into the Extension Service as junior field workers. Second, training in agriculture is associated with 13%, while each five years of service is associated with a 5% increase in informedness of field staff in technical matters.

That is, field workers who have attended agricultural courses lasting a longer period of time and those who had served the Extension Service for more years were better informed in technical matters than their colleagues in the opposite situation. He assessed the extent to which agricultural field workers were informed in technical matters - fertilizers, crop and livestock diseases, feeding of cattle, and so on and regarded those who were well informed in these matters as more competent than those who were less informed.

This study like Leonard's above study assesses the extent to which field workers in the study areas were occupationally competent; that is, the

extent to which they were well informed in technical matters and in extension methods of contacting and educating farmers. It further examines the influence of formal education, length of service, quality of training received in agriculture and system of promotions on informedness and motivation of field staff.

The discussion in the last chapter showed that field workers have to be posted to various parts of the country to permit them reach and involve farmers in these areas in agricultural programmes. Watts, E.R. (1969:6, 68) notes that density of staffing as shown by the extension worker-farmer ratio could determine the ability of field staff to make farm visits. He indicates that the ratio will equally determine the method that is to be used in contacting and educating farmers; that is, whether farmers are to be taught through demonstrations or farm visits. It is probable that an extension worker who has fewer farmers to serve may contact them more often and educate them about agricultural innovations than one with more farmers to serve. Under these conditions the Agricultural Extension Service in this country which has been noted by the second SRDP Evaluation Report (1975:ch.8:2) to have a more favourable extension worker-farmer ratio of 1:500 farmers compared to 1:1,500 farmers for Tanzania and 1:1,800 farmers for Uganda is likely to ensure more rapid transmission of

agricultural innovations to rural farm families than is the case in the other two East African countries. Heyer J. et.al. (1969:58-61) in their studies of 14 small farm districts which included Kakamega district showed that a Ministry of Agriculture agent (excluding veterinary staff) served an average of 558 families; Taita District had the most favourable ratio of one extension agent to 266 farmers while Meru district had the least favourable ratio of one extension agent to 1,206 farmers. Watts E.R. (1969:68) indicated that Kakamega district had a ratio of one Agricultural Assistant to 1,100 holdings and that the ratio of Junior Agricultural Assistants to farm holdings was much higher. Leonard D.K. (1977:9) indicated that these shown ratios were favourable enough to permit every family to be visited at least once a year by an extension agent and justified the use of the individual farm visit method in this country. This study seeks to find out whether the above cited ratio for this country as a whole prevails in the study area. The assumption is that if the ratio in the study areas is less favourable than the national one then, transfer of innovations to farmers in these areas is likely to be slower than in the rest of the nation and vice versa. Similar arguments apply in situations where one study area has a more or less favourable ratio than the other.

Study of issues related to transportation helps to show the extent to which resources allocated for field staff transportation, such as land rovers, funds for fuel and repairs, etc. meet the requirements of field staff and the extent of control exercised by senior staff in the use of these resources. The Kenya Dairy Production Improvement Programme Report (1976:124-28) noted that problems of transportation were severe in the Dairy Improvement Programme which is one of the agricultural programmes in this country. The Report noted that 53% of the vehicles in that programme were operating; the rest were not in good condition. The Report further noted that a lot of time of field staff in that programme was spent on dealing with problems related to vehicles; that procedures involved in authorizing vehicle repairs or their replacement took a lot of time and involved field staff in a lot of correspondence with senior staff. This study examines issues related to transportation of both senior and junior staff.

3.3 OPERATIONAL DEFINITIONS

The operational definitions of variables entailed in hypothesis No. I are:

- Socio-economic status factors refer to:
 - Knowledge in crop farming which is measured in terms of the extent to which farmers were knowledgeable about

various extension recommendations in crop farming.

- Economic status as measured by material properties possessed and income earning opportunities.
- Formal education standard attained as measured by the number of years completed at school.
- Age as measured by the number of years lived by a farmer from the year he was born to the time of data collection.
- Farm performance refers to the extent to which farmers were actually using farm inputs and practices recommended by the Extension Service. The farm inputs were fertilizers, seeds/seedlings, and pesticides. The farm practices were spacing and weeding of crops.

The operational definitions of variables entailed in hypothesis No. II are:

- Centralization refers to a situation where authority to make most decisions about activities of the Crops Improvement Programme is vested in the hands of senior staff. In the case of cooperative societies such authority is vested in the hands of the senior staff of the Ministry of Cooperatives. Senior

staff in either case make decisions without consulting junior staff (or cooperative societies in the latter case) and instruct junior staff to implement them.

- Senior staff refer to field officers of Assistant Agricultural Officer or higher status.
- Junior staff refer to Agricultural Assistants, Junior Agricultural Assistants or officials of cooperative societies.

- Adaptability refers to the extent to which decisions made take into account or are responsive to local conditions in the farming community.

- Activities referred to are those of:
 - Extension education
 - Credit administration
 - Marketing of farm produce and
 - Cooperative development
- Local conditions in the farming communities refer to:
 - Availability of ploughing services
 - Availability of a market for a particular crop
 - Ease of transporting farm inputs and produce
 - Sufficiency of credit awarded
 - Ease of realization of farm credit
 - Natural environmental factors
 - Ease of marketing of farm produce

The operational definitions of variables entailed in hypothesis No. III are:

- Capacity refers to the ability of the Extension Service to undertake crop production work and is measured in terms of:

- Density of staffing as shown by the ratio of extension workers to farmers.
- Occupational competence of field staff as measured in terms of the extent to which they were knowledgeable: about technical matters; and in extension methods of contacting and educating rural farm families. Occupational competence itself is influenced by:

- Formal education standard of field workers which is measured in terms of the number of years completed at school.
- Quality of training received in agriculture as measured by the number of months completed in training.
- Length of service as measured by the number of years a field worker had served the Extension Service.

- Transportation arrangements for field staff as measured in terms of the extent to which these arrangements meet the requirements of field staff.

- Centralization has been defined above.

3.4

FACTORS UNDERLYING CHOICE OF STUDY AREAS

Kakamega district was selected as the area for data collection. Within the district it was decided to collect data in Lugari division which is a settlement area and Ikolomani division which is a traditional rural area rather than in the whole district (Kakamega district has 7 administrative divisions of: Lurambi, Mumias, Butere, Ikolomani, Hamisi, Vihiga, and Lugari. The latter division is the only settlement area in the district). We did not select Hamisi and Vihiga divisions due to the fact that they are Special Rural Development Programme (SRDP) areas with distinct credit, marketing, and other support services and with a population density which is far above the average for the district. Mumias division was not selected due to the fact that it is a sugarcane growing area with a massive sugarcane development programme. Butere division could have been an alternative for Ikolomani division, but it is remotely situated with very poor roads. Lurambi division was not selected due to its close proximity to the settlement area of Lugari; there is widespread diffusion of innovations from Lugari to Lurambi division.

Data in this study could equally well have been gathered in other parts of the country. Two major factors, however, which prompted our choice of Kakamega district and especially the selection

of Lugari and Ikelomani divisions as areas in which data in this study was to be collected were:

(a) Many agencies are involved in provision of extension education and support services to rural farm families in these areas. The Ministry of Agriculture (MoA) and Ministry of Settlement (MoS) provide agricultural extension education in Ikelomani and Lugari areas respectively. Many other agencies like Agricultural Finance Corporation (AFC), Kenya Farmers Association (KFA), cooperative societies, etc. provide support services to rural farm families in these areas. The involvement of various agencies in crop production work in these areas makes it possible to study: first, the various issues internal to the Extension Service in Lugari and Ikelomani divisions; and second, issues related to inter-agency relations already indicated.

(b) Physical environmental and socio-economic conditions vary widely from one part of the district and even from one part of any division to the other and influence the types of crops grown, acreage put under these crops and even quality of husbandry of crops. For example density of population in Ikelomani is much higher than that in

Lugari (see Appendix I and II) with the result that smaller acreage is put under crops in Ikolomani compared to that in Lugari; Ikolomani is made up of a homogeneous population of two dominant Luhya sub-tribes, while Lugari consists of a heterogeneous population of in-migrants from various parts of the country and as noted by the Second SRDP Evaluation Report (1975:ch.14: pp.12-13) in-migrants are usually more innovative than other persons in a given area. Settlers in Lugari pay for land and development loans indicated in Appendix I while farmers in Ikolomani do not have to pay back any loans, a fact which is likely to compel settlers in Lugari to work harder to obtain enough income for repaying these loans and for meeting other commitments. These and many other factors made it possible for us to expect to find variations in husbandry practices among farmers in the two divisions.

In sum, the selection of Lugari and Ikolomani divisions made it possible to comparatively study the various organizational, and socio-economic status factors cited in the previous section in one area versus those in another area. This permits better understanding of factors affecting effectiveness of the Extension Service than would be the case

where the study was carried out in an area where the factors are fairly homogeneous.

3.5 THE RESEARCH DESIGN

The bulk of the data in this study was gathered from junior agricultural extension staff, and from farmers. The research design which guided us in sampling of these two types of respondents was the static group comparison. This design permits an assessment of the impact a given stimulus (X) has on one group (O_1) which is exposed to the stimulus in comparison to another group (O_2) which has not been exposed to the stimulus (Campbell D.T.:1971:309). The design is expressed as follows:

$$\begin{array}{ccc} X & & O_1 \\ \hline & & O_2 \end{array}$$

Here O_1 is the experimental or the group that has been exposed to (X); O_2 is the control or the group that has not been exposed to (X).

Junior agricultural staff were either of Agricultural Assistant (AA) or Junior Agricultural Assistant (JAA) cadre; Agricultural Assistants constituted our experimental group (O_1) while Junior Agricultural Assistants constituted our control group (O_2). The criterion for this division of junior agricultural staff was the degree of

professional competence where Agricultural Assistants are presumably more competent due to their high formal education and agricultural training. The assumption was that since Agricultural Assistants are more professionally competent than the Junior Agricultural Assistants as indicated by Leonard D.K. (1973:137), the area with more of these Agricultural Assistants was likely to be much ahead in provision of extension education and other support services and in adaptation of Extension Service plans to local community conditions than the area with more Junior Agricultural Assistants.

Two similar groups of farmers were studied: the experimental group (O_1) which had been exposed to extension education package and which presumably had adopted innovations in crop farming as had been recommended by the Extension Service and the control group (O_2) which had not been exposed to efforts of Extension staff. The extension education package (X) included:

- attendance of agricultural courses,
- attendance of demonstrations in crop farming,
- being visited by extension agent or visiting extension agent.

The control group's participation in this extension education package is none or minimal. The

underlying argument here is that study of the exposed group alone (farmers who are contacted by the Extension Service as argued in the last chapter are about 10% of the total rural population) could not help us to know how a large number of farmers who have never been exposed to the above education package manage their crops and the problems they face in doing so.

Since data was collected from two areas of Lugari and Ikolomani and since exposed and control groups of junior agricultural staff and farmers were drawn from both areas, we modified the above shown design as under:

T_I	X	O_1	$T_I = \text{Ikolomani}$
		O_2	
T_L	X	O_1	$T_L = \text{Lugari}$
		O_2	

The problem cited by Suchman (1967:95) with regard to this research design is that if the exposed group shows a significantly higher incidence of the desired conditions or behaviour, this is assumed to be attributable to the programme or stimulus. He notes further that the design itself affords no way of knowing whether the two groups were equivalent before the programme was introduced and that the problem could be overcome or minimized

through selective matching of the two groups according to pre-programme characteristics. In our opinion this cited problem might not weigh heavily in this study since recipients of agricultural programmes in this country who constitute our exposed group are largely a few progressive farmers who have the necessary resources to adopt agricultural innovations. The control group of farmers consists largely of less-progressive farmers who often do not have the necessary resources to adopt agricultural innovations. Thus the exposed and control groups of farmers in this study already differ in their socio-economic characteristics, a fact which might help to explain differences in their farm performance. As regards field staff, Agricultural Assistants have higher formal education and training qualifications than Junior Agricultural Assistants. Similarly other work conditions within the Extension Service might be more favourable for Agricultural Assistants than for Junior Agricultural Assistants. These various factors might help to explain differences in occupational competence between the Agricultural Assistants and the Junior Agricultural Assistants.

3.6 SAMPLING AND INTERVIEWING OF EXTENSION STAFF

There were a total of 25 junior field workers (19 Junior Agricultural Assistants and 6 Agricultural Assistants) in Ikolomani as shown by table 9.3 in chapter Nine concerned with crop production work namely: general agriculture, coffee,

passion fruit, and farm management. They were stationed in various locations and sub-locations of Ikolomani division. We decided to interview all the 6 Agricultural Assistants. Simple random sampling techniques were used to draw the sub-sample of Junior Agricultural Assistants in Ikolomani; the names of the 19 Junior Agricultural Assistants specified above were written on slips of paper of equal size and weight and put in a small container. By shaking the contents thoroughly and picking out one slip at a time as we proceeded we drew a sub-sample of 11 Junior Agricultural Assistants. This sub-sample of 11 Junior Agricultural Assistants together with that of 6 Agricultural Assistants indicated above gave us a total of 17 junior field workers in Ikolomani.

There were a total of 30 junior field workers (18 Agricultural Assistants and 12 Junior Agricultural Assistants) in Lugari (when Senior Assistant Agricultural Officer, Divisional Agricultural Assistant and one field worker concerned with 4-K clubs are excluded) concerned with crop production work as shown in table 9.4 in Chapter Nine. Simple random sampling techniques explained above were used which gave a sub-sample of 15 respondents 10 of whom were Agricultural Assistants and 5 Junior Agricultural Assistants.

A total of 32 junior agricultural workers
(17 in Ikolomani and 15 in Lugari) were sampled:
half of them were Agricultural Assistants and the other
half were Junior Agricultural Assistants.

These sampled junior field workers were interviewed with the help of open-ended questionnaires. We spent long hours with a good number of these extensionists and held extended informal discussions with them about various activities related to crop farming. These informal discussions have greatly helped us in interpreting some of our data and in understanding the actual nature and problems of crop production work in the research areas. We were also in a good number of cases able to observe the way these extensionists interacted with farmers and to gain insights into actual problems facing junior extensionists in their work.

Senior extension staff at the divisional and district levels were interviewed informally on a wide range of issues related to various activities of crop production work. Extended discussions, especially with the Assistant Agricultural Officer, Ikolomani and the Senior Assistant Agricultural Officer, Lugari throughout the period of data collection have greatly helped us to gain insights into various issues in the way of implementation of the Crops Improvement Programme and have greatly helped us in interpretation of the data collected.

3.7

SAMPLING AND INTERVIEWING OF FARMERS

A multi-stage sampling strategy was adopted in sampling of farmers in both Lugari and Ikolomani divisions.

The settlement area of Lugari falls into 11 schemes which are the most important units of agricultural administration comparable to the sublocations in the traditional rural areas of the district. Four of these schemes namely: Lugari, and Lumaganda schemes which are high density; and Sergoit, and Nzoia schemes which are low density were selected as sub-areas from which to sample farmers. Factors which influenced the selection of these four schemes were:

- (a) Some schemes are low density; that is, average size of farm units is about 30 acres while others are high density with average farm unit size of 15 acres; others fall between these two.
- (b) Some schemes, such as Lumaganda were started in the 1962-63 period; others like Sergoit were started in mid-1960s; while some like Nzoia were started in late 1960s.
- (c) Some schemes such as Lugari from which the division takes its name are dominated by

Luhya sub-tribes; while others like Sergoit have mixed populations of Kikuyu, Luhya, Kalenjin, Luo, etc. tribes.

- (d) Geographically - the schemes selected were not concentrated together.
- (e) In some schemes, such as Sergoit dairying is a major income earner; in certain other schemes, such as Lugari dairying is insignificant.

In Ikolomani the sublocations are the smallest units of agricultural administration. We selected 5 out of the 26 sublocations of Ikolomani as sub-areas from which to sample farmers. These five sublocations were: Lubao, Mukulusu, and Mukhonje in Isukha location and Savane, and Shitoli in Idakho location. The following factors guided us in the selection of these five sublocations:

- (a) Geographically the sublocations selected were not concentrated together.
- (b) Density of population which is lower toward the North than in the rest of the division.
- (c) The types of crops grown in these sublocations, for example, tea is grown in the east of the division, more coffee is grown in Idakho than in Isukha location.

Most of the traditional rural area of Ikolomani is, however, fairly homogeneous in terms of the types of crop enterprises, ethnic composition of its population, etc.

Thus a total of 9 sub-areas (4 schemes plus 5 sublocations) were selected. It was intended to sample 20 farmers from each sub-area; this could give a total of 180 farmers.

The actual sampling of farmers could be done in one of the following ways:

- (a) Construction of a list of all farm units in the selected sub-areas. This could have been easier in Lugari where farm units are known by their plot numbers which could be easy to obtain from settlement authorities. In Ikolomani agricultural staff do not keep a list of names of farmers in their areas or even those they approach. Where such a list may exist its use may be limited due to the fact that the original owner of the farm unit may have died, or sold out, or may be absent from home, or he may have subdivided the farm unit formally or informally to other rightful claimants.

(b) Construction of a list of farm units and their current owners from village to village in each selected sub-area using information provided by respected elders in such villages. This could permit us to know whether such farm units have benefited from extension efforts. The method is, however, costly and time consuming; some villages are remotely situated from the main roads.

(c) Agricultural staff in selected sub-areas could construct a list of farmers who benefit from their efforts. Although these field workers are expected to assist each and every farmer in their areas of operation, they rarely do so; the number of farmers who benefit from their efforts is usually small in any one sub-area.

We chose the third method: extension workers know farmers who benefit from their efforts and could readily assist us in constructing a list of those who are exposed to their education efforts. The first approach could have been effective in Iugari; its use in Ikolomani without prior knowledge of the number of farmers who benefited from extension efforts could not have permitted the drawing of a

sample with half to two-thirds of the respondents having been exposed to extension education efforts. In Ikolomani as it will become clear later on, a large number of farmers rarely benefit from efforts of extension. The second approach was not necessary in Lugari as the first one seemed adequate. In Ikolomani this second approach could not be used due to the remoteness of many places and prevalence of many poor roads; many places are inaccessible by vehicle transport.

Field staff in each sub-area selected provided us with a list of names of 40 farmers who were exposed to agricultural extension education efforts. We obtained a list of 200 farmers for Ikolomani (i.e. 40 farmers from each of the 5 sub-areas selected) and a list of 160 farmers for Lugari (i.e. 40 farmers from each of the 4 selected schemes). The above names of farmers were then arranged on lists of 1 to 200 and 1 to 160 for Ikolomani and Lugari divisions respectively. Using the strategy of interval sampling and adopting an interval of 4, sub-samples of 50 and 40 farmers were drawn for Ikolomani and Lugari divisions respectively giving a total of 90 farmers who constitute the experimental or exposed group.

The sampling of the control or non-exposed group was done at the time of visit and interview

of each member of the exposed group; for each farmer in the exposed group there was to be another farmer in the control group. In Lugari where plot numbers were known we looked for the farmer in the 5th plot from that of the farmer in the exposed group in ascending or decending order. For example, if the farmer in the exposed group was the owner of plot No. 20 then, we looked for the owner of plot No. 25 and if he was adequately exposed to extension education efforts or was not present, we looked for the owner of plot No. 15. Many farmers in Lugari have at some time or other been exposed to agricultural extension efforts. We were not in many cases able to get a farmer who was not exposed to extension education efforts owning the 5th plot in ascending or decending order from that of the farmer in the exposed group. It was only possible to obtain^a sub-sample of 25 farmers in Lugari for the control or non-exposed group instead of the anticipated 40 farmers.

In Ikolomani attempts to find out plot numbers of farmers were immediately abandoned due to suspicions on the part of many farmers that the researcher had certain ill-motives for asking for plot numbers; many farmers refused to cooperate. We were forced to adopt a measure of counting homesteads in some specific direction from the home of the farmer visited in the exposed group; these could be homesteads along a road or path. The

counting of these homesteads was also done in some other manner we found adequate; we always took the 5th homestead from that of the farmer in the exposed group. A sub-sample of 48 farmers was obtained in this way in Ikolomani and constitutes our control or non-exposed group.

The total sample drawn was 163 farmers (98 from Ikolomani and 63 from Lugari) of whom 90 were in the exposed group and 73 in the non-exposed group.

Farmers were visited and interviewed in their homes with the help of open-ended questionnaires. We made observations on the farm and raised any issues that needed clarification in our formal and informal discussions with farmers.

Field workers in each of the 9 sub-areas selected assisted us to get to the homes of these farmers. Farmers were, however, interviewed in the absence of field staff. The disadvantage for travelling and visiting farmers in the presence of field staff is that the presence of a field worker tends to sensitize farmers and make them give information which may not reflect their real experiences. The advantages for travelling in company of field workers far outweigh the above limitation and are as follows:

- (a) The researcher is able to observe the way field workers interact with farmers and to develop insights as to the nature of interaction that exist between extensionists and their clients.
- (b) The strategy saves time, effort, and funds; the field worker knows farmers sampled and directly takes the researcher to their homes.
- (c) As the researcher travels in the field comments made by these field workers or discussions between them and farmers or other knowledgeable persons helps the researcher to gain insights into various issues involved in implementation of the programme being studied; we were able to obtain a lot of information which has proved very valuable in interpretation of data. Such information could hardly have been obtained if we had restricted our interaction with field staff to office or formal interview situations.

We cross-checked the information obtained by re-visiting 20 farmers in the absence of the field worker. Their complaints and problems were voiced in the same way as they had been done in our initial visit.

3.8

DATA FROM OTHER SOURCES

Nineteen (19) officials of 8 cooperative societies were selected and interviewed formally through the use of an open-ended questionnaire as well as informally. Four of these societies namely: Lirembe, Shigokho, Isukha and Lianda were in Ikolomani division and were selected from a total of 8 societies in that division. The remaining 4 societies of Mautuma, Lumaganda, Sergoit and Nzoia were selected from the 12 societies in Lugari division. The societies selected were largely from the sub-areas where we sampled farmers. The officials of these societies interviewed included: the chairmen, honourable secretaries, treasurers, committee members and secretary managers.

We additionally interviewed a few officials of the Agricultural Finance Corporation (AFC), the Maize and Produce Board (MPB) and Kenya Farmers Association (KFA). The interviews were informal to help understand the way these agencies administer their programmes and to clarify issues raised in the field about activities of these various agencies. We also made observations in the farming community regarding local sales of maize and talked to a few persons involved in these sales. In addition a lot of data was collected from official documents which included: Annual Reports, Annual Work Programmes and calendars of work,¹ and letters.

3.9 DATA ON CROPS

We initially intended to interview farmers about their husbandry practices of all crops on the farm. Our preliminary study showed that this could be difficult if detailed information was desired about each crop. We therefore decided to restrict ourselves to a study of maize and any other crop reported by a farmer as the most important or profitable on the farm.

3.10 STATISTICS USED IN THIS STUDY

Several statistics are employed in this study as follows:

(a) The Coefficient of Correlation 'r'

This coefficient provides a measure of the degree of association between two or more variables and is computed by the formular below (Yeomans K.A.: 1968:186-94):

$$r = \frac{n\sum xy - \sum x \sum y}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

The formula is modified as follows for grouped data:

$$r = \frac{n\sum fxy - \sum fx \sum fy}{\sqrt{[n\sum f x^2 - (\sum fx)^2][n\sum f y^2 - (\sum fy)^2]}}$$

The above scholar indicates that the

coefficient shows the strength of association without indicating which variable influences which one; its value varies between zero (0) and one (1) with zero value indicating absence while one indicating perfect association between the variables in question. He indicates further that some 'r' will be preceded by a positive while others by a negative sign indicating the type of relationship that exists between the two variables in question.

(b) The Chi-Square Statistic - (χ^2)

Blalock H.M. Jr. (1972:275-77) notes that this statistic is used whenever we wish to evaluate whether or not frequencies which have been empirically obtained differ significantly from those which would have been expected if there were no relation and is widely used in contingency problems in which two or more nominal scale variables have been cross-classified and is defined as follows:

$$\chi^2 = \frac{(f_o - f_e)^2}{f_e}$$

where 'fo' and 'fe' refer to the observed and expected frequencies of each cell in a contingency table.

Yate's correction of χ^2 for continuity subtracts 0.5 from the absolute value of the differences between observed and expected frequencies

as follows:

$$x_c^2 = \frac{(\sum f_o - f_e - 0.5)^2}{f_e}$$

The corrected chi-square value is denoted by x_c^2 to distinguish it from the uncorrected values. Yate's correction is applied whenever more than two cells of the larger tables have 'fe' values falling below five (Croxtan, F.E.:1959:150).

The contingency coefficient 'C' is directly connected with X^2 test and measures the degree of association between two sets of attributes; it is the same as the coefficient of correlation, but may be applied to classificatory or ordinal scale data in addition to interval scale measurements and is calculated directly from the value of X^2 as follows (Yeomans, K.A.:1968:292-93):

$$C = \sqrt{\frac{X^2}{N + X^2}}$$

Where N = grand total of observations

Since X^2 does not measure the degree of association, but simply shows whether association exists between two or more variables, 'C' is used to measure strength of such relationship.

In sum, the coefficient of correlation 'r', chi-square and contingency coefficient

'C' are used widely in this study. A detailed discussion of these statistics could be found from the referenced sources. Percentages and proportions are also used in the forthcoming analysis.

3.11 SCALING OF CERTAIN VARIABLES IN THIS STUDY

Scaling measures have been adopted to help arrive at categories of certain variables: Training in agriculture, occupational competence, knowledge in farming, farm performance and economic status. Scores were assigned for responses to questions on various items involved in any one of these variables. We had to decide on the maximum and minimum score to give for each response. The scores of each respondent on various items of each variable were added and permitted placing the respondent in a particular category of the variable.

Scaling as a technique is explained by Moser C.A. and Kalton G. (1971:360-73), they describe a series of scales namely; Thurstone, Likert, and Guttman Scales which are all concerned with measurement of attitudes. These scales assign scores to subjects' responses in terms of their degree of agreement or disagreement with a particular item. The scoring system used in this study although not concerned with attitude questions accumulates scores for a given set of responses and corresponds closely to Likert and Guttman scales.

We have in this chapter specified and explained the three dimensions of this study namely: the capacity of the Extension Service to undertake crop production work, adaptability of activities of the Extension Service and those of other agencies concerned with crop production work to local community conditions, and socio-economic factors influencing farmers' crop husbandry practices. We have further discussed the sampling design for farmers and junior extension staff, actual ways in which sampling and interviewing were done as well as the various statistics used in analysis of data in this study.

Footnote to Chapter Three

1. Annual Work Programmes and Calenders of Work are extension plans that are made by agricultural field staff at the end of each calender year for an oncoming year. They specify major agricultural enterprises in a given area in order of priority, progress of extension work with regard to each of these enterprises, problems (if any) of each, amount of extension work that has to be done with regard to each of these enterprises, scope of progress envisaged and amount of resources needed. Each Work Programme is accompanied by a 'Calender of Work' which specifies 'what', 'when' and by 'whom' activities in each enterprise are to be undertaken.

CHAPTER FOUR

THE AGRICULTURAL EXTENSION SERVICE AND THE CROPS IMPROVEMENT PROGRAMME

4.1 INTRODUCTION

This chapter examines the structure of the Extension Service in Ikolomani and Lugari divisions and the way the Extension Service at the lower level links up with the district, provincial and national levels. We additionally examine the nature and scope of the Crops Improvement Programme paying particular attention to a few major cash and food crops grown in the study areas. The data presented in this chapter should permit ready appreciation of data presented in the forthcoming chapters.

4.2 THE STRUCTURE OF THE AGRICULTURAL EXTENSION SERVICE

The Agricultural Extension Service in Ikolomani according to information provided by the Assistant Agricultural Officer (AAO), Ikolomani was constituted as follows:

- (a) The Assistant Agricultural Officer (AAO) who is the head of the Ministry of Agriculture (MoA) in the division.

- (b) Agricultural Assistants (AAs) and Junior Agricultural Assistants (JAAs) positioned in various sublocations of the division. Each AA or JAA operates one sublocation, but due to shortage of staff a few of them are in charge of two sublocations. He may also be called upon to assist with extension work in a neighbouring sublocation when a colleague in charge of that other sublocation is sick or has gone on leave.
- (c) A few Agricultural Assistants (AAs) in charge of particular crop enterprises like Coffee, Tea or Passion Fruit in a location or in the whole division.

This structural arrangement concerns crop production work, it excludes veterinary work which is administered by a Livestock Officer (LO) at the divisional level. In Ikolomani the LO was positioned at district agricultural offices, Kakamega and was not directly under the AAO, Ikolomani. There were no Locational Agricultural Assistants (LAAs) in Ikolomani. The AAO of this division indicated that they were removed in February, 1977 on instructions from higher levels of the Extension Service and were assigned other duties. This made it possible for the AAO to have direct access to the staff in sublocations as well as those in charge of particular crop enterprises.

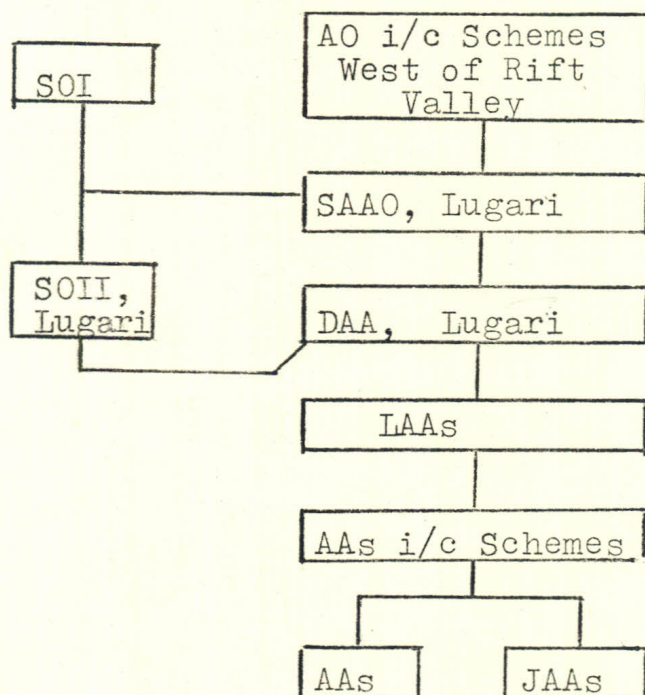
The ~~Extension~~ Service in Lugari according to information obtained from Senior Assistant Agricultural Officer (SAAO), Lugari was constituted as follows:-

- (a) The Senior Assistant Agricultural Officer (SAAO) responsible for all agricultural matters in the area.
- (b) The Divisional Agricultural Assistant (DAA) who assisted the SAAO in administrative matters.
- (c) The Locational Agricultural Assistants (LAAs) in charge of agricultural matters in the locations.
- (d) The Agricultural Assistants (AAs) or Junior Agricultural Assistants (JAAs) in charge of agricultural work in schemes. They supervise field workers in the schemes but are also responsible for extension work in one of the blocks in the scheme.
- (e) Agricultural Assistants (AAs) and Junior Agricultural Assistants (JAAs) without supervisory functions and responsible for extension work in one of the blocks in a given scheme.

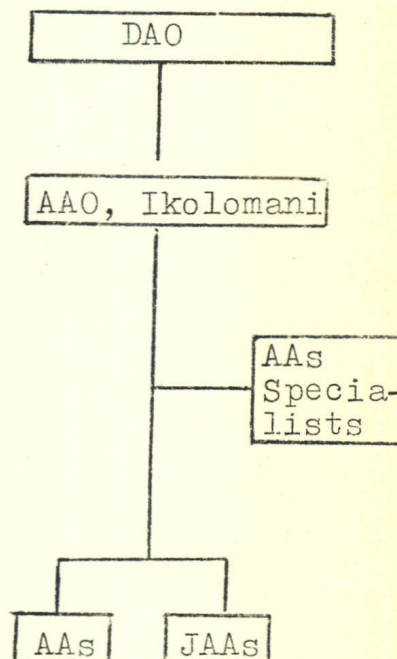
The structures of the Agricultural Extension Service in both areas is portrayed in diagram I.

Diagram I: Structure of the Agricultural Extension Service Concerned with Crop Production Work in the Study Areas

Lugari Area



Ikolomani Area



Source: Drawn by author based on information provided to him by SAAO, Lugari and AAO, Ikolomani.

Key

AA	Agricultural Assistant
AAO	Assistant Agricultural Officer
AO	Agricultural Officer
DAA	Divisional Agricultural Assistant
DAO	District Agricultural Officer
JAA	Junior Agricultural Assistant
LAA	Locational Agricultural Assistant
SAAO	Senior Assistant Agricultural Officer
SO	Settlement Officer

In the traditional rural areas the Assistant Agricultural Officer is answerable to the District Agricultural Officer (DAO), who in turn is answerable to the Provincial Director of Agriculture (PDA), and who is further answerable to the Director of Agriculture (DoA) at the national level.

In the settlement areas agricultural matters are the responsibility of the Ministry of Settlement (MoS). The SAAO, Lugari pointed out that Agricultural matters in the area used to be administered by the Ministry of Agriculture (MoA) until July, 1972 when the Ministry of Settlement was accorded a full ministerial status. That since then most of the Ministry of Agriculture's staff who had been seconded to the Ministry of Settlement had their services permanently transferred to the Ministry of Settlement. He indicated further that the Agricultural Extension Service is now a section of the Ministry of Settlement. Other sections of the Ministry of Settlement include: the Cooperative Development Section and the Settlement Section. The latter section is concerned with administrative matters relating to settlement. The organizational arrangements at higher levels of the Ministry of Settlement according to information obtained from SAAO, Lugari is as follows:

- (a) The Settlement section in Lugari was headed by Settlement Officer II (SO II) who is in charge of administrative matters relating to settlement for Lugari schemes. Above him was Settlement Officer I (SO I) stationed at Kitale in charge of administrative matters for Lugari and Kitale schemes. It was indicated that SAAO, Lugari and Settlement Officer I are district level officers equivalent to the DAO in the traditional rural area.
- (b) The Area Settlement Controller (ASC) for schemes west of the Rift Valley is in charge of all administrative matters relating to settlement at provincial level and is equivalent in status to PDA in the traditional rural area. The agricultural section of the Ministry of Settlement is at this level headed by an Agricultural Officer I (AO I). The offices of these officers are at Eldoret.
- (c) The department of Settlement at the national level is headed by the Director of Settlement (DoS). The agricultural section is headed by an Assistant Director of Agriculture who is assisted by several Senior Agricultural Officers at this level who are in charge

of Farm Management, Crops, Veterinary, etc. matters.

Thus there exist two fairly autonomous and parallel agricultural extension structures concerned with farm development in the two research areas of Lugari and Ikolomani. The following comparative information was obtained from field staff about the extension service in these two areas:

- (a) Liaison exists in areas of training, or provision of farm inputs between the two Ministries, but at the lower level the degree of autonomy tends to intensify.
- (b) The Settlement, Cooperative and Agricultural sections of the Ministry of Settlement work hand in hand and often share the same limited resources, for example, one land-rover for all of them. They liaise their activities with other Government officers, such as the District Officer, the Education Officer, etc. Farmers apart from being in debt to the Settlement section are also automatic members of cooperative societies which are concerned with agricultural development. In the traditional rural areas not many farmers are members of cooperatives. The

AAO, Ikolomani is fairly autonomous, but liaises his activities with other government officers.

- (c) There exist considerable amount of internal differentiation within the Ministry of Agriculture which extends from the national to the district and save at the divisional level, extends further to the locational level. The Ministry of Agriculture is made up of many divisions (or departments): the Crops, Farm and Land Management, Training, Veterinary, etc. divisions. The divisions have national heads who are specialists in activities of their divisions and are responsible for all administrative matters in their divisions; they are all under the Director of Agriculture. These divisions are represented at the provincial level by their respective experts namely: the Provincial Crops Officer, the Provincial Land and Farm Management Officer, the Provincial Veterinary Officer, etc. under Provincial Director of Agriculture. At the district level the District Agricultural Officer is the overall and is assisted by various specialists namely: the District Crops Officer, the District Land and Farm

Management Officer, the District Veterinary Officer, etc. At the divisional level the Assistant Agricultural Officer performs functions of these various specialists. It was indicated by Assistant Agricultural Officer, Ikolomani that the reason for functions of these various specialists being performed by one person at the divisional level is to help overcome conflict that is likely to arise from many experts approaching farmers at the same time, a fact which may not only lead to confusion of farmers but also to wastage of scarce resources including manpower.

