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SMALLHOLDER AGRICULTURE AS
A RURAL DEVELOPMENT STRATEGY;
THE CASE OF MALAWI

By

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Economy at the University of Glasgow in part fulfilment
of the requirements for the degree of
Doctor of Philosophy.

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Currency Unit

Malawi Kwacha (MK.) = 100 Tambala (t)

MK = US $1.15 = £0.63 Sterling.
(as at 16/5/78)

NB. The Malawi Kwacha was devalued by 15% towards the end of 1982.
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SUMMARY

It is widely agreed that the growth strategy pursued in most of the developing countries during the 1950s and 1960s, resulted in a development pattern whereby most of the rural masses did not share in the benefits of the development effort. The 1970s was therefore the decade during which many developing countries undertook rural development efforts, largely with the help of the World Bank and other donor agencies, in an attempt to bring the benefits of economic development to the rural poor. Smallholder agricultural development has been the commonest strategy undertaken by most of the developing countries (especially in sub-Saharan Africa), to achieve this objective.

This study looks at the extent to which the smallholder agricultural development effort has succeeded in improving the incomes of the smallholder population in Malawi. The study focuses its attention on analysing the innovation adoption pattern which has emerged in the Lilongwe Land Development Programme (a pioneering experiment in integrated rural development in sub-Saharan Africa). In particular, it looks at the factors that are associated with the adoption of productivity raising innovations, by examining the characteristics that are associated with innovation adopters in the area. This is done by building a model of household typologies, based on the observed adoption behaviour.

The findings from the study indicated that for a smallholder agricultural development strategy to succeed in reducing rural poverty, it must be in accord with other national policies. In addition, the productivity raising innovations must be able to reach the poor households. This necessitates a careful analysis of the constraints faced by the poor households so that appropriate innovation packages can be designed for them.

It was observed for example, that in the situation under review, female headed households were seen not to adopt most of the package offered by the project. The distribution of inputs on credit did not improve the situation due largely to the credit rating criteria which rendered such households' credit risks, and also the stipulation of minimum packages, which in most cases proved to be beyond
the labour and financial resources of most of the poor households. More important, the study indicated that those households that did not adopt innovations tended to rely largely on non-farm sources of income (such as petty trading, beer brewing and wage labour) not only to improve their household income positions but even to meet subsistence needs, suggesting that the smallholder development effort was not particularly meeting their needs. This suggested the need for a search for other means of improving the incomes of such households, to supplement the smallholder development effort.
CHAPTER I

INTRODUCTION

Malawi, with an annual per capita income of US $200 (mid 1977)\(^1\) is classified as one of the least developed countries in the world. Like most other developing countries in her category, she is characterised by low productivity (both land and labour) in the most predominant sector, the rural sector, where small scale farming is the leading economic activity. Over 90% of the rural population depends on peasant farming for its livelihood.\(^2\) A sample survey of agricultural holdings conducted in 1968/69 reported that the annual incomes of about 80% of the smallholder households were below K40 (about US $45) and a substantial proportion of this income came from the farm.\(^3\) Such evidence indicates that rural poverty (using the World Bank poverty line of US $60 per capita, quoted by Ghai and Radwan),\(^4\) was quite a serious problem in the country. Thus one of Malawi's development priorities was, and still is, to raise peasant productivities. The country has opted to achieve this objective within a smallholder context. Thus the development of smallholder agriculture has become a central element in the country's rural development programme (see Statement of Development Policies, op. cit., p.)

Because smallholder agricultural production in the country is basically subsistence oriented, the main problem which the smallholder development effort is trying to solve is "how to develop subsistence farmers".

The approach adopted in this study is to examine the impact of a smallholder agricultural development strategy on the reduction of rural poverty, by looking at what has been achieved so far in the field of smallholder agriculture in the country (with particular reference to the Lilongwe Land Development Programme-LLDP), and what this has meant in terms
of overall rural development. At the same time the theoretical
basis of smallholder agricultural development will be examined
to see how it relates to the broad objectives of rural development.

1. STUDY METHODOLOGY

In order to investigate the impact of the smallholder
development effort on rural poverty, the approach is to
explore the main factors that are causally linked with
raising small scale agricultural productivity (in the Malawian
context) and the conditions under which increased smallholder
productivity can reduce rural poverty. The investigation
focuses on the examination of the characteristics of subsistence
farmers, which are critical from the standpoint of causality,
to a movement into greater productivity and commercialization,
as Mosher (1966) put it. This required collecting data
from the Malawian smallholder sector that would facilitate:

(a) The diagnosis of the problem of low output levels
on the Malawian small scale farms.

(b) An assessment of the impact which the smallholder
development effort has had so far on the income
levels of small scale farmers—especially the
poorest section of the rural community.

The data collected is used to build models of the rural
economy to try to explain interhousehold differences in income
levels. A number of interrelated hypotheses concerning total
household income (within the agricultural smallholding community
in LLDP) are formulated and tested against the evidence provided
by the data.

2. HYPOTHESES TO BE TESTED.

In analysing interhousehold differences in incomes among
the survey population, emphasis will be placed on the household's
ability to adopt the various innovations introduced in LLDP.
After a decade or so of the smallholder development effort in
the area, the emerging evidence tends to indicate that a
substantial proportion of the households in the area (about 30%) appear not to have adopted the innovations.\(^6\) A closer investigation indicates that the non innovators are closely associated with small cultivated areas, an aspect which is consistent with observations in other parts of the world.\(^7\) However, it is argued here that while differential access to farm land, due to restrictive tenurial arrangements, may offer a plausible explanation of why there is a close link between farm size and adoption behaviour in such places as Asia or Latin America, the universal access to farm land in Malawi tends to invalidate this possibility.\(^8\) The main stand taken in this study on this issue is that, while farm size correlates with adoption behaviour, such a correlation does not necessarily imply causality. Because in the situation under review farm size represents the total amount of land which a household is able to cultivate, and not merely the amount of land under its disposal, as is usually the case in the Asian or Latin American cases, it is factors other than land availability per se, which play a crucial role in determining innovation adoption and therefore total farm and household incomes. This study proposes a number of such interrelated factors. A number of hypotheses intended to explore these interrelationships are listed below. In chapters V and VI, these are either confirmed or discarded according to the evidence provided by the survey data.

1. a) A household's level of total revenue from sale of crops is likely to be closely associated with the type of crop enterprise undertaken (i.e. adoption or non-adoption of the innovations offered by the project).

1. b) Adoption of the innovations offered is likely to be closely associated with a household's access to seasonal credit.

1. c) A household's access to seasonal credit is closely associated with its cultivated area.
2. a) Total farm income is closely associated with the size of the cultivated area.

2. b) For a peasant household solely dependent upon family labour (for agricultural work), the size of its cultivated area is closely associated with the number of family workers available to it (measured in adult equivalents).

2. c) A household's cultivated area is likely to be related to the household's ability to hire labour (measured by total expenditure on hired labour).

2. d) The household's ability to hire labour is closely related to the household's access to non-farm income earning opportunities (measured by total non-farm receipts).

3. Cash purchases of inputs are likely to be associated with a household's level of non-farm income.

**SUMMARY AND OUTLINE**

The main message coming from this study is that there is a great need for a proper diagnosis of the problems facing a particular group of smallholder farmers before any steps are taken to rectify the situation. The study tries to point out, using Malawian evidence, both from colonial and post-colonial times, how an improper or incomplete evaluation of the problem can lead to designing policies which may actually worsen the situation. The study particularly emphasizes that labour requirements of small scale farming in Malawi (and this could be generalised to other countries in Sub-Saharan Africa) have not been fully appreciated. It is generally assumed that smallholder households, because of their emphasis on subsistence
production have surplus family labour which can be usefully utilised in the production of cash crops, and hence integrate the households into the market economy. This assumption is reflected in the fact that the innovation packages are usually designed on the basis that families have enough family labour to cope with them.

However, evidence indicates that while the households may possess surplus labour on an annual basis, due to the sharp seasonality of the particular farming system (rain fed agriculture), many households actually suffer from labour shortages during the peak season. It is actually these peak labour demands which are the main constraints to many smallholder households' farming activities in general, and innovation adoption in particular.

The majority of innovations introduced in the Malawian small-scale agriculture (this also applies to African agriculture in general), are of the seed technology type. There is ample evidence which indicates that these are usually more labour intensive than the traditional crops they replace. One puzzle associated with seed technology is that in the Asian sub-continent they have been seen to improve smallholder productivity quite substantially while in Africa, generally, their results have tended to be disappointing. It is often overlooked that expansion of seed technology in Asia was largely accompanied by irrigation development (such as the expansion of the tubewell program in Pakistan). What this irrigation appears to have done was to have raised productivity and at the same time reduced the risk often associated with rain fed agriculture, so that returns to labour were higher and more secure. In addition, irrigation seems to have introduced an element of flexibility in the crop labour demands. That is, although the new crops required more labour say per hectare, the irrigation facility meant that the household could reasonably cope with the extra labour demands by regulating the rate at which the field is flooded, to match with its labour supply,
an aspect which is impossible' with rain fed agriculture, which predominates in Sub-Saharan Africa. Thus seed technology in Africa has invariably meant higher risks as most of these new crops tend to have specific environmental and input requirements, as well as higher labour demands on the peasant households. Unfortunately, because of the implied assumption of surplus labour in peasant agriculture, experimentation with the new seeds has been largely restricted to yield studies, soil conditions, etc. Even in LLDP, where the introduction of seed technology (improved maize and groundnut seeds) form the backbone of the smallholder development strategy, labour requirement considerations do not seem to feature prominently in the designing of innovation packages.

The evidence that seed technology is relatively more labour intensive, implies that for its adoption to be widely based, it must be accompanied by some form of controlling labour demands, to match them with family labour supplies, or by the introduction of labour saving technology. Results from this study tend to indicate that the use of labour saving technology is very low in LLDP despite the apparent labour bottlenecks. It appears that the option of labour saving technology is largely frustrated by the extractive pricing policy pursued by the state marketing agency in charge of purchasing smallholder crops (ADMARC), which is a common phenomenon of African smallholder crop marketing systems, which tend to make investment in smallholder agriculture unprofitable, and also by the unavailability of appropriate technology.

It is therefore not surprising to see that the adoption of seed technology in the African context has been largely associated with increasing labour hiring and/or large family work forces. Even the provision of input credit has not succeeded in inducing a broad based adoption of innovations. This thesis proposes two main reasons for this failure. The first is that inputs are assumed to be the only serious constraint among the small scale farmers and not labour. As a result emphasis has been placed on providing input credit only with the consequence that only those households for whom the above assumption holds, have benefited from the credit package. 
In the second place, allocation of credit is based on the "ability to repay" criterion, i.e., the ability to produce a marketable surplus over and above family subsistence needs, which is also closely associated with the amount of labour available to the household (translated through the size of the cultivated area).

The consequence of this oversight regarding the labour availability problem is the fostering of an adoption pattern that depends on labour hiring, which in the absence of proper rural wages monitoring, is likely to lead to more rural differentiation as the richer and more progressive farmers will tend to hire the smaller and poorer farmers, with the likely consequence that the latter group will be "crowded out" of cash crop production, and probably leading to increasing landlessness among the rural community. Although this is likely to happen sooner or later, given the fast population growth in the country and the rising pressure on the land, it appears that its emergence could be slowed down (while appropriate solutions are being sought to deal with it when it finally arrives) by trying to achieve a widely based adoption pattern. It appears that the achievement of a broadly based adoption pattern is prevented by lack of adequate information on the part of planners regarding the exact developmental needs of the various typologies of smallholder households.

This study therefore attempts to make two major contributions to the study of small scale agricultural development. The first contribution lies in the emphasizing the need for a more careful analysis of the factors associated with innovation adoption and the need to investigate their interrelationships so as to enable us to isolate those factors that are merely associated with innovation adoption from those that are causally linked with it. The second, and most important contribution comes from the survey findings which have indicated that in LLDP (and this could be extended to other areas in rural Malawi), female headed households (which comprised about 16% of the sample), have been largely bypassed by the smallholder
agricultural development effort. The main reason for this appears to be the deficiency in the family labour resource associated with this group of households. This has led to smaller cultivated areas and consequently restricted their access to input credit. As a result these households tend to increasingly rely on non-farm sources of income. But, because of limited non-farm income earning opportunities in the rural areas, the tendency for these households has been to hire themselves out to the "innovating" households, with the consequence that their labour problems are made worse, making their dependence on wage labour more or less a permanent phenomenon.

The study therefore argues that more insights into the characteristics of the rural population (such as resource constraints, sociological factors, etc.), would be gained if the households were disaggregated into some form of typologies based on one criterion or the other, rather than relying on aggregate attributes of the entire beneficiary group. In this way, it would be possible to design a range of innovation packages that would cater for the needs of the various typologies. In addition, it is likely that the limitations of a smallholder development strategy as an overall means for alleviating rural poverty, will be revealed, by indicating those groups who for one reason or the other, cannot participate directly as farm operators, such as the landless and near landless households. As a result it will be possible to direct the attention of planners towards more appropriate remedies for such households, such as rural employment creation programmes.

The study is divided into two parts. The first part which incorporates chapters II and III, looks at Malawi's smallholder agricultural development problem in a historical context, while the second part, comprising chapters IV to VI, is largely devoted to an examination of the smallholder agricultural development effort in IFDP, as a case study.
In chapter II, Malawi's smallholder development strategy is placed in a historical perspective, by looking at the country's resources, which seem to dictate the need for an emphasis on small scale agricultural development. This is followed by an examination of the damage done to smallholder development prospects by the colonial agricultural policy which emphasized the encouraging of settler agriculture, and later attempts to rectify the situation. Chapter III focuses on the current rural development strategy in Malawi and how it relates to the overall agricultural development programme (both estate and smallholder development). The main conclusion emerging from this chapter is that it appears that estate agriculture, despite the damaging effect which it is seen to have had on smallholder agricultural development prospects during the colonial era, has continued to receive disproportional attention in post-colonial times. At the same time, efforts at smallholder agricultural development have tended not to be broadly based. A National Rural Development Programme has been launched (since 1976/77) to try to initiate broad based smallholder agricultural development, but has not attempted to alter the balance between estate and smallholder development, thereby watering down its effect as a sectoral corrective mechanism.

Chapter IV looks at a specific case of smallholder agricultural development in the country. The aims and objectives of the development effort are analysed in the light of prevailing conditions in the area. The main conclusion emerging from this chapter is that labour availability appears to be a more crucial factor in innovation adoption in the area than is generally recognised. Chapters V and VI attempt a micro-level analysis of innovation behaviour, with the help of survey data collected in LLDI. In chapter V, the survey data are described, and a number of hypotheses to explain the observed pattern of innovation adoption are examined. In chapter VI, a more penetrating analysis of the survey data is undertaken, and the hypotheses developed in the previous chapter tested against the evidence provided by the survey data. Chapter VII offers a summary of the main findings of the whole study, and some policy
prescriptions regarding broadly based innovation adoption as well as alternative and additional measures of reducing rural poverty.
Notes - Chapter I


6. See, table 5.4a.

7. There is a large body of literature (largely pertaining to the experiences in the Asian Sub-Continent) which indicate that small farmers, on the whole, lag in their adoption of innovations. One of the main reasons for this appears to be the way the new technology affects the process of capital accumulation among the different farmers, and also the ability of the different farmers to take on the risks associated with the new innovations. See for example, Blair, H.W. (1978), "Rural Development, Class Structure and Bureaucracy in Bangladesh", in World Development, vol. 6, number 1, pp. 65-82; World Bank (1981b), "Adoption of Agricultural Innovations in Developing Countries: A Survey", World Bank Staff Working Paper No. 444, Washington; Ruttan, V.W. (1977), "The Green Revolution: Seven Generations", in International Development Review, Vol. 19, No. 4, pp. 16-23; and International Rice Research Institute (1975), Changes in Rice Farming in Selected Areas of Asia; Los Banos, Phillipines.

8. Cohen, J. (1978), for example points out that:

"foremost among the constraints that hold back smallholder innovation and skew the distribution of benefits towards the elites are the complex rules and institutions by which land is allocated, held, regulated and used."

He goes on to argue that even where the customary land tenure system prevented concentrated ownership and tenancy problems, the introduction of modern technology introduced
some tenure systems and problems which prevented the smallholding majority to acquire production credit or land to participate fully in the new production techniques. See, Cohen (1978), "Land Tenure and Rural Development in Africa", Development and Discussion Paper No.44, Harvard Institute for International Development, Massachusetts. pp.1 and 6. While the present writer agrees with some of the points raised by Cohen regarding the effects of modern innovations on customary land tenure arrangements, he still maintains that in Malawi the basic principle of customary land allocation (to avoid destitution), accompanied by the flexibility in the tenure system to re-allocate land among the families in accordance with changing needs, farm size as well as adoption of innovations are very much dependent upon an individual household's ability to cope with the resulting labour demands. However, this is likely to change in the direction indicated by Cohen as the pressure on the land continues without accompanying structural changes in the economy.


10. Boesen and Mohele (1979), for example, in their study of smallholder production of tobacco in Tanzania, have clearly indicated that tobacco growers suffered serious labour bottlenecks in the peak season, and that they had to resort to labour hiring with the help of cash loans. When political circumstances closed off the labour hiring option, farmers were forced in most cases to alter their land use pattern, opting for the relatively less labour demanding maize enterprise. See, Boesen, J. and Mohele, A.T. (1979) The "Success Story" of Peasant Tobacco Production in Tanzania, Scandinavian Institute of African Studies, Uppsala.


12. The World Bank (1981b:10), op. cit., cites evidence from a number of studies which indicate that adoption of seed technology (eg. high yielding varieties of wheat, or rice, etc.), increases seasonal demands for labour so that adoption is less attractive for those with limited family labour or with little access to hired labour. Among the studies cited are: Hicks, W. and Johnston, R. (1974), "Population growth and the Adoption of New Technology in Taiwanese Agriculture", Columbia: University of Missouri, WP in Economics No. E6; Harris, B. (1972), "Innovation Adoption in Agriculture - The High Yielding Variety Program", Modern Asian Studies No.1, PP71-98.


15. This assumption still prevails in project design despite the ample evidence cited above which contradicts this assumption.

16. Adoption of ox-cultivation, for example, has been seen to be particularly suitable to African agriculture (especially where ground tilling activities have been found to be critical). See Gemmill, G.T. (1972), "Economic and Social Factors in the Diffusion of Farm Mechanization", Mimeo, East Lansing: Michigan State University; and Weil, P. (1970), "The Introduction of the Ox-Plough in Central Gambia", in African Food Production System: Cases and Theory, (edited by McLaughlin), Baltimore, Hopkins, cited in World Bank (1981b), op.cit., p.4.
CHAPTER II

A HISTORICAL BACKGROUND TO THE MALAWI ECONOMY

A proper understanding of the reasons behind the success or failure of a country's development strategy, let alone its emergence, is impossible without some knowledge of the political and economic circumstances under which the strategy developed, and is being pursued. It is for this reason that this chapter will be devoted to a brief historical account of the political and economic developments in Malawi during the colonial era, and up to, and immediately after Independence, in order to put the development strategy in perspective. However, the objective will not be to provide a detailed history of Malawi, a subject which has been covered with considerable detail by a number of writers, but rather to try to answer two main questions; viz:

(a) How did the current Malawian agricultural development strategy emerge?

(b) What impact has the strategy had so far on rural welfare?

To provide answers to these two questions will require both an assessment of the economic and political circumstances pertaining to the Malawi economy, as well as a critical evaluation of the agricultural development policies pursued in Malawi to date.

The central theme of this chapter is that three main factors contributed to the emergence of the particular agricultural development strategy currently being pursued in Malawi. These are:

(i) The nature of the country's resources.

(ii) The country's economic and political history.

(iii) The country's development priorities as seen at Independence.
It will be argued that, because of the nature of the country's resources, peasant agriculture offers the largest scope for improving rural wellbeing. However, despite the fact that this has been recognised both in pre- and post-independence times, the country's development record tends to indicate that peasant agriculture has either been largely neglected or relegated to a secondary role, with large-scale (or estate) agriculture getting priority. Consequently, there has been a general lack of a commitment to devise policies particularly appropriate to raising peasant productivity on a broad basis.

1. THE NATURE OF MALAWI'S RESOURCES

A. Natural Resources
   (i) Topography
   Malawi falls within the East African Rift Valley System. This has resulted in great diversity in topography, which in turn has produced a wide range of relief and elevation, rainfall, climate and soil fertility. The combined effect of all these variations is an agricultural diversity similar to that in Uganda, which ranges through tropical, subtropical and temperate crops, giving Malawi great agricultural potential in a number of crops. (2)

   (ii) Land Availability
   Malawi, which is completely land locked, has a total land area of 9.4 million hectares, of which 5.3 million hectares (56%) is said to be cultivable. (3) As Pike (1968) has observed, by African standards, Malawi soils are regarded as fertile although their nutrient status shows wide differences. (4) According to a survey carried out in 1968/69, only 1.4 million hectares of the potentially cultivable area (representing 26% of the cultivable land) were under permanent cultivation at the time. (5) This indicates that at Independence the country had great scope for increasing agricultural output through hectarage expansion. However, with the Malawian population
growing at about 3% per year, between 1966 and 1977, pressure on cultivable land has been mounting, reducing the scope of hectarage expansion as an option for increasing agricultural output. This is shown in table 2.1.

Table 2.1 Population Density, 1966 and 1977  
(Persons per square Kilometre)

<table>
<thead>
<tr>
<th>Region</th>
<th>1966</th>
<th>1977</th>
<th>% Rise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern</td>
<td>18</td>
<td>24</td>
<td>33.3</td>
</tr>
<tr>
<td>Central</td>
<td>41</td>
<td>60</td>
<td>46.3</td>
</tr>
<tr>
<td>Southern</td>
<td>65</td>
<td>87</td>
<td>33.8</td>
</tr>
<tr>
<td>All Malawi</td>
<td>43</td>
<td>59</td>
<td>37.2</td>
</tr>
</tbody>
</table>

Source: Population Census, 1977

In 1968/69, it was indicated that then, average holding size (on customary land) was 1.5 hectares, with an average of 4.6 persons per holding. Given the rapid population growth between the two census years, accompanied by the rapid expansion of the estate sector experienced during the same period, it is highly likely that most of the cultivable land has now been brought under permanent cultivation. This implies that either more and more of the less suitable land is being brought under cultivation, or that the growing population is making itself felt through reduced hectarages per household, or alternatively, through increased rural-urban migration, or a combination of any of these.

Estimates of the Ministry of Agriculture, Land Husbandry Section, based on the current land use pattern in the country (see table 2.2), indicate that by 1983, only in the Northern Region will there be some arable land still idle. The Central and Southern Regions are likely to have exhausted their potentially arable lands.
Table 2.2 Land Availability and Utilization.

( '000 hectares )

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern</td>
<td>2688.7</td>
<td>994.7</td>
<td>679.8</td>
<td>314.9</td>
</tr>
<tr>
<td>Central</td>
<td>3553.4</td>
<td>1314.6</td>
<td>1196.8</td>
<td>117.8</td>
</tr>
<tr>
<td>Southern</td>
<td>3170.4</td>
<td>1172.9</td>
<td>1130.8</td>
<td>42.1</td>
</tr>
<tr>
<td>All Malawi</td>
<td>9412.1</td>
<td>3481.8</td>
<td>3007.3</td>
<td>474.9</td>
</tr>
</tbody>
</table>

Source: Land Husbandry Branch, Ministry of Agriculture and Natural Resources.

The results of the National Sample Survey of Agriculture carried out in 1980/81, will have to be awaited before more information regarding the situation of sizes of holdings in the smallholder sector is made available. At the moment, there is growing speculation that in many parts of the Central and Southern Regions, the land frontier has either been reached or is being approached at a fast rate, and that the rapid expansion of the estate sector during the past decade has accelerated this process. This implies that there is now very limited scope in Malawi for increasing agricultural output through hectarage expansion, therefore calling for greater reliance on the use of productivity raising inputs.

It would be erroneous to treat the land factor as though it was uniform throughout the country. The diversity in topography referred to above, has affected the regional distribution of arable land, and so have temperature, climate and other related factors. These in turn have affected the farming systems of different regions, and therefore their land utilization patterns. At the same time, the regional disparity in land
utilization is not merely a product of geographical factors, it has political and historic factors as well.