At the locational level, however, as table 9.3 in Chapter Nine shows, there are a few junior extensionists who specialize in certain enterprises - Coffee, 4-K clubs, etc. The reason given by Assistant Agricultural Officer, Ikolomani for differentiation at this level is that the amount of knowledge and experience required to effectively educate farmers in these enterprises is diverse and beyond that possessed by a junior worker concerned with general agricultural work. He also pointed out that some projects, such as the Passion Fruit project, are sponsored by outside agencies who usually pressurize the Extension Service to spare a few junior workers to assume full responsibility for the project.

In the Ministry of Settlement this type of specialization in its agricultural section occurs to a very limited extent at the national level as we have already pointed out and still to a very limited extent at the divisional level (see table 9.4 in Chapter Nine). Extension staff in settlement can therefore be seen as concerned with general agricultural work covering crop production and animal husbandry (animal health matters are the responsibility of veterinary staff).

4.3 THE CROPS IMPROVEMENT PROGRAMME

What is referred to here as the Crops Improvement Programme is popularly called 'Crop Production Work' by agricultural field staff. This Crop Production Work is continuously carried out from year to year in the study areas as is done in other parts of the country. It entails educating farmers about new and existing farm inputs and practices with regard to various food and cash crops which include: Tea, coffee, Sugarcane, Maize, Beans, Sweet Potatoes, etc. The nature of crop extension work varies from place to place based largely on the types of crops grown. In Lugari extension efforts covered Maize, Beans, and Sunflower while in Ikolomani crops covered included Coffee, Tea, Sugarcane, Maize, Beans, and Passion Fruit.

This section examines the nature and scope of agricultural extension education messages and expected levels of yield with regard to a few major crop enterprises in the study areas. The position as well as agricultural extension plans with regard to each of these crop enterprises at the time of data collection is reviewed.

4.3.1 Extension Education Messages and Planned
 Crop Yields

The requirements of the Ministry of Agriculture with regard to each crop enterprise specify the types and quantities of farm inputs and practices desired and the time they should be carried out. These recommendations of the Extension Service with regard to major crop enterprises in the study areas are summarized in table 4.1.

Table 4.1: The Ministry of Agriculture's Extension Service Requirements
(Recommendations) for Major Crops in the Research Areas
Per Hectare

Crop	Seed/ Seedlings	Fertilizers	Spray/ Dusts	Spacing	Date of Planting	Others
Maize	20 kg. (variety 614)	100-150 kg. of Double Super. 200-300 kg. Nitrogen	10 kg. DDT	75cm.x25cm. (2½'x1', 2½'x9" 3'x1', 3'x2')	February and March	Hybrids only - Clean seedbed
Coffee	1,100 seedlings (Arabica varieties)	10-15 tonnes FYM* 200-350 kg. Nitrogen per year.	7-10kg. of Bli- tox for disease control.	1½m.x1½m. (Formerly 3m.x3m.)	April and May	- Plant in holes - Prune - Mulch
Tea	7,000 plants	200 kg. single super. 200 kg. Nitrogen/yr.	Nil	1.5m.x 1.25m.	March and April	- Clean seedbed
Sugar- cane	24 tonnes of cutt- ings (varieties CO421, C331, etc.)	200 kg. Nitrogen for plant crop and each ratoon crop. 200 kg. of Double Super at planting.	When nece- ssary to con- trol pests and disea- ses	125cm. Between rows. Plant cuttings end-to- end within row	- Long rains - Short rains	- Clean seedbed - 3-4 weedings
Beans	20kg. (Mexican 142, Canadian Wonder, local varieties, etc.)	Nil	Nil	45cm. x 15cm. (pure stand)	February/ March and July/ August	- Inter- plant with maize in long rains - Pure stand in short rains
Sun- flower	20 kg. (dark grey or white stripe)	Nil	Nil	90cm.x 30cm.	February/ March and July/ August	Grown in long and short rains

Source: Ministry of Agriculture, Kakamega District Guidelines, 1969
Crop Standard Recommendations File, Folio 1, District Agricultural
Officer's office, Kakamega. See Also Crop and Livestock Manual
1971-1972 Crop Advisory Leaflets on Coffee (No. 255), Sugarcane
(No. 270), Maize Production in Western Kenya (No. 263) and
Sunflower (272). Other information on these recommendations
obtained from the District Coffee Officer, Kakamega and other
field staff.

* Farm Yard Manure

The requirements of the Extension Service cited in table 4.1 if observed should permit farmers to realize the levels of yield of crops shown in table 4.2. The low, average and high levels of yield shown in this table result from corresponding low, average and high levels of crop husbandry. Extension recommendations cited in table 4.1 could permit farmers to realize average levels of yield while use of more of the recommended inputs and better observation of recommended practices could help them to realize higher yields. We show in the next chapter that farmers who observed these recommendations received higher crop yields than those who did not.

Table 4.2: Levels of Yield Per Hectare of Various Crops in Kakamega District

Crop Enterprise	Level of Yield			Unit of Measurement
	Low	Average	High	
Maize	20	30	50	90 kgs. bag
Coffee (mature)	2,500	5,000	7,000	Kgs.
Tea (mature)	2,500	4,625	5,750	Kgs.
Sugarcane				
- Plant crop	50	100	200	Tonnes
- 1st Ratoon	40	80	140	"
- 2nd Ratoon	25	55	110	"
Beans (pure stand)	5	10	12	90 kgs. bags
Passion fruit	3,000	5,000	9,000	Kgs.

Source: Ministry of Agriculture, Kakamega District Guidelines, Land and Farm Management Division, 1975, pp. 1-8, 17-23.

4.3.2 The Position of a Few Major Crop Enterprises in the Study Areas

In this section we examine the state of farming and agricultural extension plans with regard to five crop enterprises in the study areas. These crop enterprises are: maize, sugarcane, coffee, tea and passion fruit.

(a) The Maize Enterprise

It was indicated by extension staff that synthetic varieties of maize were grown in Ikolomani and other traditional rural areas of Kakamega district from mid-1950s up to 1964 when 'hybrid' varieties that are currently grown in the area were introduced. In Lugari settlement area as indicated in Appendix I, current settlers were required to grow maize when they settled in this area during 1960s.

The Ministry of Agriculture, Kakamega District, Handing Over Report (1976:10) points out that maize is the major farm enterprise as well as staple food of people of Kakamega district. The report adds that the types of this crop grown in the district are 'hybrid' and 'local' maize. Table 4.3 shows acreage devoted to hybrid and local maize in various divisions of Kakamega district during 1974 and 1976.

Table 4.3: Acreage Under Maize in Various Divisions
of Kakamega District 1974 and 1976
in Hectares

Division	<u>1974</u>		<u>1976</u>	
	Hybrid	Local	Hybrid	Local
Ikolomani	11,679	1,425	12,784	559
Lugari	9,246	-	-	-
Vihiga	-	-	8,496	11,765
Hamisi	-	-	3,570	5,173
Lurambi	-	-	27,589	1,801
Butere	-	-	3,594	259
Mumias	-	-	2,916	2,227
			58,949	21,784

Sources: Ministry of Agriculture, Kakamega District
Annual Report, 1976, pp. 22-3.

Ministry of Agriculture, Ikolomani Division,
Bi-Annual Report, January-June, 1974, p.3.

Ministry of Settlement, Agricultural
Section, Lugari Division, Annual Report,
1974, p. 3.

Some of the figures were not available from the referenced documents for these two specified years as is evident from the table. The table, however, shows that nearly all farmers in Lugari grew hybrid maize while a few farmers in Ikolomani area grew local maize. It was indicated by field staff that the crop is grown for cash and food and that farmers are expected to realize an average of 37 bags (90 kg. each) per hectare. We show in the next chapter

that average maize yield per hectare in Ikolomani is 10 to 12 bags and that a large number of farmers realize well below 10 bags of maize per hectare. In Lugari average maize yield ranges from 25 to 30 bags per hectare. These low levels of maize yield, especially in Ikolomani were noted by field staff to be a result of:

- part of the crop is eaten green
- rotting, especially if there are rains at the time of harvest.
- damage by birds, ants, vermin, pests and rodents when the crop is still in the farm or during storage. The growth of the crop might also be checked by army worms or wind-break.

Further all farmers in the sample report interplanting maize with beans and usually obtain 1 to 5 bags or more (90 kg.) of beans from the same unit of land (hectare). Economic calculations of the Ministry of Agriculture based on yields shown in table 4.2 do not take this fact into account. It was, however, indicated by Ministry of Agriculture, Ikolomani Division, Annual Work Programmes (1974:1 - 6, 1975:1 - 6, 1976:1 - 6 and 1977:1 - 5) that maize yields in Ikolomani ranged from 10 to 12 bags per hectare due to problems of: late planting, inadequate weeding, inadequate use of fertilizers and pesticides, low plant population and inadequate storage and that there was potential for increasing maize yields from 10 to 12 bags to 37 to 49 bags per

hectare, through intensification of education efforts and other support services.

(b) The Sugarcane Enterprise

This crop is reported by field staff to have been grown in traditional rural areas of Kakamega district from a much earlier period largely for chewing. More farmers in Ikolomani are reported to have started growing the crop during mid-1960s when jaggery factories were started in the area. The first jaggery factory is said to have been introduced in Ikolomani between 1964-1965 followed by similar factories in late 1960s. It was further indicated by field staff that a small white sugar factory was recently started on the border of Ikolomani and Lurambi divisions. Sugarcane grown in the area is thus sold either for jaggery or for white sugar production.

The acreage under sugarcane in Kakamega district as shown by the Ministry of Agriculture, Kakamega District, Annual Reports (1970:14; 1973:13 and 1976:16) increased from 9,593 hectares in 1970 to 10,189 hectares in 1973 to 13,514 hectares in 1976. Table 4.4 shows the distribution of the acreage under sugarcane in various divisions of Kakamega district during 1976. The table shows that more acreage was under sugarcane in Mumias division, Ikolomani took the second place.

Table 4.4: Distribution of Acreage Under Sugarcane
in Kakamega District According to Division, 1976

Division	Acreage (Hectares)
Mumias - Nucleas Estate	1,366
- Outgrowers	9,856
Ikolomani	967
Lurambi	549
Butere	331
Hamisi	236
Vihiga	209
Total	13,514

Source: Ministry of Agriculture, Kakamega District, Annual Report, 1976, p. 16.

In Ikolomani division itself according to the Ministry of Agriculture, Ikolomani Division, Annual Reports (1973:5; 1975:4; 1976:15), acreage under sugarcane increased from 346 hectares in 1973 to 433 hectares in 1975 to 967 hectares in 1976. Many farmers in this division indicated that sugarcane was the most profitable crop in the area. The Assistant Agricultural Officer, Ikolomani informed us that the crop has attracted many farmers due to the ease with which it is marketed and large lump sum earnings from the crop at each harvest. He pointed out further that sugarcane is widely grown in the sublocations of Lubao, Kambiri and Shikulu and that there are three jaggery factories in the division.

The levels of yield cited in table 4.2 are, however, not obtained by most sugarcane growers due to lack of source for sugarcane planting materials, planting of inferior varieties; usually the top remains of the crop after harvest from a farmer's own or other plot. The Annual Work Programmes cited in (a) above indicate that farmers grow any variety of this crop and that they rarely use fertilizers. These Annual Work Programmes, however, indicate that credit facilities are available for farmers putting up to 2.43 hectares under this crop and that acreage under this crop has to be expanded and farmers made to grow high yielding varieties of this crop.

17 farmers in our sub-sample from Ikolomani had sugarcane plots ranging from 0.10 to 0.60 hectare. Apart from a few cases of inadequate weeding, there was no instance of gross neglect of this crop.

We were informed by Senior Assistant Agricultural Officer, Lugari that sugarcane growing started recently in lower schemes of Lugari, Chekalini, and Lumaganda. He pointed out further that the Agricultural Research Station, Kakamega has found the area to be suited to sugarcane growing although marketing of the crop is the main problem as there are no jaggery or white sugar factories in the area.

(c) The Coffee Enterprise

Coffee was reported by field staff to have been introduced in Ikolomani between 1954-1955. We were informed by the Assistant Agricultural Officer, Ikolomani that farmers in the whole division were during these early years served by Idakho Coffee Society. Isukha Coffee Society was started in 1968 and now together with Idakho Society serve coffee growers in the division. Each of these societies has a factory for partial processing of coffee before marketing. It was, however, pointed out by field staff that coffee has been a very neglected crop in the division from earlier years to about 1975 for the following reasons:

- Coffee factories were built with borrowed funds which had to be repaid over a long period of time. Since the only way of earning income open to these societies was deduction of members' earnings, they passed back to their members very meagre net earnings, a fact which greatly discouraged many members.
- Price of coffee remained low for a long time until 1976 when the 'coffee boom' set in.

Many farmers finding themselves in this critical position either neglected or in some few cases uprooted their crop.

The distribution of acreage under coffee according to society, number of growers and quality of coffee delivered to the societies for the year 1976 is shown in table 4.5. When we compare the number of members for Idakho and Isukha Societies shown in the table and those that were reported by the Ministry of Agriculture, 1969 Coffee Census,¹ we notice that Idakho Society which in 1969 had 392 members had only 343 members in 1976, while Isukha Society which had 459 members in 1969 had only 399 members in 1976. This indicates that there was a drop in membership of these Societies during this period due largely to the above cited reasons. The table shows that despite the smaller acreage devoted to coffee in the district as a whole the earnings from the crop during the year 1976 were very substantial.

Table 4.5: The Distribution of Coffee Growers in Kakamega District According to Cooperative Society, Acreage, Quantity of Coffee Produced, and Earnings, 1976

Society	Acreage (ha.)	Number of Growers	Cherry Produced (Kg.)	Earnings (K.shs.)
Idakho	68	343	33,192	77,883
Isukha	46	399	16,358	30,640
Jebrok	138	1201	196,697	512,388
Wamondo	187	1171	189,298	403,885
Lunyerere	131	1163	119,531	231,548
Bunyore	126	835	33,730	77,883
Kibuma	11	102	-	-
Total	707	5214	588,806	1,334,227

Source: Ministry of Agriculture, Kakamega District, Annual Report, 1976, p. 14.

The Annual Work Programmes cited in (a) above indicate that: first, in early and mid-1970s coffee in Ikolomani area was inadequately mulched, weeded, sprayed, pruned and fertilized and that coffee diseases were common in neglected plots; second, that nearly half of the acreage under coffee in Ikolomani was neglected and that some farmers had uprooted their coffee; finally, that many farmers were discouraged with low and irregular payments for their coffee handed to cooperatives. These various problems show that to some extent the level of yield of coffee in Ikolomani was much lower than that shown in Table 4.2

Despite these cited problems with respect to husbandry of coffee during the early and mid-1970s, the Extension Service as is evident from Ministry of Agriculture, Ikolomani Division, Annual Work Programmes (1974:4 and 1976:4) still emphasized expansion of acreage under coffee and improvement in husbandry practices of this crop which were to be attained through intensification of extension education efforts and support services. It was indicated by Assistant Agricultural Officer, Ikolomani at the time of data collection that cooperative societies in the area had completed repaying the initial loans they acquired for establishing themselves. Coffee price as indicated by Ministry of Agriculture, Ikolomani Division, Annual Report (1977:6) was also very high.

The Secretary Manager of Isukha Cooperative Society indicated that his society was paying its members K.shs. 6/85 per kg. of cherry coffee delivered to the society. Thus farmers were receiving more for their coffee, a fact which made them improve their coffee husbandry or desire to plant the crop.

There were 27 farmers in our sample from Ikolomani who had coffee on their farms. Our assessment of their quality of husbandry of this crop showed that 40.7% of them managed their crop adequately, 11.1% managed their crop poorly, the remaining 48.2% had neglected or uprooted their crop. Husbandry practices varied from conditions of adequate use of fertilizers, pruning, spraying, mulching and weeding to conditions where the crop was overgrown with weeds, or was yellowish indicating little or no use of fertilizers; to conditions where the coffee plot had grown out into a thick bush. Acreage devoted to this crop ranged from 0.10 to 0.41 hectare. The reasons given by the 13 farmers who had neglected or uprooted their coffee for doing so were:

- 69.2% of them indicated that they had not been paid for coffee they had delivered to their societies, that their earnings from coffee were diverted by their societies into other channels.

- 15.4% of them indicated that they uprooted their crop because it was not well suited to soils on their farms.
- 7.7% of them uprooted his crop because the coffee factory was very far.
- 7.7% of them gave the portion of their farms in which they had planted coffee to their sons who neglected it.

In Lugari we were informed by field staff that a little coffee was left behind by the former white settlers or in a few cases farmers themselves have planted the crop after settling. The Ministry of Settlement, Coffee Survey, 1972² indicated that there were only 12.3 hectares under this crop in Lugari Division. Senior Assistant Agricultural Officer, Lugari informed us at the time of data collection that nearly two-thirds of this crop has been uprooted and that half of the remaining acreage under the crop is neglected. He indicated further that Agricultural Research Station, Kakamega has found certain areas of the division, such as Nzoia Scheme to be suitable for the crop.

(d) The Tea Enterprise

This crop is reported by field staff to have been introduced in Ikolomani and other traditional

rural areas of Kakamega District in 1957. The crop is reported by the Ministry of Agriculture, Kakamega District, Handing Over Report (1976:12) to be one of the major cash crops of the district despite the fact that it is only grown in the 'Tea Zone' which covers Vihiga, Hamisi and some parts of Ikolomani division. The report indicates further that planting material and extension education are provided by the Kenya Tea Development Authority (KTDA) while processing of tea produced in this district is done at Chebut Factory in the neighbouring district of Nandi.

Table 4.6 shows that the number of growers, acreage, and earnings from this crop have been increasing over the past years. The breakdown of the information presented in this table on a divisional basis was not available. It was, however, indicated by the Ministry of Agriculture, Kakamega District, Annual Report (1975:17) that most of the expansion of this crop, especially during 1975 occurred in the SRDP areas of Vihiga and Hamisi. The report indicated further that during 1975 the total amount of leaf picked during that year dropped due to problems of less use of fertilizers, neglect of tea by some farmers and high labour costs.

Table 4.6: Number of Growers, Acreage, and
Earnings from Tea in Kakamega
District During 1971, 1973 and 1976

Item	<u>Year</u>		
	1971	1973	1976
Number of Growers	3,225	4,565	5,061
Hectares under Tea	749	1,199	1,501
Amount of Tea Picked (Kg.)	760,034	1,237,588	1,498,880
Value of Earnings	33,442	55,328	84,103

Source: Ministry of Agriculture, Kakamega District,
Annual Reports, 1971:15; 1973:22; 1976:17-18.

It was indicated by the Ministry of Agriculture Annual Work Programmes cited in (a) above that: first, expansion of tea in Ikolomani was unpopular due to the high initial costs entailed; second, that there are no credit facilities for this crop; and finally, that a large number of the tea holdings in the area are small and uneconomic to operate - that because of these problems a third of the crop was neglected; that is, picking is rarely done, fertilizers are hardly used, and so on. It may be concluded from these data that the postulated levels of yield for tea shown in Table 4.2 hardly obtain in Ikolomani. Despite these facts, however, it is indicated by the Extension Service in the above cited Annual Work Programmes that there is considerable potential

for expansion of this crop within the tea zone in Ikolomani. These cited reports indicate that Extension education efforts and support services are to be intensified with an aim of expanding acreage and overcoming the problem of neglect of this crop.

It was indicated by Ministry of Agriculture, Ikolomani Division, Bi-Annual Report (1976:5) that 450 hectares were under tea in Ikolomani in 1976 and that up to 250 tea holdings were neglected during that year. If we assume that the average size of tea holding in Ikolomani was 0.203 hectare, this gives a total of 50.75 hectares that were neglected in 1976. It was further indicated by this cited report that tea planted to 4.86 hectares was uprooted during 1976 giving a total of 55.485 hectares of tea that were either neglected or uprooted during 1976.

18 farmers in our sample in Ikolomani had tea holdings with acreage ranging from 0.10 to 2 hectares; 44.4% of them managed their crop adequately, the remaining 55.6% managed their tea inadequately or they had totally neglected their crop. The reason given by farmers for neglect or poor management of tea is low earnings from this crop which were not enough to pay for labour costs incurred in the crop. Many farmers with holdings of 0.20 to 0.41 hectare indicated that they realized a net monthly payment

of K.shs. 30-80/- for their tea delivered to the Kenya Tea Development Authority (KTDA). A fixed net payment of 57 cts. per kg. of green tea was being paid to tea growers by KTDA. The Assistant Agricultural Officer, Ikolomani observed in this connection that KTDA has imposed a levy on all tea growers for improvement of roads in tea growing areas and that this is the reason why tea growers are being paid very little for their crop.

Tea is not grown in Lugari Division. It is only grown in the eastern part of Ikolomani division.

(e) The Passion Fruit Enterprise

This crop was introduced in Ikolomani in 1974. The Assistant Agricultural Officer, Ikolomani indicated that the passion fruit project was proposed by the Kenya Horticultural Authority to provincial and district agricultural staff who in turn sought the cooperation of field staff and farmers in Ikolomani. A juice extraction plant was to be established as soon as 200 hectares were planted to this crop. It was indicated by Assistant Agricultural Officer, Ikolomani that many farmers showed interest in the crop and that it was not possible to cope with their demands for seedlings and for credit facilities during 1975 and 1976. He pointed out further that towards the end of 1976 a good number of farmers' crop (those

who had adopted the crop early) had come into production, although there was no indication that the proposed extraction plant could be established; that is, there was no market for the crop. This fact made farmers neglect or uproot their crop towards the end of 1976 and in the following year 1977. Surprisingly the Extension Service in its Ministry of Agriculture, Annual Work Programme, Ikolomani Division (1977:5), still emphasized expansion of acreage under this crop to the targeted acreage of 200 hectares which was not easy to realize in a densely populated area like Ikolomani. Two farmers in our sample in Ikolomani had adopted this crop in 1976 (0.20 and 0.10 hectare holdings respectively). Faced with problems of marketing, one of them uprooted while the other neglected his passion fruit.

4.4 CONCLUSION

We have in this chapter examined the structure of the Agricultural Extension Service in Lugari and Ikolomani areas. We have further examined the nature and scope of agricultural extension education messages with regard to major crop enterprises in the study areas and the crop yields that could be obtained where these extension messages were observed. We have also shown that the growing of crops in the study areas has been to some extent responsive to fluctuations in marketing conditions for different crops. Coffee price in early 1970s had been low just as price of tea was low

at the time of data collection; farmers responded by neglecting their crop or in some instances uprooting it. Farmers were forced to neglect or uproot passion fruit due to lack of a market. Prices of coffee and sugarcane were high at the time of data collection and attracted a large number of farmers. The situation concerning dual purpose crops like maize and beans does not differ very much from that concerning pure cash crops; farmers tend to manage these crops better if they foresee possibilities of earning reasonable income from them. This in effect shows that improvement in farm productivity could result largely from farmers' own initiative if marketing conditions for farm produce were improved. We have, however, shown that each crop enterprise had problems, such as lack of/inadequate use of fertilizers, planting / or inferior seed/planting materials, inadequate seedbed preparation, or inadequate weeding. These problems made it difficult for levels of yield postulated by the Extension Service for each enterprise to be attained. This in effect could tend to suggest that farm productivity is likely to be low on the majority of farms in the study areas. Assessment of the extent to which farms in the study areas are productive is done in the next chapter. It is also implicit from these data that planning of extension education activities is not adaptable to local conditions. Assessment of the extent to which extension activities are adaptable to local conditions is done in chapter Seven.

Footnotes to Chapter Four

1. Ministry of Agriculture, Circular Letter from Coffee Officer to field officers dated November 10, 1969, Coffee file, SAAO's Office, Lugari.
2. Ministry of Settlement, Agricultural Section, Letter from SAAO, Lugari to Area Settlement Controller on results of Coffee Survey, 1972, Coffee file, SAAO's office, Lugari.

CHAPTER FIVE

FARMERS' QUALITY OF CROP HUSBANDRY

5.1 INTRODUCTION

The theory and literature review in chapter Two has pointed to the need for an evaluation of productivity of farms in the study areas. Such an evaluation could help to show the extent to which the Ministry of Agriculture's objectives were being attained. This chapter evaluates the extent to which farmers in the study areas manage their crops in accordance with the requirements of the Extension Service shown in table 4.1 in the last chapter. We further find out whether there are any differences in farm performance between farmers in the two study areas. The data presented in this chapter serve as a base for the analysis of the influence of socio-economic factors on farm performance in the next chapter.

5.2 ASSESSMENT OF QUALITY OF CROP HUSBANDRY

The use of extension recommendations cited in table 4.1 in the last chapter was as indicated in chapter Three assessed for maize and any other crop reported by a respondent as an important income earner on his farm. We asked farmers questions about the extent to which they had actually used: fertilizers, pesticides, seeds/seedlings and about the way they had actually spaced and weeded the above two crops. The

information given by the respondent was cross-checked by actual observations on the farm about the extent of use of these farm inputs and the adequacy with which the two specified crops were spaced and weeded. We also made observations about the quality of husbandry of other crops and discussed any relevant issues about the husbandry of these other crops with the respondents.

Recommendations regarding the use of fertilizers on maize are shown in table 4.1. Field staff indicated that fertilizers should be applied at the time of planting maize and at the growing stage when the crop is knee high; single, double, or triple superphosphates or any other suitable compound fertilizer should be applied at the time of planting maize, while a nitrogenous fertilizer should be applied at growing stages. In each case as shown in table 4.1, 100kg. or more of these types of fertilizers should be applied to one hectare. The distribution of farmers in the sample according to area and quantities of fertilizers used per hectare for planting maize in 1977 is shown in table 5.1. Table 5.2 shows a similar distribution of farmers in these areas according to quantities of fertilizers they used for top-dressing maize in 1977. These tables show that more farmers in Lugari use both types of fertilizers than those in Ikolomani.

Table 5.1: Distribution of Farmers in Ikolomani and Lugari Areas According to Quantities of Fertilizers Used for Planting Maize per Hectare, 1977

100 kg. of Fertilizer Used per Hectare	Lugari	Ikolomani	Total
None used	6	63	69
Less than 25kg. used	-	6	6
26 - 50 kg. used	5	8	13
51 - 75 kg. used	10	6	16
76 - 100 kg. used	32	12	44
101 kg. and over used	12	3	15
Total	65	98	163

$$\chi^2_c = 59.080 > 20.517, \quad df = 5, \quad p = 0.001;$$

$$C = 0.52$$

Table 5.2: Distribution of Farmers According to Geographic Areas and Quantities of Fertilizers Used for Top-dressing Maize, 1977

100 kg. of Fertilizer used per Hectare	Lugari	Ikolomani	Total
None used	28	89	117
Less than 25 kg. used	7	1	8
26 - 50 kg. used	2	3	5
51 - 75 kg. used	7	1	8
76 - 100 kg. used	13	3	16
101kg. and over used	8	1	9
Total	65	98	163

$$\chi^2_c = 40.520 > 20.517, \quad df = 5, \quad p = 0.001, \quad C = 0.45$$

It was, however, evident that some farmers had used fertilizers at planting and not for top-dressing or vice versa. Extension recommendations mentioned above indicate that both types of fertilizers have to be used successively. Table 5.3 shows those farmers who had used both types of fertilizers during 1977. The table shows that 56.9% of the 65 farmers from Lugari compared to 9.2% of the 98 farmers from Ikolomani used both types of fertilizers on their maize crop during 1977.

Table 5.3: Distribution of Farmers Who Had Successively Used Fertilizers for Planting and Top-dressing Maize According to Area and Rate of Use, 1977

100 kg. of Fertilizer Used per Hectare	Lugari %	Ikolomani %
Up to 25 kg. used	-	11.1
26 - 50 kg. used	8.1	11.1
51 - 75 kg. used	8.1	22.2
76 - 100 kg. used	56.8	22.2
101 kg. and over used	27	33.4
Total	100	100
Base	(37)	(9)

These rates of fertilizer used were obtained by dividing the total number of 50 kg. packets of fertilizer used by the hectareage devoted to maize over which the fertilizer was applied.

The following observations about acquisition and use of fertilizers were made by 141 farmers in the sample:

- 66% of these farmers indicated that price of fertilizer and costs of transporting the fertilizer from Kenya Farmers Association (KFA) or other stores were high. The price of triple superphosphate was reported to have been Shs. 110/- in 1977 while that of single superphosphate was Shs. 72/50 during the same year. Farmers living far from KFA stores reported using 3-5/- for transport of each 50 kg. packet of fertilizer. A large number of these farmers indicated that they do not use fertilizer due to lack of cash. Some had many children in school, sickness at home or other problems which made it difficult for them to buy fertilizers.

- 17.7% of them indicated that it was not easy for them to obtain fertilizers at the time of planting due to a high demand for it at this time. Some had no cash to buy fertilizers early enough or did not have enough cash to buy large quantities and hence be served first or were unknown to the sellers and were therefore

not attended to. In some cases fertilizers were reported to be unavailable in many KFA stores. These various problems are reported to force farmers to plant their crops late.

- 2.8% of them indicated that fertilizers are given late by their cooperatives, or farm credit is often given late forcing them to receive their fertilizer requirements late.
- 1.4% of them complained of buying inferior type of fertilizers than the ones recommended for the study areas.
- 1.4% of them indicated that they do not use fertilizers due to smallness of their farm units.
- 0.7% of them indicated that they do not use fertilizers because they heard from neighbours that fertilizers harden the soil and make it unsuitable for crops.
- 10% of them indicated that they had no problems with acquisition and use of fertilizers. Some indicated that they are given fertilizers by their cooperatives or buy it early enough to permit them plant crops on time.

These comments show lack of use of fertilizers to be associated largely with lack of money. They also show that although farmers may have money it may be used for certain other purposes, such as school fees payments rather than for investment in farming through buying fertilizers. It is also evident that fertilizers may not be available in the community at the time when they are needed, or farmers may have to obtain them from far and face high transport costs. Where credit arrangements are possible through cooperatives or other lending institutions, the farmer may receive his fertilizer requirements late and end up planting his crops late. It was also clear that some farmers do not use fertilizers due to the smallness of their farm units, or because they feared that fertilizers could harden the soils in their farms and make it unsuitable for growing of crops.

Nearly 70% of farmers in the sample mention beans as the other important crop on their farms. Beans are usually interplanted with maize and utilize the same fertilizers applied to maize. Another 10% of farmers in the sample report sweet potatoes, millet, sorghum, vegetables, bananas, etc. as the next important crops on their farms, fertilizers are rarely used in these crops. The remaining 20% of farmers in the sample report tea, coffee, sugarcane, passion fruit and sunflower as other important crops on their farms. Table 5.4 shows the reported use of fertilizers on

these cash crops. A large proportion of farmers shown in this table (up to 32 of them) were from Ikolomani. The table shows that 64.7% of these 34 farmers had not applied fertilizers on their above crops for a full year ranging from 1976 to the time of data collection in 1977.

Table 5.4: Reported Use of Fertilizers on Other Crops During 1976/1977

Crop Enterprise	None % Used	Some % Used
Tea	36.4	50
Coffee	13.6	33.3
Sugarcane	40.9	-
Passion fruit	9.1	-
Sunflower	-	16.7
Total	100	100
Base	(22)	(12)

Recommendations regarding the use of seed/seedlings are shown in table 4.1 in the last chapter. We examined the types of maize seed used by farmers during 1977. We did not go into details of variety of maize seed used, but simply asked farmers whether the maize seed they used was local, hybrid, or a mixture of these two. We also made observations on the farm with a view to finding out whether the seed used was hybrid or local seed. The distribution of the sample of farmers according to the type of seed

used is shown in table 5.5. The table shows that while a large number of farmers in Lugari area planted hybrid seed, slightly more than a third of the farmers in Ikolomani planted local and hybrid seed either in the same field or in different fields, or they planted pure local seed.

Table 5.5: Distribution of Farmers in Lugari and Ikolomani Areas According to Type of Maize Seed Planted in 1977

Type of Seed Planted	Lugari	Ikolomani	Total
Hybrid	59	59	118
Hybrid plus local	6	33	39
Local	-	6	6
Total	65	98	163

$$\chi^2_c = 16.260 > 13.815, df = 2, p = 0.001. C = 0.09$$

We also found 12.2% of the 98 farmers from Ikolomani and 4.6% of the 65 farmers from Lugari to have used less seed per hectare than that recommended; that is, they had spread less seed to larger acreage.

In Ikolomani the following additional information on the use of seed was obtained: first, 2% of the farmers reported that they had more hybrid seed than they required and had to sell the surplus to the neighbours; second, 7.7% reported joining hands with other farmers in the area to buy a packet of

hybrid seed; finally, 11.2% bought all or part of their seed on a 'per kilo basis' from nearby market centres - they indicated that traders in these market centres split the 10 kg. or larger seed packets and sell them in smaller quantities.

We also examined the use of seed/seedling in other crops; coffee seedlings are often given by cooperatives on credit, tea planting materials are given by Kenya Tea Development Authority (KTDA). Cooperatives in Ikolomani also extended credit in the form of maize, bean, and sunflower seed to their members, the number of farmers in our sample who benefited from this form of cooperative credit was very small. Most farmers in our sample reported buying their own seed and other farm inputs; most of them obtain their bean seed from previous harvest. Farmers as indicated in chapter Four find their own sugarcane planting material.

The use of hybrid seed is, however, more widespread than the use of fertilizers. The first reason why this is so is that price of maize seed is much lower than price of fertilizers. We were informed by KFA staff, Kakamega, that a 10 kg. packet of hybrid maize seed was sold at Shs.32/= during 1977. In comparison a 50 kg. packet of one of the cheapest fertilizers, single superphosphates, was sold at Shs.72/50 during that year. The second reason is that a large number of

farmers in Ikolomani exhaust their maize harvest before the time for planting of the next season's crop and are forced to buy maize seed not only for planting but also for home consumption.

The recommendations on the third farm input namely pesticides are also shown in table 4.1 in the last chapter. Pesticides are recommended for pest control and are either used in dust or liquid form. They are popularly known as 'dawa' or 'olunyasi' although these local terms are also used for fertilizers. The pests involved include stalkborer, army worms, leaf minor, etc. DDT is widely used for pest control on maize in Lugari. Extension recommendations shown in table 4.1 indicate that pest control on maize as well as pest and disease control on coffee is necessary. Farmers' responses on the use of pesticides on their maize crop during 1977 are shown in table 5.6.

Table 5.6: Distribution of Farmers in Lugari and Ikolomani Areas According to Use of Pesticides on Maize During 1977

Whether Pesticides Used	Lugari	Ikolomani	Total
Yes	50	2	52
No	15	96	111
Total	65	98	163

$$\chi^2 = 100.850 > 10.827, \quad df = 1, \quad p = 0.001$$

The table shows that the use of pesticides which is almost non-existent in Ikolomani is fairly widespread in Lugari. The amount of pesticides used varied with acreage under maize, intensity of pest attack, and on the financial position of a farmer. Three farmers with 10, 12 and 12 hectares under maize had spent Shs.200/- (i.e., Shs.20 per hectare), Shs.200/- (i.e., Shs.16/70 per hectare), and Shs.145/- (i.e. Shs.12/10 per hectare) on pesticides respectively. These were the largest expenditures on pesticides reported by farmers in our sample; they were all from Lugari area. A few farmers who use pesticides in dust form reported mixing them with ash so as to cover a wider area.

48 farmers (48.9%) in the sub-sample from Ikolomani complained of army worms outbreak on their maize during 1977. Some indicated that damage caused by these pests was severe and forced them to replough their fields and to plant afresh. Others indicated that they had to buy seed and replant within the same field without reploughing. It was only one farmer among these 48 who bought pesticides for control of these army worms. The reasons given by the remaining 47 farmers for failure to use pesticides to control army worms were:

- 36.1% of these farmers pointed out that they had no money to buy pesticides.