(iii) Patterns of Land Use

Malawi can be divided roughly into three distinct zones each with its own climatic, temperature and soil fertility conditions, and therefore having different agricultural potentials. These are:

(a) The Plateaux Region – comprising the Shire Highlands and Central Region Plateaux (Lilongwe and Kasungu Plains, extending into Mzimba/Rumpfi Plains and Chitipa). These lie at an altitude of between 750 metres to 1400 metres above sea level. The region has a temperate climate, with mean annual temperature ranging between 18°C and 24°C. Mean annual rainfall is between 750 mm. and 1500 mm. This is the region of greatest peasant agricultural potential. Maize, finger millet and pulses are the main staples, while groundnuts and tobacco are the main cash crops. Wherever rainfall permits, tea, and other plantation crops are grown.

(b) The Highland Areas – of Vipya, Nyika, Misuku and Mafinga Highlands in the North; Shire Highlands (Zomba, Mulanje) in the South; and the Kirk Range and Dedza in the Central. Their altitude ranges from 1400 to 2750 metres above sea level. They have very good agricultural soils, and where the slopes are well watered, legumes, potatoes, wheat and maize are grown. Their warm climate (mean annual temperature just below 18°C and a mean annual rainfall ranging from 1300 to 4000 mm.), makes them the most suitable for temperate crops and European settlement and consequently it is the region where estate agriculture is concentrated (especially the Shire Highlands) as a result of its historic attraction to European settlers.

(c) The Shire Valley and Lake Malawi Littorals ranging in altitude from 40 to 750 metres above sea level. Rainfall is below 750 mm. (on average) per annum. Temperatures are high, averaging around 24°C. This is the region of least agricultural potential. Periodic variations in water levels in Lake Malawi and Shire River, add to water management problems.
However, successful implementation of water level control projects would allow for irrigation schemes as well as reduce the occurrence of devastating floods, thus enhancing the region's agricultural potential. Nevertheless, bulrush millet, cassava and rice are the main food crops in the region, while cotton is the main cash crop.

This diversity in agricultural potential indicates that there is no uniform solution to the country's agricultural development problem, as the development needs of each region are determined by different circumstances. There is therefore need for carefully tailoring of projects to the specific needs of each region. Indeed in some regions, agricultural development may not offer an immediate solution. However, these differences should not mask the fact that overall, Malawi's agricultural potential is quite substantial. With a mean annual rainfall of 1150 mm, ranging from 650 to 3900 mm, Malawi is luckier than most other sub-Saharan African countries, where long droughts are a perpetual hazard to crops and livestock. In fact, only about 5% of the country is said to have an average rainfall below 750 mm, which is considered to be the minimum required for dry farming in the type of climate, making most of Malawi cultivable for at least one type of crop or the other, giving the country great scope for diversifying her agricultural product mix, which could act as a cushion against the disaster that usually follows as a result of total dependence on one or two crops.\(^\text{(11)}\)

\((iv)\) Mineral Resources - Prospects for mineral resources are very limited in the country as known exploitable minerals are very limited, although exploration continues.\(^\text{(12)}\) Bauxite on Mulanje mountain may become extractable once, or if ever cheap power becomes available, and so could pyrites and pyrrhotic (sources of sulphur) near Lilongwe.\(^\text{(13)}\) Considerable deposits of low quality coal are also said to be available in the Northern region. With escalating fuel prices, these could prove to be a valuable source of energy for industry.
However, extraction of such deposits at present appears to be uneconomic. It is only natural building materials such as sources of cement (marble, limestone and aggregates) and brick clays which occur widely throughout the country. Overall, mining and quarrying activities are not very significant in Malawi. Malawi thus does not have the fortune of relying on mineral resources to finance her development programmes, as is the case with other developing countries, such as Zambia, Zaire, Nigeria and others, hence placing the onus of generating investible funds on the agricultural sector.

(v) Water Resources – As already pointed out, Malawi is a landlocked country. This means that her only water resources are in the form of inland lakes and rivers. The absence of a sea coast has naturally affected her transport network (to the outside world), making her rely entirely on overland transport.

Lake Malawi, covering an area of some 2.4 million hectares is the most prominent feature in the country. Three other lakes (Chiuta, Chirwa and Malombe) lie wholly or partly within the country's boundaries. A skeleton water transport system operates on Lake Malawi and the upper part of Shire River (Lake Malawi's outlet to the Indian Ocean, via the Zambezi River). However, the largest contribution of Malawi's water resources is by way of providing the many part time and full time fishermen and fish traders with a considerable means of livelihood. In 1978, recorded landings of fish were estimated at 67,500 metric tons (valued at K8.1 million), of these, 66,900 metric tons were estimated to have been consumed locally, with the remainder having been exported, at an estimated value of K398,000.

Malawi's greatest potential in terms of the water resources is hydro-electric power. The country's industrial power is mostly electrical. In 1978, about 70% of this electrical power was hydro, (14) with the bulk of it coming
from Nkula and Tedzani hydro-electrical power plants situated on the Shire River.

B. Human Resources.

1. Labour Force.

Any discussion of a country's agricultural potential is incomplete without an examination of labour availability in the country, especially when smallholder agriculture is the main subject under consideration.

With an average population density of 59 persons per square kilometre (mid-1977), Malawi is one of the most densely populated countries in East and Central Africa. This gives Malawi a large potential labour force. The World Bank (1981), estimated that in 1979, the total Malawian population was 5.8 million, 49% of which was eligible to work (being within the 15-64 years age category). This implies that in 1979, the Malawian labour force was around 2.84 million. The Bank further estimated that the Malawian labour force would grow at the rate of 3.3% per annum, between the years 1980 and 2000. Accepting these estimates, which seem reasonable, given that the Malawian population is growing at the rate of 3% per year, while 50% of the population is in the 10-54 years age group (1977 census), the Bank's estimate that by the end of the century, the Malawian labour force will stand at about 5.62 million, sounds reasonable.

Between 1971 and 1977, total paid employment in Malawi is estimated to have risen from 172,000 to 275,600, that is at an annual rate of about 9%. This represents a very fast rate of growth for any developing country. If, for the sake of argument, that rate is assumed to continue to the year 2000, then paid employment could reach 2.1 million at the close of the century. This could leave an estimated 3.52 million eligible workers outside the formal labour market. However, a closer look at the structure of employment in the country presents even a more gloomier picture than this.
Table 2.3 gives the structural pattern of paid employment for the years 1968, 1972, 1976 and 1980. The table indicates that total paid employment grew by 9\% between 1968 and 1972, by 8.6\% between 1972 and 1976 and by 5.4\% between 1976 and 1980. The table also indicates that the agricultural sector is by far the largest employer of paid employment. During the period under review, the agricultural sector has increased its share of paid employment from 33\% in 1968 to about 51\% in 1980. This rapid growth of employment in the agricultural sector, has not been necessarily uniform during the whole period, as represented by the growth rates of 9.6\%, 13.0\% and 5.7\% between the periods 1968-72, 1972-76 and 1976-80, respectively.

Table 2.3  
Average number of Paid Employees by Industry  

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</tr>
</thead>
<tbody>
<tr>
<td>1. All Industries</td>
<td>134.5</td>
<td>189.6</td>
<td>264.1</td>
<td>359.7</td>
<td>9.0</td>
<td>8.6</td>
<td>5.4</td>
</tr>
<tr>
<td>2. Agriculture, etc.</td>
<td>44.1</td>
<td>63.7</td>
<td>103.9</td>
<td>182.7</td>
<td>9.6</td>
<td>13.0</td>
<td>5.7</td>
</tr>
<tr>
<td>3. Manufacturing</td>
<td>17.2</td>
<td>23.2</td>
<td>36.0</td>
<td>39.1</td>
<td>7.8</td>
<td>11.6</td>
<td>6.0</td>
</tr>
<tr>
<td>4. Construction</td>
<td>15.5</td>
<td>18.2</td>
<td>21.1</td>
<td>37.9</td>
<td>4.1</td>
<td>3.8</td>
<td>16.8</td>
</tr>
<tr>
<td>5. Wholesale etc.</td>
<td>9.4</td>
<td>15.9</td>
<td>20.7</td>
<td>19.5</td>
<td>14.0</td>
<td>6.8</td>
<td>-7.9</td>
</tr>
<tr>
<td>6. Transport etc.</td>
<td>8.1</td>
<td>9.8</td>
<td>13.0</td>
<td>16.5</td>
<td>4.9</td>
<td>7.3</td>
<td>-0.4</td>
</tr>
<tr>
<td>7. Community social and personal services</td>
<td>37.4</td>
<td>54.2</td>
<td>61.9</td>
<td>49.2</td>
<td>9.7</td>
<td>3.4</td>
<td>2.6</td>
</tr>
<tr>
<td>8. Others</td>
<td>2.5</td>
<td>4.5</td>
<td>7.5</td>
<td>14.8</td>
<td>15.8</td>
<td>13.6</td>
<td>17.6</td>
</tr>
</tbody>
</table>

Source: Kydd and Christiansen (1982), *op. cit.* p. 20
Two aspects are discernible from the above data. The first is that, although paid employment in the Transport and Manufacturing sectors has a pattern of growth similar to that in total employment, during the period under review, by and large, it is growth of employment in the agricultural sector, which has dictated the pattern of paid employment in the whole economy. The second aspect is that the trend of growth seems to be tailing off.

The rapid growth of wage employment in the agricultural sector, seems to have been a direct result of the fast expansion of the estate sector (more especially tobacco estates). The 1970s saw rapid expansion of the estate sector in the form of enlarging existing estates and opening up of new ones (especially by Malawian entrepreneurs). With the assistance of a low minimum wages policy, deliberately formulated to boost rural wage employment and curb rural-urban migration, most of these estates used labour intensive production techniques, with the consequence that paid employment rose in this sector during the period.

But, as hinted above, by the late 1970 and early 1980s, the land barrier appears to have been hit in many areas, thereby reducing the scope for raising agricultural output through hectareage expansion. This means that most of the estates have had to turn to relatively less labour intensive production techniques, in order to raise land productivity (such as greater use of mechanisation and other more sophisticated techniques of production). At the same time, the liberal credit policy which was used in order to encourage indigenous participation in estate production of tobacco has led into a number of insolvencies forcing a number of estates into closing down or going into receiverships, thereby shedding labour. The result of these developments has been a reduced labour absorptive capacity of the agricultural sector (as far as wage employment is concerned). It therefore appears that, unless some fundamental structural change occurs in the economy soon, an increasing proportion of the rapidly growing labour force will find themselves outside the formal labour market. This means that, only smallholder agricultural development (at least in the short run), holds the hope for their livelihood and welfare.
However, the low productivity in the smallholder sector, coupled with the growing pressure on the land, limit the opportunities people can get on the land. This points to two possible courses of action:

(a) To improve productivity per hectare, via increased use of modern inputs, wide application of modern methods of agriculture and / or more intensive cultivation (eg. irrigation) to counter the declining fertility trend due to land pressure,

(b) Rapid creation of off farm income earning opportunities to reduce over dependence on agriculture.

Both options will be considered in the concluding chapters.

2. A BRIEF ECONOMIC AND POLITICAL HISTORY OF MALAWI

This section will attempt to briefly chart the main political and economic events in Malawi that helped to shape the current development strategy. For purposes of clarity the historical analysis will be divided into three chronological periods, viz:

(i) Colonial Period (1891-1953)
(ii) Federal Period (1953-1964)
(iii) Post-Independence Period (1964 to date)

A. The Colonial Period

The story of British administration in Malawi, began in the second half of the 19th Century, when David Livingstone, a Scottish Missionary and explorer, driven by the desire to make an open path for commerce and christianity into the interior of Africa, and so end slave trade in the region, persuaded both the British Government and Christian bodies in England and Scotland to back his expeditions into Central Africa. It was mainly his second expedition (1858-64) which subsequently led to the settlement of Europeans in Malawi. The story of how events developed in the region, leading to the firm establishment of British rule in Malawi, is well documented elsewhere. Here we shall only concern ourselves with how colonial agricultural policy evolved.
The main objective of Livingstone's expeditions was to facilitate European settlement in the area, which would in turn allow the inhabitants to apply themselves to industrial pursuits and to cultivation of their lands. In this way they would produce raw materials to be exported to England in return for British manufactures. It was hoped that by encouraging the natives to occupy themselves in the development of the resources of the country, a considerable advance might be made towards the eradication of slave trade. (25)

I Introduction of Settler Agriculture in Malawi

As mentioned earlier, Livingstone's wish was that the inhabitants were to engage in industrial pursuits and agricultural production. This view was shared by most of the missionaries who followed his footsteps into Central Africa. (26) However, those people who were entrusted with consolidating British rule in the country viewed the situation differently. Instead they pursued a policy of encouraging European settlers and companies to take up agricultural production, with the natives playing the role of labourers. One argument put forward to justify such a move was that among the first Europeans to arrive in the country were a number who were primarily interested in the export of produce purchased from the Africans, but once the character of the indigenous subsistence economy became known, it was immediately realised that such a course of action was impossible and many Europeans turned to producing crops themselves. (27) However, there is no evidence to substantiate this claim. To the contrary, there is ample evidence to indicate that well before European settlement in Malawi, the "Karavi", were surplus agricultural producers, who supplied not only the Portuguese settlements on the coast but also other African groups. (28) Such evidence suggests that either the nature of the African system was misunderstood by the early administrators, or they had other pressing reasons for encouraging settler agriculture.

An examination of the available evidence suggests that both aspects were in play. In the first place, Johnston, the architect of British administration in Malawi, is quoted to have said that the African farming system was conducted on a heedless
system ruinous to the future interests of the country. (29) This was in reference to the slash and burn method of shifting cultivation. No attempt was made to establish the rationality of the system in the prevailing circumstances. Just because the African's farming methods were different from those used by his European counterpart, it was assumed that the African was a bad agriculturalist. Yet many recent studies have established the rationality of shifting cultivation and other aspects of traditional agriculture. (30)

The most important reason for promoting settler agriculture instead of peasant agriculture appears to have been Johnston's desire to attract European settlers in the country. Krishnamurthy (1972), points out that although Johnston believed that the future of the country belonged to the African, he nevertheless, underestimated the capacity of the African to make any contribution to the development of the protectorate in the immediate future. His opinion was that the country would be developed by Europeans without whom, he thought, Central Africa would be of no value. (31)

As Williams (1978), points out, to achieve this objective, the administration had to provide conditions that would enable the settlers in the Protectorate to achieve a degree of commercial success sufficient to allow them to maintain a satisfactory standard of living comparable to that enjoyed by settlers in Rhodesia, Kenya, etc. (32) In turn the settlers were expected to provide the basis of a monetized economy on which the administration would depend for most of its revenue. It was in the pursuit of this objective that the development of settler agriculture took priority, much to the neglect of peasant agriculture, as will be indicated subsequently.

11. Tools Used in Consolidating Settler Agriculture.

Coffee was the first estate crop to be introduced in Malawi (introduced in the 1880's), and it enjoyed considerable success. In 1885 there were 16 hectares (40 acres) under this crop and by 1896 it was covering an area of well over 4050 hectares (10,000 acres), rising to about 7,000 hectares (17,000 acres) by 1900. During this year, proceeds from coffee exports (which comprised about 80% of total exports) amounted to
£62,000. However, after 1900, a combination of droughts and pests, plus stiff competition from Brazilian coffee, saw the decline of the coffee industry in Malawi, from which it has never recovered. (33) However, the main point is that encouraged by these early successes of the coffee industry, the administration was committed to attracting more European settlers into the Shire Highlands. Once these new entrants opened up estates, it was soon discovered, as Williams (1978), points out, that if these settlers had to succeed they needed:-(34)

(i) A steady supply of cheap labour.
(ii) Abundant cheap land.
(iii) Adequate communications (particularly transport).

Thus, one of the main tasks of the administration during the early years of colonial rule in Malawi was to respond to these demands. The following tools were used to this effect: -

(i) Taxes.
(ii) Labour certificates.
(iii) Restrictions on recruitment for work outside the country.
(iv) Denial of opportunities to Africans to grow certain cash crops.
(v) Forced labour and alienation of land.

(a) Taxation - was the first tool used by the administration to help the settlers with their labour problems. During the early years of his administration (1890s), Johnston introduced a hut tax of 3 shillings per annum (which was equivalent to the average monthly wage rate in the Protectorate). Although this was intended as a source of revenue for the administration, it was soon put to other uses. (35) Initially the tax was payable either in cash or in kind, but later in order to force people to work on the estates, only cash was accepted.
(b) **Labour Certificates** - Later, not only had taxes to be paid, but a labour certificate had to be produced, duly signed by an employer, stipulating that the holder had worked for a specific period of time. The tax rate was also raised to 8 shillings per annum in 1912, but a tax rebate of 4 shillings was given on production of a labour certificate—thus encouraging people to pay taxes out of wage labour. At the same time the settlers were allowed to pay taxes for their employees in return for 30 days labour. (36)

(c) **Restrictions on Migration** - Due to the presence of other cash earning opportunities, such as crop production, working as porters for the transporters, migration, etc., the imposition of tax alone did not prove effective in making labour available on the estates. (37) The settler farmers persuaded the Government to close these gaps. Their first request was for a ban on recruitment of labour from Malawi for work outside the protectorate. Secondly they urged the Government that a railway line be built to ease the transportation problem and therefore release labour from road-porterage. (38) Missionaries in the country backed these requests on humanitarian grounds. The result was that in 1908 a railway line from Blantyre to Chiromo was opened and later extended to Nsanje. And in 1909, the Government introduced measures to restrict labour migration. (39)

(d) **Forced Labour and Alienation of Land** - In addition to the above measures the Government encouraged a quasi-feudal tenancy system, whereby the settler farmers were empowered to exact payment from the Africans residing on their estates. This was termed **Thangata**. (40)

The system of **Thangata**, was made possible by settler control of land. When Johnston embarked on the task of building the Protectorate's economy, he was soon faced with the problem of land disputes. Most of the settlers had acquired large tracts of land (mostly for speculative purposes),
through dubious negotiations with the traditional leaders, to which they claimed ownership, much to the surprise and indignation of the indigenous population, to whom individual ownership of land was unthinkable. Thus naturally land disputes between the settlers and the indigenous people arose.

Johnston had to act to resolve this conflict. However, he was already committed to encouraging European enterprise, and he strongly believed in the Western notion that individual ownership of land was a paramount condition for land development. Thus in his arbitration, he merely consolidated the position of the settlers by issuing them with certificates of claim over the lands they claimed. The amount of land involved in these claims was enormous. For example, it is said that in 1903, the British Central Africa Company claimed about 149,000 hectares (367,000 acres), but cultivated only about 2,000 hectares (5,000 acres).(41) During this time, the African population was growing fast as a result of the cessation of tribal hostilities, cessation of the slave trade, and an influx of migrants from Mozambique. The result was that there was pressure on the land and consequently many people found themselves residing on European estates as tenants.(42) Thus the system of Thangata developed. Of this system, the Grant Commission of 1915 reported:

"The tenants system was that natives living on the land were compelled to work for a month in the wet season for rent and another month also in the wet season for hut tax, that is two months of work."

It must be pointed out that given the short wet season in Malawi, ie 3 months on average, and the fact that the "ticket" month of 30 working days, rather than the calender month was employed, these tenants hardly had any time to tend to their own farms. Consequently, this had disastrous effects on peasant agriculture.

Thus it can be seen that through these policies and practices a large number of Africans were condemned to work for the European settlers, for very little pay and often very bad conditions. Since both European and African agriculture were rain-fed and heavily dependent on labour, it meant that their peak labour demands (planting, weeding and harvesting) usually coincided.
The settler farmers, with the help of the above measures, got the labour, while the African farmers, because of the severity of the punitive measures taken in cases of non-conformity with the above mentioned policies and practices, had their fields inadequately attended to. The economic implication was that these policies and practices led to the creation of a peasant labouring class, greatly dependent on estates for its livelihood. Not only was African cash crop production inhibited, but even their subsistence output was at stake. In addition, the strained relations on the estates contributed to the inefficiency of European production, which coupled with an inefficient transport system, made Malawi's produce less competitive on the world market.

III The Effects of Colonial Policies on the Development of Smallholder Agriculture

(a) Obstacles to smallholder production

As already pointed out above, the devices used in promoting European agriculture, undoubtedly had a negative impact on the development of peasant agriculture in Malawi. In the first place, they reflected the lack of commitment on the part of the Government to develop this sector. For example, the policy of land alienation, initiated by Johnston, had, in addition to those evils associated with Thangata, other inhibiting aspects on peasant agriculture. For one thing, Johnston omitted any special provision for African participation in the development effort, except that he pledged that he was prepared to encourage those Africans that were willing to buy or lease land on an individual basis. But this was more of a token gesture than anything else. This is illustrated by the fact that a few years later (in 1910, when Alfred Sharpe was Governor), 47 Africans are said to have applied for land but the Government rejected their applications. In fact, the few Africans who were lucky enough to get Crown land under this provision, were only allowed 0.80 hectare (2 acres) or less, for growing cotton. This contrasts sharply with the situation in Uganda, where peasant production was considered to be the backbone of the economy. There, peasants were allowed an average of 3.2 hectares (about 8 acres), of which 1.2 hectares were devoted to cotton growing,
while plantains and subsidiary crops took up 1.2 and 0.5 hectares, respectively.\(^{(48)}\) Besides, those Africans who did venture into opening up agricultural estates, were not given the same privileges as their white counterparts. For example, they were denied the chance to benefit from the device of "labour certificates".\(^{(49)}\)

In the second place, the policy of allocating land to settlers, had the effect of unbalancing the peasant farming system. Johnston had designated, virtually all the land not in private (European) hands as Crown Land, from which new allocations could be made to intending settlers. The only safeguard against total dispossession of the Africans was that land which was currently being used by the Africans could not be alienated. But during this time the mode of peasant cultivation was that of shifting cultivation. Thus, even if the people had secure tenure over the land they were currently using, once the soil was 'exhausted' they had nowhere to shift to, the consequence was declining peasant productivity.\(^{(50)}\)

However, it is only fair to mention that despite the administration's negative attitude towards smallholder agricultural development, a few attempts were made to encourage small scale production of cash crops, especially cotton and fire-cured tobacco, when the failure of the settlers to produce these crops efficiently became apparent. For example, in 1904, Alfred Sharpe, Johnston's successor, offered tax rebates to Africans growing cotton, as an encouragement to grow the crop.\(^{(51)}\) By far the biggest boost came from Manning, Sharpe's successor, when in 1912, he initiated the Crown Land Ordinance. For all practical purposes, this Ordinance was aimed at halting land alienation, by restricting the granting of freehold titles to European settlers.\(^{(52)}\) In addition, he committed the British Cotton Growing Association to a policy of promoting cotton growing as an African peasant industry.

However, progress in this direction was impeded by a number of factors, such as:

(i) Land shortage.

(ii) Lack of funds for cash crop production.

(iii) Unfavourable marketing and price policies.

(iv) Inadequate transport services.
At the outbreak of the 1st World War, it is estimated that about 15% of the arable land in the country was under settler control. This included most of the land in the Shire Highlands. (53) Thus most of the Africans who grew cash crops, did so as tenants on estate lands. Most of the estate owners were hostile to this development, mostly due to the effect it had on their labour demands. Naturally, they put many obstacles in the way of the African cash croppers, such as outright bans on cash crop production on estate land, requiring the peasants to work on the estates during peak labour demands, etc. In addition, most of those African growers had no source of inputs. Hence, some of the estate owners took advantage of this situation by providing the Africans with inputs, such as tobacco seeds (or seedlings), watering cans, etc. In return, these "landlords" reserved the right to purchase the crops from the tenants, at very low prices, and auctioning the crops themselves, together with their own produce. Also, lack of adequate marketing facilities within commutable distances, forced these African cash croppers to sell their crops to the estate owners.

(b) Some Progress Within the Smallholder Sector.

Ironically, evidence indicates that smallholder production of cash crops (especially cotton and fire-cured tobacco) did begin to flourish, at a time when European production of the same began to decline, despite the above mentioned obstacles. For example, at the outbreak of the 1st World War, it is estimated that 10-15% of total exports (comprising mostly of tobacco and cotton) were produced by smallholders. (54) After the war, smallholder production of both crops continued to rise. It is estimated that between 1922 and 1932, smallholder production of cotton rose 7 fold in absolute terms, bringing the share of smallholder output from 14% to almost 100%. Tobacco production also went up, especially in Lilongwe, where in 1926, there were about 13,000 registered African growers. It was only during the depression of the 1930s that there was a decline in smallholder production, and this decline was much slower than that experienced in the European sector. (55) This appears to have been noticed by the colonial administration and other observers.
During the inter-war period, people had began to realise that the future of the protectorate's agricultural industry lay with peasant production. For example, the Secretary of the British Cotton Growing Association is quoted to have remarked that the introduction of white planters into tropical countries like Nyasaland, brought difficulties and complications which did not arise when the industry was solely in the hands of natives. And the Hammond Report of 1924, called for opening up of opportunities for cash crop production. As such, after the 2nd World War, although support for European agriculture continued, there was a marked move on the part of the Government towards a policy of encouraging peasant cultivation of those export crops which did not compete for resources with European agriculture, such as cotton, tobacco and groundnuts - for by this time, European agriculture was mostly concentrated in tea production in the Shire Highlands.

(C) The Revolutionary Approach to Peasant Agricultural Development.

The underlying philosophy in this move to develop peasant agriculture was that the African was a bad agriculturalist. What was needed was to revolutionize his supposedly irrational agricultural system. Emphasis was therefore placed on good husbandry practices, such as soil and fertility conservation (to counter the declining fertility brought about by the sudden change from a shifting to a more permanent system of cultivation), crop rotation, better spacing of crops, timely cultivation, etc. And, as Kettlewell (1965) pointed out, the official policy was one of concentrating on the most progressive individuals. The policy was rooted in the belief that the foundation of a prosperous agricultural industry would eventually depend upon the individual "Yeoman" farmer with a secure heritable title over sufficient land to enable him enjoy an improved level of living, thereby, neglecting the bulk of the peasant population.

(d) Labour Migration.

By far, the most serious threat to smallholder agricultural production appears to have come from labour shortage. The main consequence of the colonial policy of supporting settler agriculture, was the emergence of a peasant labouring class, who given very limited opportunities in cash crop production, was
forced either to seek work on the settler estates, often at very low wages and unpleasant conditions, or to migrate and seek their fortunes in the mines of South Africa, Zambia or on settler farms in Zimbabwe. The available evidence tends to indicate that the majority of people preferred to take the latter alternative. The effect of labour demands by the settlers on smallholder agriculture, have been considered above. It remains now to consider those of outward migration. The process of outward migration from rural Malawi, of unskilled and semi-skilled labour which started at the beginning of the 20th Century, continued throughout the whole colonial period, well into the post-Independence era. This was despite various attempts to curb it at the beginning of the century. The effects of this process have been analysed from a number of stand points. Some analysts for example, have looked at it from the humanitarian point of view, which focuses on migrants' conditions at the places of employment. Others have taken a Marxist stand looking at the process of proletarianization of the migrants, also in the place of work. The only study which focuses on the adverse effects of the process on the Malawian society emphasizes the social consequences. Data limitations and imperfections have so far prevented any useful examinations of the effects of this outward migration on peasant agricultural production. However, there is reason to speculate that labour migration dealt a severe blow to peasant agricultural development prospects. The exodus of able bodied males was appalling.

During the post-war years, the annual average level of migration was about 35,000 persons, which rose to a yearly average of about 65,000 in the 1950s. The upward trend only ceased in the mid 1970s due to official policy. Table 2.4 gives the magnitude of the proportion of the labour force which was outside the country at various times.
Table 2.4 Malawians Abroad as Percentage of Estimated de-facto Population of Malawi - 1902-1972.

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1903</td>
<td>1.1</td>
</tr>
<tr>
<td>1911</td>
<td>2.5</td>
</tr>
<tr>
<td>1924</td>
<td>2.5</td>
</tr>
<tr>
<td>1938</td>
<td>6.8</td>
</tr>
<tr>
<td>1948</td>
<td>5.6</td>
</tr>
<tr>
<td>1958</td>
<td>6.2</td>
</tr>
<tr>
<td>1972</td>
<td>10.3</td>
</tr>
</tbody>
</table>


Given the labour intensive nature of peasant agriculture (especially shifting agriculture which depended on a lot on the initial clearing of the bushes by the male-folk), it cannot be doubted that the absence of such a substantial proportion of the labour force from the rural areas, did have a negative impact on rural output. Although it is arguable that given the limited opportunities for productive work in the rural areas, at the time, earnings from migration did provide a positive contribution to household income. Consequently, this may have helped to raise peasant agricultural productivity (by providing funds for agricultural inputs), evidence to support this view is not available. The evidence which one comes across is that most of the migrants spent their money on consumer durables such as radios, bicycles, blankets, clothes and the like, either in the countries of employment or immediately upon return to Malawi - most of them only to migrate again after a short spell at home. The few who invested their money usually went into the retail trade (opening groceries, canteens etc.) in local areas. Hardly any invested in agriculture.

Several reasons may be advanced for the failure of peasant agriculture to attract migrant remittances. Firstly, the peasants were prevented from growing those crops in which the European settlers had a stake, thereby limiting their agricultural opportunities. Secondly, marketing of peasant crops was controlled
by the Government. Prices were therefore deliberately depressed, either for purposes of extracting a surplus for the administration and/or in line with the policy of forcing the peasants onto wage labour on the European estates.\(^{(61)}\) This acted as a disincentive to many would-be cash-crop producers. Thirdly, most of the migrants were male. The dependents left behind (women and children) were more concerned with meeting basic subsistence food requirements in their agricultural operations, while using migrant remittances to meet their other requirements such as school fees, etc. Besides, the absence of the male member from the household meant that the women folk, faced with domestic chores and sometimes involved in forced labour on the estates (to pay the tax for their huts in the absence of their male spouses), could not find adequate labour to engage in surplus agriculture production.\(^{(62)}\)

(e) Summary.

Thus, in summary, it can be said that colonial agricultural policy in Malawi (as was the case in Kenya also up to the late 1950s),\(^{(63)}\) was basically one of encouraging European farmers by giving them access to the best lands (eg. the Shire Highlands) facilitating them with a steady supply of cheap labour, providing them with the best veterinary and agricultural services and protecting them from competition from African farmers. The attempts at revolutionizing peasant agriculture, which were taken after the fallibility of European agriculture was exposed during the depression, did not work. This was largely because the administration failed to realize that the advancement of African agriculture was not constrained by the behavioural characteristics of the Africans, which it sought to revolutionize, but as Chanock pointed out, by the restrictions which the colonial structure had placed on the peasant population, such as restrictions on cash crop production, unfavourable agricultural prices and inadequate marketing facilities mentioned above.\(^{(64)}\) The coercive methods used to enforce the new agricultural methods (which were actually caused by the sudden imposition of permanent cultivation by the land alienation policies) proved more harmful than helpful to peasant production.
The only option open to most people to improve their lot was to migrate. By the 1930s, the Government began to positively encourage outward migration. As Vail (1977) points out, it was decided that in lieu of agricultural produce, the country would export human beings. For example, the official restrictions on labour recruitment in Malawi for work outside, imposed in 1909, were lifted in 1934, when a Rhodesian firm was allowed to recruit in Malawi. As Tapela (1979) puts it, a quasi-Government machinery was established to channel the emigration in a way that would enhance the protectorate's revenue. For example, WNLA (Witwatersrand Native Labour Association), the recruiting agent for the South African mines of Witwatersrand made an agreement with the Government that they would pay, en bloc for each recruit, a capitation fee of 10 shillings (later raised to 15 shillings), and an annual tax of 6 shillings. In addition, 2/3 of the migrants earnings were deferred and sent to Malawi. These proved to be a valuable source of foreign exchange for the country, and in addition, such monies boosted local retail trade. Furthermore, the Protectorate's products of cotton goods, entered South Africa free of charge.

As a result, the country eventually came to be looked upon by its neighbours as a labour reserve. This meant that there were very few activities in terms of industrial development taking place in the country that would have stimulated agricultural production, and therefore induced the use of productivity raising investments in agriculture (to counter the loss of labour and declining soil fertility). It is therefore not surprising to find claims that colonialism created rural poverty in the country, by destroying self-sufficiency in peasant production through its policies of forcing the peasants onto the labour market, and inducing outward migration. It was in this state of affairs, that Malawi was reluctantly dragged into the now defunct Federation of Rhodesia and Nyasaland in 1953.

I. Introduction.

In this section the main argument is that the Federation had a disruptive effect on whatever little progress had been achieved during the colonial period in the field of peasant agriculture. This was due to two main things:

(i) The coercive approach used by the Federal regime to improve African agriculture.

(ii) The bias in federal agricultural policies towards European agriculture.

The Federation of Rhodesia and Nyasaland (comprising of present day Malawi, Zambia and Zimbabwe), was established in 1953. Although most of the underlying factors behind the move were political, it was largely economic arguments which were orchestrated by its proponents.

These issues will not be taken up here, suffice it to say that most of the arguments were superficial and were merely accepted at their face value at the time. It was only after the Federation was established that some serious analyses of the arguments became available and exposed the weaknesses inherent in many of them. For example, the traditional common market argument, seems to have carried more weight at the time. But as Hazelwood has pointed out, the creation of a wider market does not necessitate political unity. After all, all the countries concerned belonged to the Congo Basin Free trade area. And, such bodies as the EEC, EFTA, ECOWAS, etc, which are primarily free trade areas, have been in operation for a considerable period, while the participating countries have maintained their political autonomy. It appears that the existence of good will and commitment on the part of the participants is all that is required to make the arrangement work. More important, it is widely recognised that, although a free trade area, or a common market (or any similar arrangement), may be advantageous, to a whole region's industrial development, it does not imply that all the participants will necessarily benefit equally from the arrangement. In actual fact, some of the participants can become worse off at least in a relative, if not in an absolute sense within.
the Union than outside it, due to such aspects as trade diver-
sion, etc. unless special and appropriate compensatory mecha
nisms are provided. But, as Hazelwood (1967) pointed out, 
the Federal development strategy was biased towards Zimbabwe. 
This was because territorial distribution of Federal funds was 
based on the pattern of territorial distribution of the white 
population in the Federation. Zimbabwe, had in 1954, a 
white population of about 158,000 (some 3% of its total 
population). In contrast, Zambia and Malawi, each with a total 
population of about 2½ million, had white populations of 53,000 
and 5,000, which represented 2% and 0.2% of their respective 
populations. As such, Zimbabwe got the lion's share of federal 
funds.


The entrance of Malawi into the federation did not improve 
matters for the peasant population in Malawi. If anything, the 
situation seems to have deteriorated.

For Malawian agriculture, the federal period was character­
ised by a number of aspects, viz:–

(i) The move to modernize peasant agriculture.

(ii) Bias of agricultural research and extension towards 
settler agriculture.

(iii) Continuation of outward labour migration.

(a) Attempts to modernize peasant agriculture.

In the previous section, the attempts made by the colonial 
administration to improve African agriculture were considered, 
and how these backfired, leading to a subsequent deterioration 
on peasant agricultural production. During the Federal period, 
the need to improve peasant agriculture was also realised. The 
basic Federal agricultural policy was to increase crop produc-
tion by use of good farming practices. This was to be achieved 
through more effective instruction and supervision of peasant 
cultivation – rather than by specific schemes – as was the 
previous case. Two main approaches were taken in this direction, 
namely, land reform and stepping up of extension efforts.

Land reform - Worried about declining soil fertility, due to 
extensive soil erosion (the result of rising population pressure
on the land), the Federal Government initiated a land reform programme (which featured in the 1957-61 Plan). This reform took largely the form of land consolidation. The idea was to introduce sound land use methods at the village, or preferably larger unit, that is, land use was to be reorganised by providing grazing, forest and arable areas in the most appropriate environment. Arable land had to be planned and conserved, and each individual within the planning unit would be allocated a holding of approximately the same hectarage as the total of the previous holding(s). It was anticipated that security of tenure would be granted on such holdings (as was the case in Kenya under the Swynnerton Plan). Assistance was also to be provided to consolidated land holders. By 1960, a number of villages were established under this scheme. In addition to the land consolidation scheme, a land resettlement scheme was initiated, whereby the Government acquired land from unused or underdeveloped estate land and re-allocated it to rent paying Africans on estates and to African Urban workers who could not afford to live in urban areas.

Both schemes met with very little success. For one thing, they involved a very small proportion of the peasant population. Secondly, the resources available for the programme (barely 10% of the planned expenditure) were not adequate to produce any significant impact.

The main thrust of this development effort was on the highly selective Master Farmers scheme. Farmers were chosen on the basis of their willingness to adopt innovations and given incentives of various types (including cash) to consolidate their land into a unit of not less than 3.2 hectares (8 acres), to conserve soil, rotate crops and adopt high standards of management. But as the table below indicates, the scheme only covered a very tiny proportion of the smallholding community, and suffered the same fate as that suffered by the two schemes mentioned above.
<table>
<thead>
<tr>
<th>Year</th>
<th>Number of farmers</th>
<th>Hectarage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1954</td>
<td>53</td>
<td>202</td>
</tr>
<tr>
<td>1955</td>
<td>129</td>
<td>851</td>
</tr>
<tr>
<td>1956</td>
<td>180</td>
<td>1219</td>
</tr>
<tr>
<td>1957</td>
<td>282</td>
<td>1410</td>
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<tr>
<td>1958</td>
<td>407</td>
<td>1910</td>
</tr>
<tr>
<td>1959</td>
<td>459</td>
<td>2023</td>
</tr>
<tr>
<td>1960</td>
<td>745</td>
<td>2546</td>
</tr>
</tbody>
</table>


Extension Services - In an attempt to foster good agricultural practices among the African farmers, three research projects were included in the 1957-61 Plan. These were for the purposes of investigating cash crop disease (eg. the Lower Shire River Farm Institute investigated cotton diseases). In addition, steps were taken to strengthen the extension services, by opening up agricultural schools (eg Colby School of Agriculture in Lilongwe) to train Africans for the agricultural and veterinary branches of the civil service.

However, these worthy efforts were undermined by the coercive approach taken by the Agricultural Department to spread modern methods of agriculture. By concentrating efforts at changing the social institutions (land tenure) and enforcing new agricultural practices, rather than initiating gradual changes within the existing system, the Federal Government's attention, like that of its predecessor, missed the real economic issues that hampered African agriculture and therefore tended to introduce elements that made the situation worse. For example, in the face of the labour shortage in the peasant sector, already mentioned above, the new labour intensive practices made no economic sense. It is seen that apart from bunding, considerable routine effort was directed towards encouraging well made planting ridges, box ridging, stream bank protection, gully control and the protection of roads, garden paths and boundaries.

Although those measures may have brought long term advantages,
in the short run, they caused a lot of hardships to many families, leaving them very little time to perform vital farming processes (such as weeding) and to attend to household chores. The imposition of fines, prison sentences and other penalties for non-observance of these regulations destroyed any good intentions the extension staff might have had. The result was widespread peasant defiance to any agricultural regulations despite whatever merits these had. This could only lead to decline in agricultural output in the peasant sector.

It must be mentioned that the over-emphasis on physical means of soil conservation, were much to the neglect of other alternatives, such as biological methods like crop rotation, use of compost and other manures, and so on. From an economic point of view, it appears that the costs associated with the labour demands arising from the strategy were far in excess of economic returns realised on the small farm, especially in the short run-period. The misunderstanding or neglect of farm labour requirements and economics of smallholder agriculture coupled with the harshness with which it was enforced, meant that the revolutionary policy was seen, at a time of great political awareness, as a manifestation of the oppressiveness of the Federal regime. It was therefore greatly resented and opposed, despite any long term advantages it may have brought to the small farm community. Coulson (1981) observes similar peasant dislike for colonial agricultural policies, during a contemporary period, in Tanzania, where he records that some peasants went as far as planting cassava upside down as a passive resistance against the compulsory planting of cassava as an anti-famine measure. (78)

(b) Bias Toward Settler Agriculture.

Within the Federal arrangement, in Zambia and Zimbabwe, non-African agriculture was under Federal jurisdiction, while African agriculture, and all types of agriculture in Malawi, were under territorial jurisdiction. This meant the non-African farmers in Zambia and Zimbabwe were serviced by the resource rich Federal Government, and therefore, enjoyed more privileges than their counterparts in Malawi. (79)
Although development of agriculture was given plenty of "lip service" at the time, the available evidence suggests that the situation was different in practice. For example, in the 1957-61 Development Plan, the agricultural sector was allocated a mere 1% of the budgeted expenditure. To make matters worse for the African farmer, the bulk of the funds allocated to agriculture went into provision of research services for improving production of crops grown exclusively by the European settlers, such as tea, coffee, tung, etc. Very little research attention was given to African cash crops (except cotton mentioned above). Up to the mid-sixties, use of fertilizer or improved seeds, was almost absent on the African farm. The result was that there was a wide gap between the technologies used in European agriculture and African agriculture, with the likely consequence that productivity (both land and labour) fell in the latter sector.

(c) Labour Migration.

As already indicated above, at the time when the Federation was being established, labour migration from Malawi was already substantial. During the Federation migration tended to increase. This was largely for two reasons. The first is that membership of Malawi in the Federation tended to depress the development of domestic industry as most of the industrial investments took place in Zimbabwe. This meant that there were limited employment opportunities at home, for the growing labour force. Secondly, the coercive approach to African agricultural development adopted by the Federal Government left the African population with very little incentives to take agricultural production seriously. The result was that for the able bodied males, their best chance was to migrate. As Hazlewood (1967) pointed out, during the Federation there were as many Malawian wage workers abroad as there were working within the country - with about 75% of those migrants working in Zimbabwe, where they were exempt from the restrictions on employment of migrant labour in the territory.

It therefore appears that due to the poor economic prospects at home, both in industry and agriculture, Malawian labour had no option but to migrate - thus the country came to be continually regarded as a labour reserve by her Federal partners, as Humphrey
(1973) has remarked. And this state of affairs did not improve the prospects of improving African agriculture.

C. POST-INDEPENDENCE DEVELOPMENT STRATEGY

At Independence (1964), as Humphrey (1973), has pointed out, the new Government of Malawi was faced with a legacy from the colonial Government, that was largely characterised by its neglect of economic development, the economy being predominantly based on low productivity agriculture. The foremost task of the new Government was therefore to embark on a programme of rapidly increasing agricultural productivity in order to:

(a) improve the welfare of the people, and
(b) to generate investible funds for overall economic development.

However, the main question was how to achieve this dual objective with a reasonable degree of balance.

1. The Dual Approach to Agricultural Development.

As has already been indicated in the previous sections, Malawi's agricultural industry was characterised by an export oriented estate sector (European owned) heavily dependent on cheap labour for its survival; and a basically subsistence oriented and largely neglected smallholder sector.

Thus at Independence, it was recognised that continuation of development on the basis of the structure inherited would, as Chanock (1977) put it, have led to the expropriation of the African peasantry by settler or company estates and the creation of landless rural class forced by circumstances into colonial towns etc. For this reason, some of the politicians advocated a populist approach to agricultural development, whereby the major concern was to improve the performance of the average farmer (as opposed to the Master Farmers scheme advocated earlier). This approach was reflected in the 1962-65 Development Plan, which although it was drawn during the Federal period, it embodied most of the elements contained in the Malawi Congress Party Manifesto of 1961. This plan, among other things, emphasized the need to stimulate production within agriculture and industry, with the requirement to provide income to the masses, and so reduce in-
equalities in the distribution of income, wealth and economic power. In other words, the plan advocated total commitment to a rural development strategy based on mass participation, with a major expansion of the cooperative movement as a key element. However, evidence indicates that during the early years of Independence, there was hesitation about following this path, which as Chanock (1977), remarked, was regarded as a line of development by which no society had yet succeeded in enriching itself. As such the strategy was never implemented as stated. This hesitation is apparent in the lack of a distinct commitment to a particular development path between 1964 and 1970.

Because of the predominant position of the agricultural sector in the economy, it was inevitable that if any growth was to take place in the economy, the impetus had to be provided by this sector. The immediate reaction was therefore to emphasize export production. Because of neglect and disarray suffered by the smallholder sector prior to Independence, the decision to boost export production, in effect, meant propping up the estate sector so that it could continue with its traditional role of export production. Within the smallholder sector, the main concern was to gain the confidence of the peasant population, regarding the intentions of the agricultural department. This confidence had been badly damaged by the coercive and punitive measures employed by the Federal and colonial regimes in an attempt to inculcate modern farming practices in the peasantry. The tendency was therefore to let this sector develop by itself aided by the provision of extension advice to those willing to accept it and improving the marketing and delivery systems.

The philosophy behind this approach was that, contrary to the previous strategy of coercing peasants to adopt better farming practices, they had to be taught by education and persuasion.

Under this approach, the Government's role, as far as smallholder agricultural development was concerned, was largely confined to the provision of an environment conducive to smallholder agricultural production (through provision of infrastructure and other facilities) and to let the spirit of individual self-determination play its role. It was envisaged that adoption of new husbandry methods would be rewarded by higher farm outputs
while non-adoption would show itself through poor results. The demonstration effect provided by the adopting farmers would eventually work itself through the whole economy and improve agricultural productivity.

It is very important to recognise the fact that direct Government intervention on smallholder agricultural production in the form of regulations etc, during the Federal and Colonial eras, had produced a traumatic effect on the peasants. This had been used by the politicians to gain massive rural support. Thus after Independence, any development strategy that would have meant the Government taking a strong interventionist role, such as the Villagisation Scheme introduced in Tanzania soon after Independence, or the establishment of state farms in Nkrumah's Ghana, was likely to arouse new suspicions among the rural people, and therefore may have proved counter productive, as seems to have been the case with the two examples quoted above.\(^{(93)}\) This meant that the Government had to take a low profile (at least in the initial period), in the field of smallholder agricultural development, with the extension services (which was trying to acquire a new image), taking the "take it" or "leave it" approach. This fact appears to have been ignored by earlier, analysts (eg. Humphrey, 1973, Thomas, 1975), in their analysis of the reasons why Malawi opted for a smallholder agricultural development strategy that placed emphasis on individual betterment as opposed to say a co-operative or collective approach.\(^{(94)}\)

Thus while the need to improve the lot of the rural masses, in a situation where agricultural production provided the only means to earn a livelihood for the majority of the people, dictated the use of a populist approach to agricultural development the need to generate investible savings cautioned against a wholesale transformation of the economy from its predominantly export oriented estate sector to a predominantly peasant one.

A balance was therefore arrived at by following a dual approach, whereby the estate sector would spearhead the country's economic development, through export expansion, while the smallholder sector would ensure the country's self-sufficiency in basic foodstuffs. While it is recognised that a proper understanding of how the Malawian agricultural strategy has performed
over the years, requires an analysis of both the estate and smallholder subsectors, this study, with its emphasis on rural development, concentrates mostly on the smallholder sector. It is hoped that this will in no way dilute the importance of the findings emerging from the study, especially as they relate to rural development through smallholder agriculture.


From what has been stated above, it can be said that agricultural development in Malawi is viewed in terms of providing investible finances for overall economic development (through export expansion) and raising the general level of living of the rural masses by increasing rural output of both food and cash crops. This imposes a "double bind" on agriculture, which has resulted in the dual approach mentioned above which is said to emphasize the achievement of a sustained rise in productivity per unit of land, and to provide a growth climate for both smallholder and estate production.

In the field of smallholder agricultural development, three main approaches to improving smallholder productivity have been tried. Two of them were attempted simultaneously as a "twin strategy", between mid 1960s and mid 1970s, viz:–

(i) The Integrated Programme Approach, and
(ii) the more General Approach.

Since mid 1970s, the "twin strategy" has been replaced by

(iii) National Rural Development Programme (NRDP).

(a) The Integrated Rural Development Package (IRDP).

Its main objective was to provide focal growth points in the form of high productivity projects, such as land development, and irrigation projects and settlement schemes. The approach was mostly capital and management intensive, and largely externally financed, aimed at raising marketable produce (both food and non food), among the smallholding community in selected high potential agricultural areas where integrated rural development projects were established. The major features of these projects were: (95)
(i) Provision of infrastructure (roads, markets, water and health facilities, etc).
(ii) Provision of land improvement and conservation measures,
(iii) Irrigation development
(iv) Improved extension and other facilities
(v) Provision of credit facilities.

Four projects were established under this approach, i.e:
(1) The Lilongwe Land Development Programme (LLDP).
(2) The Shire Valley Agricultural Development Project (SVADP).
(3) The Karonga-Chitipa Rural Development Project (KRDP), and
(4) The Lakeshore Rural Development Project (LRDP).

In addition, several settlement schemes were established to supplement the large scale projects, but dealing with specific crops, e.g;
(1) The Kasungu Flue-cured Tobacco Authority.
(2) The Smallholder Tea Authority.
(3) The Smallholder Sugar Authority.
(4) The Smallholder Coffee Authority.

The major Projects formed the main thrust of this approach. Between them they were meant to cater for about 20% of the Malawian smallholder population (at full development). By 1973/74 they were accounting for about 57% of the funds committed to agriculture, as table 2 indicates.

Table 2.6 Government Agricultural Expenditure.

<table>
<thead>
<tr>
<th></th>
<th>K millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Agricultural Development</td>
<td>0.51</td>
</tr>
<tr>
<td>Large projects</td>
<td>Nil</td>
</tr>
</tbody>
</table>


(b) The More General Approach.