- 4.3% of them asked their cooperatives to give them pesticides but were not given as the cooperatives had not stocked them.

- 25.5% of them had heard that pesticides for control of army worms could be found in Assistant Agricultural Officer's office, Ikolomani. Some reported that they received this information late, after the damage had already occurred. Others reported that they called at the Assistant Agricultural Officer's office and were informed that pesticides had been exhausted.

- 4.3% of them pointed out that the damage was not severe, that the pests were destroyed by rains before they did much harm, or that the damage was less severe due to the fact that the crop was high enough at the time of attack.

- 25.5% of them had been scared to go for pesticides due to the ill experiences of some other farmers in the area who had previously used such pesticides. They pointed out that the pesticides which had been used had not eradicated army worms and had scotched (burnt) maize and beans.

Some of them wondered whether pesticides could destroy such a large number of pests; some had never heard of any pesticides that could destroy army worms.

- 4.3% of them gave no answer.

These reasons are mixed and range from lack of cash to lack of knowledge or confidence in the use of pesticides for control of army worms. The use of pesticides, however, as has been shown above does not entail the use of more money as in the case of fertilizers. The failure of farmers in Ikolomani to use these pesticides is due to the above cited reasons as well as to local adaptations to this problem, for example, a large number of farmers in the study areas smear the tips of their maize ear with wet mud, dung or ash immediately after flowering to reduce damage from certain pests.

Coffee is normally sprayed by cooperative societies on credit. Not much spraying is recommended for tea or sugarcane. Pesticides are rarely used on other crops named above.

In sum, although half of the farmers in Lugari use fertilizers in quantities recommended by the Extension Service only about 5% of those in Ikolomani do so. Table 5.5 shows that while 90% of

farmers in Lugari grow pure hybrid maize seed, only 60% of those in Ikolomani do so. Table 5.6 shows that pesticides although used by 76% of farmers in Lugari, are used by only 2% of farmers in Ikolomani. Although these statistics largely refer to farmers' maize husbandry practices, it was evident that the same trend seemed to spread out to other crops. It could also be that the same trend is evident in the two crop cultural practices of: spacing, and weeding of crops. How far is this true?

We were informed by agricultural field staff that in Ikolomani where plot sizes are very small, thick spacing of maize (75 cm. x 15 cm; 75 cm. x 23 cm; 75 cm. x 30 cm) is recommended while in Lugari where plot sizes are large farmers could use thick spacing or much wider spacing (90cm. x 30cm. one seed per hole, or 90cm. x 30cm. two seeds per hole). They indicated that thick spacing requires more fertilizers due to the large plant population involved. For recommended spacing to be achieved tractor planting or the use of a rope and measuring instruments is called for, a fact which necessitates the use of more labour and money due to innumerable activities involved. The distribution of farmers according to their own reports and our observations of their spacing of maize is shown in table 5.7.

Table 5.7: Distribution of Farmers in Lugari and Ikolomani Areas According to How They Had Spaced Maize During 1977

How Spacing Done	Lugari	Ikolomani	Total
Adequate	39	46	85
Inadequate	26	52	78
Total	65	98	163

$$\chi^2 = 2.763 < 6.635, \text{ df} = 1, p = 0.05$$

The table shows that the way farmers spaced their crops in Lugari did not differ significantly from that in Ikolomani. Adequate spacing was that which approximated what was recommended by the Extension Service shown in Table 4.1. Inadequate spacing refers to situations where farmers plant in lines but never attain the above recommended spacing; some use oxen ploughs for planting, others do not use ropes and other measuring instruments, while others lack the necessary knowledge on how to space their crops. A large number of farmers who do not space their crops as recommended simply dig holes, throw in seed, and cover the seed with soil; they estimate distances largely by 'pacings' or by conventional wisdom. By so doing they fail to maintain recommended distances from line to line and from plant to plant within any one line. Some farmers in the sub-sample from Ikolomani never planted their maize in lines; they broadcasted their seed.

Although there was not much disparity in the spacing of maize between farmers in the two study areas, it was clear from our field observations that spacing of maize was better done and recommended measures better known in Lugari than in Ikolomani. A few farmers in Lugari use tractors for planting.

The spacing of tea, coffee, and passion fruit is often done with the help of extension staff. The situation regarding spacing of beans, sugarcane, sunflower and other similar crops is identical to that of maize.

Finally, the number of weedings needed for a particular crop are also specified by extension recommendations as shown in table 4.1 in the last chapter. The actual number of weedings done will, however, vary from one farm to another due to: quality of seedbed - if the seedbed was hurriedly prepared then, more weedings may be needed, the nature of the soil and types of weeds prevalent in the soil, and so on.

We observed the extent to which farmers in the sample had weeded their maize and found that nearly 75% of them from both areas had adequately weeded their maize as recommended. The remaining 25% had either neglected their crop completely, or had weeded one portion of the field and left another to

be overgrown with weeds, or weeded the whole field only once which was not enough and thus the field had been overgrown with weeds.

We indicated in the previous chapter that most farmers in Ikolomani had improved management of coffee and were weeding it regularly at the time of data collection. Tea and passion fruit were largely neglected due to poor marketing opportunities. The situation regarding weeding of sugarcane and other crops is very much similar to that regarding the weeding of maize.

In sum, spacing of crops seems better done in Lugari than in Ikolomani. There is not much disparity in the extent to which crops had been weeded in the two study areas. It was, however, clear that farmers were weeding their coffee more frequently in response to high coffee price prevailing at the time of data collection and had neglected tea for which they earned very little and passion fruit for which there was no market. We indicated in the last chapter that a large number of farmers in the study areas had neglected or uprooted their coffee during the early 1970s and that many of them were coming forward to be allowed to grow coffee at the time of data collection. We also indicated that a large number of farmers were making efforts to grow sugarcane due to availability of a ready market and large

earnings from this crop at each harvest. These observations reinforce those of Raikes P.L. and Meynen W.L. (1972:34) that peasants often respond favourably to economic opportunities. Thus for cash crops like tea, passion fruit, sugarcane and coffee it is not just the high yield that motivates farmers to manage these crops adequately, but also the convenience of marketing and likely earnings from these crops.

We indicated that this assessment of farmers' performance was to go beyond mere adoption of innovations; that is, it was concerned with the way innovations are managed after adoption. Thus while we found that a large number of farmers had used some fertilizers on their maize during 1977, it was only 31% of farmers in Lugari and 5.1% of farmers in Ikolomani that had used fertilizers on this crop in desired quantities. Many farmers spread smaller quantities of fertilizers to larger acreage than that recommended. This in effect shows that while adoption of a recommended farm input or practice may take place, it might not be to the standard desired by the Extension Service.

We found 90% of farmers in Lugari to grow hybrid maize seed compared to 60.2% of those in Ikolomani; the remaining farmers in both areas mix hybrid seed with local maize seed or grow pure local maize seed. 12.2% of farmers in Ikolomani

compared to 4.6% of farmers in Lugari use less seed than recommended per hectare; that is, they spread smaller quantities of seed to larger acreage than recommended. Pesticides are almost unknown and are rarely used in Ikolomani; 2% of farmers in Ikolomani compared to 76.9% of farmers in Lugari used pesticides on their maize in 1977. Some farmers report mixing these pesticides with ash to cover larger acreage. The adoption of weeding and spacing was much better in both areas.

These data reinforce P.M. Mbithi's (1974:56-58) observations cited earlier that research recommendations from Agricultural Research stations specify quantities of farm inputs that are more suitable for the large rather than small scale farmer. Most small scale farmers as indicated above respond to these recommendations by spreading farm inputs to larger acreage than recommended, mixing local with hybrid maize seed, and so on. The data further reinforce Rogers E. and F.F. Shoemaker's (1971:154) observations that innovations which are relatively simple and which in the views of their users do not entail the use of enormous resources which they may not have will be readily and better adopted than those which are complex and costly to adopt. Fertilizer, for example, is not only expensive to buy, but it is bulky and expensive to transport; its application is equally complex calling for use of

more labour which may not be available on the farm. Certain other innovations, such as hybrid seed are not costly nor bulky and expensive to transport and are widely adopted while certain innovations, such as pesticides are less costly but are not adopted because of lack of knowledge about them. Thus although these various farm inputs and practices could help farmers to realize higher yields than where they are not used, they are as Rogers and Shoemaker (1971: 141-144) have noted, not widely adopted due to issues of cost and convenience, or even because of lack of knowledge about them.

In sum, extension recommendations on the use of fertilizers, pesticides, seeds and on spacing of crops are better observed by farmers in Iugari than those in Ikolomani area. There is not much disparity in the way crops are weeded by farmers in the two areas. Factors accounting for differences in the use of farm inputs and practices include those of cost, convenience and lack of knowledge about the benefits of these innovations.

5.3 EXTENT TO WHICH QUALITY OF CROP HUSBANDRY WAS ADEQUATE

We have noted A.E. Suchman's (1967:6) observations cited earlier that the success or failure of a public service programme could be determined by an evaluation of the extent to which its objectives

are being met. We have further noted that agricultural programmes aim at increasing incomes, employment opportunities, etc. of rural farm families (Development Plan, 1974-1978, Part I:197). Mbithi P.M. (1974:41) has further observed that marginal areas of this country suffer from constant food shortages. Thus if we assume that the objectives of agricultural programmes in this country are: to increase incomes, food and employment opportunities, etc. then, to what extent is farm productivity in the study areas high enough to meet these aims?

To be able to answer this question we gave scores to farmers based on the extent to which they were practically using extension recommendations already discussed. The scores were given as follows:

- (a) Fertilizer at planting: farmers who used 75kg. or more of this type of fertilizer per hectare received three (3) scores, those who did not use fertilizer at planting received zero (0), the rest received intermediate scores within this range.
- (b) Fertilizer for top-dressing: those who used up to 75 kg. or more of this type of fertilizer got three (3) scores, those who did not use this type of fertilizer got zero (0), while the

rest got intermediate scores within this range.

- (c) Type of seed/seedlings: farmers who used recommended seed/seedlings scored three (3) points, those mixing recommended seed/seedlings with local ones got one and half (1.5), while those using local seed/seedlings got zero (0).
- (d) Pesticides: farmers who used some pesticides scored two (2) points, those who never used pesticides got zero (0).
- (e) Spacing: farmers who achieved recommended spacing or those who operated close to the recommended spacing scored three (3) points, those who had planted in lines without observing recommended spacing scored one and half (1.5), the rest who never planted in lines got zero (0).
- (f) Weeding: farmers who according to their reports and our observations had weeded their fields clean scored two (2) points, those whose fields were not cleanly weeded scored one (1), while those who had neglected their crop got zero (0).

The scores were given for maize and any other crop reported by the farmer as an important crop on the farm. The maximum number of scores that could be received by a farmer was sixteen (16) and was attained by a good number of farmers in Lugari area. The minimum scores which were received by a few farmers in Ikolomani area were two (2) points. With the help of these scores we created five categories of this factor as follows: 14 or more scores, 11-13.9, 8-10.9, 5-7.9, and 2-4.9 scores. We thereafter distributed farmers in the two study areas according to these scores as shown in table 5.8. The table shows that farmers in Lugari on the average manage their crops better than those in Ikolomani.

Table 5.8: Distribution of Farmers According to Area and Quality of Management of Crops

Farmers' Performance (Scores)	Geographic Area		
	Lugari	Ikolomani	Total
14.0 and over	21	4	25
11.0-13.9	20	7	27
8.0-10.9	18	24	42
5.0- 7.9	5	37	42
2.0- 4.9	1	26	27
	65	98	163

$$\chi^2 = 68.600 > 18.465, \text{ df} = 4, p = 0.001, C = 0.54$$

Table 5.9 shows the distribution of the exposed and non-exposed groups of farmers according to their performance. The table shows that farmers in the exposed group on the average do much better in their crop husbandry practices than those in the non-exposed group.

Table 5.9: The Distribution of the Exposed and Non-exposed Groups of Farmers According to their Performance

Farmers' Performance (Scores)	Exposed Group	Non-exposed Group	Total
14 or more scores	19	6	25
11-13.9	24	3	27
8-10.9	24	18	42
5- 7.9	17	25	42
2- 4.9	6	21	27
Total	90	73	163

$$\chi^2 = 32.280 > 18.465, \quad df = 4, \quad p = 0.001, \quad C = 0.41$$

We further correlated farmers' performance to crop yield; we asked farmers in our sample about their actual or anticipated maize yields in 90 kg. bags for the year 1977. Farmers in Lugari usually shelled their maize after harvest and were very clear about the number of bags they had or hoped to realize in 1977 as in other previous years. A large number of farmers in Ikolomani never shelled their maize and

in many instances could not tell the number of bags they realized or hoped to realize during 1977. Through observations of quantities of unshelled maize already harvested or still in the field, we were able with the help of agricultural field workers to estimate the likely yield of maize that could be realized by these farmers.

With these estimations and farmers' actual reports of maize yield for 1977 we categorized yield as follows: up to 6.9 bags; 7-13.9; 14-20.9; 21-27.9; 28-34.9; 35 or more bags with 3.5, 10.5, 17.5, 24.5, 31.5 and 38.5 scores as the respective mid-points of these six categories of yield.

To be able to correlate this factor of yield to farmers' performance, we used categories of the latter factor cited in table 5.8 namely: 2-4.9 scores; 5-7.9; 8-10.9; 11-13.9; and 14 or more scores with 3.5, 6.5, 9.5, 12.5 and 15.5 as the respective mid-points of these five categories.

With these categories and mid-points we correlated farmers' performance to yield as shown in table 5.10. The table shows that farmers who manage their crops to the standard recommended by the Extension Service had higher yields on the average than those who never managed their crop to the standard recommended by the Extension Service. It was not possible to

similarly estimate the yields of other crops. It may, however, be that what is true of maize is true of other crops. It is clear from these data that the level of yield is higher for farmers in Lugari and for those in the exposed group than it is for farmers in Ikolomani or in the non-exposed group.

Table 5.10: Relationship Between Farmers' Performance and Maize Yield Realised by Farmers Per Hectare, 1977

Farmers' Performance (Mid-scores)	Yield of Maize (Mid-points)						Total
	(3.5)	(10.5)	(17.5)	(24.5)	(31.5)	(38.5)	
(15.5)	0	0	4	5	3	13	25
(12.5)	0	3	9	7	6	2	27
(9.5)	1	11	24	6	2	1	45
(6.5)	6	21	14	1	0	0	42
(3.5)	9	14	1	0	0	0	24
Total	16	49	52	19	11	16	163

$$r = 0.758 > 0.256; \quad p = 0.005$$

To be able to readily compare farm performance in the two areas we distributed our sample of farmers such that nearly 50% of respondents performed adequately while the rest performed inadequately. That is, using data in table 5.8 we treated all those who scored 8 or more points as having done adequately and the rest as having done inadequately. With these two categories of farm performance we distributed farmers in the two

study areas as shown in table 5.11.

Table 5.11: Distribution of Farmers in Lugari and Ikolomani Areas According to Adequacy of their Farm Performance

Farm Performance	Lugari	Ikolomani	Total
Adequate (8 scores or more)	59	35	94
Inadequate (7.9 score and under)	6	63	69
Total	65	98	163

$$\chi^2 = 48.522 > 10.827, df = 1, p = 0.001$$

This table like table 5.8, shows that there is significant difference in adequacy of crop husbandry between farmers in Lugari and those in Ikolomani. It is evident from the table that 90% of farmers in Lugari manage their crops adequately compared to 35% of those in Ikolomani. Since low farm performance leads to lower crop yields, it may be concluded that farm productivity on nearly 65% of the farm units in Ikolomani and about 10% of the farm units in Lugari is much lower. Thus the problems of low incomes, low employment opportunities, etc. cited by the Kenya Development Plan (1974-1978:197) are likely to prevail in Ikolomani where the majority of farm units are lowly productive. P.M. Mbithi's (1974:41) observations that some of the marginal areas in this country suffer from food shortages might also be true in a high

potential area of Ikolomani. Is it really so?

We asked a total of 133 farmers (78 from Ikolomani and 55 from Lugari) whether the maize yield they had reserved for home consumption each year usually helped them to reach the next harvest or whether they were compelled to buy maize each year for their home consumption; the question could not be administered to the total sample as it was developed in the field. The responses of these farmers are shown in table 5.12 which shows that 78.2% of these farmers in Lugari compared to only 34.7% of those in Ikolomani had sufficient yield to store enough of it to last them until the next harvest of maize each year (see first column of the table).

Table 5.12: Responses of Farmers in the Two Research Areas About Adequacy of Maize Yields They Harvested

Period Maize Harvest Lasts	Lugari %	Ikolomani %
10-12 months until next harvest	78.2	34.7
7-9 months (we buy some maize)	1.8	14.1
4-6 " "	-	6.4
1-3 " "	-	3.8
Unspecified period "	20	41
Total	100	100
Base	(55)	(78)

The rest indicated that although they may sell part of their yield at harvest time, they are forced to buy maize at a later date when there is shortage; others indicated that they did not have enough harvest to sell or even to reserve for home consumption. This situation of insufficient maize yield is similar to that found by Roling N. et.al. (1973:3) in Tetu division of Nyeri district in this country where although hybrid maize had been introduced in 1964, it had by 1970 been adopted by only 30% of farmers in this area. They indicated that up to 60% of Tetu farmers by 1973 still bought maize for their home consumption needs each year.

Thus the problem of low productivity of the majority of small scale farms leads to food shortages not only in low potential areas as indicated above, but also in high potential areas like Ikolomani. Low productivity also means insufficient incomes, insufficient employment opportunities, and insufficient produce to market on the majority of farms in Ikolomani. This makes it clear that while objectives of the Ministry of Agriculture cited above are being attained on the majority of farms in Lugari, they are rarely attained on the majority of farms in Ikolomani.

5.4 CONCLUSION

It is evident from the foregoing analysis and discussion that the use of recommended farm inputs

and practices in Ikolomani area was not to the level recommended by the Extension Service. There was total lack of use of these farm inputs in many cases, or spreading of these inputs to larger acreage, or mixing of hybrid with local maize seed, etc. These and other problems cited with regard to use of these farm inputs and practices led to low productivity on up to 65% of the farm units in Ikolomani area. In Lugari area nearly 90% of farmers observed extension recommendations with regard to use of farm inputs and practices and realized higher crop yields than a large number of their colleagues in Ikolomani. These data do not reinforce the arguments in chapter One and Two that farm productivity is low on the majority of farm units in this country largely due to the ineffectiveness of the Extension Service. If it is really true that the Extension Service in the study areas is ineffective then, what factors could help to explain the vast differences in farm performance between farmers in these areas? The answer to this question is provided in the next chapter which examines the influence of a few socio-economic factors on farmers' performance in crop farming.

CHAPTER SIX

THE INFLUENCE OF A FEW SOCIO-ECONOMIC FACTORS ON FARMERS' PERFORMANCE IN CROP FARMING

6.1 INTRODUCTION

The discussion in chapters One and Two show that the Extension Service is ineffective in small scale farming areas in this country. This being the case, it is likely that organizational factors postulated for this study (see chapter Three) may not adequately help to explain the vast differences in quality of crop husbandry between farmers in the two study areas. This could then mean that differences in farm performance between farmers in the two areas could be explained by socio-economic status factors which were discussed in chapter Two. This chapter examines the influence of a few socio-economic factors on farmers' performance with a view to finding out whether any one of these factors could help to explain the vast differences in farm performance between farmers in Iugari and those in Ikolomani. The data presented in this chapter should help to test hypothesis No. 1 namely that: 'the higher the farmers' socio-economic status (SES) scores, the higher their farm performance'.

6.2

RELATIONSHIP BETWEEN SOCIO-ECONOMIC
FACTORS AND FARMERS' PERFORMANCE

It was clear from the discussion in chapter three that age, formal education, amount of resources possessed by a farmer, size of farm, exposure to sources of extension education, knowledge, etc. influence adoption of farm innovations. This study specifically examines the influence of the following factors on farmers' performance:

- (a) Farmers' knowledge in crop farming.
- (b) Economic status of farmers.
- (c) Formal education attained by farmers.
- (d) Age of farmers.

The extent to which farmers were knowledgeable about improved crop farming was assessed by asking them questions and assigning scores to their responses on the following:

- (a) Acreage under any two crops on the farm.
- (b) Type (variety) and quantities (per hectare) of seeds/seedlings planted.
- (c) Name and quantities (per hectare) of fertilizers used for planting.
- (d) Name and quantities (per hectare) of fertilizers used for top-dressing.
- (e) Name and quantities of dusts applied.

- (f) Actual or likely yield (bags, kgs., tonnes, etc.) per hectare.
- (g) Spacing of the two crops.

A correct response to any of these items earned a farmer three (3) scores, a 'don't know' earned him zero (0) while incorrect responses received intermediate scores within this interval. A total of 21 points could be scored at the most.

Farmers' knowledge of recommended farm inputs and practices was very low, especially in Ikolomani. A large number of farmers in Ikolomani did not know the acreage of their land or even what a 'hectare' is. Asked what type of maize seed they had planted during 1977, many farmers said it was 'Kitale' or 'hybrid' and seemed not to know its exact variety; some farmers simply indicated that it was the 'tall type of maize'. In Lugari most farmers (both men and women) knew acreage of their land and variety of maize seed planted during 1977 and in previous years. They also knew and readily approximated the acreage under different crops on their farm.

In Ikolomani pesticides are popularly known as 'dawa' and yet when farmers are asked about the particular type of dawa they used during 1977 or in any previous years, most of them do not know. Asked what their actual or expected yields for

maize for 1977 harvest were, many farmers in Ikolomani point out that they store their harvest before shelling it and have no idea as to how many bags they get each year; many of them are unable to estimate the number of bags of shelled maize consumed at home and those sold. They indicate that they put the harvest in the granary and take it out little by little which they shell both for sale and for home consumption.

As regards spacing many farmers do not know the recommended spacing, or give widely differing answers from the recommended standards. Some farmers pick up a stick to illustrate the spacing they used from line to line and plant to plant within the line from particular lengths of that stick. Some stood up and showed us the spacing they used by pacing on the floor or yard. In Lugari farmers were knowledgeable about spacing as well as about expected or actual yields of various crops and about types of pesticides they use.

Many farmers in Ikolomani as already indicated do not use fertilizers. Asked the different types of fertilizers that they could use if they wanted to, or which they had used in previous years, many of them even those who had used fertilizers in 1977 could not remember the names of these fertilizers. In Lugari a large number of farmers had to look for fertilizer packets to confirm the names of fertilizers

they had used in 1977 or previously. Most farmers simply informed us that the fertilizer used was either 'black' or 'white' or that it looks like 'green peas'. Knowledge of recommended types of fertilizers was much less in Ikolomani than it was in Lugari area.

This assessment of knowledge in crop farming was aimed at finding out how informed farmers were about recommended farm inputs and practices irrespective of whether they were using such inputs and practices. Assessment of farm performance was on the other hand based on actual adoption and management of agricultural inputs and practices irrespective of whether farmers were knowledgeable about them or not. Such knowledge of recommended farm inputs and practices is acquired from exposure to extension efforts of farmer education - courses, demonstrations, radio agricultural broadcasts, farm papers, farm visits, and so on. Using the scoring system already outlined we categorized this factor as follows: 15 or more scores, 12-14.9, 9-11.9, 6-8.9, and under 5.9 scores; with 16.5, 13.5, 10.5, 7.5 and 4.5 scores as the mid-points of these categories.

We distributed farmers in Lugari and Ikolomani areas according to their level of knowledge in crop farming as shown in table 6.1. The table shows farmers in Lugari to be better

knowledgeable in crop farming than those in Ikolomani. Table 6.2 shows a further distribution of farmers in the exposed and non-exposed groups according to their level of knowledge in crop farming. The table shows members of the exposed group to be on the average better knowledgeable than those of the non-exposed group. This in effect means that this factor may help to explain differences in quality of crop husbandry between the two study areas and between the two groups in the sample.

Table 6.1: Distribution of Farmers in Ikolomani
 and Lugari Areas According to their
 Knowledge in Crop Farming

Knowledge in Farming	Lugari	Ikolomani	Total
15 and above scores	17	0	17
12-14.9	24	5	29
9-11.9	17	32	49
6- 8.9	7	38	45
Under 5.9	0	23	23
Total	65	98	163

$$\chi^2 = 77.040 > 18.465, \quad df = 4, \quad p = 0.001,$$

$$C = 0.57$$

Table 6.2: Distribution of Farmers in the
Exposed and Non-Exposed Groups
According to Their Knowledge in Crop Farming

Knowledge in Farming	Exposed Group	Non-Exposed Group	Total
15 and above scores	14	3	17
12-14.9	22	7	29
9-11.9	33	16	49
6-8.9	17	28	45
Under 5.9	4	19	23
Total	90	73	163

$$\chi^2 = 31.810 > 18.465, df = 4, p = 0.001, C = 0.40$$

The second factor economic status was assessed by finding out the amount of properties possessed by a respondent as well as his other income earning opportunities. A scoring system was used to arrive at different categories of this variable as follows:

- (a) Size of farm in hectares: farmers with up to 0.50 hectare received zero (0), those with 0.60 to 1.5 hectares received one (1), those with 1.6 to 2 hectares received two (2), while those with 2.1 or more hectares received three (3) scores.

- (b) Paid farm workers : one (1) score for each farm worker employed up to a maximum of three (3) scores.
- (c) Wives in paid employment : 1 score for each wife in paid employment (or for husband in case of female farmer) up to a maximum of 3 scores.
- (d) Sons and daughters in paid employment : 0.25 score for each up to a maximum of 2 scores.
- (e) Respondent himself in paid employment : 1 score.
- (f) Type of house: zero score for a local house built of mud and poles, 1 score for a semi-permanent house, and 2 scores for permanent house. The scores were given for any one best house in the home.
- (g) Tractor, plough, wheelbarrow, oxcart/handcart, radio, bicycle, motorcar, sofas, table clock/watch, sewing machine, spray pump, and permanent/semi-permanent store - 1 score for each of these properties.

(h) Commercial properties, e.g. shop, butchery, and so on. 2 scores for permanent and 1 score for semi-permanent commercial property.

(i) Livestock:

- Grade cattle: 1 score for 1 to 2 animals, 2 scores for 3 to 5 animals, and 3 scores for 6 or more animals.
- Native cattle: 1 score for 1 to 4 animals, 2 scores for 5 to 8 animals, and 3 scores for 9 or more animals.
- Small livestock: sheep, goats, pigs, etc. - 1 score for 1 to 6 animals, 2 scores for 7 to 12 animals, and 3 scores for 13 or more of these animals.

The farmer who scored the highest had 31.5 points; he was a member of the non-exposed group in Ikolomani. He had four pieces of land of 3.6, 2.8, 1.2 and 2.8 hectares respectively which he had bought, three farm workers and one house girl who were paid around Shs.70/- each per month, two sons who were teachers one of them having completed his studies at the university, a large permanent house, a commercial building rented out, a petrol station in Kakamega town, five grade dairy animals, a car and other innumerable property.

The lowest scorer received 0.5 points - he was again a member of the non-exposed group in Ikolomani and had: 0.303 hectare of land which he had inherited from his parents, had not employed any farm worker, had 11 children none of whom was in paid employment although three of his daughters from among these children were reported married, had a local house built of grass-poles-mud, no cattle, sheep, nor goats or any other property save one wooden table, a few local chairs, a panga and a few hoes.

The economic position of a good number of farmers in Ikolomani approximated this very poor extreme, while that of a good number of farmers in low density schemes in Lugari approximated the very rich extreme, others fell in between these two extremes. With the scoring system already outlined we created six categories of this variable as follows: 16 or more scores, 13-15.9, 10-12.9, 7-9.9, 4-6.9, and under 3.9 scores; with 17.5, 14.5, 11.5, 8.5, 5.5 and 2.5 scores as the mid-points of these six categories.

We distributed farmers in Ikolomani and Lugari and those in the exposed and non-exposed groups according to this factor as shown in tables 6.3 and 6.4. The tables show slightly more farmers in Lugari to be economically 'well off' than those in Ikolomani and no significant difference in

economic status between members of the exposed group and those of the non-exposed group. Thus while economic status may help to explain differences in crop husbandry practices between members of the exposed and non-exposed groups in any one study area, it may not help to explain differences in crop husbandry practices between farmers in the two study areas.

Table 6.3: Distribution of Farmers in Ikolomani and Lugari Areas According to Their Economic Status

Economic Status	Lugari	Ikolomani	Total
16 and above scores	7	4	11
13-15.9	9	8	17
10-12.9	12	10	22
7-9.9	22	25	47
4-6.9	15	32	47
Under 3.9 scores	0	19	19
Total	65	98	163

$$\chi^2 = 20.570 > 20.517, df = 5, p = 0.001, C = 0.33$$

Table 6.4: Distribution of Farmers in the
Exposed and Non-exposed Groups
According to Their Economic Status

Economic Status	Exposed Group	Non-exposed Group	Total
16 and above scores	6	5	11
13-15.9	11	6	17
10-12.9	18	4	22
7- 9.9	29	18	47
4- 6.9	20	27	47
Under 3.9	6	13	19
Total	90	73	163

$$\chi^2 = 15.040 < 15.086, \quad df = 5, \quad p = 0.05, \quad C = 0.29$$

The third factor formal education was measured by finding out the number of years a farmer had completed at school. One farmer in the non-exposed group in Ikolomani had a university diploma in laboratory technology, while another farmer in the non-exposed group in Lugari had a B.Sc. degree in Agricultural Economics. At the other extreme were a good number of farmers who had never been to school; others fell in between these two extremes. We created six categories of this variable as follows: secondary and above, Std. VII-VIII, Std. V-VI, Std. III-IV, Std. I-II, and none; with 10, 7.5, 5.5, 3.5, 1.5, and 0 scores as the respective mid-points of these six categories.

We distributed farmers in Ikolomani and Lugari areas as well as members of the exposed and non-exposed groups according to this factor as shown in tables 6.5 and 6.6. These tables show that there was no significant difference in years of formal schooling between farmers in the two study areas and between the two groups of farmers. This in effect means that formal education may not help to explain differences in quality of crop husbandry between farmers in the two study areas or between the two groups in the sample.

Table 6.5: Distribution of Farmers in Ikolomani and Lugari Areas According to Their Formal Education

Formal Education	Lugari	Ikolomani	Total
Secondary & above	11	2	13
Std. VII-VIII	14	18	32
Std. V-VI	7	11	18
Std. III-IV	11	28	39
Std. I-II	5	7	12
None	17	32	49
Total	65	98	163

$$X^2 = 14.560 < 15.086, \text{ df} = 5, p = 0.01, C = 0.29$$

Table 6.6: Distribution of Farmers in the
Exposed and Non-exposed Groups
According to Their Formal Education

Formal Education	Exposed Group	Non-exposed Group	Total
Secondary & above	5	8	13
Std. VII-VIII	25	7	32
Std. V-VI	12	6	18
Std. III-IV	21	18	39
Std. I-II	6	6	12
None	21	28	49
Total	90	73	163

$$\chi^2 = 12.410 < 15.086, \quad df = 5, \quad p = 0.01, \quad C = 0.27$$

The final factor age was measured in terms of number of years reported to have been lived by the respondent from the year of his birth to the time of data collection. In some few cases farmers did not know their ages, but approximated their date of birth with some major event that took place around the time they were born, for example, one could report that he was born at the end of the First World War. In some cases we had to estimate age based on farmer's physical appearance or information provided by his neighbours or other persons who knew him well. We created eight categories of this variable as follows: under 29 years, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, and 60 or more years;

with 27, 32, 37, 42, 47, 52, 57 and 62 as the respective mid-points of these eight categories.

We distributed farmers in the two study areas as well as in the exposed and non-exposed groups according to this factor as shown in tables 6.7 and 6.8. The tables show no significant difference in age between farmers in the two study areas and in the two groups in the sample. This in effect means that this variable of age may not help to explain differences in quality of crop husbandry between farmers in the two study areas and between members of the exposed and those of the non-exposed groups.

It is evident up to this juncture that although economic status and formal education may help to explain differences in quality of crop husbandry between farmers in the exposed and non-exposed groups in any one study area, they do not equally help to explain differences in quality of crop husbandry between farmers in Lugari and those in Ikolomani areas.

Table 6.7: Distribution of Farmers in Ikolomani and Lugari Areas According to Their Age

Age in Years	Lugari	Ikolomani	Total
<29	5	2	7
30-34	7	9	16
35-39	8	6	14
40-49	9	14	23
45-49	11	15	26
50-54	10	24	34
55-59	7	8	15
60 and above	8	20	28
Total	65	98	163

$$\chi^2_c = 4.460 < 15.086, \quad df = 7, \quad p = 0.01, \quad C = 0.16$$

Table 6.8: Distribution of Farmers in the Exposed and Non-exposed Groups According to Their Age

Farmers' Age in Years	Exposed Group	Non-exposed Group	Total
<29	2	5	7
30-34	6	10	16
35-39	7	7	14
40-44	11	12	23
45-49	14	12	26
50-54	21	13	34
55-59	11	4	15
60 and over	18	10	28
Total	90	73	163

$$\chi^2 = 7.300 < 15.086, \quad df = 7, \quad p = 0.01, \quad C = 0.21$$

The only factor which may help to explain differences in the quality of crop husbandry practices between farmers in the two study areas and the two sample groups is knowledge in crop farming.

We correlated each of these four factors of: knowledge in crop farming, economic status, formal education and age to farmers' performance. Categories of the latter factor used are those shown in table 5.8 namely: 14 or more scores, 11-13.9, 8-10.9, 5-7.9, 2-4.9 scores; with 15.5, 12.5, 9.5, 6.5 and 3.5 as the respective mid-points of these five categories. The relationships between these four factors and farmers' performance are shown in tables 6.9, 6.10, 6.11 and 6.12. The tables show: first, farmers who are knowledgeable in crop farming to manage their crops much better than those who are less knowledgeable; second, farmers whose economic status is high to tend to do better in crop farming than those whose economic status is low; third, farmers who have been to school for more years to tend to do better than those who have attended school for fewer years; and finally, younger farmers do not manage their crops better than older farmers.