This approach was applied in those areas not covered by the major Projects or Crop Authorities and Settlement Schemes. It
relied on gradual improvements in extension, land husbandry and farm training, supported by minor rural development projects to improve smallholder productivity, such as ox-training (for draft power), dairy and poultry improvements and tea development, plus agro-support facilities and marketing. (97)

(c) The National Rural Development Programme (NRDP)

Results tend to indicate that the "twin strategy" represented by the two approaches outlined above, did not prove particularly successful in raising smallholder output. For example, little growth seems to have taken place in smallholder output since the late 1960s. The little evidence available, coming from the major projects, tends to suggest that the approach of concentrating resources on a limited number of people and geographical places is neither cost effective nor egalitarian. The more general approach also proved ineffective in dealing with the whole rural population (outside projects) and degenerated into a spotty and selective programme that was limited to a few progressive elements in the rural society. (98)

By 1976, it was recognised that the strategy could not be relied upon to have a significant impact on the productivity of the majority of the Malawian smallholding community. Out of this realization was born the concept of the National Rural Development Programme (NRDP). (99)

The idea behind NRDP is to stimulate rural development in a manner that will produce balanced development between rural and urban areas, while also generating growth in all geographical areas throughout the country. It is stated that the programme intends to achieve as rapid an increase as possible in local production along existing cropping lines, by utilization of minimal inputs. At the same time, the programme aims at a gradual transformation of the farming system from its traditional pattern to one with a larger proportion of the farmer's resources being devoted to production of cash crops. The emphasis of this programme is on producing a fairly immediate impact on smallholder production, i.e., improving production efficiency on small farms through provision of inputs and better services to smallholders. As such the development period for each of NRDP projects is said to be 5 years (after
which each project is expected to become self-financing) as opposed to the earlier projects under IRDP, that had, on average 10-11 years of development. The whole programme is supposed to cover the whole of rural Malawi within a 20 year period.

The development process is said to be in two phases. The first phase involves an intensive campaign by the extension services, both on an individual and group basis. During this phase, farmers are advised to follow recommended practices of cultivation. At the same time, an attempt is to be made to encourage the farmers to form local clubs (at village level) and action committees through which they are supposed to concert their response to information reaching them from the extension and other development agents. The main idea here being to promote a spirit of togetherness and self-help among the rural population and involve them in the decision making process concerning local affairs.

The next phase involves the provision of credit facilities for necessary inputs to interested farmers (provided they belong to recognised farmers’ clubs). From this point, subsequent efforts will be taken to help the adopting farmers to become predominantly cash croppers.

NRDP is said to mark a significant shift in rural development philosophy in Malawi. The previous strategy laid emphasis on the use of improved seeds and other output raising inputs. Credit was used as the main weapon (both within and outside the projects) for encouraging the use of husbandry practices recommended by the extension personnel. However, as pointed out above, the strategy did not produce broadly based improvements in smallholder productivity; which is the prime objective of rural development strategy. If this objective is to be attained under NRDP, then it must be ensured that those elements which prevented its attainment in the previous strategy do not recur in the present one.

I II. Smallholder Productivity Since Independence.

Analyses of the economic performance of Malawi since Independence indicate that the economy did extremely well in terms of overall growth (Humphrey, 1973; Thomas, 1975; Ghai and
Radwan, 1980; and Acharya, 1981). The main source of this growth is said to be rapid expansion of crop production for export especially in the estate sector. However, all these studies (except Acharya) have expressed concern over the pattern of income distribution which has resulted from the growth. Thomas (1975) and Ghai and Radwan (1980), have noted the poor performance of the smallholder sector, resulting mainly from the policy bias in favour of large scale agriculture and progressive elements ("Achikumbi" - a recent equivalent of Master Farmers) among the rural community. A more recent study (Kydd and Christiansen, 1982), has expressed pessimism over the future performance of the smallholder sector under the current agricultural development strategy which is essentially biased towards the estate sector, especially in its allocation of land and financial resources.

From these studies, it is apparent that the dual strategy of agricultural development, which necessitated the encouragement of both estate and smallholder development has not been successful in achieving a balanced course in that estate development, has been viewed more favourably. This is supported by Ghai and Radwan's observation that the estate sector doubled its share of total agricultural output and increased its share of monetary output from just over 25% to 37% over 1964-78. However, the above studies (apart from that by Ghai and Radwan) do not give an indication of what the results of the smallholder agricultural development strategy have been within the smallholding community. No attempt has been made to evaluate the constraints to higher productivity faced by the smallholders. While the previous studies provide valuable information on the imbalance between the estate and smallholder sectors, there is need for more information about the state of affairs in the smallholder sector, to enable formulation of more appropriate smallholder agricultural development strategy. This study therefore, intends to provide a step towards filling that gap, by examining adoption behaviour in the Lilongwe Land Development Programme, and how the programme has affected rural welfare.
Notes - Chapter II


2. Most of the information on the topography of Malawi is taken from Agnew, S. and Stubbs, M. (1972), Malawi in Maps, University of London Press.


6. See, Malawi, 1977 Preliminary Census Report, National Statistical Office, Zomba. The intra-census period rate of population growth is given officially as 2.9% per annum however, this includes an element of internal migration, therefore the natural rate of growth (which is net of internal migration) of 2.6% per annum, is sometimes quoted in official reports as the appropriate rate of growth for this period.


10. After Independence, this region (especially the Lilongwe and Kasungu Plains) has experienced a rapid expansion of estate agriculture, as the country has tried to expand the production of tobacco.

11. It must be mentioned that Malawi's traditional export crops, tea, tobacco, cotton and, to a certain extent, groundnuts, have served the country well in terms of foreign exchange earnings. However, there is growing concern that the country has not done all that it could have done in order to diversify into new crops and new rural activities. The emergence of sugar cane as one of the major crops, over the past decade, is a welcome development, and it holds some potential for smallholder participation.
12. There is growing speculation that deposits of oil may be present under Lake Malawi.


16. Comparable figures on population density (mid 1979) for other East and Central African countries are as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of persons per sq. Kilometre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zambia</td>
<td>7.4</td>
</tr>
<tr>
<td>Tanzania</td>
<td>19.0</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>18.2</td>
</tr>
<tr>
<td>Kenya</td>
<td>26.2</td>
</tr>
<tr>
<td>Mozambique</td>
<td>13.1</td>
</tr>
</tbody>
</table>

NB. Calculated from World Bank (1981 a), op. cit., Table 1, p. 143.

17. See, World Bank (1981 b), op. cit., Table 19.

18. Ibid.


21. Adopted from Kydd and Christiansen (1982), op. cit., Table 8, p. 368.

22. See, Ghai and Radwan, op. cit.


26. Alexander Hetherwick (a Scottish Missionary who began work at Blantyre), expressed the view that the hope of British Central Africa was in the cultivation of its own soil by the hands of its own children, in a letter to the Editor of the Scotsman, 17th, February, 1903.
27. See, Pike (1968), op.cit., p.173


Johnston's comments on African agriculture seem to be rather inconsistent. From another source, he is quoted to have stated that the Natives of Nyasaland were a peaceful and industrious people, excellent agriculturists and great smiths. See, Tapela, H.M. (1979), "Labour Migration in Southern Africa and the Origins of Underdevelopment in Nyasaland 1891-1913," in Journal of Southern African Affairs, Vol. IV, No. 1, pp.67-80.

30. Boserup, for example, has clearly indicated the economic rationality of the slash and burn system of shifting cultivation, in a land surplus situation, which prevailed in Malawi at the time. See, Boserup, E. (1965), The Conditions of Agricultural Growth, Allen and Unwin, London.


32. See, Williams (1978), op.cit., p.57

33. See, Pike (1968), op.cit., 177.

34. See, Williams (1978), op.cit., p.59.

35 See, Palmer, R.H. (1972), "Johnston and Jameson: A Comparative Study in the Imposition of Colonial Rule", in Pachai (1972), op.cit., see also, Williams (1978), op.cit., pp.73-4. To illustrate the point that taxation was deliberately used to persuade Africans to work on the estates, Tapela quotes: "in order to make the result more certain, the cost of the Native's living is to be increased by taxation, so that they will be compelled to work for the white man in order to earn sufficient money to pay taxes. It may be added that in British Nyasaland this system has already been adopted."

See, Tapela (1979), op.cit., p.67, quoted from Native Labour Commission, British East Africa (Kenya), 1912.

37. See, Tapela (1979), op. cit., p.69.

38. Vail (1977), argues that contrary to the belief that railway development would be beneficial to the protectorate's economy, it actually hampered the country's progress mostly due to the large debt it brought about, and also the priority given to the interests of the railway, vis-a-vis all other considerations. See, Vail (1977), op. cit., pp. 365-395; and also Vail (1975), "The Making of an Imperial Slum: Nyasaland and its Railways, 1895-1935", in Journal of African History, Vol. 16, pp.89-112.

39. This was done through the Employment of Natives Ordinance of 1909; see, Krishnamurthy (1972), op cit., p.397, and Williams (1976), op cit., p.76.

40. "Thangata", was a quasi-feudal arrangement under which peasants had to supply labour to the estate owner in exchange for use of a plot of land. See, Kydd and Christiansen (1982) op. cit. p. 5. For a more elaborate account of the mechanisms of "Thangata" in colonial Malawi, see Kandawire, J.A.K. (1979), Thangata: Forced Labour or Reciprical Assistance?, Research and Publications Committee, University of Malawi, Hetherwick Press, Blantyre.

41. See, Rotberg (1966), op. cit. p.34.

42. For example, Williams (1977:66), mentions that on the 65,000 hectares of the Bruce Estates, there were about 350 tenants in 1895, about 15,000 in 1920 and over 30,000 by the end of the second World War. A figure of 173,000 Africans (about 49,000 families) living on estates as tenants in 1946, is quoted by Pike (1968), op. cit. p.188, quoted from the Report of the Nyasaland Land Commission (The Abrahams Report), Government Printer, Zomba, 1946, pp.15-17.


44. Failure to conform to the labour requirements of the "land lord", or to pay tax to the Government, usually resulted in the peasants' huts being burnt and/or their crops being destroyed by the tax collectors. In extreme cases wives and children were held as hostages. See, Palmer (1972), op. cit., p.306; also Rotberg (1966), op. cit., p.45.

45. For example, Vail points out that during the 1930s, it cost 97 pence per lb. to transport Malawian tobacco by rail from Limbe to Beira, while it cost 17 pence per lb. to transport Rhodesian tobacco by rail over a similar distance. See, Vail (1977), op. cit. p.387. Similarly, the tea industry suffered the same problems. Vail (ibid.)
reports that at one time, it was cheaper to transport tea by road from Limbe to Mocuba (in Mozambique) than by rail to Quelimane, making a saving of 14 shillings and 6 pence per ton. The Portuguese had promised further freight reductions that would bring the savings to 42 shillings and 11 pence per ton, but the railways urged the Government to close the border to prevent further competition.

46. See Krishnamurthy (1972), _op. cit._, p. 385.

47. In most cases, the income from such hectarage was just sufficient for meeting tax obligations.

48. See Krishnamurthy (1972) _op. cit._, P 390.

49. Oral evidence from field work.

50. In actual fact, the problem of soil erosion and other associated aspects, which are the consequences of rising land pressure, were partly the result of the land alienation, that is, the peasants were using cultivation practices which were suitable in a shifting cultivation context, when actually permanent cultivation was imposed on them by land scarcity.

51. See Krishnamurthy (1972), _op. cit._, P 390.

52. See Rotberg (1966), _op. cit._, P 32.

53. See Williams (1978), _op. cit._, P 85.

54. Ibid, P 85. Williams attributes most of this boost in peasant production, despite the many impediments, to the availability of cheap consumer goods, mostly from Japan, which acted as an incentive to higher peasant production. Ibid. P 89.

55. Krishnamurthy (1972), _op. cit._, P 386.

56. The Hammond Report was the result of a commission of enquiry set up to investigate how to initiate development in the Protectorate following the disturbances of the 1915 Native Uprising, and the effects of the 1st World War.


59. This is the line of argument adopted by Oberai, A. and Singh, M. (1982), in their analysis of the effects of migration on the rural economy. See, Oberai, A. and Singh, H. K. Manmohan (1982), "Migration, Production and Technology in Agriculture: a Case Study in the Indian Punjab", in the International Labour Review, Vol. 121, PP.327-343. However, their analysis refers largely to rural urban migration within the same country, whereby some linkage effects exist between the two sectors. But where the outward migration is to another country, as is mainly the case in consideration, there is a leakage which breaks or weakens this linkage effect, thereby preventing the positive effects of migration from having full effect in the rural areas. See, Chapter VI for a more developed discussion of this issue.

60. Personal observation.

61. For example, following the depression of the 1930s, the administration deliberately depressed tobacco prices (one of the crops in which African participation was tolerated) each year, to provide funds for price support should need arise. Such acted as an inhibiting factor to peasant tobacco expansion. See, Chanock (1977), op. cit., P.406.

62. This is supported by the evidence provided by Kettlewell (1965), op. cit., P.239, when he cites estimates that in the late 1950s, some 20 - 25% of the adult male population was engaged in wage employment outside the protectorate, and that in some districts, it was as much as 60%.


64. See, Chanock (1977), op. cit., P.406.


67. Ibid. P.75

68. See, Chanock (1977), op. cit., P.398.


72. Ibid., PP. 195-8 and 213-4.


75. These village schemes were established in the Southern and Central regions, largely as experimental exercises in the diffusion of new farming practices. See Kettlewell (1965), op. cit. P. 244.

76. Ibid., P. 254.

77. Ibid., P. 275.


80. See, Nyasaland. Capital Development Plan, 1957/61, op. cit. Appendix A, P. 18. Only £126,000 of the £12,817,000 estimated expenditure was allocated to agriculture.

81. See, Chanock (1977), op. cit., P. 403.

82. During the Federation, there was an increasing tendency to employ Europeans at all supervisory and managerial levels, both in the civil service and in industry, thus relegating the Africans mostly to labouring and other petty jobs.

83. See Hazlewood (1967) op. cit., PP 221 - 222. This applied only to those in paid employment.

85. Ibid, P 71
86. See, Chanock (1977), *op. cit.* P 407
87. Thomas (1975), attributes this populistic approach to Development to Dunduzu Chisiza, who is considered to be one of the main architects of the 1962-65 Development Plan, see, Thomas (1975), "Economic Development in Malawi Since Independence", in *Journal of Southern African Studies*, Vol. 2, No. 1, (PP 30 - 51), pp 34 and 37.
89. Thomas, *op. cit.*, P 35.
For a different view of the reasons for the discontinuation of the populistic approach and the adoption, instead of the individual approach, see Humphrey, (1973), *op. cit.*, P 72, also Chanock, *op. cit.*, P 407.
91. The Malawi Finance Minister in 1965 is quoted to have said that the Malawi Government would give every facility and encouragement to the production of agricultural commodities by large estates with commercial capital. See, Chanock, *op. cit.*, P 405.
92. See Pike (1968), P 159.
94. Both Humphrey and Thomas are of the opinion that the individualistic approach was adopted because of the strong respect for the virtues of private enterprise and individual achievement by the Political leadership, see Humphrey (1973) *op. cit.*, P 33.
96. Ibid, PP 31-36.
98. This view is shared by both Thomas (1975: 38-39) and Kliest (1980: 37-38).

100. Ibid, P 47.


chapter III

malawi's rural development strategy

1. the concept of rural development

a. the case for rural development

Rural development as a specific strategy of development has found general acceptance in the developing world. This seems to be for two main reasons:-

(a) The apparent failure of the industrialisation or "modernization" strategy to spread the benefits of development to the majority of the population in the developing countries. (1)

(b) The need to raise resources for overall development (especially industrial development) in these countries where the rural sector predominates in the economy. (2)

It has been claimed that the pursuit of the "industrialization" strategy in the developing countries over the past two decades or so (1950-1970), has been characterised by: (3)

(a) A slow rate of transfer of people out of low productivity agriculture and related activities into more rewarding activities.

(b) A vast majority of people in the rural areas experiencing poverty.

(c) Existence of underutilized resources in rural areas which could be used to improve rural welfare.

Because of the observation that a vast majority of the poor people in the developing world (especially Asia and Africa) live in rural areas, there has been an increasing demand for an approach to development planning in the third world which emphasizes the improvement of the standard of living of rural people. Thus rural development has become a strategy designed to improve the economic and social life of a specific group of people, "the rural poor". (4) Its aims are said to be, among other things:- (5)
(a) To create the long term economic social and political viability of rural communities whose existence is based on a principle of self reliance.

(b) To expand opportunities for productive work in rural areas, ie. diversification of the rural economy.

(c) Continued up grading and improvement of the natural environment of rural communities.

(d) Providing for the satisfaction of locally determined needs.

(e) Achieving balanced rural-urban development.

It has been suggested that since rural development is intended to reduce poverty, it must be clearly designed to increase production and increase productivity. Because agriculture is the predominant activity among rural populations, in most developing countries, agricultural development has become a "sine qua non" of rural development, although such aspects as health, education, improved nutrition, etc., are recognised as being not only necessary for improving physical well being and quality of life of rural people, but also as indirectly enhancing the productivity of rural people and improving their ability to contribute to the national economy.

From the above, it could be said that the concept of rural development attempts to integrate growth and welfare economics concepts for the purposes of the development of the third world whose development problems and circumstances are viewed to be different from those which the present day developed countries faced at the time they were embarking on the development path.

B. Critique of the Rural Development Strategy.

The strategy of rural development is not without criticism. Although its exponents (the World Bank in particular) have stressed the above reasons for its pursuit, the critics have not entirely accepted all of them as genuine.
(a) **External Intervention.**

Heyer et al (1981), for example, argue that rural development tends to imply "planned change by public agencies based outside the rural areas", who represent development of the rural sector as an impossibility without their intervention. They also allege that rural development agencies tend to regard themselves as developing or emancipating the rural poor whom they accuse of being obstacles to their own development, or unable to grasp the benefits of development until exposed to persuasion that it is indeed in their interest. Due to this interventionist tendency, it is argued that the idea that rural people can in fact initiate rural development is not considered, nor are the efforts of the rural poor to do so always welcomed. Such conceptions, according to the critics, are not justifiable as they in fact contradict historical evidence, and are only used to mask the real motive behind the need for this external intervention. According to this group of critics, the intervention is necessary to fulfill the need for governments and international companies, etc, to control the conditions under which peasants sell and produce their crops, in an attempt to replace peasant production by capitalist production.

(b) **Incompatibility Between Means and Objectives.**

It is argued that, with some exceptions, it has always been observed that the strategy of rural development does not achieve its objectives. This failure to achieve objectives has been largely attributed to incompatibility, first between the objectives themselves, and secondly between the objectives and the means used to promote rural development.

(c) **Assumption that Improved Peasant Production for the Market will Improve Peasant Welfare.**

It is further argued that in the rural development strategy is implied the assumption that increasing peasant production for the market will:

(i) Improve the welfare of the rural people.
(ii) Increase their contribution to the national economy (supposedly restricted by isolation), and hence aid the task of national development.
The critics point out that such an assumption implies that poverty is the consequence of isolation, which is not valid.\(^{(14)}\) They cite evidence of persistent or increasing rural poverty in some circumstances despite substantial increases in productivity and production for the market.\(^{(15)}\) It is therefore argued that in fact, enhancing the contribution of the rural poor to the national economy becomes the means by which rural development is to be achieved, i.e.:

"Thus those involved in rural development are concerned to increase agricultural production to supply urban and international markets. They are concerned to earn foreign exchange and to extract revenue to finance public and private consumption and investments. This is not necessarily compatible with the interests of rural producers."\(^{(16)}\)

According to this line of argument, there is a form of collusion between national Governments and international agencies who finance rural development, against the rural poor. As such, the rural poor may not necessarily be the beneficiaries of rural development.\(^{(17)}\) In other words, rural development becomes a means through which peasants are made to finance industrial development to serve the needs of the domestic elite as well as those of the capitalist world.

(d) **Other Criticisms.**

Other people view the rural development drive as a deliberate attempt by the "Western" or "industrialized" world to pre-occupy the developing nations with agricultural production in order to fend off competition for their manufactured products.\(^{(18)}\)

By far the most serious criticism of rural development (in this author's view), is the implied assumption that once an area has been designated as a rural development area, and a rural development project put under way, then all the inhabitants of that particular area will benefit from the rural development effort.\(^{(19)}\) But as Stewart (1975), rightly points out, the "net discounted rates of return", which are meant to measure the benefits of the development effort to the whole community, ignore the fact that the costs and benefits do not necessarily refer to the same people. Poor peasants are not usually among the beneficiaries.\(^{(20)}\) This is the theme picked up by this study in analysing rural development in Malawi.
Despite these strong criticisms of the rural development strategy, this study takes the view that a rural development strategy, if properly planned, implemented and monitored, can go a long way towards meeting the development needs of the rural poor. A review of the rural development literature indicates that while the basic objective of the strategy is to promote increased agricultural productivity among the rural poor, what has happened is that resources (such as modern inputs, farm credit, etc.), have been channeled towards the relatively better off, leaving the poor unaffected, or in some cases, worse off. To say that because the rural development strategy has not always benefitted the rural poor as anticipated, then it must be a bad strategy and should be abandoned, is certainly an overaction akin to throwing away the dirty water together with the baby. What is needed is to ask the question similar to the one posed by Lele (1975), ie., if the aim of promoting peasant agricultural productivity is to alleviate rural poverty, then how can the development effort be extended to the low income subsistence population.

It is today generally agreed that for agricultural development to stimulate overall development, it must be broadly-based. This means that it should not be used to ensure only that agriculture fulfills its traditional functions in the development process (provision of food and raw materials for industrial expansion, provision of labour and capital to industry and provision of a market for industrial goods), although these functions are still important. In addition, agriculture should provide a vehicle through which the majority of the rural population can participate in the development process. Kotter (1974), has argued that the main problem of rural poverty is that the majority of the rural poor do not participate in the development process, whether passively as recipients of goods and services or actively as producers; in particular, they do not participate in the decision-making process. Chinn (1979), seems to echo Kotter's argument when he points out that a common diagnosis of rural poverty appears to be that agricultural productivity is low on the small farms—because of the limited access to inputs.
by these small farmers. The main reason for this is said to be that farm households find it impossible to generate sufficient surplus funds ever and above consumption needs to purchase productivity raising inputs. (26)

What emerges from the above analyses is that most of the rural development efforts fail to enlist the participation of the rural poor. Such a finding suggests that if the participation of the rural poor in the development efforts is to be enhanced, their purchasing power must be raised so as to facilitate their access to productive resources and essential services. This is the issue to which this study will address itself in analysing the rural development effort in LLDP.
2. Smallholder Agriculture and Rural Development in Malawi

A. The Rural Development Policy Outlined

At the attainment of Independence in 1964, or to be more exact, at the attainment of internal self-government in 1962, the foremost task of the Malawi Government was to launch a Development Plan (the 1962-65 Development Plan), which for all practical purposes, was committed to rapid agricultural development, with the aims of:

(a) improving rural welfare.

(b) generating investible funds for overall economic development. (27)

In the previous chapter, a brief outline of the strategies adopted to pursue these objectives, was presented. In this chapter, a detailed examination of the current smallholder agricultural development strategy (which forms the basis of Malawi's rural development strategy) will be attempted. Particular emphasis will be placed on examining the impact of the smallholder agricultural development strategy on the elimination of rural poverty. However, before doing this, it will be useful to examine the aims and objectives of both rural development and smallholder agricultural development in Malawi. For it is only after these two issues have been clearly understood (from the Malawian point of view) that a proper appreciation of the Malawian strategy of development can be made.

I. Aims and Objectives of Rural Development in Malawi.

In Malawi, like in most of the developing world, rural development occupies a prominent position in the national development plans. But, although every Development Plan for Malawi since the 1962-65 Plan, has stressed the priority of and need for rural development, it is only in 1979 that the aims and objectives of the country's rural development strategy were spelled out.
According to the *National Rural Development Programme: Policies, Strategy and General Features* (1978), rural development is said to be:

"...the primary social and economic objective of Government. Beyond the aim of raising agricultural productivity, it is also conceived as an effective vehicle for Government's objective of redistributing incomes in favour of the rural poor," (28)

Thus rural development is considered to have both growth and redistribution objectives. However, from the stated objectives of NRDP, which represents the current rural development strategy, this conceptualization does not appear to come through. The main objectives of NRDP, are said to be:

1. "To increase the general level of the Malawian smallholder production, in particular to increase the production of cash crops for export and to feed the growing urban population.
2. To provide inputs and services necessary to allow smallholder production increases, with particular emphasis on productivity per unit area.
3. To preserve natural resources." (29)

The striking feature about the objectives of NRDP is that, although it is stated that the redistribution of income in favour of "the rural poor" is part and parcel of the overall objective of rural development (which NRDP is meant to serve), it does not feature in the specific objectives of NRDP. At the same time, no definition of the rural poor is provided, nor is an outline of how NRDP intends to carry out the redistributive function given. This omission of the definition of the target group and the absence of a clearly defined strategy for achieving an egalitarian income distribution in the rural sector can be interpreted in two ways. In the first place, it can be interpreted to mean that overall low productivity in the rural areas is taken to be synonymous with rural poverty in the Malawian context, and that raising overall agricultural productivity is an aspect of primary concern while the distributional aspect occupies a subsidiary position. This view is supported by a number of official statements eg:
The vast majority of Malawi's population depends for its livelihood on peasant farming. Out of an economically active population of approximately 1.5 million, less than 150,000 are in paid employment in Malawi and about 250,000 are working in neighbouring countries. This leaves over one million workers and their dependents - whose only income is derived from small scale agriculture. It is in this sector that the national development effort is being, and must continue to be, concentrated.\(^{30}\)

In addition, it is stated that:

"A statement of more detailed objectives must therefore be concerned primarily with increasing agricultural productivity. " \(^{31}\)

These statements imply that in the situation under review, the whole smallholder sector was the target of the development effort, and that raising overall smallholder productivity was seen as the main way to combat rural poverty. Considering the state of affairs in the smallholder sector at the time the above statements were made (1971), there can be very little disagreement with this view. At the time, the whole smallholding community was an impoverished mass (as the historical review has suggested), and therefore the objective of raising overall smallholder productivity was foremost in the rural development strategy.

The World Bank (1975a) defines the "rural poor" as the group which

"includes small scale farmers, tenants and the landless". \(^{32}\)

In Malawi, it is seen that due to the abolition of Thangata in 1962, and the prevalence of the customary land tenure system (covering about 80% of arable land), there was hardly any landlessness in the rural sector during the early years after Independence. At the same time, there was no tenancy arrangement which could be said to have been causally linked with rural poverty. Thus it seems quite plausible to suggest that in Malawi, at the time, the "rural poor" were exclusively small scale farmers (even agricultural workers were heavily dependent on their family plots, for most of their livelihood). Hence the whole smallholding community, which up to the time was hardly undifferentiated (apart
from a few elements who were the remnants of the colonial Master Farmers' Scheme), was the target group of the rural development effort. This tallies with the populist approach to agricultural development emphasized in the 1962-67 Development Plan. (33)

Secondly, the above omissions could be interpreted, as implied by critics of the Malawian development strategy, as a clear manifestation of the lack of intention, on the part of the development planners to initiate broad based development. The country is alleged to have deliberately promoted an "elitist" approach to agricultural development, which emphasizes the provision of resources to a few selected individuals. (34) This view is advocated mostly with regard to the pattern of development that has emerged in the country.

However, this author is of the opinion that the situation warrants a more careful analysis. The fact that a particular pattern of development has emerged does not necessarily mean that it was willed right from the beginning. It could be due to a number of reasons. For example, initiating broad based development, among the then undifferentiated rural sector within a growth context may have been the genuine aim of the Government. However, studies of the "green revolution" have indicated that innovation adoption, by its very nature spreads differentially among the rural people. (35) This is largely due to the fact that, although the rural sector may seem to be economically undifferentiated, there are bound to be interhousehold differences in such aspects as say labour availability, soil fertility, proximity to commodity and input markets etc. These differences imply that some households will have an advantage in innovation adoption over others. And, if the programme which fosters the innovation adoption is not properly monitored or implemented, rural differentiation is likely to occur as it is alleged to have done in the situation under review. Thus the end result of a policy need not be due to the policy itself, it could be the result of implementation or monitoring failures. (36) In Chapter VI we shall attempt, with the help of a number of models, to indicate how interhousehold differences in labour availability could have affected the adoption
behaviour of various household categories, and hence their income and welfare positions.

B. NRDP and its Implications for Rural Poverty Elimination

I. NRDP and IRDP Compared.

Although it is stated in the policy statement that NRDP is less capital intensive than the IRDP which preceded it, in terms of total development costs, the available data does not bear this out. (37) As table 3.1 indicates, the costs per farm family, per year, for the four earlier (IRDP) projects − excluding LLDP Phase iv, range from K22 to K30 (1978 prices), assuming that all families within the project areas participate. The corresponding figures for NRDP − phase I projects fall within the range K17-59 (also 1978 prices), here again, assuming that everybody participates. However, in reality the participation rate in the IRDP projects was very far from 100%. The appraisal estimates of participating households ranged from 11.6% of households in KRDP to 38.5% in IRDP, giving annual development costs per participating family that ranged from K67 in SVADP to K219 in KRDP. (38)

Thus unless NRDP achieves a much higher participation rate (say in excess of 50% of households in the project area), the development costs per participating farm family may not be significantly lower than those for the IRDP projects− as is indicated in tables 3.1 and 3.2. This means that NRDP's success will very much depend on the extent to which it will embrace the farm population. This in turn, will depend on the system of input distribution and the type of agricultural activities being supported. The importance of these two aspects on the extent of farmer participation will be illustrated in chapter VI with the experience of LLDP.
Table 3.1 The Four Major Integrated Rural Development Projects

<table>
<thead>
<tr>
<th>Name</th>
<th>Total costs at Development (K.Mn.)</th>
<th>No. of Years</th>
<th>Estimated No. of Farm Families</th>
<th>Cost/Farm Family per Year</th>
<th>Estimated No. of Adopters</th>
<th>Estimated Cost per Adopter</th>
</tr>
</thead>
<tbody>
<tr>
<td>LLDP. (I-III)</td>
<td>23.3</td>
<td>10</td>
<td>103,600</td>
<td>22.2</td>
<td>31,000</td>
<td>74.1</td>
</tr>
<tr>
<td>SVADP</td>
<td>106.4</td>
<td>14</td>
<td>72,700</td>
<td>26.1</td>
<td>28,000</td>
<td>67.3</td>
</tr>
<tr>
<td>LRDP</td>
<td>22.9</td>
<td>14</td>
<td>54,645</td>
<td>30.0</td>
<td>21,000</td>
<td>77.9</td>
</tr>
<tr>
<td>KRDP</td>
<td>12.6</td>
<td>12</td>
<td>41,350</td>
<td>25.4</td>
<td>4,800</td>
<td>218.7</td>
</tr>
</tbody>
</table>


Table 3.2 NRDP Projects (Phase 1)

<table>
<thead>
<tr>
<th>Name</th>
<th>No. of Years</th>
<th>Estimated Total Cost at Development (K. Mm)</th>
<th>Estimated Cost/Farm Family per Year (K.)</th>
<th>Estimated costs per Adopting Family With 40% Adoption (K.)</th>
<th>Estimated costs per Adopting Family With 60% Adoption (K.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LLDP.-IV</td>
<td>5</td>
<td>8.4</td>
<td>104.4</td>
<td>260.0</td>
<td>175.5</td>
</tr>
<tr>
<td>Ntcheu</td>
<td>5</td>
<td>3.5</td>
<td>17.0</td>
<td>42.5</td>
<td>28.3</td>
</tr>
<tr>
<td>Thiwi-Lifidzi</td>
<td>5</td>
<td>2.9</td>
<td>17.0</td>
<td>43.1</td>
<td>28.8</td>
</tr>
<tr>
<td>Mzimba</td>
<td>5</td>
<td>2.9</td>
<td>37.3</td>
<td>93.3</td>
<td>62.2</td>
</tr>
<tr>
<td>Henga</td>
<td>5</td>
<td>3.2</td>
<td>59.0</td>
<td>147.6</td>
<td>98.4</td>
</tr>
<tr>
<td>Ntchisi</td>
<td>5</td>
<td>3.7</td>
<td>36.9</td>
<td>92.4</td>
<td>61.6</td>
</tr>
<tr>
<td>Phalombe</td>
<td>5</td>
<td>6.0</td>
<td>27.0</td>
<td>67.6</td>
<td>45.0</td>
</tr>
<tr>
<td>Mwanza</td>
<td>5</td>
<td>3.1</td>
<td>48.0</td>
<td>120.8</td>
<td>80.5</td>
</tr>
<tr>
<td>Kawinga</td>
<td>5</td>
<td>3.9</td>
<td>28.2</td>
<td>70.4</td>
<td>46.2</td>
</tr>
</tbody>
</table>

Source: NRDP, Working Papers No. 38, Table 3.
II. A Critical Review of Rural Development Strategy in Malawi.

NRDP is said to mark a significant shift in rural development philosophy in Malawi, as pointed out earlier. Up to 1976, the main emphasis was on the integrated projects approach, whose main aim was to stimulate rapid production increases of particular crops (eg cotton in SVADP, maize, groundnuts and tobacco in LLDP, and rice in KRDP), to meet the national objectives of food self-sufficiency and expansion of export production. Emphasis was laid on the use of improved seeds and other output raising inputs. Credit was used as the main weapon for enforcing recommended husbandry practices among the smallholding community in the project areas. Outside the project areas the extension services were relied upon to disseminate information on improved crop and animal husbandry practices.

However, due to insufficiency of extension personnel, and the emphasis on rapid productivity increases, there was a tendency for the extension services to be concentrated on the more progressive elements of the rural population the aim being to bring about a demonstration effect. However, as already indicated above, the available evidence tends to suggest that smallholder production during this period was rather disappointing both on a national and project basis. For example, between 1964 and 1978, smallholder production (at constant prices) is said to have grown at about 3.9% per annum, against a population growth rate of about 3%, thus giving a per capita growth rate in smallholder output of 1.0%.(39) This compares with an annual rate of growth of about 11.1% achieved in the estate sector, during the same period.(40) One important aspect is that the said growth in agricultural output (in both sectors) was more a result of hectarage expansion than rising labour and/or land productivities. This meant that as population continued to grow, more and more marginal land was being brought into cultivation - therefore resulting in declining productivities. This meant that there was limited scope for smallholder output growth being higher than population growth without a widespread adoption of innovations in the smallholder sector.
It was therefore necessary to broaden the base of smallholder development beyond that covered by the few projects and the selective general approach, to that envisaged by the scope of NRDP.

Although NRDP represents a new approach to smallholder agricultural development in Malawi, in terms of say, extent of geographical coverage and the intensity of activities, the overall agricultural strategy remains intact, that is, to increase the production of cash crops for export and meet growing urban food demand. This implies that smallholder agricultural development in Malawi is strongly linked to the industrialisation strategy, with the further implication that rural welfare aspects occupy a secondary position. This is reflected in other national policies that have a strong bearing on NRDP's success such as:

1. The export promotion policy - to boost foreign exchange earnings, and
2. Farm output pricing policy.

All these have wider implications on rural welfare. The success of NRDP to improve rural welfare will very much depend on how well reconciled these other policies are to those of NRDP.

C. The Impact of Other National Policies on NRDP.

1. Export Promotion Strategy: Its Implications on Smallholder Agricultural Development.

Table 3.4 indicate that between 1964 and 1977, Malawi's agricultural exports rose from K22.9 million to K178.6 million (at current market prices). However, it is seen that the smallholders' share of agricultural exports declined from 53.4% of total exports in 1964 to 34.3% in 1977, and there was a corresponding rise in the estate sector. This reflects, more than anything else, the rapid expansion of the estate sector. While it could be argued that at Independence the country had ample idle resources of both land and labour, and that the expansion of the estate sector had little or no effect on smallholder
agricultural production, now more than 10 years later, a stage might have been reached (or is about to be reached) whereby the two sectors compete for the same resources of land and labour, and to some extent, financial capital. For example, estate production of Burley and Flue-cured tobacco (under the visiting tenant system) has expanded considerably in the Central Region (including LLDP) and this is the traditional smallholder tobacco growing area. Such an expansion given the rising pressure on the land, is likely to have led to smallholder producers being pushed onto more marginal land, where productivity is low. At the same time the technological gap between the two sectors brought about by colonial policy of favouring settler farmers and the current emphasis on increasing productivity per unit of land, has meant that the estate sector has had a lion's share of the available resources thus perpetuating the gap in productivities between the two sectors. Unless the NRDP strategy does contain some elements of positive discrimination in resource allocation towards the smallholder sector, so as to redress the traditional technological bias, an export promotion strategy per se, which merely lets the two sectors operate side by side, may actually undermine the smallholder agricultural development strategy with the estate sector "crowding out" the smallholder sector from export production. (42)

It seems that the present bias in the field of export crop production in favour of the estate sector, apart from being a hangover from colonial legacy, has no economic justification, especially when we consider the type of crops involved. Tea, tobacco and sugar-cane, the main estate crops and leading exports of the country have all been seen to be produced successfully by smallholders in other countries. (43) Kenya, which shared the same colonial legacy as Malawi, has managed to restructure a good deal of the export crop production from the estate sector to the smallholder sector, and is today hailed as one of the success stories of smallholder agricultural development in Africa. (44) After all, evidence from Malawi,
indicates that Burley tobacco, one of the country's leading export crops, was a smallholder crop from 1948 to 1952.\(^{(45)}\)

This implies that smallholder expertise for its production already exists, but it is only hindered by lack of financial resources.

Table 3.3 **Agricultural Exports 1964 - 1977\(^{(a)}\)**

( K. Million, Current Market Prices )

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Smallholder</td>
<td>12.2</td>
<td>17.9</td>
<td>27.6</td>
<td>32.0</td>
<td>31.0</td>
<td>46.4</td>
<td>61.2</td>
</tr>
<tr>
<td>Estate</td>
<td>9.8</td>
<td>19.7</td>
<td>35.5</td>
<td>50.8</td>
<td>65.4</td>
<td>86.8</td>
<td>107.6</td>
</tr>
<tr>
<td>other Exports</td>
<td>0.9</td>
<td>3.1</td>
<td>5.7</td>
<td>6.7</td>
<td>7.6</td>
<td>8.9</td>
<td>9.8</td>
</tr>
</tbody>
</table>

\(22.9\) \(40.6\) \(68.8\) \(85.5\) \(104.0\) \(141.0\) \(178.6\)

\(a\) From 1978, the sectoral composition of the agricultural exports is not available.

Source: Economic Reports, 1974-1977, EPD.
II. Pricing and Marketing Policy and Smallholder Production

(a) The Role of Agricultural Marketing and Pricing Policy in the Development Process: The General Case.

Agricultural pricing and marketing policies, occupy a very prominent position in the development strategy of any developing country. This is for two main reasons:

(i) The marketing system is the channel through which agricultural surpluses are mobilised, largely for general economic development.

(ii) The price system determines the terms of trade, which are the means through which inter-sectoral transfers of resources take place.

These two aspects influence agricultural marketing and pricing policies in LDCs. In the first place, because agriculture occupies a prominent position in the economies of most LDCs, it is looked upon as the main source of growth. Experience from Western Europe has indicated that industrialization has provided the path towards rapid economic growth. This has led many developing countries to pursue policies which are aimed at extracting resources from the agricultural sector to finance industrial development, such as the use of extractive price policies (i.e. very low producer prices as compared to world prices, high export taxes etc), so as to extract finances for investment in industry. In addition, the need for rapid industrial expansion has led to an emphasis on export crop production (to get the foreign exchange required for industrial development). This has led to the need to keep food prices low, both as a means to direct resources toward export crop production, as well as to ease the pressure on the industrial wage bill. (46)

On the other hand, because the majority of the rural population in developing countries depend on agricultural production (either as own producers or as agricultural workers), and agricultural prices are subject to wide fluctuations, it is thought that stabilizing farm prices is one of the ways which could contribute to stable agricultural incomes.
All these aspects have led to the widespread practice, in the developing world, of controlling the marketing of smallholder crops, usually through the use of para-statal organisations. However, experience from the developing world tends to indicate that this control is mostly undertaken for surplus extraction.

There is a wide body of opinion which expresses the view that the significance of agriculture's contribution to the industrialization process in the industrialized world has been over-emphasized. Other factors such as access to growing markets (domestic and foreign), wealth from the colonial empire (in the case of Britain and Japan), etc, played a major role in the industrialization process of these countries. It is argued that present day developing countries lack these factors. In fact, the pursuit of an extractive price policy, may not succeed in initiating industrial expansion. Because of the proportion of the population dependent on agricultural incomes, depressing farm prices may reduce agriculture's contribution to industry by reducing the purchasing power of the farm population, thereby, retarding industrial expansion. In addition, it may also deter peasants from producing marketable surpluses. This is where agricultural price policy becomes a very important component of the development strategy. While it is true that a number of the so called Newly Industrialized Countries (NICs) have achieved export led growth, it is equally true that their internal markets also expanded rapidly as a result of improvements in rural incomes.

(b) Agricultural Marketing and Pricing of Smallholder Crops in Malawi.

As a general rule, marketing of agricultural produce in Malawi is in two distinct categories, ie. estate crops and smallholder crops. Estate crops are marketed directly by the producers either to consumers (mostly industrial users) or at the auction floors. The marketing of smallholder crops, on the other hand, is largely the responsibility of the Agricultural Development and Marketing Corporation (ADMARC), which exercises control over the trade in commercial crops, and has a regulating function in the trade of food crops. That is, ADMARC has purchasing monopoly of smallholder export crops, such as tobacco
cofton, coffee, rice etc., while it also buys surpluses of food crops, either directly (through bush and permanent markets) or indirectly through licensed traders. However, only a very small proportion (10 – 40%) of the food crops (maize, pulses etc) produced on the smallholder farms are purchased by ADMARC, the bulk being disposed of through such channels as:

(i) barter
(ii) unlicensed traders
(iii) local and district council markets
(iv) Urban centre markets
(v) border trade (illegal).

This means that the marketing of non-export produce is more or less under free market conditions (with ADMARC acting as a floor price sett^ar) while the marketing of export produce is under the control of ADMARC.

Table 3.4 Quantity of Smallholder Agricultural Production and its Destination in 1969.

<table>
<thead>
<tr>
<th>Crops</th>
<th>Net Production ('000 S.Tons)</th>
<th>Own consumption at farm ('000 % of Total Sales)</th>
<th>Own consumption at farm ('000 % of Total Sales)</th>
<th>Exported Net Prod. (S.tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>1166</td>
<td>1002</td>
<td>164</td>
<td>14</td>
</tr>
<tr>
<td>Pulses</td>
<td>141</td>
<td>113</td>
<td>28</td>
<td>20</td>
</tr>
<tr>
<td>Groundnuts</td>
<td>133</td>
<td>86</td>
<td>47</td>
<td>35</td>
</tr>
<tr>
<td>Cotton Seed</td>
<td>21</td>
<td>1</td>
<td>20</td>
<td>95</td>
</tr>
<tr>
<td>Paddy</td>
<td>19</td>
<td>8</td>
<td>11</td>
<td>58</td>
</tr>
<tr>
<td>Tobacco (a)</td>
<td>15</td>
<td>-</td>
<td>15</td>
<td>100</td>
</tr>
</tbody>
</table>

Notes: (a) includes estate tobacco
(b) includes previous year's stock.

Source: Table 8.3, Malawi Statistical Yearbook, 1972.
(i) Marketing of Smallholder Produce Through ADMARC.

The control of smallholder export crop marketing in Malawi dates back to colonial times. During the early years of smallholder participation in export production (see chapter 2), which was largely restricted to production of some varieties of tobacco, and cotton, the African producers could only sell their produce to the European settler farmers, who in turn, either re-sold it at the auction floors or exported it directly to the outside world. This was resented by the Africans.

In 1926, the Tobacco Marketing Board was set up, followed by the Cotton Marketing Board and Produce Marketing Board. These were established for two main purposes:

(a) "to encourage the production of better quality crops and to introduce marketing schemes with strict grading of products purchased, in order to ensure uniform standards of goods offered for sale;

(b) to organise an export market for graded primary products which would bring in revenue for the country." (54.)

These Boards established rural markets in the export crop producing areas. It is pointed out that up to 1956, the policy of these Boards was to pay such producer prices which were considered to give the producer a "reasonable" return and no more. This policy, is said to have inhibited improvements in crop husbandry since it was realised by the farmer that most of the profits of good farming were taken up by the Boards. (55) In 1956, the three Boards were amalgamated to form the Agricultural Production and Marketing Board (A.P.M.B.), which was later renamed the Farmers Marketing Board (FMB) and given statutory powers, including monopoly rights for the marketing of smallholders' export crops. Among its price policies, featured aspects of guaranteed minimum prices and price stabilization (with the help of a reserve fund, from which price support was paid to farmers in bad years). After 1967, the Board was instructed to operate on a commercial basis. By operating on a "farmer prices plus marketing costs below sale price" basis, the Board was able to generate funds for other development efforts and subsidies on improved farm inputs. In 1971, the Agricultural Development and Marketing Corporation...
(ADMARC) came into being, taking over the responsibilities of PMB.

As already indicated above, ADMARC, has a purchasing monopoly of smallholder export crops, and buys surpluses of non-export crops. In addition, it acts as a pace setter in the pricing of smallholder produce, while at the same time it has control over the issue of traders licences. As such ADMARC pricing policies have a very strong bearing on smallholder farm production. In addition ADMARC influences smallholder production through its function of distributing inputs to the smallholders. ADMARC’s buying and selling prices are controlled being set annually in consultation with the Government. ADMARC proposes the guaranteed minimum prices for each smallholder crop, and these are announced by the Ministry of Agriculture, once agreement has been reached, at the beginning of the year. The prices are uniform throughout the country. The traders are offered a higher price at the main depots than paid to farmers at the bush and permanent markets, to allow them a reasonable profit margin after meeting transport expenses.

In its formation of price policy, ADMARC seems to have inherited the extractive strategy pursued by its predecessors. This can be well illustrated by examining the aims and objectives of the price policy. The stated aims and objectives of ADMARC’s price policy are said to be:

(i) To ensure a "reasonable return" to the farmer.
(ii) To enable ADMARC to earn a surplus to support national development programmes.

A closer examination of these aims and objectives reveal a number of interesting aspects. In the first place, the first objective is an inoperative concept as it stands, in that it does not provide any basis on which a "reasonable return" to the farmer is calculated. All that is said is that ADMARC aims at a gradual increase in farm prices over the years. Whether it is real or nominal prices that are at issue, is not specified. The strategy is justified as a means to stabilize farm prices on a long term basis, with the view to stabilizing farm incomes. However, it appears that although the strategy may have succeeded in shielding farmers from fluctuations and
uncertainties on the world commodity markets, its main effect has been a gradual fall in farmers real prices of most export crops. As Tolley (1982), has pointed out, price stabilization alone, at the farm level, does not necessarily stabilize farm incomes, other factors such as price of inputs, cost of manufactured items, etc, also have an impact on the level of farm income. For example, since 1973, ADMARC has withdrawn input subsidies from the smallholders. Table 3.5 below, indicates that the real price of maize paid by ADMARC to producers, has been more or less static between 1971 and 1978, while that for tobacco actually fell below its 1970 level between 1971 and 1974, and began to rise gradually in 1975. It was only in 1978 when it rose above its 1970 level.

Table 3.5 ADMARC Producer Price Indices For Maize and Tobacco 1970 - 1978.

<table>
<thead>
<tr>
<th>Year</th>
<th>Maize Nominal (Tambala/kg)</th>
<th>Real</th>
<th>Tobacco Nominal (Tambala/kg)</th>
<th>Real</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>1971</td>
<td>142.5</td>
<td>131.6</td>
<td>133.0</td>
<td>122.8</td>
</tr>
<tr>
<td>1972</td>
<td>142.5</td>
<td>126.9</td>
<td>111.3</td>
<td>99.3</td>
</tr>
<tr>
<td>1973</td>
<td>142.5</td>
<td>120.7</td>
<td>102.3</td>
<td>87.1</td>
</tr>
<tr>
<td>1974</td>
<td>199.5</td>
<td>146.6</td>
<td>103.3</td>
<td>77.3</td>
</tr>
<tr>
<td>1975</td>
<td>199.5</td>
<td>126.9</td>
<td>127.2</td>
<td>80.7</td>
</tr>
<tr>
<td>1976</td>
<td>256.5</td>
<td>155.4</td>
<td>145.3</td>
<td>88.6</td>
</tr>
<tr>
<td>1977</td>
<td>256.5</td>
<td>150.0</td>
<td>164.8</td>
<td>96.4</td>
</tr>
<tr>
<td>1978</td>
<td>256.5</td>
<td>133.0</td>
<td>206.0</td>
<td>111.1</td>
</tr>
</tbody>
</table>

Notes: The Real prices are calculated by deflating the prices by the Low Income Consumer Price Index for Blantyre, which although not particularly appropriate, is used in the absence of any other better indicator of the cost of living of the rural households.