We further correlated the four factors of: knowledge in crop farming, economic status, formal education and age to each other as shown in tables 6.13, 6.14, 6.15, 6.16, 6.17 and 6.18. The tables show: first, farmers who were knowledgeable in

Table 6.9: Relationship Between Knowledge in
Crop Farming and Farmers' Performance

Farmers' Performance (Mid-scores)	<u>Knowledge in Crop Farming</u> (Mid-scores)					Total
	(4.5)	(7.5)	(10.5)	(13.5)	(16.5)	
(15.5)	0	0	3	10	12	25
(12.5)	1	0	7	14	5	27
(9.5)	1	14	27	3	0	45
(6.5)	7	22	11	2	0	42
(3.5)	14	9	1	0	0	24
Total	23	45	49	29	17	163

$$r = 0.797 > 0.256, \quad p = 0.005$$

Table 6.10: Relationship Between Economic Status
and Farmers' Performance

Farmers' Performance (Mid-scores)	<u>Economic Status</u> (Mid-points)						Total
	(2.5)	(5.5)	(8.5)	(11.5)	(14.5)	(17.5)	
(15.5)	0	1	8	6	3	7	25
(12.5)	0	9	7	3	7	1	27
(9.5)	2	13	13	9	6	2	45
(6.5)	6	16	14	4	1	1	42
(3.5)	11	8	5	0	0	0	24
Total	19	47	47	22	17	11	163

$$r = 0.539 > 0.256, \quad p = 0.005$$

Table 6.11: Relationship Between Formal Education
 and Farmers' Performance

Farmers' Performance (Mid-scores)	Formal Education (Mid-points)						Total
	(0)	(1.5)	(3.5)	(5.5)	(7.5)	(10)	
(15.5)	5	0	4	5	5	6	25
(12.5)	5	1	5	2	10	4	27
(9.5)	9	5	13	5	10	3	45
(6.5)	17	3	12	4	6	0	42
(3.5)	13	3	5	2	1	0	24
Total	49	12	39	18	32	13	163

$$r = 0.411 > 0.256, \quad p = 0.005$$

Table 6.12: Relationship Between Age and Farmers'
 Performance
 (Mid-scores)

Farmers' Performance (Mid-scores)	Farmers' Age in Years (Mid-points)								Total
	(62)	(57)	(52)	(47)	(42)	(37)	(32)	(27)	
(15.5)	4	2	4	4	5	3	3	0	25
(12.5)	2	5	4	4	4	4	2	2	27
(9.5)	8	5	7	9	7	3	3	3	45
(6.5)	8	2	14	7	2	4	4	1	42
(3.5)	6	1	5	2	5	0	4	1	24
Total	28	15	34	26	23	14	16	7	163

$$r_{cal.} = -0.68, \quad \text{critical } r = \pm 0.165 \text{ at } p = 0.05$$

Table 6.13: Relationship Between Economic Status
and Farmers' Knowledge in Crop Farming

Knowledge in Farming (Mid- scores)	<u>Economic Status of Farmers</u> (Mid-points)						Total
	(2.5)	(5.5)	(8.5)	(11.5)	(14.5)	(17.5)	
(16.5)	0	1	5	3	3	5	17
(13.5)	0	5	11	5	5	3	29
(10.5)	2	13	16	10	6	2	49
(7.5)	8	19	11	4	2	1	45
(4.5)	9	9	4	0	1	0	23
Total	19	47	47	22	17	11	163

$$r = 0.525 > 0.256, \quad p = 0.005$$

Table 6.14: Relationship Between Formal Education
and Farmers' Knowledge in Crop Farming

Knowledge in Farming (Mid-scores)	<u>Formal Education of Farmers (Mid-points)</u>						Total
	(0)	(1.5)	(3.5)	(5.5)	(7.5)	(10)	
(16.5)	0	0	5	3	6	3	17
(13.5)	6	2	2	5	6	8	29
(10.5)	13	3	12	6	13	2	49
(7.5)	13	6	17	4	5	0	45
(4.5)	17	1	3	0	2	0	23
Total	49	12	39	18	32	13	163

$$r = 0.482 > 0.256, \quad p = 0.005$$

Table 6.15: Relationship Between Age of Farmers
and Their Knowledge in Crop Farming

Knowledge in Farming (Mid- scores)	<u>Age of Farmers</u> (Mid-points)								Total
	(62)	(57)	(52)	(47)	(42)	(37)	(32)	(27)	
(16.5)	1	0	5	3	3	4	0	1	17
(13.5)	3	4	2	5	5	3	5	2	29
(10.5)	9	6	10	10	5	5	2	2	49
(7.5)	9	4	8	6	9	2	5	2	45
(4.5)	6	1	9	2	1	0	4	0	23
Total	28	15	34	26	23	14	16	7	163

$r_{\text{cal.}} = 0.162$, critical $r = \pm 0.165$ at $p = 0.05$

Table 6.16: Relationship Between Economic Status of
Farmers and Their Formal Education

Formal Education (Mid- points)	<u>Economic Status of Farmers</u> (Mid-points)						Total
	(2.5)	(5.5)	(8.5)	(11.5)	(14.5)	(17.5)	
(10)	0	1	3	2	4	3	13
(7.5)	2	6	9	6	6	3	32
(5.5)	1	2	7	3	3	2	18
(3.5)	5	13	10	5	3	3	39
(1.5)	2	2	7	1	0	0	12
(0)	9	23	11	5	1	0	49
Total	19	47	47	22	17	11	163

$r = 0.455 > 0.256$, $p = 0.005$

Table 6.17: Relationship Between Farmers' Age and Their Economic Status

Economic Status (Mid-points)	Farmers' Age (Mid-points)								Total
	(62)	(57)	(52)	(47)	(42)	(37)	(32)	(27)	
(17.5)	0	0	3	3	3	2	0	0	11
(14.5)	4	0	2	2	6	2	0	1	17
(11.5)	2	2	4	4	2	2	4	2	22
(8.5)	8	8	11	7	2	3	5	3	47
(5.5)	11	5	10	5	6	4	5	1	47
(2.5)	3	0	4	5	4	1	2	0	19
Total	28	15	34	26	23	14	16	7	163

$$r = 0.101 < 0.165, \quad p = 0.05$$

Table 6.18: Relationship Between Farmers' Age and Their Formal Education

Formal Education (Mid-points)	Farmers' Age (Mid-points)								Total
	(62)	(57)	(52)	(47)	(42)	(37)	(32)	(27)	
(10)	0	0	2	2	3	2	2	2	13
(7.5)	3	0	6	5	9	6	2	1	32
(5.5)	2	1	1	4	1	2	4	3	18
(3.5)	3	4	8	10	8	2	4	0	39
(1.5)	2	3	4	2	1	0	0	0	12
(0)	18	7	13	3	1	2	4	1	49
Total	28	15	34	26	23	14	16	7	163

$$r_{cal.} = -0.577, \text{ critical } r = \pm 0.256 \text{ at } p = 0.05$$

crop farming to be on the average economically 'well off' and to have been to school for more years; second, farmers who were economically 'well off' had on the average been to school for more years; and finally, younger farmers had on the average been to school for more years than older ones, but were on the average not well informed in crop farming nor economically 'better off' than the older ones.

6.3 CONCLUSION

It is conclusive from these data that: first, age does not influence farmers' crop husbandry practices; younger farmers had on the average attended school for more years but were not more exposed to agricultural messages and hence did not do better in farming than the older farmers. These observations seem to reinforce those of Heyer, J. et.al. (1969:72-83) that farmers who adopted more innovations in their sample were neither young nor old and to be contrary to those of Rogers E. (1969:102) that younger farmers tend to be exposed to agricultural messages and to adopt innovations faster than older farmers. Second, economic status and formal education are correlated to farmers' performance. Sharma D.K. and Leogans G.P. (1967:16-25), Rogers E. and Shoemaker F.F. (1971:183-86), and Heyer J. et.al. (1969) had similarly found farmers who had attended school for more years and whose economic status was high to be more exposed to sources of agricultural messages, a fact which made them adopt innovations faster than illiterate farmers. Economic status could be both

a cause as well as an effect of farm performance. However, formal education and economic status cannot help to explain the vast differences in farm performance between farmers in Lugari and those in Ikolomani. The only factor which helps to explain these differences in farm performance is 'knowledge in improved crop farming'. These observations support those of Roling N. and Ascroft J. (1971:17-18) cited in chapter Three that exposure to sources of extension education could make farmers knowledgeable and to do better in farming.

These data show that the hypothesis stated in the introduction to this chapter holds true in the case of the relationship between knowledge in crop farming and farm performance, partially true in the case of the relationship between economic status and formal education to farmers' performance, and does not hold at all and is discredited in the case of the relationship between age and farm performance.

The question, however, which may be posed is why is it that farmers in Lugari are more knowledgeable in crop farming than those in Ikolomani? Since the Extension Service as indicated in chapters One and Two is likely to be ineffective in both study areas, it is likely that some other factors (other than organizational factors) could explain the current better informedness of the majority of farmers

in Lugari area and hence their better farm performance.

Members of the exposed group in both areas were more informed in improved crop farming due to the fact that they were as indicated in chapter Three more exposed to various sources of extension education than members of the non-exposed group. In Lugari, however, unlike in Ikolomani a large number of farmers in the non-exposed group were well informed in improved crop farming and did better in their farming. This in effect means that the better crop husbandry practices in Lugari area resulted from some other factor rather than current extension education efforts. There are three possible reasons for the better crop husbandry practices in Lugari area. The first reason is that settlers on taking up their new farms (see Appendix I) were compelled to adopt a number of agricultural innovations which included sisal, hybrid maize, pastures and grade dairy animals. Development loans were offered to facilitate their adoption of these innovations. The initial extension education input was heavy; farmers were scheduled for courses, had to attend demonstrations, and were visited regularly by the agricultural, cooperative, and settlement officers who worked hand in hand. Many farmers and extension staff in this area indicated that extension education input during the period of settlement was substantial and has tended to decline in subsequent years.

The second reason is that some of the settlers (see Appendix I) in Lugari area had been farm workers on European farms and were settled when the farms were left by their former white employers; some settlers were farmers who had already been progressive prior to settlement and hence better knowledgeable in farming; while some, especially a large number of those from the more populous parts of Kakamega district were not at all progressive in farming but went to settle due to dire need for land. Thus Lugari area was settled by a mixed population, a fair proportion of which was already knowledgeable about improved farming.

The final reason indicated by Senior Assistant Agricultural Officer, Lugari was that farms which were not made use of by their owners could be reclaimed by the Ministry of Settlement. This in effect meant that even those farmers who were absent from the land had to make arrangements for their farms to be constantly farmed. This observation shows that some pressure was exerted by government to settlers to farm well just as they were forced to join cooperative societies (see Appendix I).

Thus the historical situation in Lugari area has been largely responsible for better informedness of farmers in the area. It was also clear from the remarks of a good number of farmers in this

area that they consult and learn from one another more than is the case in Ikolomani where each farmer tended to be on his own.

Thus if the historical situation is responsible for the better informedness of field workers in Lugari area, is it really true that agricultural extension activities are equally less adapted to local conditions in the two study areas? The answer to this question is provided in the next chapter.

CHAPTER SEVEN

ADAPTABILITY OF FIELD ADMINISTRATIVE ACTIVITIES IN THE CROPS IMPROVEMENT PROGRAMME TO LOCAL COMMUNITY CONDITIONS

7.1 INTRODUCTION

We have shown in chapters Five and Six that the vast differences in farm performance between farmers in the two study areas could be explained largely by historical factors which were more favourable in Lugari area in the 1960s when the current farmers were settled. This in effect means that extension activities discussed in Chapters One, Two and Three are likely to be equally less adapted to local conditions in Ikolomani and Lugari areas. How far is this true? This chapter examines the extent to which extension activities of farmer education, credit administration and marketing of farm produce are adapted to local conditions. The assumption underlying the study of these activities is that decisions are made with regard to planning and implementation of all activities in the Crops Improvement Programme. Data presented in this chapter should help to test hypothesis No. II namely that: 'the more centralized the process of decision making in the Crops Improvement Programme, the less adaptable activities of this programme are likely to be to local conditions'.

We discussed issues related to extension education activities in chapters Two, Three and Four. In this section we examine 'who' makes 'what' decisions with regard to farmer training courses and farm demonstrations with a view to finding out the extent to which decisions made with regard to these activities of farmer education are centralized. We seek to find out whether senior staff ever consult farmers in making decisions regarding farmer education activities. Our assumption is that decisions made by each party in isolation will not adequately take into account views of other parties and will hence tend to be centralized. We further hope to show how the process of decision making in these education activities influences farmers' attendance of agricultural courses and farm demonstrations. We posed several questions to farmers and field staff in this connection. The questions and responses from the sample of 32 field workers were:

- (a) Asked by whom the need for a crop demonstration to be set up in a worker's area of operation was determined, answers were:

- 93.8% of these field workers indicated that it is they who make such decisions when the right season is about or when they notice general lack of knowledge in cultural practices of a particular crop.
- 6.2% of them indicated that they decide to stage a demonstration after receiving instructions from senior staff indicating the types and number of demonstrations to be carried out in their areas of operation and the materials available for carrying out these demonstrations.
- (b) Asked how the farmer, on whose plot the demonstration was to be held (farmer demonstrator) was selected, the responses were:
 - 93.8% of these field workers select the farmer demonstrator themselves.
 - 6.2% of them were unclear in their responses.
- (c) Asked who decided the need for agricultural courses, the responses were:
 - 84.4% of these field workers pointed out that the need for agricultural courses is decided by the Principal of the Farmer

Training Centre in collaboration with Provincial, District or Divisional staff.

- 15.6% of them pointed out that they decide the need for an agricultural course in a divisional staff meeting and inform Farmer Training Centres. That they do so after seeing the need for the course in the farming community or after being approached by farmers demanding a course of a particular type to be organized for them.

(d) Asked whether farmers play any role in determining the need for courses, the responses were:

- 46.9% of these field workers pointed out that farmers play no part as this is done by agricultural staff and in some cases by cooperative societies.

- 53.1% of them indicated that farmers play an indirect part in determining the need for agricultural courses; they go to field workers individually and tell them about their interests and problems. Similarly, when there is a new enterprise some farmers express interest in it and ask field staff to recruit them for a course in the new enterprise.

- (e) Asked whether farmers play any part in selecting other farmers to go for agricultural courses, the responses of field staff were:
- 56.2% of these field workers maintained that farmers played no part whatsoever; they themselves recruit those they want to attend courses. That some farmers may have no fees, or may be unwilling to go for a course.
 - 31.3% of them pointed out that those farmers who have already attended courses at FTCs know advantages of these courses and often convince their colleagues to go and attend them. Such farmers may inform field staff of their friends or neighbours who can be recruited for courses. Sometimes farmers may send their wives, or farm workers to these courses.
 - 9.4% of them pointed out that farmers are selected collectively in barazas with the help of the Assistant Chief and elders of the baraza.
 - 3.1% of them pointed out that selection is done by cooperatives or church groups.

(f) Asked whether field staff played any part in formulating courses for farmers, the responses were:

- 65.6% of these field workers point out that they play no part at all as this is done by senior staff who inform them when everything is ready. They simply recruit farmers to attend courses; each one is told the number of farmers to recruit from his area of operation.

- 18.8% of them pointed out that they discuss the types of courses to be organized by Farmer Training Centres in divisional meetings and when such courses should be organized. Similarly, whenever they come across problems in the field needing a course they inform FTCs in writing or through the Assistant Agricultural Officer/Senior Assistant Agricultural Officer.

- 15.6% of them pointed out that they are called by Farmer Training Centres to tell them the needs of the field; that whenever they go for courses or seminars they normally inform FTC staff of problems in the field.

- (g) Asked whether Work Programmes or Plans are made collectively by senior staff, junior staff, and farmers, the responses were:
- 53.1% of these field workers pointed out that the Assistant Agricultural Officer prepares his Work Programme and reads it to them in a staff meeting. They are then asked to make their Work Programmes taking into account some of the issues raised in Assistant Agricultural Officer's Work Programme.
 - 43.8% of them in Lugari indicated that each of them makes his own Work Programme which he submits to his Locational Agricultural Assistant who uses information in these Work Programmes to compile a single programme for the location which he forwards to Senior Assistant Agricultural Officer, Lugari.
 - 3.1% of them indicated that they participate in formulation of the divisional Work Programme.

In sum, these responses indicate increased instance of segmentation of decision-making processes. Senior staff make decisions of certain magnitude,

such as number of courses to be held and when they are to be held; junior staff make certain other decisions, such as who to recruit for attendance of an agricultural course. The responses fail to indicate that decisions are ever communally made between senior staff, junior staff and farmers. Senior staff tend to make decisions without consulting junior staff just as junior staff tend to make decisions without consulting farmers.

We asked farmers a few questions similar to those we asked field staff: Their responses to these questions were:

- (a) Asked who determined the need for the courses that they had attended, the responses of 78 farmers who had attended agricultural courses were:
 - 84.6% of these farmers pointed out that this was done by agricultural staff (in conjunction with Settlement staff for farmers in Lugari).
 - 6.4% of them pointed out that this was done by the Assistant Chief, or Chief.
 - 6.4% of them mentioned cooperative societies.

- 2.6% of them mentioned the Ministry of Education (they were teachers).

(b) Asked by whom these 78 farmers were selected to attend these courses, their responses were:

- 87.2% of these farmers indicated that they were selected by agricultural staff.

- 6.4% of them were selected by cooperative societies.

- 2.6% of them were selected by the Chief/ Assistant Chief.

- 2.6% of them were selected by the Ministry of Education (they were teachers).

- 1.2% of them went for courses on their own.

(c) Asked by whom the need for a crop demonstration (in which they participated) on their farms or other farms was decided, the responses of 80 farmers who had attended such demonstrations were:

- 87.5% of these farmers indicated that this was done by agricultural staff.

- 2.5% of them mentioned the Chief/Assistant Chief.
- 10% of them were unclear in their responses or gave no answer.

These various responses indicate that government officials dominated in deciding the need for courses and demonstrations and in selecting farmers to attend courses or in mobilizing them to attend demonstrations. Decisions made with regard to these extension education activities were made by extension staff in isolation and were imposed on farmers; there was no mention of instances where farmers were consulted.

Thus it is evident from these responses that decision-making processes in the crops programme are not communal; senior staff do not consult junior staff. What implications does this lack of joint decision making sessions or even consultations of one party by another have on participation in agricultural courses and in demonstrations?

It was indicated by field staff that there have been two Farmer Training Centres in Kakamega district namely: Bukura and Lugari Farmer Training Centres. The Senior Assistant Agricultural Officer, Lugari informed us that Lugari Farmer Training

Centre had been active during the 1960s and that it was closed down in 1975 due to administrative problems. The Assistant Agricultural Officer, Ikolomani also indicated that due to expansion of Bukura Agricultural Institute, Bukura Farmer Training Centre was closed down in 1977. The course programme, however, for Bukura Farmer Training Centre for various participants from Western Province during 1970 and 1974 as indicated in tables 7.1, 7.2 and 7.3 shows the following:

Table 7.1: Distribution of Various Types of Courses
Organized by Bukura F.T.C. in 1970 & 1974

Type of Course	1970	1974
Courses in crops and livestock for farmers	12	15
Courses for chiefs, assistant chiefs, and their wives	5	-
Farm machinery for drivers in Western Province	1	-
Dip committee members	-	-
Coffee spraying teams	1	1
Courses for agricultural instructors	9	9
Courses for wives of agricultural instructors	2	-
Senior staff courses (AAO and district level)	3	-
Courses for school teachers	1	-
Courses for Young Farmers	-	1
4-K club members' course	1	1
4-K club local leaders' course	1	-
Courses for traders	1	1
Courses for officials and members of cooperatives	2	2
Courses for secondary school students	1	-
Total	40	30

Sources: Adapted and modified slightly from
Ministry of Agriculture, Kakamega District,
Annual Reports, 1970 and 1974.

Table 7.2: Planned Versus Actual Attendance of Courses Organized for Farmers by Bukura F.T.C. in 1970 and 1974

Type of Courses	Places Allocated	1970			Places Allocated	1974		
		<u>Actual Attendance</u>				<u>Actual Attendance</u>		
		Men	Women	Total		Men	Women	Total
Animal husbandry	205	155	11	166	115	71	21	92
Crop husbandry	240	117	4	121	125	69	1	70
General agri- culture	80	25	1	26	31	31	-	31
Cooperative	60	23	-	23	25	15	-	15
Poultry, Pigs & Fish keeping	13	5	8	13	110	28	18	46
Home Economics	40	-	20	20	40	-	20	20
SRDP	-	-	-	-	30	5	8	13
Totals	638	325	44	369	476	219	68	287

Sources: Adapted and modified slightly from Ministry of Agriculture, Kakamega District Annual Reports, 1970 and 1974.

Table 7.3: Planned Versus Actual Attendance of Courses Organized for Agricultural Staff by
Bukura FTC in 1970 and 1974

Type of Courses	Planned Places	1970			Planned Places	1974		
		Actual Attendance		Total		Actual Attendance		Total
		Men	Women			Men	Women	
Animal husbandry	45	15	-	15	60	57	8	65
Cooperative	90	47	-	47	-	-	-	-
Coffee	9	9	-	9	-	-	-	-
Tea	25	25	-	25	-	-	-	-
Farm management	120	89	3	92	15	15	-	15
Soil conservation	10	38	-	38	30	22	-	22
Agricultural Inputs	-	-	-	-	20	7	-	7
JAA Upgrading	-	-	-	-	105	80	3	83
Totals	299	223	3	226	230	181	11	192

Sources: Adapted and modified slightly from Ministry of Agriculture, Kakamega District, Annual Reports, 1970 and 1974.

- (a) 30% of the 40 courses in 1970 and 50% of the 30 courses in 1974 were scheduled for farmers. The remaining courses were organized for officials of government and other organizations.
- (b) 57.8% out of 638 places allocated for farmer training in 1970 were taken up; 60.3% out of 476 places allocated for farmers' training in 1974 were taken up.
- (c) 75.6% out of 299 places allocated for agricultural field staff in 1970 were taken up. 83.5% out of 230 places planned for field staff in 1974 were taken up.

Bukura Farmer Training Centre is reported by Ministry of Agriculture, Kakamega District Annual Report (1974:34) to have been confronted with shortage of funds; some courses that had been scheduled for that year had to be cancelled or postponed. These data show that attendance of FTC courses by farmers was somehow low. A few farmers in our sample raised the following problems with regard to agricultural courses:

- 1 farmer pointed out that he had no cash to go for a course (farmers pay a small fee of Shs. 15/- for attendance of an

FTC course).

- 1 farmer who had attended these courses twice indicated that what was taught in the second course was identical to what had been taught in the first course.
- 3 farmers pointed out that the period of one week over which an FTC course is held is often too short and that a lot of ground is covered quickly making it difficult for them to understand most of what is taught.
- 1 farmer complained of sleeping on a storey bed and of poor meals at Lugari Farmer Training Centre.

It was also evident from the remarks of some farmers that what they/taught is sometimes not feasible /are in their individual situations as evident from the following remark by one farmer in Lugari area:

"...at Lugari FTC...we saw planting done by machine...it digs holes..puts in seed...and fertilizers..those with enough cash could use machine in planting..."

Although problems of FTC courses were cited by a small number of farmers they show that to some extent the more

literate members of the farming community get bored with the same course content, while the less literate ones see the content as difficult and the courses as hurriedly carried out over a short period of time. The problems also show that Farmer Training Centres use planting equipment which is out of reach of the average small scale farmer. These facts partially help to explain the low rate of attendance of FTC courses by farmers and why a large number of courses are organized for officials of government and other organizations. Roling N. et.al. (1973:2) in discussing these similar problems have noted that Farmer Training Centres in Kenya are not able to recruit enough farmers to fill their classes and usually work at less than 50% capacity and that the majority of their trainees are not farmers but officials, traders, etc. Mbithi P.M. (1974:5) in discussing these similar problems notes that agricultural innovations are presented in packages which cannot be readily adapted for the small scale farmer, so that what farmers learn in courses may not be seen by them as worthy of application on their farm units.

During 1976 a total of 63 crop demonstrations (on maize, beans, coffee, sugarcane - 26 in Ikolomani and 37 in Lugari) were organized by our sample of 32 field workers. 20 of these field workers cited

the following problems with regard to the use of demonstrations:

- 35% of these field workers indicated that attendance of demonstrations was very low due to: first, farmers' attitude that they had already learnt a lot about what was being demonstrated in previous demonstrations; second, where demonstrations are held for crops which cannot be easily marketed, like passion fruit in Ikolomani.
- 15% of them in Ikolomani pointed out that farm inputs like fertilizers for carrying out these demonstrations are often given late; in 1977 they were given between March and April when most farmers had already planted their crops. As demonstrations are staged late participants in them rarely find a chance to immediately practice what they are taught in their own farms.
- 25% of them in Lugari indicated that inputs for demonstrations are not given by government as it used to be done in earlier years. Many farmers are reluctant to provide inputs for demonstrations, or they rarely provide what is sufficient.

- 20% of them pointed out that demonstrations for maize and beans are always in pure stands for each of these crops; there is emphasis on certain levels of resource combinations for each of these crops. That at the farm level maize is often interplanted with beans with little or without the use of recommended farm inputs.

- 5% of them pointed out that a demonstration must show practical and acceptable results to participants to ensure their confidence; that failure of a demonstration due to hail, wind-break or insufficient use of inputs will not help win the confidence of farmers.

A number of similar problems were cited by 30 farmers in our sample with regard to the use of demonstrations:

- 33.3% of these farmers indicated that demonstrations emphasize the use of substantial inputs which most of them could not afford.

- 10% of them reported having attended a demonstration at one stage (planting); they never went back to see the various practices

demonstrated at later stages.

- 6.7% of them indicated that tea for which demonstrations were being held had poor marketing opportunities.
- 13.3% of them indicated that demonstrations were usually organized for loanees; some of these farmers complain that they have little land for which they could not realize loans.
- 26.7% of them indicated that demonstrations have never been organized in their areas for the past 2 to 3 years. They indicate that demonstrations used to be held on nearby plots which are no longer visited by agricultural staff for some reason or other.
- 6.7% of them were teachers and reported that they had no time to attend demonstrations.
- 3.3% of them attended a demonstration which was destroyed by hail.

These observations show that: the same things are taught year after year

and fail to uphold interest of many participants, unavailability of inputs for use in demonstrations, teaching of pure stands of certain crops when these crops are usually intermixed with others in the farming community, staging demonstrations for crops which cannot be readily marketed, etc. This in effect means that some of the things that farmers are taught in demonstrations and even in courses, such as pure stands of certain crops are at variance with what farmers actually do - all farmers in the sample interplant maize with beans and give the following reasons for doing so: first, interplanting of the two crops saves labour and enables one to catch up with the rains; second, hail damage is less severe when beans are interplanted with maize than when beans are planted in pure stand; finally, mixing of the two crops permits beans to make use of fertilizers applied to maize.

In sum, decisions in crop production work are made individually rather than communally between the various parties involved. Each party exercises some discretion in the making of decisions regarding activities of the Crops Programme he is going to undertake, for example, a junior field worker asked to recruit two farmers from his area of operation to attend an agricultural course, will have to decide on the particular farmers to recruit; a farmer asked to go for an agricultural course will have to decide

whether to do so or not. Junior staff, however, exercise such discretion in an atmosphere dominated by pressure from above, while farmers are equally pressurized by junior staff. This in itself portrays an instance of centralization of decision-making processes where senior staff maintain a hold on field administrative activities and allow junior staff to make decisions in very limited dimensions of any one activity.

The result of this centralization of decision-making processes to senior staff is as Bell G.D. (1967:103) has noted namely that in a situation where decisions are made by each party in isolation, the other parties will not be left with anything to invest their 'selves' in ; that is, they will not feel obliged to implement these decisions. It is conclusive from these comments that the inability of the Extension Service in the study areas to involve junior staff and farmers in the making of decisions about various activities of the crops programme that they are required to undertake makes them not identify with these decisions. This fact partially helps to explain the low rate of attendance of agricultural courses and demonstrations by farmers. It also explains why the Extension Service emphasizes certain combinations of resources in its

education activities which are rarely attained by most farmers in the study areas, and why it emphasizes pure stands of maize and beans when in fact most farmers rarely grow pure stands of these crops. It is because of this inability of decisions made with regard to extension education activities to be adaptable to local conditions that extension education efforts seem to have very little positive effect on farm productivity.

7.3 CREDIT ADMINISTRATION ACTIVITIES

We have discussed issues related to administration of farm credit to small scale farmers in chapter Three. In this section we examine issues related to award, use and repayment of farm credit. Guaranteed Minimum Return (GMR) credit is discussed in greater detail with an assumption that most issues that show up in the administration of this credit are likely to similarly show up in administration of other forms of credit. We hope, as in the previous section, to find out the extent to which the administration of GMR and other forms of credit is adaptable to changing conditions in the study areas.

The District Farm and Land Management Officer (DFLMO) informed us that Kakamega District had the following credit schemes:

- (a) The International Development Association (IDA) credit scheme which covers crops, livestock, and purchase of agricultural machinery and is awarded to both small and large scale farmers.
- (b) USAID Loan Scheme is financed by the United States of America and is administered to farmers through Agricultural Finance Corporation (AFC), cooperatives and Kenya Farmers Association (KFA). This loan scheme was started in 1975 with an aim of assisting farmers with smaller acreage of less than 2 hectares.
- (c) The Integrated Agricultural Development Programme (IADP) loan scheme which is extended to farmers largely growing maize, sunflower and beans through cooperatives and AFC. It was indicated that this loan scheme was started in 1976.
- (d) Commercial Bank loans: these rely on land titles and other property as security and are repaid over a shorter time period.
- (e) Guaranteed Minimum Return (GMR) loan scheme which is seasonal loan awarded to maize and wheat growers. This credit scheme was

by far the most important in Lugari area.

We will discuss issues related to administration of the latter credit scheme in detail. The Kakamega District Annual Reports (1974:28 and 1976:33) show that: first, a total of 295 and 581 farmers during 1974 and 1976 respectively were awarded GMR credit amounting to K.shs. 1,347,400/- in 1974 and K.shs. 3,514,350/- in 1976; second, the amounts awarded were K.shs. 520/- in 1974 and K.shs. 865/- per hectare in 1976; finally, only about 7 to 10 farmers awarded this credit were from the traditional rural areas of the district - the rest were from Lugari area. It was indicated by Divisional Agricultural Assistant, Lugari that the award of GMR credit is based on the following conditions:

- (a) A farmer must have 16 hectares to qualify for GMR award; must not have any outstanding GMR loan. The award must be used for maize, wheat, or both.
- (b) A farmer's application for GMR must be approved by the Divisional and District Loans Committees.
- (c) A fixed amount of Shs.1235/- per hectare was given to GMR loanees in 1977 intended to

finance some farm activities and purchase of inputs; the farmer was expected to finance other activities.

- (d) A farmer must insure his crop against natural environmental calamities at the rate of Shs. 5/- per acre.
- (e) The credit is not given in cash but in terms of materials and services. The loanee has to sell enough output to cover the loan awarded through agents of AFC (Kenya Farmers' Association and Maize and Produce Board). He should repay credit immediately after sale of produce at an interest rate of 10% per annum; there is no moratorium period.

A total of 581 farmers as indicated above received GMR credit in 1976. A similar figure for 1975 was not available in various reports of the Ministry of Agriculture. During the year 1975 and 1976 a total of 53 and 65 farmers respectively encountered crop failure and applied to the District Agricultural Committee for exemption from repaying the loan. It was indicated by Divisional Agricultural Assistant, Iugari that an inspection team composed largely of Ministry of Agriculture and Agricultural Finance Corporation officials visited these farmers on

behalf of the District Agricultural Committee. The distribution of these farmers according to reasons given by the team for failure of their maize crop is shown in table 7.4.

Table 7.4: Distribution of Farmers who Reported Crop Failure According to Reasons Given by Visiting Team

Reason for Crop Failure	Percentage of Farmers	
	1975 (%)	1976 (%)
Planting done late	5.7	29.2
Poor crop husbandry	26.4	20
Less acreage planted	18.9	6.2
Natural environmental factors	49.	44.6
Total	100	100
Base	(53)	(65)

Source: GMR Crop Failure File, SAAO's Office, Lugari.

The table shows that 51% of farmers in 1975 and 55.4% of farmers in 1976 who encountered crop failure did not, according to the team, conform to the requirements of GMR award. It was indicated by Divisional Agricultural Assistant, Lugari that the team recommends a farmer to be exempted from repaying the loan if his crop failure was severe and caused by physical environmental factors, such as hail-storms, wind-storms, floods, drought and termite

damage. He added that the farmer must have observed the following conditions:

- (a) He must have planted his crop within the gazetted planting intervals which were mid-February to mid-May for 1975 and early March to end of April for 1976. The invoices used by the farmer for obtaining seed and other farm inputs help the team to know whether planting was done within the gazetted interval or not.
- (b) He must have carried out all cultural practices; seedbed preparation, fertilizer application, weeding, etc. Insufficient use of farm inputs was reported to result from tendency on the part of a large number of farmers to sell farm inputs or failure to subsidize GMR loan with their own cash.
- (c) He must have planted 6 or more hectares for which GMR credit was approved. That some farmers claim that they planted part of the crop on a neighbour's farm, but cannot produce any written evidence to this effect.

Divisional Agricultural Assistant, Lugari indicated further that the team assesses the severity

of crop failure; that where the crop has been affected by environmental factors and is likely to recover, the team revisits the farm at a latter date to confirm the yield that was obtained per hectare. A farmer's claim may be rejected if the team feels that he is likely to realize 17 or more bags per hectare on grounds that such yield should earn the farmer enough income to permit him to repay the loan. He added that those who get less than 6 bags may be recommended for partial exemption from repaying the loan; that is, they are requested to pay a certain proportion of the loan.

Table 7.5 shows the team's reactions to farmers' claims during the years 1975 and 1976. The table shows that total rejections were 77.5% in 1975 and 87.7% for 1976; that is, a very large number of claims for exemption from repaying GMR loans during these two years were rejected despite the fact that nearly 50% of farmers' crop failure (see table 7.4) was caused by environmental factors. The Divisional Agricultural Assistant, Lugari pointed out that such widespread rejections were intended to discourage other loanees from submitting claims for exemption from repaying loans and to make loanees much more responsible and committed to repay credit extended to them.

Table 7.5: Distribution of Crop Failure Claimants
According to Recommendations of Visiting
Team, 1975 and 1976

Team's Recommendation	<u>Number of Farmers</u>	
	1975 %	1976 %
Claim rejected	77.5	87.7
To be revisited or partial exemption recommended	18.7	10.8
Claim accepted; farmer exempted from repaying	3.8	1.5
Total	100	100
Base	(53)	(65)

Source: Crop Failure File, SAAO's Office, Lugari

It is evident up to this juncture that: first, committees are the main bodies that handle issues of award of farm credit and those related to crop failure. Farmers are represented in the Divisional Agricultural Committee as well as in the District Loans Committee. Second, there is considerable amount of cooperation between the Agricultural Extension Service and the Agricultural Finance Corporation (AFC) in issues related to award and repayment of farm credit and an insistence that farmers should repay farm credit extended to them. In which way, however, has this cooperation between the Extension Service and Agricultural Finance Corporation resulted in the smooth adminis-

tration of farm credit in the study areas? To answer this question we will briefly examine the rate of repayment of GMR and other forms of farm credit as well as problems (if any) encountered by farmers in the acquisition and utilization of such credit.

A total of 78 farmers in our sample (39 from Lugari and 39 from Ikolomani) reported having used farm credit at some time in the past. A question about repayment of credit extended to them in the past years other than the year 1977 was developed in the field and was administered to 53 of these 78 loanees. Their responses to this question on whether they had repaid the credit extended to them or not are shown in table 7.6.

Table 7.6: Credit Repayment as Reported by
Loanees in our Sample of Farmers (Excluding
the Year 1977)

Credit Repayment	Lugari (%)	Ikolomani (%)
Repaid full amount	28.6	40
Repaid some amount (not all)	46.4	24
Repaid nothing so far	25	36
Total	100	100
Base	(28)	(25)

The table shows that over 70% of these loanees in Lugari had not at the time of data collection fully repaid GMR loans extended to them in previous years, while in Ikolomani 60% of the loanees had not fully repaid GMR and other loans extended to them in previous years. The reason for slightly more farmers in Ikolomani having repaid their loans than those in Lugari was that in the former area most credit is extended to farmers through their cooperative societies; some of them gave farmers loans on security of produce already delivered to them.

The number of loanees in both study areas who had not fully repaid their loans was 35. The reasons given by these 35 loanees for failing to fully repay loans awarded to them were:

- 62.9% of these loanees pointed out that they failed to repay due to poor harvest which resulted from environmental calamities of hail, wind-breaks, drought, or army worms.
- 11.4% of them complained that ploughing by GMR contractors was done for them late, or that they were late in receiving the loan, or that they were late in receiving farm inputs.

- 8.6% of them pointed out that they had not been requested by lending institutions to repay the loans they had been awarded.
- 5.7% of them pointed out that they had personal or family problems, such as disease or school fees.
- 11.4% loanees gave no reason for their failure to fully repay loans extended to them.

Generally these data show the rate of repayment of GMR and other forms of farm credit to be much lower than would have been expected. We similarly asked 62 out of the 65 farmers in the sub-sample from Lugari whether they were punctually repaying the land and development loans extended to them at the time of settlement (see Appendix 1). Their responses were:

- 50% of these 62 farmers informed us that they had stagnated in effecting their repayments regularly. They now received larger bills than they used to receive previously.
- 40% of them reported that their repayments of these loans were up-to-date.

- 8% of them reported that they had completed repaying these loans or that they had bought their farms by cash.

- 2% of them were not clear in their answers.