Sources: Malawi Statistical Yearbook, 1979, PP69 (Table 8.11) and 137 (Table 16.3); and NRDP, Policies, Strategy and General Features, Annex 12, Table 2.12.
The observation that the strategy of price stabilization has been accompanied by a decline in the real prices of the smallholder questions the genuine concern of the strategy to farmers' wellbeing. This points to the overriding importance of the second objective, ie, that of accumulating investment funds, which is reflected in ADMARC's annual trading accounts as indicated in the table below.

Table 3.6 ADMARC Crop Trading Accounts - Net Profit (a) as a % of Farmers Receipts

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton</td>
<td>33</td>
<td>38</td>
<td>74</td>
<td>92</td>
<td>16</td>
<td>64</td>
</tr>
<tr>
<td>Tobacco</td>
<td>139</td>
<td>76</td>
<td>71</td>
<td>146</td>
<td>243</td>
<td>270</td>
</tr>
<tr>
<td>Groundnuts</td>
<td>54</td>
<td>48</td>
<td>48</td>
<td>24</td>
<td>24</td>
<td>106</td>
</tr>
<tr>
<td>Rice</td>
<td>(15)</td>
<td>(10)</td>
<td>9</td>
<td>36</td>
<td>(82)</td>
<td>(46)</td>
</tr>
<tr>
<td>Maize</td>
<td>(5)</td>
<td>(3)</td>
<td>75</td>
<td>8</td>
<td>(49)</td>
<td>(45)</td>
</tr>
<tr>
<td>Total Trading</td>
<td>62</td>
<td>38</td>
<td>57</td>
<td>65</td>
<td>49</td>
<td>98</td>
</tr>
</tbody>
</table>

Notes: (a) The bracketed figures represent losses.
Source: NRDP, Phase I. Selected working papers, 1978, Vol.1 Table 1, P23. Adapted from ADMARC Reports.

Table 3.6 indicates that ADMARC has allowed itself a very high profit margin on almost the smallholder crops, while occasionally making losses on the major food crops, mostly through subsidizing urban consumers. This overemphasis on the extractive function by ADMARC reflects the fact that it views itself as essentially fulfilling a developmental function, ie to use its price policy as an instrument for speeding up the process of development in the economy. Consequently, most of the surplus extracted from the smallholder sector has been invested in development activities such as providing loans for the development of estates by Malawian entrepreneurs (especially flue cured and burley tobacco), introduction of new crops like cashew and macadamia nuts on estates, managing small scale projects for evaluating the feasibility of other crops such as citrus, pyrethrum, etc., and maintaining a reserve supposedly for price support, (58) and investment in industrial activities.
While it could be argued that the development function is worthwhile for the whole country, it should be pointed out that the high level of surplus extraction may have some adverse effects on the development process. In the first place, it could be counterproductive in that it could act as a disincentive to higher smallholder production, thereby, reducing the volume of smallholder exports. As already indicated in the previous section, the share of smallholder exports declined from 53% of total exports in 1964 to 34% in 1977 (see Table 3.3). Although such a decline is partly explained by the rapid expansion of the estate sector, it nevertheless represents an underlying slowing down of the growth in smallholder export production.

(ii) Smallholder Response to Price Incentives in Malawi.

The role of price policy in influencing smallholder agricultural production is largely an unresolved issue in Malawi. The main issue at hand is to find out the exact nature of the relationship between agricultural prices and smallholder agricultural production. A number of studies have been undertaken with the aim to establish whether smallholders in Malawi respond strongly to price changes. If this is proven to be the case, then prices provide a powerful policy instrument for influencing agricultural production in accordance with national priorities. On the other hand, should the response be found to be weak, this will imply that more emphasis should be placed on other factors that affect smallholder productivity, such as farmer education through extension services, and other incentive schemes such as input subsidization, etc.

Four main attempts at getting empirical evidence on the response of Malawian smallholders to price changes will be briefly reviewed here. The general approach of these studies has been to examine crop production over a period and try to explain production variations by means of factors such as technological change, levels of experience with the crop, etc. Dean (1966) focused his investigation on tobacco sales between 1926 and 1960. He found four main explanatory factors of variation in production (estimated by tobacco sales), namely:
(i) The previous year's tobacco prices (real).
(ii) A weighted index of the overseas wage rate in the previous year.
(iii) An index of the consumer prices in the previous year.
(iv) the weather.

He estimated a price elasticity of supply of 0.48.

Minford and Ohs (1968), examined the response of smallholder total output to real price changes between 1949 and 1968. They too found all the four variables identified by Dean, plus an unofficial export variable (for border trade), as strongly related to the value of crop sales. Their estimates of price elasticity of supply were around 0.60. The fact that total price elasticity of supply is positive signifies that during the period under review, the smallholder sector had ample idle resources of say land and surplus labour that a properly balanced price policy could achieve rises in output of almost all smallholder crops, as there was apparently no strong competition among the various crops for the available resources.

Coleman and Garbertt (1973), dealt with the cotton supply response in the Lower Shire, between 1955/56 and 1970. Producer price, deflated by the consumer price index and lagged by one year, and rainfall, were found to be strong determinants of supply (also as represented by sales figures), and a very high price elasticity of supply of 2.36 was obtained. In addition, the study also indicated that smallholders were more interested in maximising net revenue per labour unit rather than per unit of land, suggesting that labour was a more critical constraint in the circumstances, than land.

Gordon (1971), focused his study on investigating the supply response of groundnuts, by looking at the changes in acreage planted with the crop in response to changes in real producer prices, also lagged by one year. His estimate indicated that the price responsiveness of the supply of groundnuts was as high as 2.3.

All the above studies indicate high price elasticities of supply in the Malawian smallholder agricultural sector. One
limitation of the above studies is that they all used crop sales to ADMARC (except that by Gordon which used changes in area planted to groundnuts) as a proxy for the supply of the marketed output of the crop concerned. As indicated earlier, ADMARC purchases represent a small proportion of the marketed output of smallholder crops, especially those which happen to be both food crops and cash crops. Thus although they may give a close indication of total marketed output of the export crops, for which ADMARC has a purchasing monopoly, eg cotton, tobacco and say, sunflower seeds, they may not do so for the other crops. Most important, the rigidity of ADMARC producer prices (see table 35) does not allow for a proper examination of smallholder response to price changes.

These few positive results of smallholder response to producer prices, coupled with ample evidence from other countries which has indicated that smallholders do respond positively to price incentives (65), are indicative of a number of things. First they indicate that price policy does indeed have a role to play in influencing smallholder agricultural production decisions. For example, a relaxation of the extractive price policy pursued by ADMARC with regard to export crops, would likely lead to higher output of export crops by smallholders than is the case at present. This would lead to higher rural liquidity and thus provide a market for industrial goods, thereby aiding the industrialization programme. Secondly, the aim of the smallholder agricultural development effort is to encourage farmers to adopt more profitable, high yielding crop enterprises, however, many smallholders have fixed amounts of resources (land, labour, capital) etc., at least in the short run. This implies that the new crops and old crops represent competing demands on these resources. And, if indeed the Malawian smallholders respond positively to price changes, then variations in relative prices will play a very important role deciding how farmers allocate their resources between the various crops. This is an area in which price policy could be particularly useful in achieving a desired product mix. Tolly et al (1982), give the example of Korea as a country
which has achieved self-sufficiency in rice partly due to
Government price policy (i.e. provision of price support to paddy
rice growers). In a way, it can be said that price policy in
Malawi has contributed towards the apparent self-sufficiency
in foodstuffs. As already pointed out, smallholder export crop
marketing is under the monopoly of ADMARC price policy. On the
other hand, the bulk of smallholder non-export crops, which are
largely food crops, such as maize, pulses, etc., are disposed of
on what may be termed a "free market". A survey in 1977,
indicated that private traders offered prices which were on average
40%, 30% and 60% above those offered by ADMARC for rice, maize and
mixed beans, respectively (see table 3.7), thus partly accounting
for the low share of ADMARC purchases of these crops. At the same
time, table 3.6 has indicated that between 1972 and 1977, ADMARC
extracted relatively lower surpluses from food crops than from
export crops. This implies that considering actual prices, the
barter terms of trade between food crops and cash crops turned in
favour of food crop producers. As a result, more people tended to
allocate more of their resources to the production of food crops
than export crops, with the consequence that the production of
such cash crops as cotton and groundnuts declined, while that of
food crops such as maize and rice rose, thereby making the country
more or less self-sufficient in food crops. This aspect is well
supported by the evidence in LLDP which indicates that up to 1977/78,
the hectarage under maize continued to rise in the project area, in
contrast to say, that of groundnuts (the crop which was considered
to be the main cash crop - unlike tobacco which was under quota
controls) which declined over the same period. This point will be
examined in more detail in chapters iv and v. But the above
evidence clearly indicates that the price policy pursued with
regard to smallholder export crops is at variance with the export
promotion objective of NRDP.
Table 3.7 Comparison of ADMARC Buying Prices With Mean Local Market Prices - 1977.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Mean Local market price (Tambala/kg)</th>
<th>ADMARC buying price (Tambala/kg)</th>
<th>(b/a) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice Paddy</td>
<td>12.8</td>
<td>7.7</td>
<td>60</td>
</tr>
<tr>
<td>Shelled groundnuts</td>
<td>47.7</td>
<td>15.4</td>
<td>32</td>
</tr>
<tr>
<td>Unshelled groundnuts</td>
<td>22.4</td>
<td>9.9</td>
<td>21</td>
</tr>
<tr>
<td>Beans</td>
<td>26.6</td>
<td>11.0</td>
<td>41</td>
</tr>
<tr>
<td>Pigeon peas</td>
<td>11.9</td>
<td>6.6</td>
<td>56</td>
</tr>
<tr>
<td>Cow peas</td>
<td>16.9</td>
<td>5.5</td>
<td>32</td>
</tr>
<tr>
<td>Maize</td>
<td>7.0</td>
<td>5.1</td>
<td>70</td>
</tr>
</tbody>
</table>

Notes: These mean prices may not highlight the whole magnitude of the discrepancy between the ADMARC and local market prices as they are more likely to represent the prices obtainable during the ADMARC crop purchasing period (say June to October), and not a weighted average for the whole year.


Finally it should be emphasized that price policy has a vital role to play in encouraging the adoption of particular innovations. It is not enough to provide the smallholders with improved seeds, teach them good crop and animal husbandry methods and provide them with farm credit, without ensuring that the smallholders are actually going to derive financial benefits from the innovations.
The Impact of the Incomes Policy on Smallholder Agricultural Production.

According to Ghai and Radwan (ILO, 1981), the incomes policy pursued in Malawi has three major objectives:

(a) To control rural - urban migration through reducing the incomes gap between peasant and urban unskilled workers.

(b) To promote wage employment, particularly in the agricultural sector.

(c) To maintain economic stability.

In order to achieve the first two objectives, the strategy has been to firmly control the statutory minimum wage rate, while the achievement of the third objective has necessitated a relaxation of control on higher wage incomes, and profits or dividends.

Table 3.8, indicates that between 1968 and 1972, the statutory minimum daily wage rate (in money terms) was constant, just to be increased by a mere 5% in 1973, and remained constant at that level up to 1978. However, in real terms, the minimum wage rate shows a decline of about 54% between 1968 and 1978. It is mostly in the estate sector where most of this decline in the real wage rate has been felt, because of the majority of the workers are employed on a seasonal basis and are therefore usually paid the minimum wage, unlike in the non-agricultural sector where employment tends to be more permanent and basic wages tend to rise with length of service.
### Table 3.8 Statutory Minimum Daily Wage Rate For Blantyre-Limbe, as at 1st January, 1968 - 1978.

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal Tambala/ Day</th>
<th>Real (a) Tambala/ Day</th>
<th>Price of (b) maize Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Index</td>
<td>Index</td>
<td></td>
</tr>
<tr>
<td>1968</td>
<td>38</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>1969</td>
<td>38</td>
<td>100.0</td>
<td>99.0</td>
</tr>
<tr>
<td>1970</td>
<td>38</td>
<td>100.0</td>
<td>90.0</td>
</tr>
<tr>
<td>1971</td>
<td>38</td>
<td>100.0</td>
<td>83.4</td>
</tr>
<tr>
<td>1972</td>
<td>38</td>
<td>100.0</td>
<td>80.5</td>
</tr>
<tr>
<td>1973</td>
<td>40</td>
<td>105.3</td>
<td>80.2</td>
</tr>
<tr>
<td>1974</td>
<td>40</td>
<td>105.3</td>
<td>70.2</td>
</tr>
<tr>
<td>1975</td>
<td>40</td>
<td>105.3</td>
<td>60.5</td>
</tr>
<tr>
<td>1976</td>
<td>40</td>
<td>105.3</td>
<td>58.2</td>
</tr>
<tr>
<td>1977</td>
<td>40</td>
<td>105.3</td>
<td>55.8</td>
</tr>
<tr>
<td>1978</td>
<td>40</td>
<td>105.3</td>
<td>51.3</td>
</tr>
</tbody>
</table>

**Notes:**

(a) The real daily wage rate has been calculated by deflating the nominal wage rate by the low income consumer price Index for Blantyre (shifted from 1970 to 1968).

(b) Adapted from Ghai and Radwan (ILO. 1981), Table 5, P 14.


The consequences of this low wages policy have been mixed. In the first place, it has led to the encouragement of the use of labour intensive production techniques, both in agriculture (estate sector) and industry. This has led to the relatively fast rate of employment growth in the country already referred to in chapter 11. Secondly, it has contributed to keeping rural-urban migration at a moderate rate. According to World Bank (1981a) estimates, urban population grew by 6.6% and 6.8% between 1960 and 1980, respectively. (72) Most of the internal migration in the country has been of the rural - rural type, rather a rural - urban type, as people have tended to move from those areas with little agricultural potential, say the Lower
Shire, to those areas where a lot of estate development has been taking place, such as the Central Region.

On the other hand, the low wages policy has had an effect on ADMARC's price policy. That is in order to maintain the low wages, ADMARC has resorted to keeping food prices down, as table 3.5 indicates. And it could be argued that this low food prices policy had a bearing on the price ADMARC offered for export crops, as a relatively higher export prices would have had the effect of reducing the production of food crops as farmers would tend to allocate most of their resources towards the more profitable export crops, thereby causing food prices to rise and thus putting pressure on the wage rate. In this case the low wages policy had a negative impact on both smallholder export crop production and surplus food production. More important, the low wages policy was formulated with a view to encouraging the expansion of wage employment, as already indicated. In order for this to take place, the return to labour in wage employment had to be higher than that in smallholder production (otherwise the estates would not be able to attract labour), and this necessitated a low farm prices policy. This particular point is very important for it explains the paradox observed in the Malawi economy (see Ghai and Radwan, ILO, 1981), whereby between 1968 and 1978, employment in the estate sector continued to rise despite the apparent fall in the real wage rate. The explanation for this is that real incomes in the smallholder sector must have been more badly affected by the low farm prices policy. In actual fact the returns to labour in smallholder agriculture (using official ADMARC producer prices) were very close to those in the estate sector. For example, in 1978, the statutory minimum wage rate was 40 tambala per day, which if we assume an 8 hour working day, works out to be 5 tambala per hour. This compares to returns to labour of between 4 and 7 obtainable from smallholder crops, as indicated in table 6.10. (72) Given the high risk associated with smallholder agriculture as compared with estate employment, households with surplus labour over and above subsistence food production requirements, or facing acute problems with smallholder agricultural production (e.g. lacking adequate land and/or labour), would opt for estate employment instead of trying to produce marketable
surpluses. This tends to indicate that the prices and income policies in Malawi are closely linked up with the general objective of expanding estate production of export crops, thus accounting for the fast expansion in paid employment in the agricultural sector referred to above, to the detriment of smallholder production. It therefore appears that although efforts to encourage smallholder agricultural production are not lacking there are internal inconsistencies in the overall strategy, which tends to inhibit smallholder agricultural development.
Notes - Chapter III

2. World Bank, (1975a), op. cit.

3. Ibid. P 3

4. Ibid. P 3.


8. World Bank (1975b), op. cit.

9. For example, most of the the third world countries face faster population growth rates than those faced by the developed countries a century or so ago, this means that the developing countries require large GDP growth rates just to keep in pace with population growth. The absence of fast growing markets (both overseas and domestic), as those faced by say, Britain in the 19th Century, makes their development the more difficult.


11. Ibid. P 11.

12. Ibid. P 1.

13. Ibid. P 2.

14. Ibid., another typical view along these lines is that expressed by Myint (1964), when he says that: "The typical problems of the present-day underdeveloped countries arise, not because these countries are in the traditional state of isolation, but because they have been "opened up" to outside forces, in the form of foreign trade, investments, etc., and colonial rule. The expansion of export production and the spread of the money economy have disrupted in varying degrees the economic self-sufficiency of the traditional "subsistence economy."


16. Ibid. P 3.


18. Sinha, R., a comment made at a seminar.


31. Ibid, P 2.


35. For a more comprehensive summary of the findings on this issue, see World Bank (1981 b), op. cit.

36. The fact that the outcome of a programme need not be the result of a deliberate policy is supported by the evidence provided by Adelman (1974), for Korea. Adelman expresses the view that, 'the development strategy of Korea was chosen primarily on purely economic growth considerations, the favourable equity consequences, while now welcomed, were not recognised at the time. See Adelman, I (1974), "South Korea", in Chenery et al, (1974), Redistribution With Growth, op. cit., P282.

37. One important aspect to bear in mind about Malawi's agricultural development financing is that, up to now, most of this financing has come from the Development Account, which is largely financed by external loans, grants etc, and this has naturally led to heavy external indebtedness - servicing charges for Government debt alone, for 1982, were estimated at 20% of export receipts, this rises to about 30% of export receipts, when debt servicing of public corporations is added. However, it is stated that each NRDP project will be transferred from the Development Account after its fifth year of development. The effect of this will be to put pressure on local resources in order to maintain the projects, as well as to service the debt so contracted. Unless the revenue generated from these projects exceeds the recurrent costs, NRDP may prove to be a burden on the national economy, once this external financing is removed.


42. One of the reasons why wage employment has expanded very fast in the estate sector, despite declining real wages, could well be due to the fact that prospects in the smallholder sector, have been increasingly getting worse. See Kydd and Christiansen, op.cit.

43. Cotton in Tanzania, Tea in Kenya and Coffee in Uganda, are some of the few examples.

46. Food prices to the urban workers are subsidized mainly through the controlling of the prices at which maize flour and rice are distributed by the Grain Milling Company, a parastatal organisation.

47. According to World Bank (1975 a) estimates, about 80% of the poor are estimated to live in rural areas, and agriculture is the principle occupation of 80% of them. See World Bank (1975 a), op. cit., P 4.


49. The procurement policy of the Soviet Union is the most quoted example. See for example, Shaffer, H.G. "Soviet Agriculture: Success or Failure", in Shaffer (1977) editor, Soviet Agriculture, an Assessment of Its Contribution to Economic Development, Praeger, London. PP 56-105.

50. Sinha, R, personal communication. Also writers such as Nove and Miller are very sceptical of the view that Soviet agriculture was the main generator of funds for the industrial expansion programme. They argued that in fact overall agricultural production actually declined after collectivisation thereby undermining its contribution to industry. See, Miller, J.R. and Nove, A (1976) "A Debate on Collectivisation: was Stalin Really Necessary?" in Problems of Communication, July-August 1976, PP 49-62, cited in Shaffer (1977), op. cit., P 1.

51. This is particularly true of countries like Taiwan, Korea and Japan. See Chenery et al (1974), op cit., PP 280-290; also Chinn (1979), op. cit., PP283-301.


55. Ibid, P 18.


58. Ghai and Radwan (ILO, 1981) point out that ADMARC's increasing element of investments has had no connection with the smallholder sector whilst through its loan and equity policies some element of transfer of funds from the smallholder sector to the estate or industrial sector has taken place. See Ghai and Radwan (140, 19810, op. cit. P. 30.

59. It has actually been observed that production and exports of seed cotton have actually fallen over the past few years due largely to the low producer prices paid by ADMARC, which appear not to provide a sufficient incentive to farmers, see NRDP, Selected Working Papers, op. cit., P 20.

60. Ibid, P 39.


66. Ibid, P 3.


68. See chapter 11.


70. It was raised to 50 tambala per day in 1980.

71. The decline in the average monthly wage rate for the same period is reported to have been 17%, see Ghai and Radwan (ILO, 1981), op. cit., P 14.

72. World Bank (1981 a), op. cit., Table 20, P 172.

73. See table 6.4.
CHAPTER IV

SMALLHOLDER AGRICULTURAL DEVELOPMENT IN THE LILONGWE LAND DEVELOPMENT PROGRAMME (LLDP).

This chapter addresses itself to two main issues.

(i) An investigation of the factors associated with raising small scale agricultural productivity in LLDP.

(ii) An examination of the impact of the smallholder agricultural development effort on rural welfare in the project area.

The analysis will begin with an examination of the aims and objectives of LLDP, to find out how they compare with the generally proclaimed aims and objectives of rural development. This will be followed by an examination of the strategy that was employed in LLDP in an attempt to achieve the stated objectives, and how the strategy relates to the socio-economic conditions obtaining in the area.

1. BACKGROUND ON LLDP.

The Lilongwe Land Development Programme (LLDP), was launched in 1968/69, by the Malawi Government, with the help of the World Bank (at an estimated cost of K24.4 million). It was originally a three phase 13 year development programme. In 1979/80, it entered its 4th phase, in the 1st phase of the newly launched National Rural Development Programme.

As Kinsey (1974) has pointed out, LLDP typifies one of the World Bank's two principal strategies for integrated smallholder development programmes, namely, that of focusing on a broad concept of development including a wide range of activities to support production for both subsistence and for the market. (1)

(1) Aims and Objectives of LLDP

Although LLDP is classified as an integrated Rural Development Programme (IRDP), it was essentially a crop productivity project whose principal aim was to raise yields of maize, groundnuts and tobacco, (the principal crops in the area) on a large enough scale to produce an impact on the National economy. (2)
Among the benefits which were originally expected to accrue from the project, were the following:

(i) An increase in net family income (among the participating farm families) of about K52.0 million per year.

(ii) Production of an exportable surplus valued at K4.6 million per year.

(iii) An increase in Government revenues from taxes and other charges (e.g. interest on loans for inputs).

(iv) Establishment of a stable pattern of agriculture, commercially oriented, with built in incentives to greater production and investment by the farmers.

(v) Formation of a corps of particularly experienced agricultural development officers, some of whom could be available for the subsequent planning and execution of similar projects elsewhere in the country.

(vi) Realisation of an internal rate of return (IRR) to the national economy of about 16% over a 20 year period.

(vii) Transformation of the attitudes of the farmers.

Over the years most of these objectives have been modified and revised, and the programme has evolved towards a more widely based integrated approach to rural transformation, although the emphasis on productivity still persists.

II. Natural Characteristics.

The project area surrounds the city of Lilongwe (Malawi's capital) - except on the North East, where the Lilongwe North East Agricultural Development Project is in progress. It lies at an altitude of between 1,100 and 1,230 metres above sea level. It consists mostly of gently undulating plains with slopes seldom exceeding 2 to 3%. The annual rainfall ranges between 640 to 1090 millimetres (falling between October and February), while its temperature is within the 15°C to 23°C range. Its soils, generally red clay to sandy loam are moderately rich and well suited to the growing of maize, tobacco and groundnuts. At the commencement of phase iv (1979/80), the total area covered by LLDP was
MAP 1: LLDP Development Units in situ
approximately 485,000 hectares (about 5% of total land area of Malawi), of which some 348,000 hectares were available for smallholder agriculture. Of the balance, some 65,000 hectares were devoted to the Dzalanyama ranch (an integral part of LLDP, intended to boost smallholder livestock production). By mid 1977 it was estimated that a total of 103,600 farm families, with mean household size of 4.8 persons, were within the project boundaries (about 3% of the Malawian smallholder population).

III. Development Strategy in LLDP.

Maize, groundnuts and tobacco (fire-cured), are the main peasant crops in the area. While maize (the local varieties) is predominantly grown for food purposes, groundnuts and tobacco are the main cash crops. As already pointed out, the initial objective of LLDP was to raise output of the main crops in the area. The strategy to be employed with regard to each crop was as follows:

(i) **Maize** - to raise yields per hectare, through intensive use of fertilizers, new and improved seeds (mainly hybrid varieties) and modern crop husbandry methods - while reducing hectarage planted to maize.

(ii) **Groundnuts** - also raising output per hectare, through use of improved seed varieties and modern farming methods as well as expanding hectarage.

The experience of LLDP indicates that the strategy did not work out exactly as intended. For example, the proportion of maize hectarage did not decline as anticipated. This appears to have been for two main reasons:

(i) The uptake of improved maize varieties did not reach appraisal projections partly due to seed shortages and partly as a result of the inappropriateness of the improved maize varieties (especially the hybrids) for subsistence purposes.