These latter data on land and development loans support the data presented above on repayment of other forms of farm credit; that is, while 70% of farmers in Lugari and 60% of those in Ikolomani have not fully repaid loans advanced to them in previous years, 50% of the farmers in Lugari in our sample were not punctual in repayment of land and development loans. The rate of repayment of the latter types of loans was indicated by Senior Assistant Agricultural Officer, Lugari to be much better in those schemes where cooperative societies were active and where there was an alternative income earner of dairying e.g., in Sergoit scheme. In such schemes the cooperative sells members' produce delivered to it and retains a portion of members' earnings for effecting payments of land and development loans on their behalf. In other schemes like Lugari scheme where dairy animals have died from diseases and where the cooperative society has been demobilized due to lack of sufficient produce to handle the rate of repayment of land and development loans seemed rather low. In such schemes where maize was the major income earner, the farmer himself repays

the loan whenever he finds himself with sufficient funds to do so. Reasons given by farmers for failure to repay these land and development loans regularly include: death of their dairy animals so that they now depend on maize for cash and subsistence, poor harvests of maize, sickness at home, school fees, etc.

Asked whether they had experienced any problems in acquisition and utilization of farm credit, 34 loanees responded as follows:

- (a) 38.2% of them complained about the high cost of travelling from Lugari area to Agricultural Finance Corporation office, Kakamega (some areas like Nzoia scheme are 130 to 160 km. from Kakamega town). They indicated that one had to go to Agricultural Finance Corporation offices several times before he could be awarded a loan. They also pointed out that the loans were usually approved late which forced them to plant their crops late.
- (b) 32.4% of them pointed out that the contractors authorized by Agricultural Finance Corporation to plough for GMR loanees were very few and that these contractors prefer to plough for farmers with hard cash before ploughing for those

with Agricultural Finance Corporation invoices; that this fact makes GMR loanees plant their crops late.

- (c) 17.6% of them in both Ikolomani and Lugari areas pointed out that the amount given as GMR or other loans was not sufficient to cover the various costs of farm operations and farm inputs. They indicated that many cooperatives in Ikolomani give inputs without the necessary cash for carrying out farm operations.
- (d) 11.8% of them in Ikolomani pointed out that farm inputs are often given late by their cooperative societies.

Senior Assistant Agricultural Officer, Lugari indicated in this connection that the main problems facing GMR loanees are: first, late approvals of these loans leading to late planting; second, scarcity of tractors, and insistence of tractor owners on cash payments leading to delays in seedbed preparation and planting. This observation about scarcity of tractors in Lugari division is supported by data in table 7.7.

Table 7.7: Distribution of Tractors in Operating Conditions in Lugari Division, 1976

Scheme	Privately Owned	Owned by Cooperatives	Total
Mautuma	1	1	2
Kongoni	16	-	16
Lumaganda	8	-	8
Sango	2	-	2
Soy	17	1	18
Nzoia	31	-	31
Sergoit	10	-	10
Lugari	3	-	3
Mabusi	5	-	5
Chekalini	6	-	6
Mois Bridge	12	1	13
Total	111	3	114

Source: Ministry of Settlement, Agricultural Section, Annual Report, 1976, Lugari.

The table shows that there were 114 tractors in Lugari division, 97.4% of which were privately owned. Some of the private tractor operators undertake contract of ploughing for GMR loanees. The table also shows that the number of tractors in some schemes, such as Mautuma, Sango and Lugari was very small compared to the large number of plots in these schemes. It is conclusive that so long as there is high demand for the services of these few tractor

operators, farmers' claims that tractor owners prefer cash payments to Agricultural Finance Corporation invoices (payable at a later date) are justified. Similarly, field staff in Lugari felt that distances to Agricultural Finance Corporation offices, Kakamega were enormous and that there was need for establishment of another Agricultural Finance Corporation office in Lugari area to help overcome inconveniences caused to GMR loanees. However, one of the Agricultural Finance Corporation field officers we talked to indicated that establishing an office in Lugari area would be uneconomic in the face of the current low rate of repayment of GMR loans by farmers in this area. It was further indicated by field staff in Lugari and one Agricultural Finance Corporation field officer that there existed a tendency on the part of some farmers and GMR contractors to claim that larger acreage was ploughed than that actually ploughed and to share payments earned this way among themselves. The Agricultural Finance Corporation field officer pointed out that whenever such malpractices were identified they immediately reacted by breaking the contract with the GMR contractor in question and could take any other legal action against the contractor.

In sum, the administration of farm credit in the study areas portrays an instance in which there is cooperation between the Extension Service

and lending institutions, especially Agricultural Finance Corporation. The Cooperation, however, is not geared toward grappling with problems of farming communities. Thus amount of credit awarded is fixed per unit of land (i.e. 1235/- per hectare in 1977 for GRM loanees), no attention is paid to availability of ploughing services, or to distances commuted by farmers to Agricultural Finance Corporation office, Kakamega. There is no similar attention paid to the reasons why some farmers sell farm inputs given to them on credit, nor to why they collude with GMR contractors to claim that more hectares were ploughed and to share payments earned in this way with the GMR contractors. There is equally no attention paid to the availability of a market for the crop for which credit is awarded as we will see in the next section. Farmers are represented in committees handling issues related to award and repayment of loans. The farmer representatives in these committees, however, do not seem capable of bringing problems of farming communities to the attention of these committees. It is further true as already argued in Chapter Four that field staff are knowledgeable in these problems of farming communities, but although they are members of these committees they are equally incapable of doing something about these problems due to increased central control of field activities.

The system employed by government and lending institutions in evaluating the genuineness of crop failure claims is rigid and not adaptive to individual farmer situations. Farmers are not represented in the team that evaluates such crop failure claims. Thus it is conclusive that the system of credit administration in the study areas was inadaptive to community and individual farmer situations, a fact which as we showed has led to a growing rate of non-repayment of farm credit in the study areas.

7.4 MARKETING ACTIVITIES

We have discussed issues related to marketing of farm produce in chapter Three. In this section we examine administrative rather than economic issues entailed in marketing of farm produce with an aim of showing the extent to which activities of these marketing institutions take into account agricultural extension efforts of farmer education as well as constraints of farming communities and of individual farmers. The marketing of maize is discussed in greater detail.

Maize in the study areas is sold either to the Maize and Produce Board (MPB), Kenya Farmers Association (KFA), cooperative societies, private traders, or locally in the farming community. The sample of 32 field workers made the following

observations with regard to marketing of maize:

- 34.3% of these field workers from Iugari indicated that farmers faced a lot of difficulties in getting their crop accepted by the Maize and Produce Board; that the Board's personnel always insist that the crop is not dry enough, or that the farmer has put his crop in old bags, or that storage space is exhausted. They indicated that it was easier for private traders who have established connections with the Board's personnel to be issued with permits to deliver their crop to the Board than it is for average farmers. Transport costs (due to poor roads in many places) are said to be as high as 5/- to 8/- per bag; to deliver 100 bags to the Board by lorry, costs a farmer 500/- to 800/-.

- 53.1% of them largely from Ikolomani pointed out that farmers usually sell their produce in small or larger quantities to local businessmen at trading centres. The maize is sold in standard Maize and Produce Board buckets although some businessmen make their own buckets resembling those of the Maize and Produce

Board. There is no weighing of the contents of these buckets (maize is poured in these buckets until it peaks and overflows).

Selling in these buckets was said to earn a farmer nearly Shs. 60/- instead of the Shs. 80/- a bag paid by Maize and Produce Board. It was pointed out that farmers also sell their crop locally to other needy persons in the farming community.

- 6.3% of them pointed out that farmers wishing to deliver their crop to the Maize and Produce Board had to use new gunny bags (sold at Shs. 6/45 ~~early~~ in 1977) obtainable from Kenya Farmers Association. That in some cases farmers are informed that the bags have run out of stock. Some farmers lack money to buy new gunny bags.

- 6.3% of them in Ikolomani indicated that there is no problem in the marketing of maize due to prevalence of high local demand for it in the area.

Our sample of 63 farmers made similar observations with regard to the marketing of this crop. These observations were as follows:

- 44.9% of these farmers reported that they sell their crop locally to businessmen at trading centres (markets) or to institutions like schools at a lower price of up to Shs. 60/- per bag. Some of them report selling their crop at home to persons in need in which case the amount paid per bag, especially in Ikolomani is said to be up to Shs. 85/-.

- 17.8% of them report selling their crop through cooperative societies. Some of them complain that societies do not pay them promptly for their produce.

- 11% of them from Lugari market their crop through the Maize and Produce Board. These farmers pointed out that the Board rejects their crop even when such crop is sufficiently dry. That to get a permit to deliver the crop to the Board may take up to three months. They also point out that hiring a lorry to transport one's crop to the Board is very expensive and usually costs Shs. 5/- to 8/- per bag.

- 2.4% of them in Lugari were members of the the Kenya Farmers Association and marketed their crop through this body. They

complained of high costs of transporting their crop to Kenya Farmers Association stores.

- 4.3% of them from both areas did not cite any problem with regard to marketing of their maize.

- 19.6% of them largely from Ikolomani reported that they do not sell any maize as their consumption needs are always in excess of whatever they harvest.

We observed local sales of maize at Khayega, Lumaganda, Elianda/ Kambi ya Mwanza trading / and centres (markets). Private traders in these markets were buying maize (October, 1977) in buckets. The price paid to farmers was Shs. 11/50 for a 20 litre bucket. We were informed by some of these traders that 5 such buckets could fill a 90 kg. bag (i.e. farmers were receiving Shs. 57/50 per bag). Maize was also sold in 10 litre buckets and even 5 litre buckets at Shs. 5/75 and Shs. 2/85 respectively. Buckets were filled till they overflow.

At Khayega market (October, 1977)

we observed similar local sales of maize by women. The sales were Shs. 11/- to 12/- for a local tin (i.e. Shs. 66/- to 72/- per bag). Most of these women were petty traders who normally buy maize at slightly lower prices from the area or from Lugari and then sell it at the above specified prices. At Lumaganda market and in most homes in Lugari area maize was locally being sold at Shs. 8/- to 10/- per local tin (i.e. 48/- to 60/- per bag).

However, although most farmers in Ikolomani area report that they sell part of their maize harvest, many of them further point out that they again have to buy maize when the home supplies run down.

These various observations by field staff and farmers together with our own personal observations bring to light the following: first, that farmers

in Lugari area who market their crop through the Maize and Produce Board experience problems of transportation of their produce to the Board and of getting their crop accepted by the Board; second, that a large number of farmers sell their produce to local businessmen at lower prices than those paid by the Board; third, some farmers market their crop through cooperatives in which case there are often delays in realizing payment; and finally, some farmers do not produce enough to spare a portion of it for sale.

A large number of farmers, agricultural field workers, cooperative officials and other knowledgeable persons we talked to in Lugari felt that there was a widespread incidence of corruption among the Board's officials. That it was almost impossible for a farmer to deliver his produce to the Board without spending reasonable sums of money to the chain of workers at any of the Board's stores in the area. In reacting to these comments one Produce Inspector we talked to at Turbo Board store pointed out that the following conditions must be met before a farmer's produce can be accepted by the Board:

- (a) The farmer must buy new gunny bags at Shs. 6/45 each; produce delivered in old bags will be rejected.
- (b) Each bag of maize to be delivered must weigh 91 kg. or the produce may be rejected. This implies that farmers should have weighing scales or should borrow such scales from their neighbours.
- (c) The crop must be sufficiently dry; Turbo Board store has no drying equipment. There is further no space to allow farmers to dry their crop within the Board's precincts.

He pointed out further that they can handle up to 30 lorries per day each carrying up to 100 bags of maize. Issuing of permit is therefore restricted to this amount of crop that can be handled in any one day. He added that most farmers rush for permits immediately after harvest and that since all of them cannot be served at the same time, they are often cautioned to wait for a little while.

It is inferable from these comments of the Produce Inspector that favouritism crops up in the Board's activities at the time of: issue of permits

and delivery of produce. When one's crop is rejected he has to transport it back home and later transport it again to the Board when it is dry enough. Most farmers would rather buy their way to get their crop accepted than confront the heavy transport costs involved where a crop is rejected. We have also indicated that a large number of farmers sell their crop to traders; a large number of these traders are reported to have established the necessary contacts with the personnel of the Maize and Produce Board and often market their crop easily.

Apart from these problems, fluctuations in price of maize as in prices of other agricultural products are normally painful to farming communities. At the time of maize harvest in Lugari, it was reported by the Kenya Daily Nation newspaper (September, 1977) that market price for maize had world fallen from Shs. 1,300/- to Shs. 700/- per tonne and that Kenya had a large maize surplus which made it difficult to absorb the 1977 harvest.

In sum, the marketing of maize as entrusted to the Maize and Produce Board is characterized by flaws such as high transport costs, widespread rejections of produce, bribery, etc. Businessmen with substantial resources are at an advantage in the marketing of farm produce than average farmers. These businessmen, however, buy farm produce at much

lower prices. Apart from selling the produce to the Board these businessmen may hold it and sell it at an even higher price at the time of shortage or may transport it to other areas where there is shortage. Similarly, fluctuations in market price of maize greatly discourage farmers and make it difficult for government to declare the price of this crop till in some instances at the time of harvest. This in effect means that farmers in the study areas grow this crop without even knowing what price to expect for it. The price for maize in 1977 was not declared by government until the time of harvest.

We indicated in chapter Four that coffee price remained low throughout the early 1970s until the coffee boom 'set in' in 1976. While the price remained low many farmers neglected or uprooted their coffee. Tea price was too low at the time of data collection, a fact which led to poor management or neglect of tea in the study areas. The acreage expected for establishing a passion fruit project was too high, but while efforts were being made to attain this acreage, no efforts were made to absorb the produce of those farmers who had adopted this crop earlier, a fact which led to failure of the passion fruit project in Ikolomani.

The marketing function even for pure cash crops seems totally divorced from other agricultural activities. There is little or no cooperation between the Extension Service and marketing bodies, especially the Maize and Produce Board, or even cooptation of farmers in decision making regarding the marketing of their produce. Senior Assistant Agricultural Officer, Lugari informed us that in October, 1977 the District Commissioner, Kakamega toured the various Maize and Produce Board stores in Lugari area and cautioned the personnel in these stores to be fair in their dealings with farmers, a fact which indicates the inability of the Extension Service to handle these various issues related to the marketing of farm produce. Perhaps there is more coordination of Extension activities and those of marketing agents at higher levels, e.g., at provincial and national levels. If such coordination exists it has never taken into account conditions prevailing in the study areas with regard to marketing of farm produce.

In fact the goals of the Extension Service of increasing farm productivity seem at variance with those of a parastatal body like the Maize and Produce Board which even if not interested in making profit may simply aim at 'breaking even' in its operations. However, unless there is cooperation between marketing agencies and other parties in a

development programme it becomes difficult for the marketing agencies to appreciate what the other agencies in the programme are doing. Farmers may respond by selling at lower prices to whoever demands their produce, although this may not help to uphold their motivation in a certain agricultural enterprise. They may alternatively switch to other agricultural enterprises in which marketing is less problematic; such an action may be harmful to the larger society and even to the particular marketing agency in question. It may further frustrate extension education efforts as well as efforts of lending institutions which as we have seen in previous sections are much less adaptable to changing conditions in farming communities.

7.5 CONCLUSION

It has been evident from data presented in this chapter that extension messages are usually in a package and are less utilized by farmers due to their failure to take into account views of their recipients. This problem is partly caused by lack of consultations between senior staff, junior ones, and farmers in the process of decision making about various activities of the Crops Improvement Programme. The situation which prevails is that in which junior staff receive directives from above and impose them to farmers without critically evaluating such directives or seeking farmers' views about them.

This failure of senior staff to effectively involve their juniors in the making of decisions regarding farmer education activities could partly help to explain why farmers' attendance of agricultural courses and farm demonstrations was low. These courses and demonstrations advocated resource combinations which are far beyond the reach of the majority of farmers in the study areas, especially in Ikolomani as we saw in Chapter Five. Attempts were being made to overcome this problem through provision of farm credit, but as has been indicated, the system of credit administration equally failed to take into account local community conditions, a fact which could partly help to explain the low rate of repayment of farm credit in the study areas. There was considerable liaison of activities of Agricultural Finance Corporation and the Extension Service, but the liaison was not oriented toward grappling with problems of farming communities.

There was similarly no cooperation between the Extension Service and the Maize and Produce Board. Further, although there is a ready market for maize in other parts of Kakamega district, the Extension Service in Lugari does nothing to organize farmers in this area to sell their maize to other areas of the district.

It is conclusive that extension activities of farmer education, credit administration, and marketing of farm produce are unadapted to local conditions in the two study areas due largely to insufficient delegation of authority to field staff. This in effect shows that hypothesis No. II stated in the introduction to this chapter is validated. It could, however, be that these activities are more adapted to local conditions in situations where authority has been devolved to rural farm cooperatives. How far is this true? The answer to this question is provided in the next chapter.

CHAPTER EIGHT

THE ADAPTABILITY OF ACTIVITIES OF COOPERATIVE SOCIETIES TO LOCAL CONDITIONS

8.1 INTRODUCTION

We indicated in chapter Two that authority has been devolved to farmers' cooperative societies to permit them exercise discretion with regard to marketing of farm produce, provision of farm credit and inputs and in education of their members. It was clear in this cited chapter that the amount of authority delegated to cooperative societies in this country was not adequate. Government dominance of affairs of these societies made it difficult for them to act flexibly in making and implementing their decisions, a fact which shows that most of the decisions made by these societies are not likely to be adaptable to local conditions and hence do not appeal to members of these societies. This in turn could mean that cooperatives do not adequately carry out the above specified functions and hence that member participation in them is low.

A.E. Suchman's (1967:21) observations cited in chapter Two about evaluation of success or failure of a given programme in terms of the extent to which its stipulated objectives were being met could be extended to cooperative societies. We will in this chapter assess the effectiveness of cooperatives in

the study areas by finding out the extent to which they are actively carrying out the above functions of marketing of produce, provision of credit, etc. We further examine the period that officials of these societies have held office; if the period is short it may make it difficult for these societies to undertake long-term projects. We finally study origins and problems of these societies with a view to understanding the main forces that dominate in affairs of these societies and make it difficult for them to adapt their decisions to local conditions. The data presented in this chapter should further help to test hypothesis No. II stated in the introduction to the last chapter.

8.2 EFFECTIVENESS OF COOPERATIVES IN STUDY AREAS

The total number of societies in the traditional areas of Kakamega district during 1974 and 1976 were 46 and 33 respectively as shown in table 8.1.

Table 8.1. : Distribution of Cooperatives in Kakamega District According to their Functional State (Lugari Area Excluded), 1974 and 1976

Type of Society	1974			1976		
	Active	Inactive	Total	Active	Inactive	Total
District Union	1	-	1	1	-	1
Coffee	6	2	8	6	2	8
Sugarcane/ Jaggery	-	1	1	-	4	4
Multi- purpose	3	24	27	10	1	11
Dairy	1	-	1	1	-	1
Poultry	-	1	1	-	-	-
Cooperative Farms	-	1	1	-	-	-
Credit/ Savings	4	2	6	3	2	5
Building Construction	-	-	-	1	-	1
Mining	-	-	-	1	-	1
Consumers	-	-	-	1	-	1
Total	15	31	46	24	9	33

Source: Ministry of Agriculture, Kakamega District Annual Reports, 1974 and 1976.

Nearly 80% of these societies as shown in

this table were concerned with farming - coffee, dairying, sugarcane, etc. These various societies undertook different functions with regard to - crop farming. It was indicated by officials of the

eight societies sampled in Lugari and Ikolomani that their societies at some time or other undertook functions of: first, provision of credit to members in the form of materials like seeds/seedlings, fertilizers, dusts, or in the form of services like ploughing, dipping animals, transportation of members produce like maize and milk, etc. Second, marketing of farm produce; those in Lugari indicated that due to lack of enough capital they often borrow money from the Cooperative Bank of Kenya and use it for buying maize, beans, and sunflower. This permits them to meet needs of farmers who often need cash for paying school fees, buying farm inputs, or it permits them to compete with private traders in buying of farm produce. Finally, societies were reported to provide extension education to their members and officials through courses or seminars.

There were a total of 20 societies in the study areas (8 in Ikolomani and 12 in Lugari). We sampled 8 of these societies as explained in chapter Three. Membership in the societies in Lugari area was compulsory at the time of settlement (see Appendix I). This being the case all farmers in Lugari may be assumed to be members of cooperative societies. The entrance fee, value of shares and total membership for the four societies studied in Ikolomani is shown in table 8.2.

Table 8.2: Entrance Fee, Value of Shares, and
Total Membership of Sample of
Societies in Ikolomani

Name of Society	Entrance Fee (K.shs.)	Value of Shares (K.shs.)	Number of Members with Shares	Members Without Shares	Total Number of Members
Lianda	5/-	20/-	128	44	172
Isukha	2/-	40/-	-	-	700
Lirembe	2/-	10/-	-	-	614
Shigokho	2/-	10/-	325	100	425

Source: Information Provided by Secretary Managers of cited societies.

The table shows total membership in these four societies to be 1911 members giving an average of 478 members per society. If we assume that each of the 8 societies in Ikolomani had up to 478 members then, there were 3824 members of cooperative societies in Ikolomani. In chapter Nine we indicate that there were 22,912 farmers/households in Ikolomani division. If we assume that each member of a cooperative society in Ikolomani was a farmer or a head of a household then, 16.7% households/farmers in Ikolomani have been reached by the cooperative movement; the remaining 83.3% farmers have not been affected by the movement.

The distribution of the sub-sample of farmers from Ikolomani according to whether they were members of cooperatives or not is shown in Table 8.3.

Table 8.3: Distribution of Sub-sample of Farmers from Ikolomani According to Membership in Cooperatives

Membership in Cooperatives	Exposed Group (%)	Non-exposed Group (%)
Yes	74	20.8
No	26	79.2
Total	100	100
(Base)	(50)	(48)

The table shows that 74% of farmers in the exposed group were members of cooperative societies. The fact, however, that only 20.8% of the farmers in the non-exposed group were members of cooperatives tends to confirm the above argument that a large number of farmers in Ikolomani area have not been affected by the cooperative movement. This is so due to the fact that nearly 90% of farmers in smallholder areas are not exposed to extension efforts as indicated in chapters One and Two.

Despite these facts, however, cooperative societies in both the traditional rural areas and the settlement areas of Kakamega district as indicated

by Ministry of Agriculture, Kakamega District, Annual Reports (1974:36 and 1976:45) do not seem to do well; a large number of them are inactive or dormant, some have been or are in the process of being liquidated. In the traditional rural areas of the district as shown in table 8.1, 32.6% societies were active during 1974; while 72.7% are shown to have been active during 1976; that is, they effectively assisted their members with farm credit, marketing of their produce, and in educating them about farming. There are apparent disparities in these statistics, a fact which tends to indicate that some of the societies that had been there in 1974 had been liquidated by 1976, or that some of the societies which had been inactive during 1974 had become active by 1976.

Table 8.4 shows the extent to which the 20 societies in Lugari and Ikolomani areas actively assisted their members in farming. The table shows that 16.7% of the societies in Lugari and 25% of those in Ikolomani were active; the rest were either marginally operative or dormant. These facts show that the problem of dormancy of societies discussed above is under-reported by government agencies. Some societies in the study areas had management committees which were hardly re-elected and which did not handle any significant business for a whole year. Others had been proposed and registered during the

1970s but had not become operational at the time of data collection.

Table 8.4: Functional State of Cooperative
 Societies in Lugari and Ikolomani
 Areas, 1977

Functional State	Lugari (%)	Ikolomani (%)
Actively functioning	16.7	25
Marginally functioning	66.6	37.5
Inactive/dormant	16.7	37.5
Total	100	100
Base	(12)	(8)

Source: Information supplied by Agricultural Staff and Officials of some Cooperative Societies.

It is evident up to this juncture that the cooperative movement had affected nearly all farmers in Lugari and only 16.7 % of those in Ikolomani. However, only 16.7% of the societies in Lugari and 25% of those in Ikolomani actively assisted their members with farm credit, marketing of their produce, and educating them about improved farming; the remaining societies were either marginally operative or dormant and did not significantly assist their members in their varied farming activities. Two of the four active societies were in Lugari and the other two in Ikolomani. The two active societies in Ikolomani were coffee societies which at the

time of data collection were diversifying their activities to other agricultural enterprises. The other two societies in Lugari were in schemes where dairying was prominent. What, however, are the causes of the ineffectiveness of a large number of societies in the study areas?

8.3 REASONS FOR INEFFECTIVENESS OF COOPERATIVES

Many factors may be responsible for the apparent ineffectiveness of most societies in the study areas. This study briefly examines three of these factors namely: period of office holding of officials of cooperatives, origins of societies sampled and government dominance in affairs of these societies. These cited factors are by no means mutually exclusive. We examine each of these three factors in turn.

The first factor period of office tenure in cooperative societies was studied by finding out the length of time each of the 19 officials of the 8 cooperative societies that we sampled had served his society. We categorized these 19 officials as follows:

- Elected officials: there were 9 elected officials (6 chairmen, 1 treasurer, 1 honourable secretary and 1 vice-chairman).
- Committee members who are also elected but do not hold any other post on the committee: there were 4 committee members.

Secretary Managers who are appointed officials and responsible for the day-to-day administration of their societies: there were 6 such Secretary Managers.

The period that was reported by these 19 officials to have held position in their respective societies is shown in table 8.5..

Table 8.5: Distribution of Officials of Cooperative Societies According to Period of Office Holding in Their Societies

Number of Years	Elected Officials %	Committee Members %	Secretary Managers %
Up to 1.9	33.3	25	33
2 to 3.9	44.5	50	17
4 or more	22.2	25	50
Total	100	100	100
Base	(9)	(4)	(6)

The table shows that Secretary Managers have on the average served these societies for slightly more years than the other officials; the average period of service for these 6 Secretary Managers was nearly 4 years, while that for elected officials was 2 years and that for committee members was $2\frac{1}{2}$ years. The low average period of 4 years for Secretary Managers points to a likely high rate of turnover

of these officials due mainly to poor conditions of service within these societies. We were informed by the Chairman of one of the societies in the sample that his society which was started in 1964 had at the time of data collection (October, 1977) had 9 different chairmen over the 13 year period from 1964 to 1977 giving an average period of office tenure of nearly $1\frac{1}{2}$ years per chairman. The same society had had 5 different Secretary Managers over the same period of time giving an average period of office tenure of nearly $2\frac{1}{2}$ years per Secretary Manager. It is conclusive from these data that the period of office tenure for officials of cooperatives is fairly low, a fact which tends to indicate that it may not be possible for most societies in the study areas to embark on long term programmes of action.

The second factor which helps to explain the ineffectiveness of most societies in the study areas is the way in which these societies originated. The way in which the 8 societies in our sample originated as reported by officials of these societies was:

- (a) The Secretary Manager of Isukha Coffee Growers Society informed us that Isukha Society was started in 1968 to cater for coffee growers in Isukha location. The

reason for starting this society was that there were many coffee growers in Ikolomani division who were not adequately served by Idakho society which was the only coffee society in the division. Many farmers had to commute long distances to Idakho coffee factory which was the only one in the division.

- (b) The two societies of Lirembe and Shigokho in Ikolomani were started by a prominent leader in the area with substantial financial aid from the Dutch government. We were informed by the Chairman of Lirembe Society that Mukumu Farmers Cooperative was also started under the same project but although the first two societies were able to minimally 'take-off', Mukumu Society could not equally 'take-off' due to the fact that Dutch assistance was discontinued for political reasons. He indicated that it was an integrated development project - at Lirembe apart from provision of agricultural services of extension education and farm credit, other projects were undertaken which included: a nursery school, a homecraft centre, a village polytechnic, etc.

- (c) Lianda Farmers Cooperative was first registered in 1959 to assist in marketing of maize and was then known as Kambiri Farmers Cooperative. The Secretary Manager of this Society informed us that the Society became inactive throughout the 1960s due to its inability to compete with private traders in the marketing of maize and beans. The initiative to revive the Society came from the Provincial Cooperative Officer, Western Province in 1973¹. The Society was duly revived under the new name of 'Lianda Farmers Cooperative'. The Secretary Manager of this society informed us that the society had already joined the District Union and that it was giving out credit and assisting its members in the marketing of maize, beans and sunflower.
- (d) The Societies in Lugari area were started by government; farmers were compelled to join these societies on settlement or they could not be allowed to settle (see Appendix I). Settlers were expected to market their produce and to repay their land and development loans through these societies.

We may conclude from these data that government has dominated in initiation of cooperatives in the study areas. The Coffee Society of Isukha as coffee societies elsewhere in this country, must have been started through government initiative. Even where societies were started by prominent individuals as illustrated above, involvement of government officials was considerable. Lianda Society as well as societies in Lugari area were started through government initiative. This being the case, government say in the affairs of these societies must be considerable, a fact which might explain the inability of societies in the study areas to act flexibly in making and implementing their own decisions.

The third factor which helps us to understand the ineffectiveness of most societies in the study areas is the nature of the relationship between cooperatives and government or other agencies involved in agricultural programmes. The nature of this relationship is best understood by examining a few problems that face the cooperative movement in the study areas. These problems are:

(a) Accumulated Debts

Some societies in Lugari were given GMR credit during 1967/68 period to pass on to their members. It was indicated by officials

of these societies that although they extended this credit to their members, the credit was not fully repaid. During that year when these societies delivered their produce to the Maize and Produce Board, Agricultural Finance Corporation agreed with the Board to confiscate the produce. In many cases produce confiscated was not sufficient to cover the value of GMR awards extended to these societies; considerable amounts have been left unpaid and had not been paid at the time of data collection and have been increasing at changing rates of interest. The Chairman of Chekalini Cooperative Society which was so affected indicated that his society owed Agricultural Finance Corporation Shs. 149,000/-. The Chairman of another society which was similarly affected, remarked:

"....we had a lorry...sold by court broker....we had to hide cabinet and other properties of the society...I personally went to court and promised to settle the debts of the society slowly".

The Assistant Cooperative Officer, Lugari whom we talked to indicated that Agricultural Finance Corporation has refused to 'write off' these debts; it still insists that

cooperatives must pay. Officials of societies affected indicated that confiscation of produce by Agricultural Finance Corporation in collaboration with the Board has led to fear among many farmers to market their produce through cooperatives. Two societies in our sample from Lugari were affected in this way.

(b) Procedure for Handling Complaints

Members of one society in Lugari owed the Society well over Shs. 25,000/-. The Chairman of the society indicated that members had borrowed material inputs or cash amounting to this indicated sum during 1972/73 and earlier periods. This money had not been repaid by members involved at the time of data collection. It was also indicated that of the 8 members who owed the society Shs. 300/- or more, 7 of them were officials of the previous management committees. The Chairman of this society informed us that the Cooperative Societies Act (1966) forbids the society from instituting legal proceedings against its members, nor can a member institute such legal proceedings against the society without the consent of the Commissioner of Cooperatives. The Commissioner's consent

can be obtained through the normal bureaucratic routine of handling correspondence; that is, complaints must be forwarded to the Commissioner through the junior most officers of the Ministry of Cooperative Development; feedback is realized in the same way. Often realization of feedback will be after a long time. The Assistant Cooperative Officer, Lugari indicated that the Commissioner may provide his own ruling or he may settle the complaint or dispute in the way he finds fit. The Chairman of this particular society informed us that he had been struggling for the last three years to recover the above stipulated sum of money from debtor members of the society but had not succeeded by the time of data collection.

(c) Competition in Marketing of Farm Produce

Many alternative sale channels exist for maize in Lugari area which increase problems of marketing of this produce as indicated in the last section. The Assistant Cooperative Officer, Lugari observed that farm produce is sold at the end of the year when there is pressing need for money for buying farm inputs, paying school fees, etc. That unless a society is able to

offer farmers cash for their produce many of them will by-pass the society. As indicated in the last section, cooperatives try to overcome this problem by borrowing money from the Cooperative Bank of Kenya to buy farm produce. This in effect calls for some protection of cooperatives when they market their members' produce, or for them to be given priority by marketing agencies like the Maize and Produce Board in delivery of their members' produce; this does not happen.

(d) Run-away Members

It was indicated by the Secretary Manager of Chekalini Society that many of their members who were in debt with their society had joined another society to which they were delivering their dairy products. He pointed out that the society had informed the Ministry of Cooperatives about this problem, but the Ministry indicated that it cannot take any action against these members so long as they were selling their produce to an authorized body; that is, to another cooperative society in this case even if they had not relinquished their membership in Chekalini Society.

(e) Mismanagement of Funds

One Cooperative Assistant in Lugari area informed us that some Treasurers of cooperatives collude with certain officials of the committee and make fictitious entries of expenditures in their books of accounts, e.g., that a particular farmer has been paid so much money when in fact he has not been paid anything, or that so much material inputs were bought when in fact nothing was bought. He indicated that he insists on checking all cash entries in the books of accounts against cash in hand and in the bank. He added:

"...I check all entries of items bought by seeing the items themselves or their empty containers...I insist on inspecting all invoices or receipts for purchases made..in many cases the officials avoid me as far as possible..evade my efforts to check what they are doing, or give me vague excuses for what they have done..ordinary members are not allowed to inspect society's books of accounts..if they have a complaint they usually pass it to one of the officials who informs the committee....the committee will then decide on action...I counter-sign all cheques issued by societies in my area".

These comments show the suspicions and fears of government and the fact that government dominates in decision-making processes of cooperatives in the study areas.

8.4 CONCLUSION

These data show that 16.7% of the societies in Lugari and 25% of those in Ikolomani were active; some like Sergoit Farmers' Cooperative which was by far the most successful in Lugari actively assisted their members with marketing of their produce, with ploughing and transportation services, etc. However, government has played a leading role in initiation of societies in the study areas, a fact which justifies its current dominance in management affairs of these societies. Elections are supposed to be held annually even where they are unnecessary, a fact which may explain the high rate of turnover of elected officials of these societies. Secretary Managers are appointed but seem to leave these societies after serving them for a short period of time probably due to poor conditions of work or other internal problems in these societies. This high rate of turnover of officials of societies makes it difficult for a society to maintain continuity of its activities or to embark on long-term projects since each committee may embark on actions which are totally different from those of previous committees.

Other government regulations concerning the way these societies should operate are equally rigid. The process of obtaining consent from the Commissioner of Cooperatives for the purpose of taking a member who is in debt with the society to

court is very long. The society on the other hand when in debt with any of the lending institutions could readily be taken to court or its produce delivered to a marketing organization can readily be impounded for recovery of money owed to such financing institutions. In Lugari we found that societies were not given priority in delivery of their produce to the Maize and Produce Board; they had to face severe competition from private traders in delivery of produce to the Board. One society which was faced with the problem of many of its members delivering their milk to a neighbouring society could not be assisted by government to overcome this problem. There was suspicion and fear from government officers that officials of cooperatives may misuse their societies' funds; they counter-sign all cheques issued by societies, audit their financial records and confirm all purchases made by each society.

These government controls on activities of societies are, as McAuslan J.P.W. (1970:102-105) has noted, provided for by the 1966 Cooperative Societies Act in this country whose provisions include: registration of all societies before being allowed to carry on business; societies must keep books of accounts and must produce them for inspection and auditing to officers of the Cooperative Department at any time; all cheques issued by societies must

be counter-signed by officers of the Cooperative Department, etc. These and other provisions of the Cooperative Societies Act seem to be enforced by the Cooperative Department in the study areas. These data reinforce Goran Hyden's (1970:61-81) observations cited earlier that the cooperative movement in this country is very weak due to problems of excessive government control, general and financial mismanagement and ethnic rivalry. He indicated further that these and other problems faced by cooperatives in this country make it difficult for these societies to act flexibly in pursuit of their various objectives; government control made it difficult for societies to make and implement their own decisions and hence to continuously adapt their activities to changing community conditions. As we have shown societies in the study areas find it difficult to compete with private businessmen in marketing of maize, beans, and sunflower. Government control of affairs of cooperatives helps to explain to some extent why a large number of cooperatives in the study areas are dormant or only marginally operative. This ineffectiveness of nearly three quarters of the societies in the study areas means that the contribution which the people themselves could make to farm development through their cooperatives is not forthcoming.

It is conclusive from these data that insufficient devolution of authority to cooperatives

makes it difficult for most of them to adapt their activities to local conditions and hence to function effectively. This fact provides further support for hypothesis No. II stated in the introduction to the last chapter. It is also evident from data in this and the last chapter that extension activities of farmer education, credit administration, marketing and cooperative development were equally less adapted to local conditions in the two study areas. This being the case, could it be that the capacity of the Extension Service to implement the Crops Improvement Programme was equally low in the two study areas? The answer to this question is provided in the next chapter.

Footnote to Chapter Eight

1. See Letter dated 30.4.1973 from Provincial Cooperative Officer, Western Province addressed to the District Cooperative Officer, Kakamega, in Lianda Farmers' Cooperative Society File, folio No. 153, District Cooperative Office, Kakamega. The District Cooperative Officer was requested by this letter to visit the areas which used to be served by this Cooperative Society and talk to the leaders there about the need for revival of this Society.

CHAPTER NINE

THE CAPACITY OF THE AGRICULTURAL EXTENSION SERVICE TO IMPLEMENT THE CROPS IMPROVEMENT PROGRAMME

9.1 INTRODUCTION

The theory and literature review in Chapter Two as well as the subsequent discussion in Chapter Three showed that the Extension Service in smallholder areas in this country was faced with problems which included: reliance of the Extension Service on a large number of lowly trained workers to educate farmers, low pay and promotion prospects, defective transportation arrangements, etc. These and similar problems made it difficult for the Extension Service to reach and effectively involve the majority of rural farm families in its programmes of change. We will in this chapter examine the capacity of the Extension Service in the study areas; that is, we examine density of staffing, occupational competence and factors influencing it, transportation arrangements, and the system of promotions with a view to finding out the extent to which the Extension Service in the study areas was prepared to implement the Crops Improvement Programme. We further find out whether there was difference in capacity between the Extension Service in Lugari and that in Ikolomani. The data presented in this chapter should help us to test hypothesis No. III namely that: 'the less the capacity of the Extension Service to

adapt the Crops Improvement Programme to local conditions,
the more centralized the process of decision making
is likely to be in this Programme'.

9.2 DENSITY OF STAFFING

Issues related to density of staffing were discussed in Chapter Three. This section examines the extent to which the Extension Service in Lugari and Ikolomani areas is staffed with a view to finding out the extension worker-farmer ratio in both areas.

We indicated that a large proportion of Extension work is done by junior agricultural workers of Agricultural Assistant and Junior Agricultural Assistant cadres. These junior field workers were found by Leonard D.K. (1977: 8-9) to spend a large proportion of their time ranging from 37-46% providing information to individual farmers and 20% of their time on providing information to groups of farmers as shown in table 9.1. Thus 57-66% of time of junior extension workers was spent on providing information to individual or to groups of farmers while the remaining 43-34% of their time on the Ministry's organizational activities and on collecting data for senior staff. Leonard concluded on the basis of these data that the individual method of farmer contact was the most widely used by the Kenyan Extension Service. This method, however, can only be effective if the worker-farmer ratio is favourable; that is, if the

worker has sufficient time for each farmer. How far then was the extension worker-farmer ratio in the study areas favourable relative to other parts of this country, keeping in mind the fact that time available for farmer education activities is considerably reduced because of time spent on other activities of the Ministry of Agriculture?

Table 9.1: Time Spent on Different Duties by
Agricultural Field Staff in Kakamega
and Embu Districts

Type of Activity	<u>%age of Work Week</u>	
	Kakamega	Embu
Organizational Tasks (staff meetings, tours with officials, courses, etc.)	15	22
Collection and standardization of information for superiors	16	12
Extension of information and services to groups of farmers	20	20
Extension of information and services to individual farmers	37	46
Unaccounted for	12	-

Source: Taken from D.K. Leonard (1977:9),
Embu data was collected from AAs. Those
from Kakamega were collected from both
AAs and JAAs.

The Agricultural Extension Service in the traditional rural areas of Kakamega District during 1976 was composed of general agricultural staff (excluding veterinary staff) of varying cadres as shown in table 9.2. The three Agricultural Officers (AOs) were: the District Agricultural Officer (DAO), District Land and Farm Management Officer (DLFMO), and the District Animal Husbandry Officer (DAHO) - they were positioned at the District Headquarters. Six of the 11 AAOs were in charge of divisions,

two were Horticultural Officers at district headquarters and in the Special Rural Development Programme (SRDP) area of Vihiga, one was in charge of Home Economics for the whole district, while two were positioned at Bukura Farmers Training Centre. The remaining junior agricultural staff (AAs and JAAs) were positioned in the divisions. Leonard D.K. (1977:9) has indicated that Agricultural Officers (AOs) hold university degrees, Assistant Agricultural Officers (AAOs) hold diplomas in agriculture, most AAs have obtained certificates in agriculture after 1-2 years training, while most of the Junior Agricultural Assistants (JAAs) have not undergone any training in agriculture. He indicates that this last cadre including veterinary staff number 3,800 (or 60%) of the total Ministry of Agriculture's extension workers. This later observation is confirmed by the data in table 9.2 which shows that nearly 51% of the Ministry of Agriculture's 212 extension workers in Kakamega district were Junior Agricultural Assistants.

Table 9.2: General Agricultural Staff in Traditional Rural Areas of Kakamega District, 1976

Rank of Agricultural Worker	Number
Agricultural Officers (AOs)	3
Assistant Agricultural Officers (AAOs)	11
Agricultural Assistants (AAs)	89
Junior Agricultural Assistants (JAAs)	109

Source: Taken from the Ministry of Agriculture, Kakamega District Annual Report, 1976, Appendix B.

We have shown in Appendix table II.a. that the traditional rural areas of Kakamega district's projected population was 928,786 persons in 1976 (excluding persons in Lugari, townships, and Kakamega forest). If we assume that the head of each family is a farmer and that each family has an average of 7 persons then, the traditional rural areas of the district had a total of 132,683.7 families/farmers. When the 198 junior extension workers shown in table 9.2 is divided by the total number of farmers shown above we get a ratio of one junior extension worker: 670 farmers. This ratio is close to that found by Heyer J. et.al. (1969:58-61) in their studies of 14 small farm districts which included Kakamega district. They showed that on the average a Ministry of Agriculture agent (veterinary staff excluded) served 558 families; Taita district had the lowest ratio of one extension agent:266 farmers while Meru had the highest ratio of one extension agent:1,206 farmers. Leonard D.K. (1977:9) indicated that these cited ratios were favourable enough to permit every farmer to be visited at least once a year by an extension agent and justified the use of the individual farm visit method in this country.

Staffing with regard to the two areas of Ikolomani and Lugari during the year 1977 is shown in tables 9.3 and 9.4. Table II.a. in the Appendix shows that Ikolomani had a total of 160,382 persons

in 1976 when persons in Kakamega forest are excluded. By using the above assumption of 7 persons per family we get a total of 22,912 families/farmers in the whole division. Table 9.3 shows that there were a total of 38 junior agricultural workers in Ikolomani giving a ratio of one junior extension worker to 603 farmers. This ratio is slightly lower than that of one junior extension agent:670 farmers for traditional areas of Kakamega district, but falls within the range shown above by Heyer J. et.al. for the 14 small farm districts in this country.

Table 9.4 shows the distribution of extension workers in Lugari area according to cadre, area of specialization, and number of farmers in each scheme during 1977.

Table 9.3: Distribution of Extension Staff in Ikolomani Division According to Cadre and Area of Specialization, 1977

Duties and Responsibilities	Occupational Cadre			Total
	AAO	AA	JAA	
Administration	1	-	-	1
General Agriculture	-	3	16	19
Coffee	-	-	2	2
Passion Fruit	-	1	-	1
Farm Management	-	2	1	3
4-K Clubs	-	-	1	1
Home Economics	-	1	1	2
Animal Husbandry	-	5	5	10
Total	1	12	26	39

Source: Information provided by AAO, Ikolomani, October 1977

Table 9.4: Distribution of Extension Staff in Iugari Area According to Cadre, Area
of Specialization, Scheme, and Number of Farmers in Each Scheme

Duties and Responsibilities, and Number of Farmers Per Scheme	Occupational Cadre						Total
	SAAO	DAA	IAAs	AAs	JAAs		
Administration	1	1	3	-	-		5
Farm Management	-	-	-	1	-		1
4-K Clubs	-	-	-	1	-		1
General Agriculture:							
Iugari (669 farmers)	-	-	-	1	2		3
Mautuma (535)	-	-	-	2	1		3
Sango (328)	-	-	-	1	1		2
Chekalini (561)	-	-	-	2	1		3
Iumaganda (559)	-	-	-	1	1		2
Sergoit (169)	-	-	-	1	1		2
Soy (151)	-	-	-	1	1		2
Kongoni (239)	-	-	-	1	1		2
Nzoia (190)	-	-	-	2	-		2
Mabusii (126)	-	-	-	1	1		2
Mois Bridge (204)	-	-	-	1	2		3
Total (3,731)	1	1	3	16	12		33

Source: Information obtained from SAAO, Iugari, October 1977.

The table shows Lugari area to have a total of 3,731 farmers and 31 junior extension workers giving a ratio of one junior extension agent:120 farmers which is five times lower than the cited ratios for traditional rural areas of Kakamega district and Ikolomani division. It is further lower than the lowest ratio of one extension worker:266 farmers for Taita indicated above. This in effect means that extension agents in Lugari are likely to find it easy to contact and educate the few farmers in their areas of operation than those in Ikolomani and other parts of Kakamega district or even those in many smallholder areas in this country.

Further when we consider the ratio of each cadre of junior staff to farmers we find that in Ikolomani using the information shown in table 9.3 the ratio of Agricultural Assistants to farmers is one Agricultural Assistant:1,909 farmers while that of Junior Agricultural Assistants to farmers is one Junior Agricultural Assistant:881 farmers. In comparison in Lugari as shown in table 9.4 there were 16 Agricultural Assistants (excluding Divisional Agricultural Assistant and Locational Agricultural Assistants whose responsibilities were largely supervisory) and 12 Junior Agricultural Assistants engaged in extension work in various schemes. This gives ratios of one Agricultural Assistant:233 farmers and one Junior

Agricultural Assistant:311 farmers. It is evident from these ratios that in Ikolomani Agricultural Assistants serve eight times while Junior Agricultural Assistants serve three times more farmers than their colleagues in Lugari. Watts E.R. (1969:68) had indicated a similar ratio of one Agricultural Assistant:1,100 farm units for Kakamega district. Since some farmers are likely to have two or more plots, it may be concluded from these observations that the number of farmers per Agricultural Assistant was slightly lower than the above cited number of plots. It is, however, evident that the ratio of Agricultural Assistants to farmers in Ikolomani was much higher than the above cited number of plots and was much lower than the cited plots in Lugari. What then is the implication of these latter ratios on the implementation of the Crops Improvement Programme? As we have indicated the task of farmer education is largely shouldered by junior extension workers. Leonard D.K. (1973:137), however, indicated that Agricultural Assistants are better informed and hence occupationally competent than Junior Agricultural Assistants. If this observation is really true then, one would expect the transfer of agricultural messages to farmers in Ikolomani with more farmers per Agricultural Assistant to be much slower than in Lugari.

In sum, the extension worker-farmer ratio

in Ikolomani and in other traditional areas of Kakamega district is average and could permit each farmer in these areas to be visited by a junior field worker at least once a year. The ratio in Lugari is lower than that in Ikolomani and that in other areas of Kakamega district and could permit each farmer to be visited by a junior field agent at least twice or more times a year. However, the fact that Agricultural Assistants are more competent than Junior Agricultural Assistants and that the ratio of Agricultural Assistants to farmers is much more favourable in Lugari than it is in Ikolomani is likely to make transfer of agricultural messages to farmers to be much faster in the former than in the latter area.

9.3 THE OCCUPATIONAL COMPETENCE OF FIELD STAFF AND FACTORS INFLUENCING IT

The pre-service and in-service training offered to junior field staff in various agricultural institutes and Farmer Training Centres (FTCs) for varying periods of time is intended to make these field workers competent and committed to do their work (Ogola G.D. 1974:5-7). We were informed by the lecturer in Farm Management and Extension Methods at Bukura Agricultural Institute that courses offered by the Institute cover technical and economic aspects of farming as well as methods of imparting extension education to rural farm families.

In addition senior staff at divisional, district, or even higher levels of the Extension Service play a significant part in educating field workers about the various requirements of their work. At one divisional meeting of field workers in Ikolomani, (July, 1977) the District Coffee Officer, Kakamega taught field staff in this division about the new recommended coffee spacing of $1\frac{1}{2}$ metres by $1\frac{1}{2}$ metres (the old spacing was 3 metres by 3 metres). He stressed the importance of this new spacing for small scale farming areas like Ikolomani in which farm sizes are very small. The Assistant Agricultural Officer, Ikolomani during the period July to October, 1977 actively instructed and helped his field staff in construction of accurate and detailed Annual Work Programmes and Calendars of Work. Similarly, research findings and any other information in crop production work is passed to the field staff through Assistant Agricultural Officer/Senior Assistant Agricultural Officer who interprets the findings or information in a language that can be readily understood by junior staff. The Assistant Agricultural Officer, Ikolomani usually passed on new information or research findings to his field workers in staff meetings which were held twice a month. He also in a few instances attended crop demonstrations held by his junior staff for farmers and could also use the same demonstrations to teach his field staff. Further, whenever field staff encountered problems in their areas of operation which

they could not adequately deal with, they usually brought them to the attention of their senior officers who explained them how to solve such problems.

Thus training provided to field workers prior to their entry into the Extension Service is continuously supplemented by refresher courses, seminars and other teaching efforts by senior staff with a view to keeping field staff well informed in their work. Field staff are further provided with the "Crop and Livestock Manual"¹ in which requirements of various agricultural enterprises - spacing, fertilizer requirements, etc. are provided.

This section assesses the extent to which field workers in the study areas were occupationally competent as measured by the extent to which they were informed about the various aspects of crop production work. The assumption is that field workers who were more competent were likely to be more effective in implementation of the Crops Improvement Programme than those who were less competent. This in effect would show that an area with more competent field workers could be ahead of another area with less competent workers in the implementation of the crops programme. We further examine the effect of a few socio-economic factors on competence of field workers with a view to isolating those factors which have the highest influence on field workers' competence.

9.3.1: Assessment of Occupational Competence

We assessed the occupational competence of agricultural field workers in two ways:

- (a) By finding out the extent to which field workers were informed or knowledgeable about crop farming recommendations provided by the Extension Service for farmers. We treated such knowledge of extension recommendations as technical knowledge. This technical knowledge is acquired from various training situations as we have mentioned above. Leonard D.K. (1973:134) used the same method in finding out the extent to which agricultural field workers were technically informed about their work and regarded those who were well informed as technically more competent than those who were less informed. We asked extension workers questions about eight selected extension recommendations on any two crops they indicated as the most important or profitable in their areas of operation. A correct response on any one of these recommendations earned three (3) scores, a 'don't know' response earned zero (0), while incorrect responses were assigned scores within this specified range. The recommendations were:

- (i) Time of land preparation and planting of the two crops;
- (ii) Spacing of the two crops;
- (iii) Seed rate/number of plants per hectare.
- (iv) Number of weedings required;
- (v) Quality of seed/planting materials recommended;
- (vi) Type and amount of fertilizers applied at planting time;
- (vii) Type and amount of fertilizers applied at growing stage;
- (viii) Type and amount of dusts/sprays required.

The information needed for each of these recommendations was on a per hectare basis. A maximum of twenty four (24) points could be scored by a field worker who gave correct responses for all of the eight recommendations.

- (b) By finding out the extent to which field workers were knowledgeable about extension methods of farmer education, for example, about the need for use of demonstrations or courses in teaching of farmers, the socio-

economic attributes of a farmer selected for a demonstration to be held on his farm (farmer demonstrator), precautions taken to ensure maximum participation of those who come to attend the demonstration, etc. These and other related issues constitute an important component of extension training efforts *already discussed*.

We asked farmers questions on eight issues of this nature. Responses to these issues were scored in such a way that those which took into account needs of farmers and farming communities and which could permit participation of more farmers in agricultural programmes received three (3) points, a 'don't know' response or a response dictated from above, or based on purely technical considerations could score as low as zero (0), while other responses were assigned scores within this range. The items, responses and scores for these items were as follows:-

(i) Reasons given for desirability of a crop demonstration to be held in a particular area:

- permits group teaching; difficult to visit and teach each farmer - 3 scores.
- when a new crop, practice, or farm input is being introduced into a given area, or when crop husbandry

practices are poor - 2 scores.

- when the right season 'sets in' and when the necessary facilities for carrying out the demonstration are available - 1 score.

(ii) A farmer with certain socio-economic characteristics is selected for a demonstration to be held on his farm:

- such a farmer must be interested in farming and be liked by other farmers. This may make it easy for him to influence them and to get them learn something from him. He need not necessarily be progressive in farming - 3 scores.
- he must be progressive in farming to serve as a model of change for others as well as to afford farm inputs needed for the demonstration - 1.5 scores.
- his plot must be near a public market, road, or in a central place in the farming community - 1 score.
- don't know or unclear response - 0 score.

(iii) What role is played by a farmer on whose plot a demonstration is carried out:

- provides facilities, carries out activities, and is taught to teach farmers about the demonstration in

the presence or absence of the field worker - 3 scores.

- provides facilities and carries out activities. He does not teach other farmers in the absence or presence of the field worker - 1.5 scores.
- don't know - 0 score.

(iv) In which way do you carry out a demonstration so as to ensure maximum participation by farmers coming to attend it?

- farmers are explained, shown what to do and how to do it; they are then allowed to do it practically - mistakes are corrected and room allowed for questions and discussion - 3 scores.
- farmers are explained and shown what is to be done and allowed to do it themselves - 2 scores.
- farmers are explained what is to be done - 1 score.
- don't know or unclear response - 0 score.

(v) In which way do you identify farmers' problems during farm visits?

- launch discussion with farmer and come to grips with his problems during these discussions. Also make direct observations of a farmer's farm activities and home conditions

to get a better picture of the problem - 3 scores.

- launch discussion with farmer and learn his problem from such discussion - 2 scores.
- farmer tells you or you ask him what his problem is - 1 score.
- don't know or unclear response - 0 score.

(vi) In which way do you contact and teach farmers of a given community with identical problems?

- organize a meeting in the farm of one of them, or in any convenient place in the community, or hold a demonstration, field day, or course for them - 3 scores.
- visit each of them and teach him individually - 1.5 scores.
- concentrate on one of them; others are likely to learn from him - 1 score.
- don't know - 0 score.

(vii) When you find a farmer carrying out an activity in a way you do not approve how do you usually correct him?

- discuss problem with him and indirectly draw his attention to the mistake. Show him the benefits of carrying out the activity in some other way

and encourage him to do so practically on the spot or some other time. Praise him for any activity he has done correctly - 3 scores.

- discourage him on the spot and teach him a better method. Where activity has already been done advise him not to do it again. Recruit him for a course if he does not understand - 1.5 scores.
- stop him from going on with the activity and if he does not listen invite a senior extensionist to show him his mistake - 1 score.
- don't know - 0 score.

(viii) Having determined the need for a given crop demonstration, which methods do you use to get farmers know about the demonstration?

- several methods were mentioned including:
 - Barazas
 - Church meetings
 - Posters
 - Cooperative society meetings
 - Farm visits, etc.

We gave 0.75 score for each of these mentioned methods up to a maximum of three (3) scores.

With the exception of responses in item (viii) scores for responses in items (i) to (vii) were given to any one best response given by the respondent on each item. The scores were cumulative. A total of twenty four (24) scores could be earned by a respondent who gave correct responses to these eight items.

Demonstrations and farm visits were not included in this assessment of occupational competence; adequate questions about them were developed in the field after a number of field workers had already been interviewed. Data obtained about farm visits and demonstrations is therefore used for other purposes elsewhere in this chapter.

We correlated the first set of scores on technical knowledge (y_1) with those on knowledge of extension methods (y_2) as shown in table 9.5. The table shows that field workers who were well technically informed tended to be also well informed in extension methods. Table 9.6b shows Junior Agricultural Assistants (JAAs) who were well technically informed to have been on the average well informed in extension methods, while table 9.7a shows field workers in Lugari

who were well technically informed to have been on the average well informed in extension methods. Despite the fact, however, that both types of knowledge are significantly correlated, we will separately assess the influence of formal education, training in agriculture and length of service on informedness in both types of matters.

9.3.2: Factors Influencing Occupational Competence

We postulated in hypothesis No. III Chapter Three that three factors could influence occupational competence of agricultural field staff. These factors are:

- (a) Formal educational qualifications.
- (b) Training in agriculture: each full month of course attendance was assigned one (1) score. Refresher courses lasting a few days to several weeks but less than a month were not considered.
- (c) Length of service.

It was indicated by Ogola G.O. (1974:5) that qualifications for pre-service training of agricultural workers for the Ministry of Agriculture and agricultural industry in this country as a whole have been rising steadily and that nowadays those recruited for agricultural training should have had secondary or higher educational qualifications. He

indicated further that there were 5,940 workers in 1974 (out of a total of 11,186 employees of the Ministry of Agriculture in this country) involved in agricultural extension work of whom 605 were university degree and diploma holders, 2,335 were certificate holders from Embu and other similar institutes, while 3,000 were untrained junior field workers. This latter figure is slightly lower than that cited in the previous section probably due to exclusion of junior veterinary workers or due to the fact that recruitment to this cadre as noted by Leonard D.K. (1973:137) had been stopped by 1970. This referenced scholar noted further that certificate holders are trained at Embu and Bukura agricultural institutes for a two year period and are appointed as Agricultural Assistants when they join the Extension Service, while field workers who do not undergo similar training may be briefly trained in Farmer Training Centres (FTCs) and get appointed as Junior Agricultural Assistants. He notes, however, that appointment to the latter cadre has been stopped, a fact which shows that the two year certificate course in agriculture is currently the only means for entry into the Extension Service as a junior field worker.

It is indicated further that in-service courses are frequently organized for field staff with an aim of improving their competence and commitment to their work and that the criteria for selection for such courses vary with the nature of

the course although those selected for longer courses must have served the Extension Service for a minimum period of two years and proved that they are good extension workers (Ogola G.O., 1974:7).

It is evident from these arguments that the Ministry of Agriculture emphasizes higher formal educational qualifications in selection of persons for agricultural training. This training whether pre-service or in-service is aimed at equipping field staff with the necessary competence needed for effective implementation of agricultural programmes. The arguments about in-service training continuously provided to extension workers during their period of service lead to the conclusion that the longer a field worker serves the Ministry of Agriculture, the more in-service courses he is likely to attend and hence the more competent he is likely to be. Thus it is likely that the three factors of: formal education (x_1), training in agriculture (x_2) and length of service (x_3) are determinants of competence of agricultural field workers. How far is this true?

Table 9.5 shows the relationships of these factors to each other and to occupational competence measured in terms of informedness in technical matters (y_1) and extension methods (y_2). Table 9.6a, 9.6b, 9.7a and 9.7b show the relationships between these cited factors for field workers of Agricultural

Table 9.5: Relationships Between Occupational Competence, Formal Education, Training and Length of Service

Technical knowledge Scores	Extension Method Scores	Formal Education (yrs.)	Training in Agriculture Scores	Length of Service (Yrs.)	
Y_1	Y_2	X_1	X_2	X_3	
17	15	6	3	23	
17	13	8	12	17	
15	14	12	0	6	
15	15	8	12	10	$ry_1y_2 = 0.433$
20	14	8	18	18	
18	16	12	24	6	$ry_1x_1 = 0.271$
18	17	8	0	16	
16	14	8	4	14	$ry_1x_2 = 0.185$
13	12	8	24	23	
17	15	8	6	15	$ry_1x_3 = -0.233$
17	17	8	12	12	
13	13	8	6	12	$ry_2x_1 = 0.263$
13	13	7	6	22	
14	14	8	24	10	$ry_2x_2 = 0.117$
12	14	6	12	24	
14	11	8	0	16	$ry_2x_3 = -0.306$
13	11	4	4	22	
18	14	5	3	21	$rx_1x_2 = 0.451$
16	17	6	3	17	
16	16	12	24	1	$rx_1x_3 = -0.722$
16	15	8	3	13	
17	17	8	28	29	$rx_2x_3 = -0.109$
14	11	8	12	24	
15	15	8	4	20	
14	12	5	3	25	
15	16	8	3	21	
12	15	5	6	26	
17	15	6	4	24	
16	14	6	3	22	
16	13	6	12	29	
17	11	8	14	25	
18	15	10	26	19	
499	454	244	315	582	

Decision criterion: relationships between factors cited in this table are significant when:

$$r \pm 0.306, p = 0.05, n = 32$$

Table 9.6a: Relationships Between Occupational Competence, Formal Education, Training and Length of Service for Field Staff of Agricultural Assistant Cadre

Technical Knowledge Scores	Extension Method Scores	Formal Education Scores	Training in Agriculture Scores	Length of Service Scores	
Y_1	Y_2	X_1	X_2	X_3	
17	15	6	3	23	
17	13	8	12	17	$ry_1 y_2 = 0.423$
15	15	8	12	10	
20	14	8	18	18	$ry_1 x_1 = 0.244$
18	16	12	24	6	
13	12	8	24	23	$ry_1 x_2 = 0.107$
17	15	8	6	15	
17	17	8	12	12	$ry_1 x_3 = 0.097$
13	13	7	6	22	
14	14	8	24	10	$ry_2 x_1 = 0.373$
16	16	12	24	1	
17	17	8	28	29	$ry_2 x_2 = 0.258$
14	11	8	12	24	
16	13	6	12	29	$ry_2 x_3 = -0.472$
17	11	8	14	25	
18	15	10	26	19	
259	227	133	257	283	

Decision criterion: Relationships between factors cited in this table are significant when:

$$r \geq \pm 0.426; p = 0.05, n = 16$$

Table 2.6b: Relationships Between Occupational Competence, Formal Education, Training, and Length of Service for Field Staff of JAA Cadre

Technical Knowledge Scores	Extension Method Scores	Formal Education Scores (yrs.)	Training in Agriculture Scores	Length of Service Scores (Yrs.)	
Y_1	Y_2	X_1	X_2	X_3	
15	14	12	0	6	
18	17	8	0	16	$ry_1y_2 = 0.489$
16	14	8	4	14	
13	13	8	6	12	$ry_1x_1 = 0.523$
12	14	6	12	24	
14	11	8	0	16	$ry_1x_2 = -0.575$
13	11	4	4	22	
18	14	5	3	21	$ry_1x_3 = -0.215$
16	17	6	3	17	
16	15	8	3	13	$ry_2x_1 = 0.194$
15	15	8	4	20	
14	12	5	3	25	$ry_2x_2 = -0.037$
15	16	8	3	21	
12	15	5	6	26	$ry_2x_3 = -0.054$
17	15	6	4	24	
16	14	6	3	22	
240	227	111	58	299	

Decision criterion: Relationships between factors cited in this table are significant when:

$$r \geq \pm 0.426, p = 0.05, n = 16$$

Table 9.7a: Relationships Between Occupational Competence, Formal Education, Training and Length of Service for Field Staff in Lugari Division

Technical Knowledge Scores	Extension Method Scores	Formal Education (yrs.)	Training in Agriculture Scores	Length of Service Scores (Yrs.)	
Y_1	Y_2	X_1	X_2	X_3	
17	15	6	3	23	
17	13	8	12	17	$ry_1y_2 = 0.568$
15	14	12	0	6	
15	15	8	12	10	$ry_1x_1 = 0.254$
20	14	8	18	18	
18	16	12	24	6	$ry_1x_2 = -0.032$
18	17	8	0	16	
16	14	8	4	14	$ry_1x_3 = -0.226$
13	12	8	24	23	
17	15	8	6	15	$ry_2x_1 = 0.168$
17	17	8	12	12	
13	13	8	6	12	$ry_2x_2 = -0.188$
13	13	7	6	22	
14	14	8	24	10	$ry_2x_3 = -0.362$
12	14	6	12	24	
235	216	123	163	228	

Decision criterion: Relationships between factors cited in this table are significant when:

$$r \geq \pm 0.441, p = 0.05, n = 15$$

Table 9.7b: Relationships Between Occupational Competence, Formal Education, Training and Length of Service for Field Staff in Ikolomani Division

Technical Knowledge Scores	Extension Method Scores	Formal Education Scores (Yrs.)	Training in Agric. culture Scores	Length of Service Scores (Yrs.)	
Y_1	Y_2	X_1	X_2	X_3	
14	11	8	0	16	$ry_1y_2 = 0.364$
13	11	4	4	22	
18	14	5	3	21	
16	17	6	3	17	$ry_1x_1 = 0.343$
16	16	12	24	1	$ry_1x_2 = 0.349$
16	15	8	3	13	
17	17	8	28	29	
14	11	8	12	24	$ry_1x_3 = -0.075$
15	15	8	4	20	$ry_2x_1 = 0.276$
14	12	5	3	25	
15	16	8	3	21	
12	15	5	6	26	$ry_2x_2 = 0.445$
17	15	6	4	24	$ry_2x_3 = -0.247$
16	14	6	3	22	
16	13	6	12	29	
17	11	8	14	25	
18	15	10	26	19	
264	238	121	152	354	

Decision criterion: Relationship between factors cited in this table are significant when:

$$r \geq \pm 0.412, p = 0.05, n = 17$$

Assistant and Junior Agricultural Assistant cadres and those in Lugari and Ikolomani divisions respectively. These cited tables show the following:

- (a) Table 9.5 shows that field workers who have served the Extension Service for more years tended to be less informed in extension methods than those who had served for fewer years ($ry_2x_3 = -0.306$, $n = 32$, $p = 0.05$). Table 9.6a similarly shows Agricultural Assistants who have served the Extension Service for more years to be less informed in extension methods than those who have served for fewer years ($ry_2x_3 = -0.472$, $n = 16$, $p = 0.05$). Table 9.5, however, shows further that the amount of training received by field workers who have served the Extension Service for long does not significantly differ from that received by new entrants ($rx_2x_3 = -0.109$, $n = 32$, $p = 0.05$). This in effect could mean that field workers, especially Agricultural Assistants who were trained many years back probably did not receive significant training in extension methods, a fact which means that the nature of extension training could influence the extent of informedness of field staff in certain issue areas. However, as table 9.5 further shows field workers who had served the Extension Service

for long tended to be more lowly educated than those who had served for fewer years ($rx_1x_3 = -0.722$, $n = 32$, $p = 0.01$). This in effect could mean that differences in years of formal schooling rather than training could help explain differences in informedness between those who had served the Extension Service for long and the new entrants.

- (b) Table 9.6b shows that Junior Agricultural Assistants who had attended school for more years tended to be better informed in technical matters than their colleagues who had been to school for fewer years ($ry_1x_1 = 0.523$, $n = 16$, $p = 0.01$). The same table shows that Junior Agricultural Assistants tended to be better informed in technical matters despite their low training ($ry_1x_2 = -0.575$, $n = 16$, $p = 0.01$). This in effect means that some other factor other than training influenced informedness of Junior Agricultural Assistants, this could be formal education as argued above.

- (c) In Ikolomani as shown in table 9.7b field workers who had been trained for a longer period tended to be better informed in

extension methods than those who were lowly trained ($r_{y_2x_2} = 0.445$, $n = 17$, $p = 0.05$). However, since two thirds of the sub-sample of field workers from this area were Junior Agricultural Assistants and as Junior Agricultural Assistants are on the average lowly trained, it could be that more years of formal schooling rather than training accounted for informedness of field workers in extension methods in this area. This is supported by the fact that there was significant correlation between formal education and training ($r_{x_1x_2} = 0.451$, $n = 32$, $p = 0.01$) as shown in table 9.5 and by the arguments in (b) above that Junior Agricultural Assistants who had been to school for more years tended to be informed in technical matters.

It is evident from these data that formal education seems to be the major factor influencing informedness of field staff in technical matters or in extension methods. The fact that field workers who have served the Extension Service for long tend to be lowly educated confirms D.K. Leonard's (1973: 135) observations that although emphasis is currently placed on a good secondary education in selection for agricultural training, a good primary certificate was all that was needed before independence; that

even those hired directly as untrained Junior Agricultural Assistants who before independence were standard IV leavers should have Kenya Junior Secondary Examination (KJSE) Certificates. His observation that an agent tends to know more the longer he has served the Ministry of Agriculture; that is, that each five years of experience is associated with a 5% increase in informedness in technical matters is not supported by these data. We have found length of service not significantly related to informedness in technical matters ($ry_1x_3 = -0.233$, $n = 32$, $p = 0.05$ see table 9.5); that is field workers who have served the Extension Service for long have not increased their stock of knowledge in technical matters during their period of service; if anything there is a slight tendency for them to be less knowledgeable in technical matters. We have similarly shown that field workers who have served the Ministry for long are less informed in extension methods. The reasons for the low informedness of these long service workers in extension methods could be: first, their low levels of education as those field workers who joined the Extension Service in late 1950s and early 1960s tended to have been to school for fewer years than their colleagues who joined in late 1960s and in 1970s² and; secondly, a probable lack of emphasis of extension methods in earlier training efforts of the Ministry of Agriculture or even in various in-service training efforts.

Table 9.8 shows that slightly more Agricultural Assistants than Junior Agricultural Assistants were better informed in both technical matters and in Extension methods. (The table is constructed based on the criterion that approximately half of the cases in the sample fall in the 'high' category while the other half fall in the 'low' category. Field workers who scored 16 or more points in technical knowledge and 15 or more points in extension methods fell in the 'high' categories, the rest fell in the 'low' categories).

Table 9.8: Distribution of Junior Agricultural Workers According to Scores on Knowledge in Technical Matters and in Extension Methods

Item	<u>Status Cadre</u>		<u>Geographic Area</u>	
	AAs	JAAAs	Lugari	Ikolomani
Knowledge in technical matters (y_1)				
High	0.69	0.44	0.53	0.59
Low	0.31	0.56	0.47	0.41
Total	1.0	1.0	1.0	1.0
Base	(16)	(16)	(15)	(17)
Knowledge in extension methods (y_2)				
High	0.50	0.47	0.40	0.53
Low	0.50	0.53	0.60	0.47
Total	1.0	1.0	1.0	1.0
Base	(16)	(16)	(15)	(17)
Knowledge in both (y_1) and (y_2)				
High	0.44	0.25	0.33	0.35
Low	0.56	0.75	0.67	0.65
Total	1.0	1.0	1.0	1.0
Base	(16)	(16)	(15)	(17)

These data reinforce Leonard's (1973:137) observations that Junior Agricultural Assistants are on the average less technically informed than the Agricultural Assistants. He indicated that difference in informedness between these two cadres was largely due to differences in levels of training between them; he found training to be associated with a 13% increase in informedness of junior field workers in technical matters. It is also evident from data in tables 9.6a and 9.6b that slightly more Agricultural Assistants than Junior Agricultural Assistants (56.25% of Agricultural Assistants as compared to 43.75% of Junior Agricultural Assistants) had served the Extension Service for a shorter period of less than 20 years. However, these differences in length of service and even in training between Agricultural Assistants and Junior Agricultural Assistants do not explain differences in informedness of these two cadres of field workers. As indicated above, Junior Agricultural Assistants who had been to school for more years tended to be better informed in technical matters than those who had been to school for fewer years.

The above referenced scholar found field workers with lower primary and secondary education to be less technically informed while upper primary schooling to be positively correlated to technical knowledge. The reasons he gave for low informedness of secondary school graduates were: first, their

having lived for longer periods in boarding schools and thereby being isolated from much farming experience; and second, that secondary school education makes its holders look at farming as a low occupation. He argued that although secondary education could be an added asset there was need for care to be taken in selection of secondary school graduates for agricultural training; that is, issues of motivation of such extension workers had to be taken into account. The first observation is not supported by our data. In fact even for the lowly trained Junior Agricultural Assistants as indicated above education was the only factor which influenced their informedness. This in effect leads us to a conclusion which is contrary to that of Leonard; that is, that more years of schooling lead to increased informedness of extension workers. We agree with his arguments that improvements in selection procedures and in issues related to motivation could serve to improve the informedness of secondary school graduates.