(ii) The rapid growth of the city of Lilongwe - necessitated a higher growth in maize production (the staple food) than could be sustained by the new technology being
introduced - and the natural way to meet this rising demand for maize was through hectarage expansion.

This meant that a substantial number of farmers were increasingly growing the local maize varieties (with lower yields) and therefore, not releasing land as anticipated.

On the other hand, groundnut yields and hectarages were declining, contrary to expectations. For example, the land cultivated with groundnuts fell from 21% (of total cultivated area) in 1969/70 to 16.5% in 1978/79. The reasons for this decline have been largely attributed to such factors as low farm prices, managerial practices, labour availability problems and many others. We shall take up these issues in chapter 5.

Parallel to the developments in maize and groundnuts production, was the rising role of the tobacco enterprise. Between 1969/70 and 1978/79, the proportion of land planted to tobacco in LLDP more than doubled, increasing from 7.3% of total cultivated to 15.9%. Such developments in the land use pattern must have had a profound influence on the income distribution pattern that emerged in the area. However, lack of appropriate time-series household survey data prevents a more detailed analysis of the development model in LLDP. The present picture (from the survey results reported in chapter 5) indicates that those households who grew either tobacco and/or improved maize, have higher farm and total incomes than those that did not.
Table 4.1 Proportion of Cultivated Land Under Maize, Groundnuts and Tobacco in LLDP - 1969 to 1979

<table>
<thead>
<tr>
<th>Year</th>
<th>Crop (percentage)</th>
<th>Maize (all varieties)</th>
<th>Groundnuts</th>
<th>Tobacco</th>
</tr>
</thead>
<tbody>
<tr>
<td>1969/70</td>
<td></td>
<td>63.6</td>
<td>20.8</td>
<td>7.3</td>
</tr>
<tr>
<td>1970/71</td>
<td></td>
<td>64.6</td>
<td>22.2</td>
<td>6.6</td>
</tr>
<tr>
<td>1971/72</td>
<td></td>
<td>62.6</td>
<td>21.5</td>
<td>9.8</td>
</tr>
<tr>
<td>1972/73</td>
<td></td>
<td>69.6</td>
<td>21.7</td>
<td>9.0</td>
</tr>
<tr>
<td>1973/74</td>
<td></td>
<td>65.7</td>
<td>18.4</td>
<td>10.7</td>
</tr>
<tr>
<td>1974/75</td>
<td></td>
<td>60.0</td>
<td>24.4</td>
<td>12.0</td>
</tr>
<tr>
<td>1975/76</td>
<td></td>
<td>57.0</td>
<td>24.4</td>
<td>12.7</td>
</tr>
<tr>
<td>1976/77</td>
<td></td>
<td>63.1</td>
<td>21.6</td>
<td>11.0</td>
</tr>
<tr>
<td>1977/78</td>
<td></td>
<td>64.0</td>
<td>15.3</td>
<td>16.0</td>
</tr>
<tr>
<td>1978/79</td>
<td></td>
<td>64.0</td>
<td>16.5</td>
<td>15.9</td>
</tr>
</tbody>
</table>


Table 5.1

IV. Innovation adoption Behaviour.

As pointed out above, the main concern of this chapter is to investigate the factors which were associated with the adoption of particular innovations in the area. The main hypothesis being investigated is that labour availability could have been a crucial factor that affected the pattern of adoption of innovations in the area, implying that interhousehold differences in labour availability (family and/or hired), had profoundly affected the pattern of income distribution, through its influence on the land use pattern. More important, in this chapter, we raise the issue that, the innovation "packages" through which higher farm output and incomes were expected to come from (such as adoption of modern crop husbandry methods, which include use of improved seed varieties, proper application of fertilizers and other inputs, etc), were of a labour intensive nature. Especially, as the success of these innovation "packages" depended very much on timeliness of operations, in a rain fed agriculture, this meant
that only those households which were able to provide the required labour at the appropriate time, either because they had large family labour forces, or could be able to hire labour were able to take on the innovations. But the issue will be discussed in detail in chapters 5 and 6.

2. Production Conditions in LLDP.

A. Level of Capital Stock and Availability of Capital Finance.

For well over 90% of the small scale farmers in LLDP, hoes, axes and pangas are the only instruments used in farming operations. In a survey conducted by the Evaluation Section of LLDP, in the 1977/78 season, it was revealed that only 2.1% of the households interviewed had ridgers, less than 1.5% had cultivators and about the same proportion had ploughs. Only the ox-cart (for farm transport) was relatively more popular with about 8% of the sampled population owning one. This indicates that the level of capital stock (in the form of farm implements) available in the area is very low.

It is rather paradoxical that in an area with apparent labour shortages, the level of adoption of labour saving farm implements should be so low. How can this apparent paradox be explained?

1. Lumpiness of Mechanical Implements.

It is often argued that the size of the farm limits the use of mechanical implements. For example, the World Bank (1981 b) quotes Gemmill's study in Malawi which revealed that adopters of ox-cultivation cropped larger areas and significantly, larger farms. Similar findings are reported for Gambia, by Weil (1970). However, experience has indicated that this problem is not insurmountable. Again, the World Bank (1981 b), cites evidence from Green (1973), which indicates that in Thailand, smaller farms overcame an initial lag in use of tractors by using hired tractor services. The present author observed that in Bimbi area (a rice growing area, along lake Chilwa, in Southern Malawi) that this process of hiring out extra plough-time by the wealthier farmers, to the smaller farmers, was going on with great success among rice growers, such that hand prepara-
tion of the ground is almost a thing of the past for a majority of the farmers. This indicates that lumpiness of mechanical implements *per se*, need not account for a low level of adoption of mechanical implements by small farmers, as there is always scope for hiring out extra-time. Nevertheless, where timeliness of operations is crucial, such as in the weeding process, hiring in and out, of extra mechanical implement time has its limitations in reducing labour bottlenecks.

11. Lack of Financial Capital

Shortage of financial capital in the Malawian small scale sector has been recognised for a long time by the agricultural planners and various efforts have been made to rectify it. For example, as early as 1958, the Nyasaland Loans Board (the first body to grant agricultural credit to African Farmers), granted loans for oxen and livestock, farm carts, items of farm equipment, fencing and other farm requirements. (17) Cash loans were sometimes granted in connection with improvements and capital development. (18) The Central Farmers Loans Board, continued to provide supervised credit for purchase of oxen and ox-driven implements. However, all these loan schemes had a definite bias against small farmers. As such, they tended to affect only a very small proportion of the smallholding community, as table 4.2 indicates.

Table 4.2 Loans Given to Farmers, 1958 - 1960

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Farmers</th>
<th>Total Value of Loan (K)</th>
<th>Average Loan/farmer (K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1958</td>
<td>57</td>
<td>8300</td>
<td>146</td>
</tr>
<tr>
<td>1959</td>
<td>208</td>
<td>23700</td>
<td>114</td>
</tr>
<tr>
<td>1960</td>
<td>214</td>
<td>84000</td>
<td>112</td>
</tr>
</tbody>
</table>

The launching of LLDP seems not to have altered the situation considerably for farmers within the project area. Although agricultural credit was regarded as vital and essential for the success of the programme, seasonal, rather than medium or long term credit, was given priority (taking up over 90% of the resources available). The uptake of medium term credit, for farm equipment was very low, as table 4.3 indicates. This could have been due to two main problems:

1. Low return on capital.
2. Inappropriate technology.

Table 4.3 Seasonal and Medium Term Credit in LLDP - 1968/69 to 1976/77

<table>
<thead>
<tr>
<th>Year</th>
<th>Seasonal Credit</th>
<th>Medium Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Amount</td>
<td>Average/Farmer</td>
</tr>
<tr>
<td>1968/69</td>
<td>5</td>
<td>7.4</td>
</tr>
<tr>
<td>1969/70</td>
<td>7</td>
<td>12.3</td>
</tr>
<tr>
<td>1970/71</td>
<td>83</td>
<td>18.4</td>
</tr>
<tr>
<td>1971/72</td>
<td>343</td>
<td>16.6</td>
</tr>
<tr>
<td>1972/73</td>
<td>392</td>
<td>16.6</td>
</tr>
<tr>
<td>1973/74</td>
<td>488</td>
<td>14.2</td>
</tr>
<tr>
<td>1974/75</td>
<td>736</td>
<td>29.1</td>
</tr>
<tr>
<td>1975/76</td>
<td>860</td>
<td>25.3</td>
</tr>
<tr>
<td>1976/77</td>
<td>1001</td>
<td>26.9</td>
</tr>
</tbody>
</table>

Source: LLDP, Some Facts and Figures, 1977, pp 10 and 15

(a) Low Returns on Capital

Medium term credit, because of the size of the loan (average loan per farmer between 1971/72 and 1973/74 was K430), carried with it rather stringent conditions. For example, a down payment of between 25-33% of loan value, plus some form of collateral of up to 150% of the loan was required
before the loan could be secured. This meant that if a household wanted to purchase say, an ox-cart, whose average price during the 1973/74 period was K400, it needed to raise a deposit of about K100 - K120, and/or provide collateral of up to about K600. Livestock and other forms of rural wealth were accepted as a collateral, to make things easier for the farmers. But even then, the collateral required was in the region of up to 5 or 6 head of cattle (needless to mention the countless head of goats, sheep or pigs), and as our survey (reported in chapter 5 - see table 5.5.b) indicated, only 5% of the sample owned cattle, implying that the majority of the farmers could not meet the collateral requirements. At the same time, the relatively short duration of the loan (up to 3 years) necessitated that borrowers undertook projects which yielded high returns within relatively short periods. As such, farm implements like ploughs, groundnut lifters, etc, whose returns were relatively low due largely to the depressed farm prices mentioned in the previous chapter, were not considered good investment risks. For example, using the gross margin analysis data presented in the 1977/78 Project Completion Report (20), a 1.8 ha farm (which is slightly above the average farm size in the region), growing improved maize, improved groundnuts and improved tobacco, would provide a net revenue of K494 (at 1978 prices), in three years. Implying that at the given farm gate prices and production costs, if the household took say a K400 loan for a farm implement, all its farm revenue for three years (net of cost for fertilizers, insecticides transport etc), would go towards meeting the loan and interest charges. As Kinsey (1974) observed, the majority of medium term loans in LLDP were for maize hammer mills which yielded high profits due to the deliberate action of LLDP in restricting their supply (21).

(b) Inappropriate technology.

Mechanical implements are generally used for substituting capital for labour, especially in labour scarce conditions. However, they are not a perfect substitute for labour, the degree of substitutability depending on several factors, such as the type of crops grown, type of operations being undertaken, etc, all of which depend on the type of farming system. If mechanical implements are to be adopted, they have to be suitable for the
operations on which labour availability is a binding constraint. In the situation under review, weed control during the crop establishment period (December/January) appears to be the most labour demanding and time specific operation for all the crops concerned (see the crop labour demand schedule in chapter 5).(22)

If mechanical implements are to alleviate the labour bottleneck associated with this process, then they must be appropriate for this purpose. However, the majority of the mechanical implements which have been introduced in the area (eg the ox-ploughs, ridgers cultivators, groundnut lifters, etc), do not appear to tackle the binding labour constraint. In actual fact, use of mechanical implements for ground preparation has tended to increase cultivated area thereby increasing the labour demands for weeding.

Thus, it appears that not only is the unavailability of capital finance to the majority of the smallholder farmers that is responsible for the low level of use of mechanical implements in LLDP, but also the relatively low returns to capital, brought about by the output price structure and the inappropriateness of the available range of farm implements to operation(s) on which labour availability is a binding constraint. However, due to the overall low level of mechanical implements in the area, they do not constitute a significant source of interhousehold differences in farm incomes. As such, they will not feature in our analysis of interhousehold differences in incomes in LLDP.

B. Impact of LLDP Strategy on Farm Productivities.

Yield studies conducted in Lilongwe District, before LLDP was launched indicate that average maize yields in the area were around 7 bags (about 740 kg) per hectare, while groundnut yields averaged about 750 kg of kernels per hectare. Timeliness of planting and weed control were said to be the main determinants of output. (23) When LLDP was launched in 1967/68, it sought to improve yields mostly through the introduction of improved seed varieties and the use of non-farm inputs (fertilizers, etc). Evidence indicates that between 1969/70 and 1972/73, average maize yields were consistently higher in the developed area, while groundnut yields were higher on the developed areas only for two out of the four years. (24)
Table 4.4 Maize and Groundnuts Yields in Developed and Undeveloped Areas in LLDP, 1969/70 - 1972/73.*

<table>
<thead>
<tr>
<th>Year</th>
<th>Maize Developed Units</th>
<th>Maize Undeveloped Units</th>
<th>Groundnuts Developed Units</th>
<th>Groundnuts Undeveloped Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>1969/70</td>
<td>1226</td>
<td>1116</td>
<td>534</td>
<td>651</td>
</tr>
<tr>
<td>1970/71</td>
<td>1437</td>
<td>1281</td>
<td>469</td>
<td>600</td>
</tr>
<tr>
<td>1971/72</td>
<td>1636</td>
<td>1225</td>
<td>463</td>
<td>456</td>
</tr>
<tr>
<td>1972/73</td>
<td>1314</td>
<td>1139</td>
<td>298</td>
<td>254</td>
</tr>
</tbody>
</table>

Source: LLDP, Yield Reports and Data supplied by the Evaluation Unit. - cited in Kinsey (1974), op. cit., Table 31, p 152.

Although the above data tends to indicate a positive contribution of the project to yields in the area, there is some need for caution. As Kinsey (1974) has pointed out, the apparent increase in the maize yields over the years, within the project area, seem to have been enhanced more by the incorporation of more productive areas into the project, during the later years, than mere project impact as such. He goes on to add that there was no significant evidence to support the view that yields were significantly higher within the developed units than outside, as bivariate regression models indicated that inclusion or non-inclusion of an area in LLDP explained only some 2 to 3 percent of the variation in yields. Thus up to the end of phase 1 (1967/68 to 1972/73), the available data do not provide any conclusive evidence that smallholder productivity within the project area was higher with project support than without.

Ten years after the launching of the project, an interesting pattern of development seems to have emerged in the area. The 1977/78 Sample Survey of Smallholder Agriculture conducted by LLDP (Evaluation Section), indicated that the mean yield of maize (all varieties) was 1206 kg/hectare, which was lower than the average annual yields obtained during the 1969/70 to 1972/73 period, in the "developed" areas of LLDP. However, as table 4.5 indicates there was a great deal of variation in the mean yields.
obtained for each of the varieties grown in the area.

The table indicates that the productivity improvement enjoyed by a farm operator was very much dependent upon the variety of maize grown. For instance, those farmers growing hybrid maize, obtained on average, a yield level which was about 3 times higher than that achieved by those growing local maize. This means that the mean yield figures presented in the earlier studies (which lump together all varieties) do not provide us with any helpful indication of how the alleged productivity improvements were distributed among the farmers.

Table 4.5 A Comparison of Mean Yields of Different Maize Varieties in LLDP.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Mean Yield (kg/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local maize</td>
<td>1075</td>
</tr>
<tr>
<td>Synthetic maize</td>
<td>1436</td>
</tr>
<tr>
<td>Hybrid maize (SR52)</td>
<td>2998</td>
</tr>
<tr>
<td>Composite maize (UCA)</td>
<td>1227</td>
</tr>
<tr>
<td>Mixtures</td>
<td>1367</td>
</tr>
<tr>
<td>All varieties</td>
<td>1206</td>
</tr>
</tbody>
</table>

A recent study by Kydd (1982), indicates that adoption of improved maize varieties (the major improvement introduced in LLDP), although initially high (in the 1969/70 season), has since declined, being mostly confined to two groups of farmers, viz, the "commercial maize farmers" and the "richer tobacco farmers". This indicates that although yields per hectare obtainable from improved maize varieties were quite high, they were only attainable by a limited number of people, while productivity per hectare on the majority of small scale farms was still low.

3. The Problem of Labour Availability and its Consequences on Smallholder Agricultural Development.

A. Labour Availability and Farm Size.

It is generally agreed that the World's rural poor (apart from the landless) are mostly small-scale farmers whose very
smallholdings (less than 1 hectare per family in most cases), cannot provide enough to sustain their basic subsistence needs. (28) With evidence obtained mostly from Latin America and Asian experiences, it has been inferred that lack of land, mostly due to either, inequalities in land distribution or high population pressures on the land, is at the heart of the rural poverty problem in the Third World. (29) The improvements in rural productivity and welfare that have taken place in countries like Japan, Taiwan and Korea, after egalitarian land reforms were undertaken, are cited as examples that support this view. (30) Hence the question of access to land has been at the centre of rural development discussions.

It is thus perhaps surprising to see that low smallholder productivity has been experienced in countries with or without acute population pressures as well as in those countries with or without land tenure arrangements that restrict access to land. (31) This observation serves as a cautionary note against the universal applicability of the popular belief that the correlation between low farm output and small farms observed throughout the Third World suggests a direct causal link between farm size and poverty resulting from limited access to land. In sub-Saharan Africa, for example, there is a prevalence of customary land tenure arrangements (which safeguard against landlessness), and population pressures, even in the most densely populated countries, are not as acute as those obtaining in most of Asia. In circumstances like these, farm size, which is a measure of worked land rather than available land, is more likely to be a manifestation of poverty than a cause of it. Recent studies in Africa tend to indicate that African farms achieve lower productivities per unit of land largely because they organise their production activities in such a way that they maximise returns to labour, which is often scarce relative to land. (32)

Such findings tend to suggest that in order to understand the causes of rural poverty in situations where arable land can be said to be more or less universally accessible, there is need to seek alternative causes other than land availability per se. In Malawi for example, the general agreement among researchers,
is that there are no significant barriers to access to land, such as restrictive land tenure systems that favour land concentration. This is because the customary land tenure system (under which about 80% of the land falls) tends to favour even distribution of land. Even in LLDP, where most of the land has been demarcated and certificates of claim issued to family heads (on behalf of their families), the basic principle of allocating land for individual use remains unaltered within the family structure. Thus overall, it could be said that in Malawi, the land tenure system operates against land concentration per se, as farm size is largely determined by the households' ability to work the land. Although there is very little evidence to support this claim, that available seems to be affirmative. Kydd (1979, for example, in his study of Namwera (an area in Southern Malawi), investigated the distribution of cultivated land among the rural households. He obtained Gini-Coefficients of the order 0.36 – 0.38 and 0.29 to 0.32 for Lorenz curves constructed on per-capita and per-adult basis of distribution, respectively. Both measures indicate that the cultivated land is fairly evenly distributed in the area. But the fact that the per-adult measure depicted a more even distribution of cultivated land among the households than the per-capita one, suggests that cultivated land was distributed more according to a household's ability to use it (as expressed by household's potential workforce, ie number of adults) than mere land availability per se.

Further evidence of land distribution among smallholders, in accordance to ability to farm it, is provided by the National Sample Survey of Agriculture, 1968/69. This survey indicated that only 1.38 million hectares of the 5.3 million hectares of arable land (representing 26%) were being cultivated then, and yet the majority (63%) cultivated area of under 1.6 hectares. At the same time, the average cultivated area per household in the sparsely populated Northern Region (24 persons per sq.km) was 1.4 hectares, while that in the densely populated southern Region (67 persons/km²) was 1.3 hectares. More interestingly, this survey indicated that
32% of the holdings in the Northern Region and 36% in the Southern Region were under 0.8 hectares, and in both cases, the average number of persons living and working on such holdings was 2.3. (39)

B. Labour Availability and Smallholder Credit.

There is general support to the Schultzian hypothesis that the small farmer responds to his opportunities with considerable economic rationality. (40) However, it is felt that small farmers have not shown an impressive response to technical opportunities in production that promise high economic rewards. As such, it is pointed out that most traditional small farmers are producing close to their capacity ceiling given the level of technology they have access to (Goyoso, 1973). (41) According to Chinn (1979) a common diagnosis of the problem is that "agricultural productivity is low on small farms because of limited access to controlled water supplies, chemical fertilizers, pesticides, mechanical implements and other inputs..." (42)

It is felt that credit can be the facilitating input that allows effective access to new inputs and technology. (43) Thus most smallholder development projects have tended to incorporate a credit programme as part and parcel of the whole development effort. In such circumstances, the issue of smallholder credit becomes central in the discussion of input use by the small scale farm community.

1. Smallholder Credit in Malawi

In Malawi, the agricultural sector is composed of two main sectors, as already indicated, i.e. the smallholder sector, and the estate sector. The former which consists of some 1.1 million smallholdings (most of them below 2 hectares) accounts for over 85% of the agricultural production and supports over 90% of the population, while the latter exports over 60% of the total agricultural exports (NRDP, Policies, Strategy---, op. cit. P1)

Prior to Independence (1964), institutional agricultural credit was almost exclusively available to the estate sector, which was predominantly European owned. It was not until 1958 that institutional agricultural credit became available to
African farmers, when the Nyasaland Loans Board (operating through Local District Committees) started to issue loans of up to K500 (£250) with a minimum of K40 (£20) at an interest rate of 5.5% per annum. Such credit was available mostly for agriculture, housing, commercial and industrial purposes. These loans which were in cash for improvement and capital or in kind, for seeds, fertilizer, oxen and other livestock, farm carts etc, were mainly short-term, as they depended on the character of the farmer for collateral. In 1964, the Central Farmers' Loans Board (CFLB) was established as a supervised agricultural credit programme, which in addition to seasonal loans, also provided medium and long-term loans for specific purposes related to capital development of farms.

However, these facilities only benefited a small proportion of the smallholding majority. In the first place, before a farmer could get a loan he had to satisfy the Loans Board that he had a farm enterprise capable of benefiting from the investment and that he had experience and ability to utilize the loan effectively - to increase productivity and efficiency. In other words, a farm plan, was a prerequisite to obtaining a loan. In the second place, short-term credit to individuals for fertilizers, seeds, etc., were not favoured because of the administrative difficulties associated with them. As Kinspy (1974) pointed out, there was a definite bias against small farms, as it was felt that small farm units would be unable to support the burden of loan repayment. As such, up to the introduction of Integrated Projects in the country (1968/69), agricultural credit was only available to a handful of farmers (mostly Master Farmers), for oxen and carts.

11. Types of Credit

During the late 1960's and early 1970's, three main types of agricultural credit operated in Malawi.

(a) Supervised Credit - this was largely provided to farmers in the projects, crop authorities and settlement schemes and administered by the authorities running the particular projects.

(b) Unsupervised Credit - provided outside the project areas and administered by the Government Loans Board.
(c) Commercial Bank Credit - only available to large farmers on leasehold land.

It is only (a) and (b) which are of direct relevance to smallholder agricultural development. The seriousness with which the question of providing credit for smallholder development was taken during the post-Independence era, is reflected in the general principles outlined in the 1972 "proposal for the formulation of Agricultural Supply and Credit Organisation of Malawi (ASCOM)". It was thus stated:

(i) The needs of smallholder and estate agriculture in respect of credit and input supply are different - suitable arrangements for each should be considered separately.

(ii) The provision of credit to farmers is not an end in itself - but only one of a number of means toward increasing the value of farm production.

(iii) The usefulness of credit in achieving this end depends on the availability of other complementary factors, in particular extension advice, ready availability of farm inputs and crop marketing opportunities.

(iv) As a general rule, therefore, credit will normally be restricted to small farmers falling within the orbit of projects and settlement schemes, or those otherwise recommended by the extension service as being credit-worthy.

(v) The provision of credit to farmers should as far as possible aim to avoid any element of hidden subsidy, unless specifically intended, the restriction of credit in general, to farmers in projects will help to lessen costs and hence keep credit charges down to an acceptable level to the farmer.

(vi) Since virtually all credit is and will continue to be provided to the farmer in kind and not in cash, the question of arrangements for credit cannot be divorced from procurement, stocking and supply of farm inputs. It is therefore desirable that credit and inputs be handled by the same organisation. (47)
Several developments have emerged from these guidelines; a major one being the "package" approach of smallholder credit. That is credit is offered in the form of input "packages" which are supported by "extension advice". This linking of credit, input supply and extension has both its advantages and disadvantages. On the positive side, it could be argued that such an arrangement takes advantage of the complementary nature of three services. On the other hand, it can result in cumbersome procedures in assessing credit worthiness, as will be discussed later on. In addition, the multiplicity of objectives (as each service has its prime objective) may lead to difficulties in arriving at an optimal strategy. We shall demonstrate this point with reference to the experience of LLDP in the next chapter.

III. Performance of the Credit Programme in LLDP.

(a) - Objective of Credit Programme.