Two conclusions may be drawn from these data. The first concerns the amount of competence that is available in the research areas for the implementation of the Crops Improvement Programme and whether such competence is sufficient. Table 9.8 shows that 53% of the field workers in Iugari as compared to 59% in Ikolomani were well informed in technical matters and that 40% of field workers in Iugari as compared to 53% in Ikolomani

were well informed in extension methods, while nearly one third of the field workers in both areas were well informed in both technical matters and in extension methods. These data do not show much disparity in informedness of field staff in these matters in the two study areas. It is, however, crucial that field workers are informed not only in technical aspects of their work but also in extension methods since these permit a worker to organize, contact, and educate his farmers. Under these conditions a field worker who is well informed in both technical matters and in extension methods could be seen as better prepared to implement the Crops Programme than one who is well informed in one or none of these matters. This in effect means that deconcentration of authority to field staff could achieve better results where field staff were informed both in technical matters and in extension methods. The fact, however, that nearly two thirds of field workers were less informed in both technical matters and in extension methods means that deconcentration of authority to them could not help to ensure rapid implementation of the Crops Programme. Such deconcentration of authority cannot be done to Agricultural Assistants (and not to Junior Agricultural Assistants) since as table 9.8 shows over half of the Agricultural Assistants are less informed in both matters. This fact that a large number of agricultural field workers, despite intensive training efforts of the Ministry of Agriculture mentioned in the introduction to this section, are less

informed in both matters justifies centralization of decision making process in the Crops Improvement Programme as indicated in Chapter Seven.

The second conclusion relates to the negative impact of length of service on occupational competence; that is, a large number of field workers who are lowly educated and ill-trained have served the Extension Service for more years but are less competent than the newer entrants with higher educational and training qualifications. We found that many of these field workers who had served the Extension Service for more years had not received any significant promotions during their period of service. 24 field workers in our sample had been promoted either during the 1960s or 1970s. We calculated the average length of time from the year the promotion was effected to 1977 for these field workers and found it to be 8.7 years. A few field workers who had been promoted recently were promoted in the past 4 to 5 years; some had been promoted 15-16 years back. Only one of these field workers had been promoted twice in 1964 and 1971; the rest had been promoted only once.

The length of service for these 24 field workers ranged from 29 to 6 years with an average

length of service for all of them of 18 years. This in effect shows that most of these field workers had served the Ministry of Agriculture for a long time during which they had only realized one promotion. Further, 75% of these promotions were effected within the same status cadre, e.g. from Junior Agricultural Assistant III to Junior Agricultural Assistant II; the remaining promotions were from the Junior Agricultural Assistant to Agricultural Assistant cadre. These latter promotions were effected after attendance of an up-grading course. One out of the 8 field workers that had never been promoted was a new entrant from Bukura Institute; the rest had served the Extension Service for a period of more than 13 years.

It was evident from various comments of these field workers that they were grossly dissatisfied with the system of promotions in the Extension Service. Many of them indicated that promotions are not based on merit or that they are given to new entrants with higher educational and training qualifications. They also complained about pay, lack of training opportunities and other benefits that should rightfully be extended to them.

Leonard's (1973:146-47) comments on conditions of work cited in Chapter Two are validated by

these data. He did his study in the same research area as the one in which this study was done during the 1969/71 period and found the same ill-conditions of work; little or no promotion prospects, low pay, etc. prevalent within the Extension Service. These poor conditions of work have remained unchanged throughout the 1970s irrespective of the tremendous increases in the cost of living during this period. Leonard had cautioned that alienation of agricultural field workers had reached a point at which they were resorting to the use of 'informal organizations' of their work groups to control and reduce the amount of effort put in their work. He found (1977:64) that extension workers in his sample visited an average of 1.75 farmers instead of 4 to 5 farmers a day, a fact which showed that these field workers exerted less effort in their work.

We asked 18 field workers in our sample the number of farmers they visited in each month of 20 full working days. Four of these extension workers from Iugari indicated that they visited an average of 45 farmers a month each (or 2.25 farmers a day) while each of the remaining 14 field workers in Ikolomani indicated an average of 63.2 farmers a month (or 3.16 farmers a day). These averages are less than the 4 to 5 farmers a day that could be visited by extension agents and therefore equally show a low level of effort exerted by junior extensionists in their work.

Field workers in our sample similarly reported organizing demonstrations in various crops for teaching of farmers. The sub-sample of 15 field workers in Lugari reported having organized a total of 37 demonstrations in various crops during 1976 giving an average of 2.47 demonstrations (i.e. 37 demonstrations divided by 15 field workers) organized by each extension worker during that year, while the sub-sample of 17 field workers from Ikolomani reported organizing a total of 26 demonstrations for various crops during the same year giving an average of 1.53 demonstrations (i.e. 26 demonstrations divided by 17 field workers) organized by each of them. If we assume that a field worker could organize an average of 4 demonstrations each year (i.e. 3 during the long rains and 1 during the short rains) / 1 then, the average number of demonstrations organized by field workers in our sample shows equally low level of work effort.

It is clear from these arguments that apart from issues of competence of staff issues related to work conditions such as promotions, training prospects, etc. may equally affect motivation of field staff and make them exert less effort in their work than in situations where work conditions are conducive. This fact could probably help to explain why the lowly educated field workers who have served the Extension Service for more years tend to be less

informed in technical matters as well as in extension methods.

9.4 TRANSPORTATION ARRANGEMENTS

Issues related to transportation are of primary concern in implementation of agricultural programmes as indicated in chapter Three. Field staff with supervisory functions may find it difficult to travel from one place to another if they are not provided with vehicles and the necessary fuel. Similarly contact with the field may be minimal in situations where vehicle repairs take several months to be effected. The reason is that many places in some of our rural communities are very remote and cannot be promptly (or effectively) reached by public transport.

Transportation arrangements for field workers in Ikolomani division as indicated by Ministry of Agriculture, Ikolomani Division, Handing over Report (1975:3) were as follows:

- (a) The Assistant Agricultural Officer has been allocated a land-rover. He could also travel by public means and claim refunds for money he spends on public transport. He could also use his private car and claim mileage allowance.

- (b) Junior staff use their bicycles and are paid a bicycle allowance of Shs.15/- per month. Field staff who own motor-cycles could use them and claim mileage allowance.

The Assistant Agricultural Officer, Ikolomani indicated that the amount of fuel allocated in previous years has been 80 litres per month and that in 1977 the amount of fuel allocated was increased to 150 litres per month. He, however, indicated that this amount of fuel allocated was reduced again and again toward the end of the financial year. It was further indicated by Ministry of Agriculture, Ikolomani Division, Bi-Annual Report, (January to June 1977:2) that the increase in fuel allocation during 1977 could not cope with work that had been scheduled for that year and that there were frequent breakdowns of the land-rover which were not repaired immediately. Further, the removal of Locational Agricultural Assistants in Ikolomani in 1977 led to an increase in the amount of supervision that the Assistant Agricultural Officer had to do. This in effect means that the increase in fuel allocation must be very substantial and land-rover breakdowns very infrequent for the Assistant Agricultural Officer to maintain contact with his junior staff. However, insufficient fuel allocations and frequent land-rover breakdowns which take long to be repaired are reported in various Annual Reports of Assistant Agricultural Officer, Ikolomani.

The Divisional Agricultural Assistant (DAA), Lugari in July 1977, pointed out that the Agricultural Section of the Ministry of Settlement (MoS) had no land-rover of its own; it shared one land-rover with the Settlement and Cooperative Sections of the Ministry. He indicated further that the Agricultural Section is normally allocated Shs. 250/- per month for petrol which is often reduced to Shs. 180/- or less per month towards the end of the financial year. This stated amount of Shs. 250/- per month could fetch up to nearly 85 litres of petrol at the then prevailing petrol price of Shs. 3/- per litre. If we assume that the land-rover petrol consumption rate is 5 litres for every 32 km. then, a distance of up to 550 kilometres could be covered with the fuel allocated each month. The Divisional Agricultural Assistant indicated that with long distances involved in travelling from one place to another this quantity of fuel allocated did not permit extension staff in divisional offices to effectively supervise their junior staff.

Both the Assistant Agricultural Officer, Ikolomani and Senior Assistant Agricultural Officer, Lugari had private cars but never used them for field work during 1977 due to prevalence of many unimproved and often impassable roads in these rural areas which lead to frequent breakdown of vehicles.

The Senior Assistant Agricultural Officer, Lugari asked (July, 1977) what was happening to one land-rover deserted in the yard of the divisional office block at Lumaganda remarked:

"...the land-rover is used by the District Officer. It overturned...it was not badly damaged...it cannot be allowed to operate in that state..it has to be repaired after permission has been obtained from the Ministry. The Ministry requires the following information before authorizing such repairs:

- (a) who was driving the vehicle at the time the accident occurred and whether he was authorized to drive a government vehicle,
- (b) whether the journey which was being made when the accident occurred was authorized by an appropriate official, and (c) the time the accident occurred and when it occurred".

These comments show that major repairs of government vehicles are authorized by senior government officials after being satisfied with the reasons necessitating such repairs. It is inferable from these comments that obtaining permission to effect major vehicle repairs often takes a long time and often involves lengthy correspondence between field staff and senior government officials.

Apart from the above mentioned land-rover, three other vehicles namely: an Anglia, a land-rover shared between Senior Assistant Agricultural Officer, Cooperative and Settlement Officers, as well as a motor-cycle were not operational and were in need of repairs.

The Dairy Assistant, Igari had in February, 1977 written to the Area Settlement Controller (ASC) seeking permission to get the above mentioned motor-cycle repaired, but the motor-cycle had not been repaired by December, 1977.³ The land-rover shared by the Agricultural, Cooperative, and Settlement Sections of the Ministry of Settlement mentioned above remained inoperative during most of 1977 due to problems of lack of repairs and insufficient fuel allocation.

These similar problems regarding lack of vehicles, insufficient fuel and lack of repairs are cited by various reports of the Ministry of Agriculture in Kakamega district referenced in this study.

Junior staff reported that they travel by bicycles for which they are paid a bicycle allowance of Shs. 15/- per month; they also travel on foot and by public means. 28 field workers in our sample used bicycles for field work and made the following comments with regard to bicycle allowance or ease of travelling by bicycles in their areas of operation:

- 35.7% of these 28 field workers in Ikolomani complained that payments of bicycle allowance have since 1973 either been irregular or not been effected for longer time spans here and there.

- 53.6% of these field workers from both areas indicated that the bicycle allowance given was too little. They pointed out that roads in these rural areas are very poorly maintained and that because of this fact bicycles break down frequently. They felt that this allowance should be increased from the present Shs. 15/- to Shs. 50 - 75/- per month. One junior field worker commented:

"...when a tyre is worn out.. it costs about Shs. 30/- to buy a new one...the Shs. 15/- given is too little...we have talked about this issue again and again in staff meetings.. ..we have always been told that the matter has been forwarded to the District Agricultural Officer and Provincial Director of Agricultureup to this time nothing has been done".

- 3.6% of these field workers indicated that riding a bicycle everyday is tiring.

- 7.1% of these field workers cited no problem with regard to bicycle allowance.

These comments show that a large number of field staff who use their bicycles for travelling in their areas of operation are not satisfied with the amount of bicycle allowance they are paid. In

Ikolomani payments of bicycle allowance were infrequent or sometimes not effected during certain periods leading to further dissatisfaction among extension workers affected. In addition one field worker in Lugari and three field workers in Ikolomani indicated that they used public transport, but it was not easy for them to be refunded whatever sums they spent in this way; that sometimes refunds were effected after two to three months or were never effected at all if the Extension Service was short of funds in its travelling vote. In Ikolomani where there is no vote, the refunds are made at the District Agricultural Officer's office, Kakamega which is several kilometres away.

In sum, field staff at the lower level of the Extension Service face severe problems of transportation as indicated above. Fuel allocated for the running of land-rovers was inadequate; field staff at the divisional level had to struggle with staff at higher levels of the Extension Service for more fuel and vehicle repairs irrespective of the urgency of work in their hands. It was also clear that senior staff at higher levels of the Extension Service equally face these problems of insufficient funds for fuel and maintenance of vehicles and engage in a lot of correspondence with the headquarter's staff for further allocation of these resources, or for authorizing vehicle repairs. As noted by Maddick H. (1963:44-47) insufficient allocation of resources

and increased centralization of authority regarding their deployment leads to struggle between field staff and men in headquarters, a fact which leads to waste of time and energies of field staff who are a very scarce resource in the process of development. He indicated further that these struggles between field staff and their seniors lead to great delays which often reduce the motivation of field staff and recipients of a given programme and subsequently increase the cost of running the agency in question.

Similar problems of transportation were reported by the Dairy Production Improvement Programme Report (1976:125) which indicated that only 53% of the vehicles in this programme were serviceable and in operating conditions; the rest were inoperative. It was indicated that a lot of time of field staff in this programme was spent on dealing with problems related to vehicles and that procedures involved in authorizing vehicle repairs or replacement of vehicles were very long and involved field staff in a lot of correspondence with higher levels of the Ministry of Agriculture's veterinary Extension Service.

These problems regarding transportation of senior staff force them to spend most of their time in offices; they leave most of the extension work to their juniors. The junior staff in their turn due to insufficient amounts paid as bicycle

allowances, or due to difficulties they encounter in realizing refunds for amounts spent on public transport, might not feel motivated to travel widely from one place to another in their areas of operation. These observations reinforce those of Mbithi P.M. (1974:60) that senior staff of the Ministry of Agriculture spend most of their time in offices on administrative matters; that when they go out to the field they simply supervise and check on what their junior staff are doing.

9.5 CONCLUSION

It has been clear from the foregoing arguments that the task of educating and assisting farmers is largely entrusted to junior agricultural staff of Agricultural Assistant and Junior Agricultural Assistant cadres. Ikolomani with a ratio of one junior extension worker:603 farmers was on the average well staffed in comparison with other traditional areas of Kakamega district and other parts of this country. Lugari with a ratio of one junior extension agent:120 farmers was in comparison relatively overstaffed. Likewise, there were eight times more farmers per Agricultural Assistant in Ikolomani than in Lugari. With fewer farmers per junior extension worker, especially per Agricultural Assistant who are said to be more competent than Junior Agricultural Assistants, it was probable that the Extension Service in Lugari was better prepared to undertake the task of implementation of

the Crops Improvement Programme than that in Ikolomani.

We, however, found 53% of field workers in Lugari as compared to 59% in Ikolomani to be well informed in technical matters while 40% of field workers in Lugari compared to 53% of those in Ikolomani were well informed in extension methods. It was only about one third of the field workers in both areas who were well informed in both technical matters and in extension methods. We indicated that deconcentration of authority could attain better results where field workers were well informed in both technical matters and in extension methods. The fact, however, that a large number of field workers were less informed in both technical matters and extension methods tends to justify centralization of decision making processes in the Crops Improvement Programme as indicated in Chapters Seven and Eight.

Although length of service and training in agriculture seemed to influence informedness of extension workers in one way or the other, it was clear that formal education had by far the highest impact on informedness of junior field staff; those who had been to school for more years tended to be better informed than those who had attended school for a few years. Poor conditions of service as indicated by arguments on the system of promotions and transportation arrangements tended to reduce motivation of field staff and to make them less inclined to work. Thus

although the extension worker-farmer ratio in the study areas was favourable, issues related to competence, transportation, and motivation of field workers made the Extension Service in both study areas less prepared to undertake the task of implementation of the Crops Improvement Programme. This being the case it was likely that the Extension Service could not adequately adapt activities of farmer education and those of provision of support services to local conditions. This in effect means that hypothesis No. III stated in the introduction to this chapter is validated by these data. Apart from the extension worker-farmer ratio, there was not much disparity in competence of field staff, transportation arrangements and promotion prospects between the two study areas. That is, the capacity of the Extension Service did not differ significantly as to help explain the vast differences in farm performance between farmers in the two study areas.

Footnotes to Chapter Nine

1. Crop and Livestock Manual is a handbook given by the Agricultural Extension Service to each junior field worker for reference purposes. The manual contains information about various agricultural enterprises and technical recommendations or requirements of each.
2. Information obtained from field staff in our sample shows that those of them who joined the Extension Service in late 1950s and early 1960s tended to have attended school for four to eight years, while those who joined the Extension Service during mid-1960s and later periods tended to have received secondary school education.
3. See Letter (ref. TUR/5/8/Vol.X/1 of February, 1977) written by the Dairy Assistant, Lugari to Area Settlement Controller, Vehicles/Machinery File, SAAO's Office, Lugari. There was no reply to this letter at the time of data collection (October, 1977).

CHAPTER TEN

DISCUSSION OF FINDINGS AND THEIR IMPLICATIONS

10.1 INTRODUCTION

The discussion in Chapter One shows that agricultural development occupies a central place in this country's rural development efforts. Objectives specified by the Development Plan (1974-1978, Part I, 1, 197) include increase in incomes to be achieved through increase in quantity of farm produce marketed, increase in employment opportunities, and increase in expenditure on agricultural extension activities. Mbithi P.M. (1974) further indicates that marginal areas of this country suffer from constant famines and necessitate famine relief to be extended to them. This in effect means that agricultural programmes should further aim at increasing food supplies for rural farm families.

Following A.E. Suchman's (1967) observations about evaluation of public service programmes (see Chapter Two) we indicated that the success of an agricultural programme could be determined by an evaluation of the extent to which the above specified objectives were being met. Such an evaluation could expose factors responsible for success or failure of an agricultural programme.

The discussion in Chapter One, Two and Three showed that the above objectives of the Ministry of Agriculture were not being achieved in smallholder areas in this country and that the majority of farm units in these areas are lowly productive. We felt that this problem of low productivity of the majority of farm units in small scale farming areas in this country could be explained by: (a) socio-economic status factors; (b) unadaptability of agricultural field activities to local community conditions due to centralization of authority regarding the implementation of the Crops Programme to Senior staff; and (c) internal issues within the Extension Service relating to competence of field staff, density of staffing, transportation arrangements, and so on which make the Extension Service less capable of adapting its field activities to local conditions. We formulated three hypotheses (see Chapter Two) to cover these three dimensions of this study and collected data in Ikolomani and Lugari divisions of Kakamega district on the Crops Improvement Programme (see Chapter Three) to test these hypotheses.

The discussion in Chapters Four to Nine has helped to test the above mentioned hypotheses. In this chapter we isolate and discuss some of the main findings of this study and their likely implications. We seek to show the measures that have to be taken to improve the capacity of the

Extension Service and of local communities to implement agricultural programmes.

10.2 ADAPTABILITY OF EXTENSION ACTIVITIES

We found extension activities of credit administration, marketing, cooperative development and farmer education to be unadapted to local conditions. The reasons for unadaptiveness of these activities to local conditions could be realized by a brief examination of each of them.

First, credit administration activities were fairly well liaised with those of extension education. The Extension Service in the case of credit extended to farmers through Agricultural Finance Corporation and cooperative societies educated loanees about management of crops for which credit had been acquired. Despite such coordination of activities of the Extension Service and those of lending institutions, there were innumerable problems associated with administration of farm credit which included: late award of credit which forced farmers to plant their crops late, lack of enough tractors for ploughing, unavailability of farm inputs, failure of crops due to physical environmental factors, lack of a market for a crop for which credit had been awarded, and so on. Failure of lending institutions and the Extension Service to overcome these problems accounted for the low rate of repayment of credit awarded to farmers. Why, however, were credit administration activities unadapted to local conditions? The main reason why

extension activities of credit administration were unadapted to local conditions was that the headquarters of the Ministry of Agriculture and of lending institutions specify to field staff and to various agricultural committees conditions that have to be observed in award and repayment of credit, for example, type of farmer to be given certain type of credit, amount of money to be given per unit of land, procedures for handling crop failure claims, etc. These guidelines do not take into account conditions prevailing in any one local community and may not be modified to take these conditions into account without the consent of top authorities.

Second, marketing activities as indicated in Chapter Seven are rarely liaised with other extension activities. The widespread rejections of produce by the Maize and Produce Board in Lugari area made it possible for marketing of produce through the Board to be dominated by private businessmen. Failure of individual farmers to market their produce directly to the Board meant that they had to receive low earnings from their produce by selling it to businessmen or other needy persons. We also indicated that there were problems of lack of a market for passion fruit and low earnings from tea in Ikolo-mani area which greatly discouraged many farmers. This lack of coordination of activities of marketing agents with those of the Extension Service and lending

institutions defeats the aims of these latter institutions of educating and assisting farmers with credit to enable them produce more on their farms. The marketing of farm produce although widely discussed in meetings of agricultural committees mentioned above seems out of control of these committees just as it was out of control of individual extension workers. This problem as indicated in Chapter Seven is made worse by fluctuations in market prices of farm produce; some of these fluctuations are international in nature. This in effect calls for need for stabilization of prices of farm produce. The Extension Service at the lower level seems incapable of doing something about these problems concerning marketing of produce.

These similar problems although not clearly discussed in this study predominate with regard to availability of farm inputs, such as fertilizers, pesticides and seeds/seedlings in the study areas. It was clear from the remarks of some farmers in Chapter Five that inferior fertilizers were sold to them or that costs of transportation of fertilizers were high. We indicated in Chapter Four that there was no established source for sugarcane planting materials. In our opinion extension education provided to farmers can only be effectively utilized if farm inputs that farmers have been taught about are available in the study areas.

Third, farmers could be reached and made to utilize extension education messages through cooperative societies. We showed in Chapter Eight that societies in the study areas had at one time or other assisted their members with farm credit, marketing of produce, ploughing of their farms, or with repayment of land and development loans. Further, as shown in Chapter Seven, some courses are organized by Farmer Training Centres for members and officials of cooperatives. The cooperatives could also, with the help of agricultural staff, organize farm demonstrations or tours to other farming areas for their members.

The problem, however, as noted in Chapter Eight is that most cooperatives in the study areas are ineffective due largely to government dominance of their affairs. However, those societies which seemed to have a constant source of income - coffee and milk societies - seemed to do well. These societies additionally handled other seasonal crops like maize, beans, and sunflower. Produce delivered to these societies could be used as security for award of credit; that is, coffee and milk societies were secure in lending to their members. Similarly, the fact that members were paid on a periodic basis (monthly, quarterly, etc.) encouraged them to constantly deliver their produce to these societies. Many societies which relied on seasonal crops like maize and beans had no significant business to handle

during most months of the year and hence no reliable source of income. Further, as many alternative sale channels existed for these latter commodities, farmers could bypass their societies in marketing of these commodities. It was also clear from the discussion in Chapter Eight that societies were not given priority in marketing of maize, beans, and other farm produce by the Maize and Produce Board. Indeed one of the ways in which the cooperative movement in the study areas could be strengthened and current dominance of businessmen in marketing of farm produce minimized is for them to be given monopoly or priority by the Board in marketing of produce. Cooperatives currently have a monopoly in marketing of coffee, milk and other farm produce. Thus three possible ways in which cooperatives in the study areas could be strengthened are: diversification of their activities, giving them monopoly or priority in marketing of produce, and giving them authority that could permit them act flexibly in planning and / to and implementation of their projects; as indicated in Chapter Eight, government control of activities of cooperatives was considerable.

Finally, the discussion in Chapter Seven on 'who' makes 'what' decisions shows that little or almost no authority is delegated to junior agricultural workers to permit them make major decisions related to agricultural courses and farm demonstrations for

farmers. Junior staff and farmers are not consulted and hence their views are not taken into account when such decisions are being made. This in effect means that senior staff impose their views on farmers. We showed that this lack of consultation among various parties in the Crops Programme or insufficient delegation of authority to junior staff with regard to agricultural courses, farm demonstrations, and other extension education activities partly accounted for the low rate of attendance of courses and demonstrations by farmers in the study areas, for reliance on extension education messages which entailed the use of resources which were rarely achieved by farmers in the study areas, and for emphasis on pure stands of certain crops like maize and beans when these crops are usually interplanted in the farming communities.

It is clear up to this juncture that there is need for authority to be deconcentrated to the Extension Service at the lower level to permit it to adapt credit administration activities to local conditions. There is similar need for the Extension Service to check on whether farm inputs recommended for the area have been stocked by Kenya Farmers Association and other stockists. Issues related to marketing need considerable thought and careful planning due to: first, the fact that the price of a particular farm product may be low in a given period and greatly discourage farmers - it may be high in another period and win their enthusiasm; second,

where specified acreage for a certain crop has to be attained within a short time period as was the case with the passion fruit project in Ikolomani discussed in Chapter Four, reliance on the individual method of contact may not permit the specified acreage to be attained within the given time period. The smallness of farm units in this area necessitated the use of an extension approach that could permit a large number of farmers to be assisted to adopt the crop within the shortest time period. Finally, problems encountered in the marketing of certain other produce like maize could be minimized through sale of this crop to other needy areas of Kakamega district. Such local sales were not encouraged due to the fact that maize could not be transported freely from one part of the district to another; permits allowing maize to be transported from one area to another had to be obtained from officials of Provincial administration.

The above discussion further shows that certain other services are needed to facilitate implementation of the Crops Programme. These services are: first, improvement of roads - this calls for cooperation with the Ministry of Works or Local authorities which are charged with the responsibility for construction and maintenance of roads. (A National Youth Service team had considerably improved roads in Lugari area; the state of roads in Ikolomani area was very poor). Second, availability and cheapness

of transport for farm inputs and produce; a few societies assisted their members in this connection. Most farmers had to hire vehicles for transportation of farm produce or inputs at high cost as indicated in Chapter Seven. Third, availability of tractors for ploughing, especially in Lugari area. This problem could be overcome or minimized through establishment of a tractor hire service. Reliance of farmers on a few tractors which were privately owned greatly increased costs of farming and frequently led to late ploughing and planting. The problem could equally be overcome if cooperatives were active and if they owned tractors. However, as table 7.7 shows only about 2.6% of the tractors in Lugari area were owned by cooperatives; the rest were privately owned. Finally, need for protection of farmers against crop failure or fluctuations in market prices; this could be done by cooperatives if they were active and if they had enough capital, or through exploration and exploitation of the local market for crops like maize and beans. Similarly, creation of additional storage space and improvement of storage techniques by the central government for crops like maize could help to overcome problems of shortages of this crop in certain years.

10.3: IMPROVEMENT OF CAPACITY

Crop production work as described above could be seen as a package with many components - extension education, credit administration, marketing, input

provision, and cooperative development. The success of the Crops Programme depends on the effective coordination of these various aspects of the programme with a view to adapting them to local conditions. These observations show that there is need for an integrated approach to be employed in implementation of this programme. Such an approach could entail effective planning of all activities involved in the Crops Programme; it could expose problems involved in implementation of each activity and seek cooperation of all agencies involved in solution of these problems. The Extension Service in the study areas did not have the capacity to employ an integrated approach and hence failed to adapt activities of the Crops Programme to local conditions. In which way then, could the capacity of the Extension Service to adapt the Crops Programme to local conditions be improved? Three possible ways exist for improvement of capacity of the Extension Service. These are:

(a) improvements in occupational competence and conditions of work for field staff; (b) change in structure of the Extension Service; and (c) employment of appropriate methods of contacting and educating farmers. Let us briefly examine each of these ways.

10.3.1 Occupational Competence and Conditions of Work

Insufficient delegation of authority to junior field staff tended to be justified on grounds that only about one third of these workers were

occupationally competent; that is, were well informed in technical matters and in extension methods of contacting and educating farmers in improved crop farming. However, the Extension Service spends considerable sums of money on personal emoluments, transportation, training, and on facilities to enable junior staff implement the Crops Programme. This fact / to paradoxically justifies the need for junior staff to exert more efforts in their work. This, however, is not possible in present circumstances where less authority is delegated to field staff. Further, conditions of work which include promotions, transportation, and so on are not satisfactory and do not motivate field staff to exert more efforts in their work as indicated in the last chapter. We showed that junior field staff, as Leonard D.K. (1973) had found, exert less effort in their work. The solution to this problem of retaining a large number of junior field workers in the service who are less inclined to work, seems to be gradual reduction of their number. We showed that a large number of these junior field workers (of both Agricultural Assistant and Junior Agricultural Assistant cadres) had attended pre-service and in-service courses of varying duration, but did seem to be well informed in technical / not matters nor in extension methods. Those of them who had been to school for more years tended to be better informed in these matters. Since the Extension Service currently recruits holders of good secondary school

two or more years, it is likely that these new entrants into the Extension Service will be more competent; that is, capable of interpreting and adapting decisions made at higher levels of the Extension Service to local conditions. Leonard D.K. (1973) observed that although Agricultural Assistants and Assistant Agricultural Officers were secondary school graduates, the one more year of training given to the latter cadre led to considerable differences in privileges and responsibilities between these two cadres. This problem could be overcome by mounting three year diploma courses for all holders of secondary school certificates. This could enable the Extension Service to gradually replace the current cadres of Agricultural Assistants and Junior Agricultural Assistants with Assistant Agricultural Officers who in our opinion are more capable of interpreting and adapting decisions in agricultural programmes to local conditions. Improvement in their conditions of service; that is, in the system of promotions, training prospects, remuneration, and travelling arrangements could help to motivate them and to retain them in the service. This argument is critical if one considers the fact that extension work is technical and could best be performed by field workers who are professionally competent rather than by a large number of lowly educated and ill-motivated field workers who are less inclined to work. Such a cadre of field workers could also be better prepared to grapple with problems of transportation

of farm inputs and produce, availability of tractors for ploughing, stabilization of prices, and so on. To what extent is this likely to be possible?

It was clear in our discussions with field staff of Assistant Agricultural Officer and Agricultural Officer cadres that they were knowledgeable about problems of farming communities, such as neglect or uprooting of certain crops, difficulties in transportation and marketing of produce, and so on. These extension workers, however, seemed incapable of doing something about these problems. The discussion in Chapter Four shows that problems prevailing in various crop enterprises are indicated in work programmes although strategies proposed for solution of these problems are inadequate. Similarly, no critical evaluation is made as to why proposed solutions to problems never work as envisaged, for example, why the use of more extension education efforts has not succeeded in overcoming the problem of neglect of tea. This fact shows that insufficient authority is equally delegated to field staff of Assistant Agricultural Officer and Agricultural Officer cadres; they seem to respond to guidelines from higher levels of the Extension Service. The discussion in Chapter Two, however, showed that the type of extension organization that could ensure better husbandry of crops is one which is capable of making and implementing its decisions with as little pressure from above as possible. This requires

giving the Extension Service in a given district or province authority to operate as a semi-autonomous unit and should be allocated sufficient resources to permit it to implement its plans. As Price J.L. (1968) has noted, the headquarters of an organization should concern itself with training of staff, allocation of scarce resources, research, etc., while implementation of programmes should be left to field staff. Despite this observation, implementation of the Crops Improvement Programme as the above argument shows was dominated by top authorities, a fact which made it difficult for field staff to adapt extension activities in this programme to local conditions.

10.3.2: Change in Structure of the Extension Service

The above argument points to the need for the Extension Service to shoulder the task of implementation of the Crops Improvement Programme and that for the Extension Service to be able to do this, there should be as little control of its field administrative activities as possible. This, in our opinion, can only be possible if there is a change in the structure of the Extension Service in the study areas.

We indicated in Chapter Four that the Extension Service in Lugari area was headed by a team of specialists in the headquarters of the Department of Settlement. There was one Agricultural Officer in charge of agricultural matters in settlement schemes west of the

Rift Valley (provincial level). There was no Agricultural Officer in charge of agricultural matters in schemes in Kitale area (district level). The Extension Service in this area, however, tended to be more hierarchical at the lower level. The hierarchy at the lower level could be reduced by having one Agricultural Officer in charge of the division and three Assistant Agricultural Officers responsible for extension work in the three locations of this division. This type of structure for Iugari area is justified in the next subsection.

There is a team of specialists in the headquarters of the Ministry of Agriculture and similar teams at provincial and district levels as indicated in Chapter Four. The observations cited above justify the need for the presence of a team of specialists at headquarters but not at the provincial and district levels. The reason is that the task of farmer education is carried out at the sub-district rather than district and provincial levels. As indicated in Chapter One field staff at these levels, due to a large number of staff under them or due to transportation problems within the Extension Service, rarely come in contact with farmers and hence rarely educate them about farming. If we assume that the district could be the optimum geographic unit of operation then, there could be need for the district to have one or two senior agricultural extensionists charged with the task

of coordinating extension work in various divisions of the district. Each division within the district could be headed by a senior agricultural extensionist charged with the responsibility of supervising extension workers in his division and of ensuring effective implementation of agricultural programmes in his area. He could have a small team of Agricultural Officers and Assistant Agricultural Officers. There would, however, be need to decide: first, on whether these extensionists are to be entrusted with responsibilities for general extension work or whether they could specialize in particular crop enterprises; and second, on the area of operation of each - this could be a division, location, or a few selected sublocations.

This type of structure could make it possible for the currently large number of better qualified staff at the district and provincial levels as well as some of the material resources such as land-rovers, money for fuel and repairs used at these levels to be spared for the divisional level where they are really needed. The problem, however, is that the Extension Service in the study areas has a large number of Agricultural Assistants and Junior Agricultural Assistants; these could have to be phased out gradually, or those with a secondary school certificate could be given further training lasting one or more years. A large number of these field workers as indicated in the last chapter had served the Extension

Service for 15 or more years; a period of 10 years could be sufficient to permit them to voluntarily retire from the Service or for training of some of them. This in effect means that each division could still continue to have a large number of Agricultural Assistants and Junior Agricultural Assistants who could still assist in extension work. Alternatively, a mobile task force of these junior field workers could be formed and moved from division to division with an aim of enhancing capacity of each division for adoption and management of innovations as discussed in the next sub-section. The size of the mobile task force could reduce over the years with the gradual phasing out of its members; it could spend two to three years in each division 'pushing' certain crop enterprises.

This re-structuring of the Extension Service permits each district to operate as a semi-autonomous unit; the national headquarters no longer controls the implementation of agricultural programmes but restricts itself to the above specified functions of training, research and allocation of scarce resources. It specifies priorities for agricultural development and provides general guidelines concerning the way extension work should be carried out. These priorities and guidelines leave sufficient room for the 'District Extension Service' to exercise discretion in planning and implementing its activities. Preli-

minary plans could be prepared by each division and could specify crops to be given priority in a given time period, methods of contacting and educating farmers, number of farmers likely to be reached, amount of credit and farm inputs required, and money needed for fuel and repairs. These preliminary plans could be discussed further at the district level in a meeting in which all divisions are represented. A joint plan for the district could then be formulated and forwarded to headquarters around April to permit the needs of the district to be taken into account when a budget for an on-coming year is being worked out. Resources allocated to the District Extension Service could be re-allocated to the divisions in accordance with their needs specified in the district plan. The divisions could, however, adjust their requirements to match actual resources allocated. In this case control and use of these resources allocated for agricultural development will be in the hands of the District Extension Service.

It was indicated that farmers' attendance of FTC courses was very low (see Chapter Seven) and also that findings from agricultural research stations were not adapted to needs of small scale farmers in this country (see Chapter One). In which way could the contribution of these institutions to crop production work be enhanced? The name 'Farmer Training Centre' shows that it is only farmers who are trained at these

centres and tends to be associated with low quality type of training. In our opinion these training institutions could play a leading role in agricultural development. It could be preferable to rename them as 'Agricultural Development Institutes' if they are to play such a role. The institutes, if manned by staff of Agricultural Officer or higher cadre, could play a leading role in linking activities of agricultural research stations and those of the District Extension Service. They could organize seminars, lectures, or short courses which could be attended by research scientists and extensionists. This could make it possible for agricultural research scientists to know the needs of farming communities, and for extensionists to know what the research scientists are doing. This could further make it possible for extensionists in one area to share ideas with those in another area about their real experiences. Each institute could invite specialists in other areas, such as social sciences to participate in seminars with, or to give lectures to these extensionists and research scientists on topics like communication, planning, methods of approach to farmers, management of resources, etc. The institute could also take part in training of officials of cooperatives, dips, 4-K clubs, or a few influential farmers to serve as 'local extensionists' as indicated in the next sub-section. Most of the training of the majority of farmers could be done in the farming community with extensionists positioned in these communities and could be assisted where

possible by staff of the 'Agricultural Development Institute'; this was done on a small scale in the study areas as indicated by the discussion in Chapter Seven. We also indicated that FTCs in the study areas were faced with administrative or financial problems. To overcome such problems one 'Agricultural Development Institute' could be established for Western Province. Khan A.H. (1973:3) has in this connection indicated that a rural development institute was established in Commilla and that it carried out baseline studies about feasibility of various projects, planned the way the projects were to be implemented, trained field workers and local leaders and sought support of the villagers and public service agencies for projects that were started in that community.

10.3.3 Methods of Contact and Education of Farmers

The capacity of the Extension Service, however, may not be effectively improved if defective approaches are employed in contacting and involving rural farm families in agricultural programmes. Which methods of approach could be more preferable? The individual farm visit method as indicated in Chapter One and Two is widely used by the Extension Service in this country. This method, however, leads to concentration on a few progressive farmers, a fact which leads to low productivity of the majority of farm units in smallholder areas in this country. Which alternative

approaches could the Extension Service employ?

The discussion in Chapters Five and Six showed that 90% of farmers in Lugari area compared to only 35% of those in Ikolomani area managed their crops to the standard required by the Extension Service. Most farmers in the former area were better informed in crop farming than a large number of those in the latter area. This informedness in crop farming results from exposure to various sources of extension education - courses, farm demonstrations, visits, etc. This was confirmed by the fact that members of the exposed group in the sample tended to be better informed and to do better in crop farming than members of the non-exposed group. In Lugari, however, a large number of farmers in the non-exposed group managed their crops close to the standard desired by the Extension Service. This situation in which a large number of farmers of a given area (Lugari in this case) are knowledgeable about agricultural innovations is likely to lead to widespread adoption and better management of innovations than in a situation (e.g. Ikolomani) where a few farmers are well informed. The reason is that in the former case farmers are more likely to talk to one another about what they have learnt about agricultural innovations and even to compete in their crop husbandry practices than in the latter case. Watts E.R. (1970) had indicated in this connection that in Uganda the 'Extension Saturation

Projects' were started due to the realization that communal pressures had compelled progressive farmers to stop adopting agricultural innovations.

We indicated that the historical situation in Lugari in 1960s when current farmers were settled favoured adoption and better management of innovations; some farmers who were settled could have been progressive prior to settlement, others had been exposed to agricultural innovations as workers on European farms, or as indicated by the Second SRDP Evaluation Report (1975), migrants to a given area are likely to be innovative. Despite these considerations the Extension Service in Lugari area used a method of approach which permitted each and every settler to be educated about agricultural innovations. Settlers were given development loans to permit them to adopt improved seed/seedlings, fertilizers, pesticides, and to cover ploughing costs. This approach has also been used by the Extension Service in Ikolomani area to 'push' certain crop enterprises like tea and coffee. It could equally be used to 'push' other agricultural enterprises like maize, beans, sugarcane, and passion fruit in Ikolomani area if conditions that could favour its use, such as availability of markets, better prices, or lack of sufficient food at home, prevailed and if farmers were aware of these conditions. This method which permits majority of farmers of a given area to be educated about agricultural innovations and to be assisted with credit to adopt

them differs from the individual approach which is currently employed in the study areas. This method of farmer contact is for the sake of convenience referred to here as the 'Communal Extension Approach'.

This method is likely to lead to an increase in farm produce due to widespread adoption of innovations by majority of farmers of a given area. This in effect means that economic arguments of demand, supply, and price may not be ignored where this method is used. However, as indicated in Chapter Seven there is a large local market for certain farm products like maize and beans (or milk and poultry products) which is largely ignored by the Extension Service and which is partially exploited by a few businessmen. It is also likely that if cooperatives were well managed they could help to insure members against fluctuations in market prices or even crop failure.

The costs entailed in the use of a communal approach in terms of manpower and facilities are considerable. However, the long-run benefit of such an approach is that it permits an area to develop local capacity for adoption and management of innovations which we believe is the overall (implicit) aim of extension education programmes. This being the case, we feel that the present extension machinery in Lugari area (there are 32 Junior Agricultural Assistants/Agricultural Assistants and 1 Senior

Assistant Agricultural Officer) is underemployed due to the fact that the area has already acquired capacity for adoption and management of innovations. It would in our opinion be possible to maintain the current level of management of crops in this area through the use of a few qualified staff (say, 1 Agricultural Officer in charge of agricultural matters in the division and 3 Assistant Agricultural Officers in charge of extension work in the three locations of this division). There would be need for them to be adequately provided with transport; the Agricultural Officer could be allocated a land-rover while each of the three Assistant Agricultural Officers could be allocated a motor-cycle. They could reach and educate farmers through the use of: (a) 'Model' farmers as was done in Commilla - they were trained in various aspects of farming and served as local extensionists in their villages (Khan, A.H., 1973:14); (b) farm newspapers or handouts containing simple information about farming; (c) films about farming; etc. In other words once an area has acquired the capacity for adoption and management of innovations less costs would be incurred by the Extension Service in implementation of its programmes; the extra extension workers available in the area could be transferred to another needy area. This in effect means that good results could be obtained where the approach is employed by a district

or region. Field staff in an area which has acquired the capacity for adoption and management of innovations could be moved to another area which has not done so. The use of this approach requires considerable thought to be given to issues of marketing of farm produce, credit administration, provision of farm inputs and cooperative development.

In Ikolomani the method as indicated above was used in respect of a few crop enterprises. However, as the experience in Lugari shows, the method could, if conditions were favourable, be used to simultaneously educate farmers about many agricultural enterprises.

The group extension method discussed in Chapter Two is equally intended to involve the majority of farmers of an area in agricultural programmes. This method was employed on an experimental basis in some SRDP areas. The method has so far not been used by the Extension Service on a large scale. Problems related to formation of village committees, or even training of field staff in the use of this method have to be known. Farmers could also be approached and taught as groups through their cooperative societies. In an area like Ikolomani where less than 20% of farmers are members of cooperatives, the use of the method could require formation of more cooperatives in this area. Further, since nearly 75% of the societies in the study areas are ineffective, the use of this method through cooperative societies could necessitate strengthening the cooperative movement in the area. Issues related to formation and strengthening of cooperatives or village committees are beyond the scope of this study.

10.4 RECOMMENDATIONS FOR FURTHER STUDIES

Studies done in this country by Mbithi, P.M. (1974), Chambers, R. (1971), Moris J.R. (1973) and other scholars cited in Chapter One, Two, and Three show that the majority of farmers in small scale farming areas in this country rarely participate in agricultural programmes due to failure of activities of these programmes to be adapted to local community conditions. We developed this idea of 'adaptability' and studied various situations in which extension activities were unadapted to local community conditions. This study of adaptability of extension activities to local conditions permitted us to draw conclusions or inferences about the extent of authority delegated to field staff for a limited area of Kenya. Further studies could investigate in greater detail and for other farm zones the extent to which extension activities were adapted to local conditions or could, as Leonard (1973) did, investigate the extent to which individual extensionists adapted extension messages to local conditions.

Much research has already been done in this country by Leonard D.K. (1977), the Dairy Production Improvement Programme Report (1976), Heyer et.al. (1969), Watts E.R. (1969) and others about occupational competence of field staff and factors influencing it, transportation arrangements, and extension worker-farmer ratio. We felt that

these various factors together with that of 'delegation of authority to field staff' helped to show the 'capacity' of the Extension Service to implement the Crops Improvement Programme. Further studies of capacity of the Extension Service could / the help to show the extent to which the changes we have proposed for improvement of the ability of the Extension Service to implement its programmes could be possible.

This study, by evaluating quality of farm performance, has gone beyond studies of mere adoption of agricultural innovations cited in Chapters Two and Three. It has examined the way agricultural innovations are managed after being adopted. As we have indicated innovations are rarely adopted to the standard recommended by the Extension Service; farmers make their own local adaptations. This fact calls for need for subsequent studies of this nature to examine farmers' adoption and management of innovations rather than mere adoption of innovations. This is particularly critical in agricultural extension research which aims at showing the extent to which objectives of the Extension Service are being attained.

This study further examined the influence of economic status as an indicator of the 'level of living' of a farmer; doing so entailed measuring

economic status in terms of many indicators - occupation, material possessions, size of farm, etc. as shown in Chapter Six. Many studies of this nature tend to assess the separate influence of each of these indicators of 'level of living' on farmers' adoption of innovations. Similarly, many studies show that exposure to extension education messages leads to increased adoption of innovations. This study has gone a step further to find out whether farmers who are exposed to extension education messages are knowledgeable in improved crop farming. We found farmers in our two study areas to differ in the extent to which they were knowledgeable about crop farming despite the fact that farmers in both areas seemed to be equally exposed to extension education efforts. We indicated that the historical situation in Lugari area when present farmers were settled was largely responsible for informedness of majority of farmers in this area in crop farming. Thus the history of farming in a given area might be one of the factors that influence farm performance in that area. These findings need to be taken into account by subsequent studies of this nature. Indeed, such studies, as the work of Barnes (1976) on the history of farming in Kisii, need to be replicated in other areas as a part of this broader exercise.

10.5- CONCLUSION

The above observations show that there is need for an integrated approach to crop production work; its various components ranging from extension education, credit administration, marketing, input provision, cooperative development, and other related services need to be implemented as a package to ensure success of the Crops Improvement Programme. The Extension Service in the study areas did not have the capacity to implement the Crops Improvement Programme as a package. We have indicated that capacity of the Extension Service to implement its programmes could be improved through major transformation of the structure of the Extension Service. The 'District Extension Service' indicated above could be fairly autonomous and entrusted with full responsibility for implementation of its programmes and control of resources allocated to it. It could be staffed by more qualified extensionists capable of adapting extension activities to local conditions. The present lack of liaison between activities of agricultural research stations and Farmer Training Centres could be overcome through establishment of an 'Agricultural Development Institute', preferably at the provincial level, which could carry out tasks outlined above. Training of farmers could be done largely in farming communities by the more qualified staff stationed in these communities and could be facilitated through the use of extension approaches

that could permit each community to develop the capacity for adoption and management of agricultural innovations.

These suggestions about the way the capacity of the Extension Service could be improved equally apply to livestock production work. The suggestions could, with certain modifications, apply to other closely related rural development programmes.

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Appendix I

HISTORICAL BACKGROUND OF LUGARI AREA

Lugari division is the only settlement area in Kakamega district. It was indicated by the Senior Assistant Agricultural Officer, Lugari that the division has 11 schemes some of which are 'high density schemes' with an average of 6 hectares per holding, while others are 'low density schemes' with an average of 12 hectares per holding.

We were informed by agricultural field staff that settlement in this area begun in 1962 in the high density scheme of 'Lugari' from which the division takes its name. Settlement in Lugari scheme is said to have been initially restricted to people from the more populous Vihiga division of Kakamega district. Pressure for settlement from other parts of Kakamega district led to part of Lugari scheme as well as other high density schemes of Mautuma, Lumaganda, Chekalini and Sango (settled between 1962-1966) to be settled not only by people from all parts of Kakamega district, but also by some from Busia and Bungoma districts of Western Province. Field staff indicated that persons who settled in these schemes were of the following types:

- (a) Persons who had been employees of European settlers and who lost their jobs when farms in these areas were sold to government for redistribution to the local people. Some of these persons had been squatters on European farms in these areas. They were largely Luhya and a few Kalenjin.
- (b) Persons from outside the area who genuinely needed a place to settle in. Many plots

remained vacant after allocation of plots to the above specified persons. This led to the provincial administration being requested by government to send in more people from traditional rural areas. In places where demand for settlement was high, provincial administration staff (chiefs and assistant chiefs) recruited those they favoured or those who were already progressive in their farming. They also in some instances recruited persons who were troublesome in their areas.

It was indicated by agricultural field staff that the initial deposit for a plot in high density schemes was Shs. 82-102/-. The settler was further required to pay Shs. 25/- for membership in a cooperative society that was to be formed in the scheme in which he had to settle. Thereafter each settler was given a 'development loan' which covered the following items:¹

- (a) Seedbed preparation for 1.6 hectares.
- (b) Farm inputs - seeds, fertilizers, fencing materials, etc.
- (c) Two grade dairy animals.
- (d) Sisal planting materials for one hectare. . Each settler was required to have part of his plot under sisal. He was also required to have at least 0.203 hectare of his plot under improved pasture.
- (e) Materials for building a local house and a subsistence wage of nearly Shs. 30/- per month for the initial six months.

The value of land in each plot in high density schemes was Shs. 2,300/- and was to be

paid for by each settler in the form of a 'land loan' over a period of 30 years.² The value of the 'development loan' for each settler was Shs. 2,000/- and was to be repaid over a ten year period.³ The rate of interest on these loans was indicated by Senior Assistant Agricultural Officer, Lugari to have been 6% p.a. at the time of settlement and 10% per annum at the time of data collection.

The low density schemes of: Sergoit, Kongoni, Nzoia, Mabusi and Moisbridge were settled between 1966-1968. They were meant for farmers with more capital and were settled by Luhya, Kalenjin, Kikuyu, Luo and Kamba. Field staff informed us that initial deposit in these schemes ranged from Shs. 500/- to Shs. 2,047/- per plot. Each settler was additionally required to pay Shs. 25/- for membership in a cooperative society that was to be formed in the scheme in which he was to settle. The value of 'land loan' was Shs. 6,000/- and was to be repaid over a 30 year period, while that of 'development loan' was Shs. 5,000/- and was to be repaid over a 10 year period at the rate of interest cited above.⁴ The development loan was intended to assist settlers acquire grade dairy animals, cultivate their fields, obtain farm inputs, etc. as in high density schemes.

It was indicated by field staff that the first instalment on the above loans was to be paid after six months of settlement and that subsequent instalments could be paid on a monthly, quarterly, half-yearly, or yearly basis. They indicated further that settlers were compelled to join cooperative societies so as to facilitate recovery of these loans.

A settler who completes paying the above specified loans could obtain a freehold title for

his plot. The following conditions, however, were to be observed by each settler:⁵

- (a) The land was to be used for agricultural purposes only.
- (b) It is not to be subdivided, let, leased, or transferred to other persons without consent of the Central Land Board.
- (c) The settler should:
 - i. Cultivate at least 0.41 hectare of arable land on his plot.
 - ii. Erect a dwelling house, and
 - iii. Fence the plot.

It is indicated that if these conditions were not observed, the plot could be taken over by the Central Land Board.⁶

This settlement area was reported by field staff to have been a ranching area during the period of European settlement; sisal was the main crop. Today maize is the main cash and subsistence crop although grade dairy animals are kept in fairly large numbers in low density schemes and are an important income earner in these schemes. Sisal which was imposed on farmers in high density schemes has been abandoned by many settlers (a little sisal is used to mark boundaries of farm units). Improved pasture, especially napier grass which was also imposed on settlers is rarely found - has been abandoned by many farmers in schemes like Lugari where most dairy animals have died.

Although a large number of settlers were the 'Luhya' of Western Province, many persons who were not originally settled in this area from different parts of the country have acquired plots in these schemes. Extension staff indicated that

selling, letting, leasing or even sub-division of land were common and were done with or without approval of government.

Footnotes to Appendix I

1. Ministry of Settlement, / Allotment Forms. / Land
These forms show economic value of land,
initial deposit paid, value of development
loan, and amount to be paid in each
instalment.
2. Ibid.
3. Ibid.
4. Ibid.
5. Ibid.
6. Ibid.

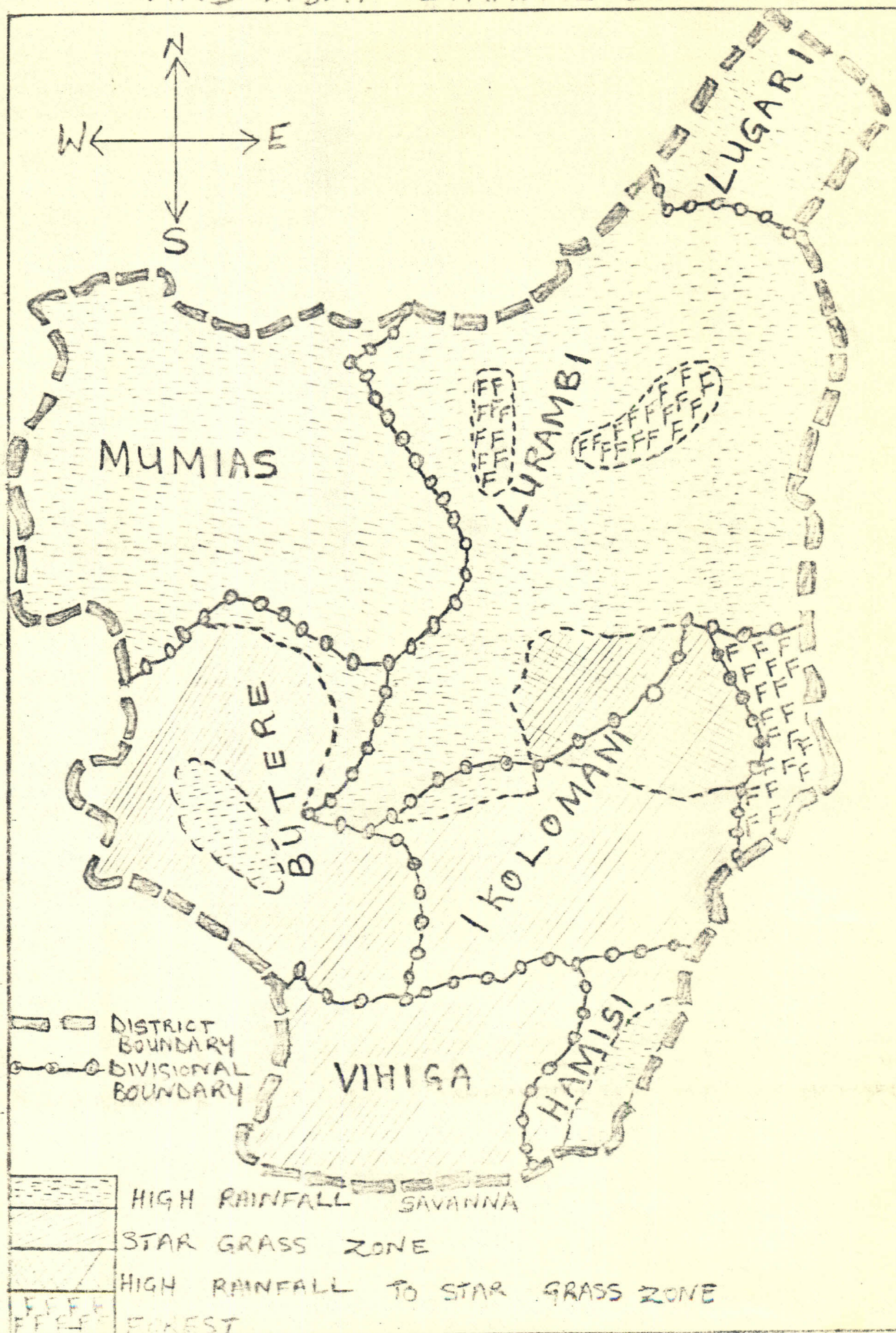
ECOLOGICAL AND DEMOGRAPHIC FACTORS
INFLUENCING CROP FARMING IN KAKAMEGA DISTRICT

Western Province is made up of three districts of: Kakamega, Busia and Bungoma. Kakamega whose total area is 3,562 sq.km. is the largest of these districts.¹ It borders with Bungoma district to the North; Nandi, Uasin Gishu and Trans-nzoia districts to the North-east; Kisumu district to the South; and Busia and Siaya districts to the West and South West as shown in Map I.

(1) Density of Population

Kakamega is one of the most densely populated districts in Kenya. Table II.a. shows that in 1969 the district had a total population of 784,919 persons while projections for 1976 based on the 1969 population and an annual rate of increase of 3.5% showed the district to have a total population of 992,143 persons. The projections for 1976 show that Vihiga division with a density of 696.1 persons per square km. was the most densely populated; Ikolomani division had a high density of 382.2 to 471.5 persons per sq.km., while Lugari division had the lowest density of 86.9 to 93.4 persons per sq.km. Ikolomani (excluding Kakamega forest) had a total area of 386 sq.km. which amounted to 38,600 hectares out of which 30,430 hectares are arable.² Lugari division has a total area of 570 sq.km. amounting to 57,000 hectares, a large proportion of which is arable.³ Maps II and III respectively show Ikolomani and Lugari divisions.

MAP I

KAKAMEGA DISTRICT: VEGETATION ZONES
AND ADMINISTRATIVE DIVISIONS

Source: Extracted and reduced to present size from map in Western Province Research Station, Kakamega.

Table II.a.: Distribution of Total Area of Kakamega District According to Administrative Divisions and Population Density

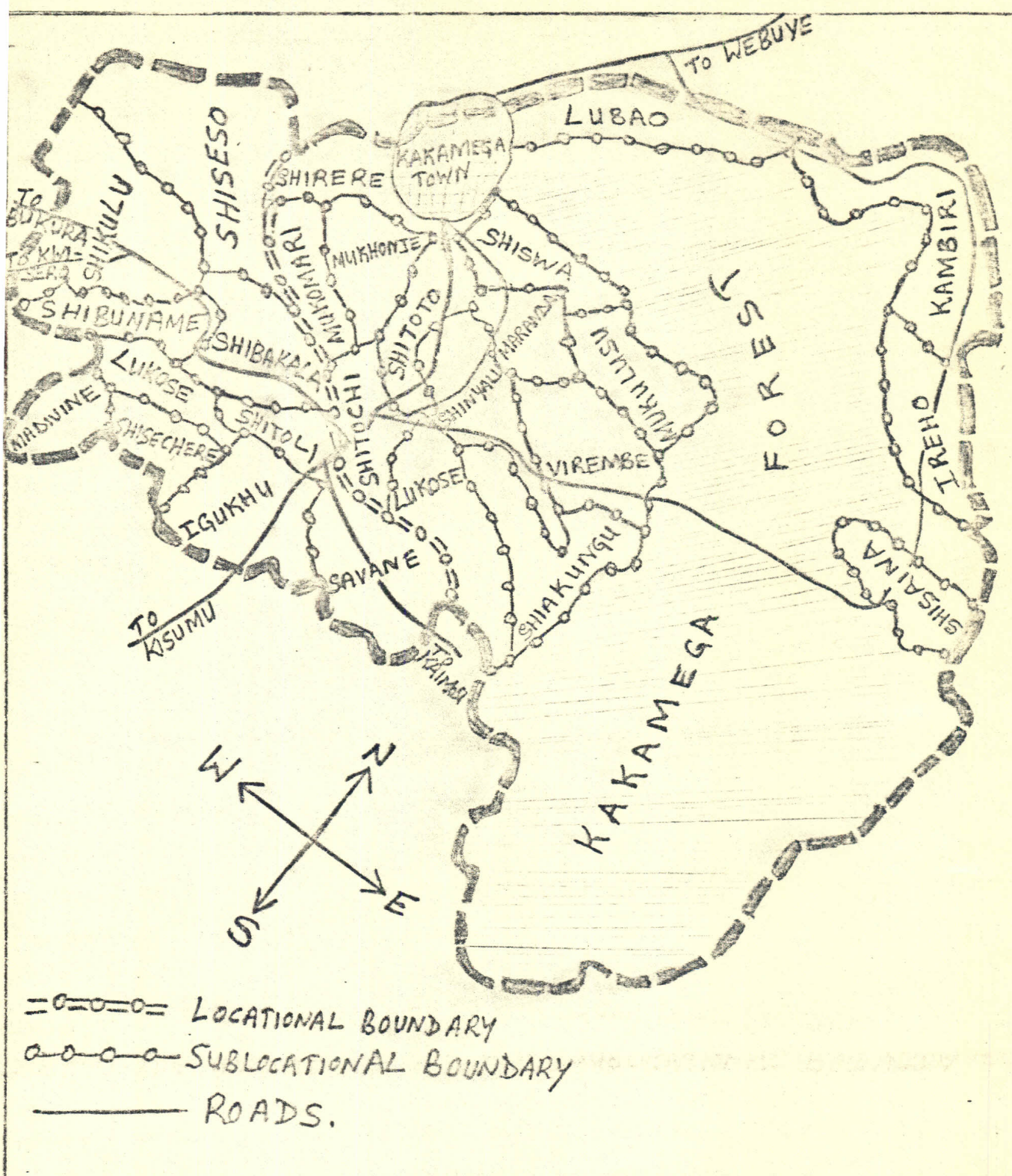
Division Location	Area in Sq. km.	1969 Population	Density (1969)	Projection for 1976	Density (1976)
Ikolomani:					
Isukha	242	72,662	300.3	92,488	382.2
Idakho	144	53,340	370.4	67,894	471.5
Forest	237	2,313	9.8	2,945	12.4
Lugari:					
South	307	20,962	68.3	26,681	86.9
North	263	19,306	73.4	24,574	93.4
Lurambi	860	128,461	149.4	163,513	190.1
Mumias	597	80,932	135.6	100,418	168.2
Vihiga	390	216,663	555.5	271,476	696.1
Hamisi	164	79,591	485.3	101,307	617.7
Butere	350	103,462	295.6	131,690	376.3
Townships: (Kakamega, Mumias, Butere)	8*	7,227	-	9,157	-
Total	3562	784,919	220.4	992,143	278.5

* For Kakamega town only

Source: Extracted and Adapted with slight modifications from Handing Over Report, 1976
op.cit., p. 2.

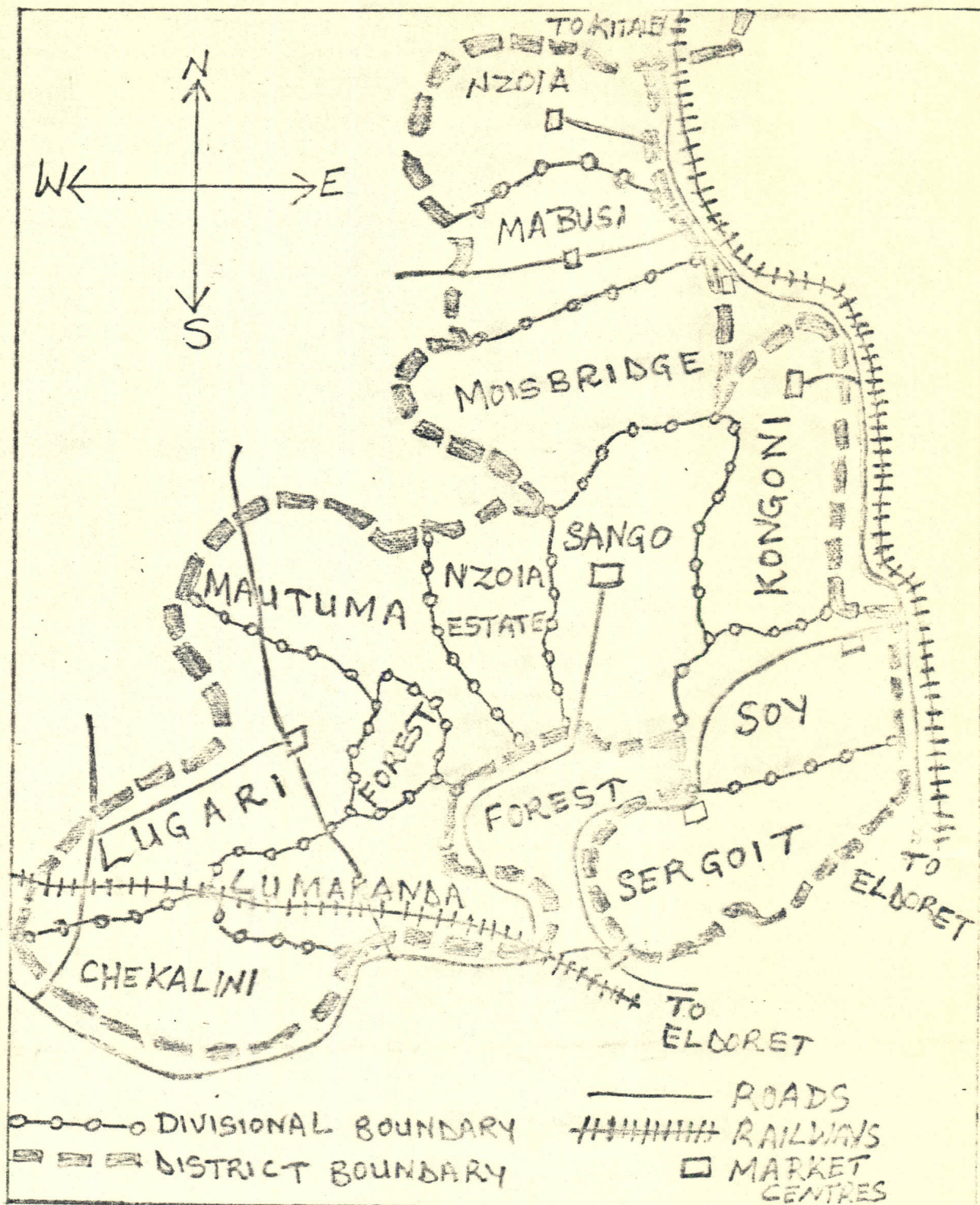
MAP II

IKOLOMANI DIVISION: SUBLOCATIONS
AND ROADS



Source: Extracted and reduced to present size from map in AAO's Office, Ikolomani.

MAP III LUGARI DIVISION: SCHEMES RAILWAYS AND ROADS



Source: Extracted and reduced to present size from map in SAAO's Office, Lugari.

(2) Altitude, Rainfall and Other Water Sources

The altitude of the district ranges from 1,200 to 1,800 metres above sea level - the altitude of traditional rural areas of the district is nearly 1,200 metres while the altitude of Lugari settlement area ranges from 1,600 to 1,800 metres above sea level.⁴

Kakamega district receives some of the highest rainfalls in Kenya - the amount of rain received ranges from 1,500 mm. to 2,200 mm. per annum.⁵ The rain is received in two seasons namely: the long rains season which lasts from mid-February to June; and the short rains season which lasts from August to November of each year. Table II.b. shows the amount of rainfall received in the district during 1973 and 1976. It was indicated by Senior Assistant Agricultural Officer, Lugari that the amount of rainfall received in Lugari area approximates that received in the traditional rural areas of the district. He indicated, however, that although rainfall is received in the traditional rural areas from around mid-February, rain begins to fall in Lugari area around mid-March.

The rain is received over a fairly large number of days in any one year,⁶ a fact which makes it possible to grow crops like tea, coffee and sugarcane which require an almost even distribution of rainfall during the year.

In both Lugari and traditional rural areas of the district farmers obtain their water supplies from rivers, streams, boreholes, roof catchment tanks and dams. The main rivers include: Nzoia, Kipkaren, Isiukhu, Yala, Lusumu and Essava. The Senior Assistant Agricultural Officer, Lugari indicated that Nzoia Water Project supplies water to farmers in Mabusi, Nzoia, Moisbridge, Kongoni and Sango schemes in Lugari area.

Table II.b.: Amount of Rainfall Received in Kakamega
District During 1973 and 1976
(Millimitres)

Months of the Year	1973	1976
January	237.4	66.6
February	261.3	95.7
March	23.4	118.9
April	181.3	219.7
May	362.1	312.8
June	285.8	158.8
July	109.9	148
August	241.5	330.5
September	357.8	163.7
October	237.2	130.2
November	142.1	116.8
December	39.6	74.9
Total	2,479.4	1,936.6

Source: Ministry of Agriculture, Western Agricultural Research Station, Kakamega, Annual Report, 1973, p. 3.

Ministry of Agriculture, Kakamega District, Annual Report, 1976, op.cit.

(3) Vegetation Zones and Soils

The three main vegetation zones in Kakamega district are as follows:⁷

- (a) The 'Kikuyu Star Grass Zone' which is found mainly on the Eastern side of the district to the east of Kaburengo-Kisumu road.
- (b) The 'Equitorial Rain Forest Zone' which covers the forests of Malava, Kakamega and Kaimosi.
- (c) The 'High Rainfall Savanna' covers the rest of the district.

The district has three main types of soils as follows:⁸

- (a) Red friable loams which are derived from volcanic and basement complex rocks and are found mainly to the South and East of the district.
- (b) Orange clay loams are derived from sedimentary rocks and are found mainly in the Central area of the district.
- (c) Sandy loams with murram pans are found in the North and Western parts of the district.

These various vegetation zones and soils determine the types of crops that can be grown in different parts of the district.

(4) Temperatures, Hail and Windstorms

In both Lugari and traditional rural areas of the district, records of temperatures were not available. The various Annual Work Programmes and Annual

Reports referenced elsewhere in this thesis make it clear that days are normally sunny and hot and sometimes wet and cloudy and that nights are usually warm and cloudy. Hail and windstorms are reported to be common and often lead to severe crop damages as indicated in chapter Six.

(5) Land Registration

Land registration was indicated by Assistant Agricultural Officer, Ikolomani to have been completed in Ikolomani division at the time of data collection. He indicated that a few farmers had already collected their title deeds from the Ministry of Settlement Offices, Kakamega and could use these titles as security in acquisition of farm credit. In Lugari area it was indicated by the Senior Assistant Agricultural Officer, Lugari that no land titles had been issued by the time of data collection - most farmers were still paying for their land.

(6) Other Factors

Both Ikolomani and Lugari areas have many earth roads most of which are not adequately maintained; most are impassable during rainy seasons and very dusty during dry seasons. The Kaburengo-Kakamega-Kisumu road passes through Ikolomani division and is the only tarmac road in the Division. Other tarmac roads include Eldoret-Kitale, and the Eldoret-Kampala roads which are to the eastern and southern borders of Lugari Division respectively. The Mombasa-Nairobi-Kampala and Eldoret-Kitale railways pass to the southern and eastern borders of Lugari Division respectively. These roads and railways are used in transporting farm produce and inputs in the study areas.

Ikolomani division is made up of two locations of: Isukha; and Idakho. There are a total of 26 sublocations in these two locations distributed as follows:

- (a) Isukha Location: Shitochi, Mukomari, Mukulusu, Shiakungu, Lubao, Ireho, Shitoto, Muranda, Shirere, Shinyalu, Kambiri, Mukhonje, Shiswa, Lukose, Virembe and Shisaina.
- (b) Idakho Location: Shikulu, Savane, Shibakala, Lukose, Shiseso, Madivine, Igukhu, Shitoli, Shibunane and Shisecheli.

These various sublocations are portrayed in Map II. They are the lowest units of Agricultural Administration in Ikolomani and other traditional rural areas of the district.

Lugari area is made up of 11 schemes which fall in the following locations and sublocations:

- (a) Lumakanda Location has four sublocations of: Chekalini, Lugari, Mautuma and Lumakanda each of which is itself a scheme.
- (b) Nzoia Location has: Moisbridge sublocation which is equivalent to a scheme, and Nzoia sublocation which has two schemes of Nzoia and Mabusi.
- (c) Soy Location has: Soy sublocation which has two schemes of Soy and Sergoit, and Sango sublocation which has two schemes of Kongoni and Sango.

Thus in Lugari area some schemes are equivalent to sublocations while in a few cases two schemes constitute a sublocation. The scheme in Lugari area is the lowest unit of agricultural administration. Some schemes were sub-divided into 'blocks' each of which was assigned to an agricultural worker for ease of operation. Map III shows various schemes in Lugari area.

Footnotes to Appendix II

1. Ministry of Agriculture, Handing Over Report, Crop Production Division, Kakamega District, 1976, op.cit.
2. Ministry of Agriculture, Land Use Data, Ikolomani Division, 1975, Farm Planning File, AAO's Office, Ikolomani.
3. Ministry of Settlement, Agricultural Section Annual Report, Lugari Division, 1972, SAAO's Office, Lugari, p. 1.
4. Ministry of Agriculture, Handing Over Report, 1976, Loc.cit.
5. Ibid., p. 2.
6. Ministry of Agriculture, Western Agricultural Research Station, Kakamega, Annual Report, 1973, op.cit.
7. Ministry of Agriculture, Kakamega District, Annual Work Programme, 1973, p. 1.
8. Ibid., p. 2.