At the commencement of LLDP it was envisaged that within the existing structure of smallholder farming, the anticipated improvements in productivity could not be realised unless specific inputs were used. This was based on several assumptions:

1. That farmers in the programme area would not otherwise use the recommended inputs, either at all or in the prescribed manner, or
2. that credit would enable a larger group of farmers to participate in the programme than would otherwise be the case,
3. that the necessary credit was not available from the private sector.

Provision of inputs on credit was therefore used as an incentive for farmers to use inputs and follow recommended husbandry practices, as the extension staff were able to use the leverage created by the farmers' indebtedness to ensure that extension approved techniques were used. What was the strategy used to achieve this objective, and how successful was it?

(b) - LLDP Credit Strategy and its results.

According to Goyoso (1973), smallholder credit programmes can be usefully assessed on two main criteria:
(1) Has the programme been successful in improving the economic viability and degree of participation of those individuals it has reached?

(2) Has the programme succeeded in improving the economic viability and degree of political participation of a substantial proportion of the small farm population sufficient to make a difference in the make up of society? (51)

In other words Goyoso suggests that we can usefully evaluate a credit programme on whether or not it has led to high farm productivity (and incomes) among the credit recipients, and on its coverage of small scale farming community. This approach will be adopted here in trying to evaluate the credit programme in LLDP.

(i) Impact of Credit on Smallholder Farm Productivity and Incomes.

The impact of credit on smallholder farm productivity and incomes is very difficult to determine mostly because many factors determine the level of these variables. Such factors include farm size, land quality, level of technology used, administrative skills of the farm operator, etc. While credit can enhance access to technology, its effectiveness in raising productivity will also depend on the other factors.

It is very important to recognise that different smallholdings are at different levels of economic viability. While credit can usefully enhance the economic position of some categories of farmers, it may not do so for others. (52) In such circumstances, a useful way to assess the impact of credit would be to disaggregate the smallholding community into several categories (using one criterion or the other, which represents the levels of economic viability of the different groups) and then examine the role of credit on each of these categories.

Goyoso (1973, op cit), suggested that a useful way of evaluating the farm households would be to divide them into the following categories:

(1) Those households which are already operating as profitable enterprises.
(2) Those which have the potential to operate profitably but lack inputs.

(3) Those with such poor resources that improved technology would not mean anything.\(^{(53)}\)

Such a breakdown would clearly show the policy measures appropriate for each group. For example, Goyoso argued that the above breakdown of the smallholding community would indicate that if the aim of a rural development effort, in such circumstances, was to attain economic viability of the small scale farmers, then the appropriate strategy would be to aim at:

(1) Maintaining the viability of the first group.

(2) Minimising the time period needed for farmers in the second group to become viable, and

(3) Designing special programmes such as rural employment programmes, resettlement schemes, etc, for the last group - as credit alone would not solve its problem.\(^{(54)}\)

It is the opinion of the present writer that, the way the credit programme has operated so far in LLDP, tends to assume that those who have not been able to benefit from the "packages" offered, were at fault (e.g., uncreditworthy, lack of enterprise, etc.) and therefore have themselves to blame. As such the programme is mostly geared to help those who can help themselves with little or no effort being made to meet the special needs of the very needy farmers. This issue will be highlighted when we discuss the survey results in the next chapter.

C. Distribution of Seasonal Credit in LLDP.

Up to the 1979/80 cropping season, seasonal credit in LLDP was distributed via two channels;

(i) Individual credit.

(ii) Group credit.

While individual credit was the norm in the standard units, group credit (introduced in 1973) was initially restricted to what were referred to as the Modified Input Areas (MIA - ie areas with low agricultural potential - within LLDP). It eventually spread to other areas, becoming the only form of credit available to farmers, outside the projects, settlement schemes and
crop authorities, where it was administered by the Government Loans Board. However, the high administrative costs associated with individual credit, coupled with the willingness of farmers outside the project areas to "gang up" (with the encouragement of ADMARC) and act as a group in order to get inputs on bulk at a discount, has led to the adoption of the group credit approach in the entire programme area from the 1980/81 season.

(i) Individual Credit.
For a person to qualify for seasonal credit he/she had to satisfy two basic criteria.

(1) Managerial ability criterion.
(2) Credit worthiness criterion.

**Managerial Ability** - the person had to possess a certain standard of managerial ability in order to achieve the potential benefits and high returns from "packages" of new non-farm inputs. That is, he/she was judged on individual ability of cultivation practices and such husbandry aspects as ridging, planting, spacing, fertilizer use, weeding and harvesting. Each of these were rated by the Extension personnel as poor, average, good and excellent. Any farmer with more than 3 poor ratings was considered ineligible for credit.

**Credit worthiness** - had to be established before an individual could be issued with credit. The rating was based on a risk criteria related to five farmer typologies, as indicated below:

(1) Men, born, living and farming in the village or elsewhere in LLDP.
(2) Women born, living and farming in the village but whose husbands (if married) were living elsewhere.
(3) Men born outside the village but married and farming in the village.
(4) People with farms outside the programme area.
(5) People with farms in the programme area but living outside it.

These five typologies of farmers clearly indicate that the risk factor was related to the person's tenural position with regard to the piece of land he was farming. Only groups 1 to 3
which had reasonably secure tenure on their lands (within the customary tenure system) were considered reasonable credit risks - and not the last two groups.

(ii) Group Credit

The main objective for the introduction of group credit in LLDP was to reduce lending costs, by transferring most of the administrative, accounting, and collection responsibilities from project - management to the groups. Each member of the credit group had to satisfy the above criteria for individual credit. In addition, the credit group (with a membership of 10-30 farmers) must have been approved by LLDP. A down payment of 11% was required (10% as security plus 1% administrative charges), before the group loan could be secured. Interest on group credit was 10% per annum, while that on individual credit was 15% per year.

The performance of group credit in LLDP seems to indicate that the scheme had been a major success from the point of view of the Project Administration. For example, the scheme had maintained an almost 100% repayment record (as against an average of 98% between 1972/3 and 1977/78, for individual credit). This high repayment rate had been achieved because of the sanction placed on the group, ie, the group could not secure input credit if any of its members defaulted the previous season. Thus any defaults were made good from the 10% security fund, which was replenished once the defaulter had been pressurized by his fellow members, who were eager to secure credit - and in most cases, such defaulters were expelled from the group.

However, the problem with this tendency was that the credit groups, because of their keenness to preserve their creditworthiness, seemed to be highly selective, accepting only those who were very likely to repay credit, to the exclusion of the poorer and needy farmers. Perhaps it was a realization of this aspect by the planners, that a new philosophy in group lending has emerged in LLDP. This philosophy involves the replacing of credit groups by farmers clubs, which are supposed to perform other development functions other than being mere channels for
credit. These farmers clubs are discussed in more detail in the next chapter.

Table 4.6 Individual and Group Credit in LLDP

<table>
<thead>
<tr>
<th>Year</th>
<th>Individual Credit</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Borrowers</td>
<td>Amount of Loans</td>
<td>Loan/Borrower</td>
</tr>
<tr>
<td></td>
<td>('000)</td>
<td>(K'000)</td>
<td>(K)</td>
</tr>
<tr>
<td>1972/3</td>
<td>21.1</td>
<td>382</td>
<td>18</td>
</tr>
<tr>
<td>1973/4</td>
<td>23.9</td>
<td>460</td>
<td>19</td>
</tr>
<tr>
<td>1974/5</td>
<td>20.5</td>
<td>601</td>
<td>29</td>
</tr>
<tr>
<td>1975/6</td>
<td>24.6</td>
<td>624</td>
<td>25</td>
</tr>
<tr>
<td>1976/7</td>
<td>23.5</td>
<td>627</td>
<td>27</td>
</tr>
<tr>
<td>1977/8</td>
<td>14.6</td>
<td>453</td>
<td>31</td>
</tr>
<tr>
<td>1978/9</td>
<td>23.1</td>
<td>656</td>
<td>28</td>
</tr>
</tbody>
</table>

Table 4.6 Individual and Group Credit (continued)

<table>
<thead>
<tr>
<th>Year</th>
<th>Group credit</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Borrowers ('000)</td>
<td>No. of Groups</td>
<td>Borrowers Per Group</td>
</tr>
<tr>
<td>1972/3</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1973/4</td>
<td>1.8</td>
<td>94</td>
<td>19</td>
</tr>
<tr>
<td>1974/5</td>
<td>4.6</td>
<td>242</td>
<td>19</td>
</tr>
<tr>
<td>1975/6</td>
<td>7.6</td>
<td>410</td>
<td>19</td>
</tr>
<tr>
<td>1976/7</td>
<td>13.3</td>
<td>670</td>
<td>20</td>
</tr>
<tr>
<td>1977/8</td>
<td>27.9</td>
<td>1267</td>
<td>22</td>
</tr>
<tr>
<td>1978/9</td>
<td>28.4</td>
<td>1217</td>
<td>23</td>
</tr>
</tbody>
</table>

Source: Schaefer-Kehnert (1980), P. 333, Tables 1 and 2.
(d) Coverage of Credit Programme in LLDP.

Within LLDP, the initial programme policy was to issue as much credit as possible, since credit was used as a weapon to ensure a widespread adoption of technology.\(^{(56)}\) Credit rose from K4,826 in 1967/68 to K390,991 in 1972/73, with average loan per borrower rising from K7.4 to K17.3 during the same period.\(^{(57)}\) Von Pischke (1973), cites evidence of how in some units in LLDP (3, 4 and 5), the number of borrowers in 1967/69 ranged from 68 to 133 but increased by more than 10 times by 1972/73.\(^{(58)}\) The result of this rapid expansion was that some non-creditworthy farmers were included in the programme, with the consequence that the credit repayment rate fell from 100\% in 1967/68 to about 56\% in 1972/73, and this was despite the fact that all credit was provided in kind (to minimise diversion) and was supervised (to ensure effective use.)

This seems to indicate that while wide coverage of the credit programme (in terms of number of borrowers involved) can be a useful measure of the impact of the credit scheme, on the smallholder community, it may have some undesirable effects. In the case of LLDP, it led to a high default rate. The project officials, concerned about the economic viability of the credit programme had to resort to harsh measures (eg legal proceedings) to enforce repayment and this dealt a severe blow to the credit- lity of the programme.\(^{(59)}\)

In addition, an increase in the number of borrowers per se, may not necessarily indicate the extent of coverage, in terms of the different categories and/or needs of the farmers. The small-holding community does not constitute a homogeneous group in terms of say, land resources, managerial ability, labour resources etc. As such different types of farmers have different needs. And this applies to credit as well. A credit programme that aims to enhance the access of a substantial proportion of the small-holding community to modern production inputs, should therefore begin by assessing the credit requirements of the various typologies of farmers so that the different categories can be catered for according to their needs. It appears that LLDP, in its initial attempt to facilitate a widespread adoption of technology, interpreted coverage in terms of absolute numbers.
As a result there was no attempt to tailor the credit "packages" offered to the needs and resources of the recipients, with the consequence that for people whom the "packages" offered were inappropriate, the desired productivity results did not materialise and this led to their inability to repay credit.

Results from a survey conducted by the Evaluation Section of LLDP in 1971/72 indicated that there were significant relationships between:

(1) default rate and type of package taken, and
(2) defaulting and the mean labour units available to the household.

Growers who included groundnuts in their credit "packages" for example, although they constituted less than 10% of the sample, made up over 20% of the defaulters. At the same time, the mean labour unit per defaulter was found to be about 20% less than that of the non-defaulters as table 4.7 indicates.

Table 4.7 Borrowers Labour Units and Dependent Food Units.

<table>
<thead>
<tr>
<th>Category</th>
<th>Average Dependent Food Unit</th>
<th>Average Labour Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defaulter</td>
<td>4.28</td>
<td>2.44</td>
</tr>
<tr>
<td>non-defaulter</td>
<td>4.70</td>
<td>2.98</td>
</tr>
<tr>
<td>All households</td>
<td>4.64</td>
<td>2.84</td>
</tr>
</tbody>
</table>

Source: LLDP (1972) Survey Credit Borrowers 1971/72 Cropping season, annex, p8 Table 2.8.

These results suggest that some households were offered packages which were not appropriate to their resource endowments. For example, it could be argued that some labour deficient households were offered labour intensive packages, which they were unable to attend to adequately, leading to poor yields. These poor yields, coupled with low farm prices (discussed in chapter III) led such households to default.
C. Labour Availability And Adoption of Innovations in LLDP.

In the previous sections, it was pointed out that the main objective of the smallholder development effort in LLDP, was to raise smallhouseholder productivity of the marketable surplus. The production conditions within which this objective was to be achieved and the strategy to be employed were considered. From the above discussion, lack of modern productivity raising inputs was considered to be the main constraint to higher farm output among the households. This lack of inputs was presumed to be due to lack of purchasing power among the rural people. Credit was therefore used as the main instrument for encouraging innovation adoption in the area. However, the experience of LLDP indicates that not all households were able to take up the innovations offered in the area (as will be indicated in the next chapter) and therefore, not all households were able to raise their farm outputs and farm incomes as a result of the innovations introduced in the area.

In this section the main argument to be considered is that labour availability was very important factor that affected the pattern of innovation adoption among the households in LLDP, and that interhousehold differences in labour availability profoundly affected the pattern of income distribution that emerged in the area.

(I) Labour and Peasant Production

Chayanov (1966), argued that in a "purely peasant" situation because peasant production was the most predominant economic activity, differences in household incomes were mostly a result of how each household allocated its most important resource, family labour. Hence income distribution in peasant societies followed from the determinants of household family labour. (61) He further argued that labour (number of workers in a family) proportionate to the size of the family was the stable element which determined changes in land area used by the farm family. This implies that larger families (in terms of active labour force) cultivated more land and implicitly got more farm output than smaller ones. In such a situation, the size of the
farm was not so much the determining factor of peasant activity but rather an expression of it. He produced empirical evidence that showed that in the observed correlation between farm size and family size, the direction of causality was from family size to farm size - i.e. labour availability and not land availability was the main constraining factor to household incomes. (62)

The Chayanovian model of peasant production has been subjected to many criticisms, among which are:

(i) Lack of Universality - It is generally argued that the model addresses itself to peasant conditions in 19th Century Russia, and that these conditions no longer obtain in many of the peasant societies today. (63) As such any conclusions or predictions emerging from the model cannot apply to these circumstances.

While it is true that present day peasant societies are not a replica of Chayanov's "pure peasant economy" it is important to realise that Chayanov presents a theoretical model and that the usefulness of a model does not lie in the fact that it should accurately describe every case to which it is applied, but rather that it should be able to illuminate differences and similarities between the case in question and that represented by the model. This should provide a basis for a search for alternative explanations. In addition, Hunt (1978 and 1979), showed that where the main assumptions of the Chayanovian model hold (universal access to farm-land, dominance of non-wage family economic units, universal access to a given level of technology, and predominance of subsistence production, etc.), the model did accurately describe family resource allocation. (64)

(ii) Economic Differentiation among Peasant Households - Harrison (1975 and 1979), criticises Chayanov on the issue of economic differentiation. (60) Harrison's main concern is what happens to peasant production under a capitalist structure. He is of the view that the peasant system (or smallholder production) is vulnerable to capitalist expansion, and that Chayanov and his colleagues were not able to perceive this problem because of their obsession with the "small is beautiful" vision of the peasant institutional framework. Harrison took the Marxist stand that "the peasant who produces with his own means of
production, will either gradually be transformed into a small capitalist who also exploits the labour of others, or he will suffer the loss of his means of production .......and be transformed into a wage worker". By excluding his "pure peasant" family from employing labour, Harrison argues, Chayanov foreclosed this possibility.\textsuperscript{66} This is a very valid argument which is backed by many examples of smallholder development (including that in LLDP) which has been accompanied by an increasing tendency for the progressing farmers to hire labour.
Notes - Chapter IV

2. Ibid. P 33
3. Ibid. PP 30-31.
4. Ibid. P 33.
7. Ibid. P78
8. Ibid. PP 150-162.
12. This could very well be one of the reasons why farm output is low in the area.
18. Ibid. P 80.
19. Ibid. P 78.


22. Ibid. PP 146-7.

23. Ibid. PP 151-2.


35. However, with a rapidly growing population (about 3% per annum) and a rapidly expanding estate sector, the availability of land to smallholders is likely to be restricted.


40. Chinn (1979) op. cit.


43. See Nankumba, J. (1980), Agricultural Credit: An Evaluation Study of Supervised and Unsupervised Agricultural Credit Systems in the Lilongwe District of Malawi, University of Malawi, Bunda, Lilongwe.

44. Prior to 1958, loans to Africans farmers were available from local sources - however, as Kettlewell pointed out, the machinery was cumbersome and funds were inadequate to have any substantial impact on smallholder productivity. See Kettlewell (1965), op. cit, P 246.

45. Ibid, P 246.


47. Malawi, The Future Supply of Farm Inputs and Credit in Malawi, EPD, Zomba. (undated)

48. See Kinsey (1974), op. cit., P 81. Von Pischke, in a report prepared for the World Bank (on credit in LLDP), seriously challenges this view, especially since the way credit has been distributed, seems to favour the relatively better off, who could easily afford the inputs without it, as long as proper incentives for their use were provided. See Von Pischke, J.D. (IBRD, 1973), Malawi - Lilongwe Land Development Project: Small Farm Credit Arrangements and Proposals for the Development of Smallholder Credit, Washington.

49. See Nankumba, J.S. (1980), op. cit., PP4-5. This view is based on the assumption that the rural sector cannot generate savings or secure credit from elsewhere. However, Nankumba has cited an example of how through proper organisation a Farmers Club in LLDP managed to obtain a commercial bank loan of K382 for its 98 members in the 1971/72 season (see Nankumba, op. cit., P 16). Although such situations are very rare in rural Malawi, the example nevertheless illustrates that other alternatives to facilitate access to other sources of credit) do exist, which can be used to bridge the purchasing power gap of the farmers.


52. One author has actually gone to the extreme of claiming that smallholder credit does in some circumstances lead to an acceleration of rural poverty. See Landivar, J. (1982), "Do Credits Promote Rural Poverty?", in Development and Corporation 3, (May/June) PP 12 - 13.


54. Ibid, PP 9-10.


56. World Bank (1981b) op. cit., P12, cites lack of input credit as one of the reasons for low innovation adoption.


59. Nankumba (op. cit. 53), notes that psychologically, credit from LLDP had remained a matter of fear to many smallholder farmers. Many felt that they might have landed in goal or have their farm produce or livestock taken over by LLDP had they failed to repay. This fear still remains. Among those people who did not take credit in our survey (reported in chapter 5), the main reason for not taking credit was fear of consequences of failure to repay (given by 49% of non credit takers). Most of these people were mostly the old folk, single women or those cultivating very small holdings.

60. Scott, P.J. and Bryson, T (1972), Survey of Credit Borrowers 1971/72 Cropping Season. LLDP, PP 4-5.


62. Ibid, PP XIV-XV.

63. See For example Kerblay, B, "Chayanov and The Theory of Peasants as a Specific Type of Economy" in Shannin, T (ed) Peasants and the Peasant Societies. PP 150-160.


CHAPTER V

SAMPLE SURVEY OF SMALLHOLDER AGRICULTURAL HOLDINGS IN LLDP

A Description of the Survey Results

The main instrument of the study was a survey questionnaire administered to a sample of smallholder households in LLDP between April and June 1981. This was supplemented by information officially published by the following main bodies:

1. The Ministry of Agriculture and Natural Resources (MANR).
2. The Lilongwe Land Development Programme (LLDP).
4. The Agricultural Development and Marketing Corporation (ADMAC).

In addition, informal discussions were held with officers of various departments of the Lilongwe Agricultural Development Division (LADD) under which LLDP now falls, as part of the National Rural Development Programme, and with local and traditional leaders within LLDP. The researcher had also the opportunity to attend a number of farmers' meetings organised by LADD officials.

1. SURVEY METHODOLOGY

A. Sampling Procedure

The aim of the survey was to collect information regarding the characteristics of farm household that are associated with innovation adoption. The "household", was the basic unit of sampling. As already indicated, the population of LLDP at the time of the survey was approximately 104,000 households (with a mean household size of 4.8 persons per household) occupying an area of about 6159 square kilometres. Because of the sheer size of the population and area involved, a multistage cluster sampling design was used. Two main considerations were borne in mind in the design procedure:
(a) to minimise expenses and time so that the survey could be completed within 8 to 10 weeks.

(b) to reduce the variation of the observed sample results from the true population results to an acceptably small level, so that inferences from the sample statistics could be made about the survey population with a reliable degree of confidence.

Due to the above stated reasons, the sample size was limited to 160 households. This represented about 1 in every 720 households in the survey area being selected for the sample. Although this is a very small proportion of the total population involved (about 0.14%), because of the observed homogeneity of the survey area, in terms of ecological factors, farming systems, level of technology, etc., and the use of the cluster sampling technique, the selected sample can be taken to be reasonably representative of the survey population.

For administrative purposes, the programme area is divided into 40 units. These served as our primary selection units. Four units were selected using the "probability of selection proportional to size" (PPS) method, in the first stage. The second stage involved the selection of 4 villages from each of the selected 4 units, again using the PPS procedure. From the lists of farm families in each village, maintained by the Unit Centres, and updated annually (in most cases), a list of ten households was selected, using the help of a table of random numbers.

Advance notices were sent, through the village headmen of the selected villages, to each of the selected households, requesting the head of the households (or their representatives - who were to be members of the household), to make themselves available at their homes at a pre-arranged date and time for the interview. This arrangement greatly minimised the extent of non-response. Only on a very few occasions was it necessary to make callbacks or replacements (by picking another household
from the village family listing, with the help of a random numbers table).

All interviews were conducted in the vernacular language (with the help of a standard translation of the English questionnaire), at the homes of the interviewees. The degree of co-operation from the respondents was very impressive, making it possible for the survey to be completed in 9 weeks.

B. Data Analysis

The completed questionnaire which contained information on various household characteristics, were analysed on the Glasgow University computer, using the Statistical Package for Social Sciences (SPSS). (4)

The data contained on the questionnaires were both of a qualitative and quantitative nature. However, due to the absence of any records regarding smallholder use of say inputs, labour allocation to various activities, cash outlays on inputs and labour, etc., even the quantitative data could only at best, be presented as grouped data. This imposed a serious limitation on the type of data analysis that could be undertaken. It meant that greater reliance had to be placed on non-parametric analysis techniques, such as frequency distributions and crosstabulations. However, in a few cases, where a more rigorous analysis was required in order to gain a deeper understanding of the relationship between some variables, some transformations had to be made on the grouped (quantitative) data to make them ratio variables which could be subjected to such statistical techniques as contingency tables analysis, regression and correlation analyses, etc. This was done by multiplying the group means by the frequencies associated with those groups. It is therefore very important to bear in mind that these more advanced analytical techniques were improvised (due to the nature of the data), thus their results, which although they usefully exposed the relationships between the various variables, should be interpreted within this limitation.
C. Household Typologies.

(i) Criteria of Classification

The main improvements in household income in the project area, were supposed to come from the adoption, by the farmers, of the various innovation packages introduced in the area, and the improved crop husbandry practices advocated by the extension services. Thus the extent to which a farm household would benefit from the project depended very much on its extent of adoption. Experiences elsewhere have indicated that there are a lot of factors that determine whether a particular household will adopt a particular type of innovation or not at any one given point in time. The World Bank(1981b), for example, lists the following factors among those that inhibit adoption of innovations:

(a) Lack of credit.
(b) Limited access to information.
(c) Inadequate farm size.
(d) Inadequate incentives associated with farm tenure arrangements.
(e) Insufficient human capital.
(f) Absence of equipment to relieve labour shortage (thus preventing timeliness of operations).
(g) Chaotic supply of complementary inputs and inappropriate transportation infrastructure.

The World Bank points out that removal of such constraints by introducing facilities to provide credit, information, orderly supply of inputs, infrastructure investment, etc., with the expectation that greater adoption would result, leading to improved farming practices and consequently higher farm incomes, has not been borne out by the results. This is largely attributed to differences in adoption behaviour across socio-economic groups and overtime. It therefore appears that there is no way of knowing a priori what the impact of introducing a certain innovation in the area will be among the people, without a comprehensive knowledge of the socio-economic set
up of the place. That is, there is need to know the characteristics of the various innovating households. Here an attempt will be made to present a theoretical model of the smallholdings in LLDP (based on our survey results), to try to explain the current pattern of innovation adoption in the area.

As already pointed out, our argument is that the likely benefits accruing to a household (from the development effort) will depend a great deal on the type of crop enterprise(s) the household engages in. This in turn depends on the labour availability situation in the household. From these two aspects, it could be argued that the households in LLDP can be usefully categorised on two main criteria:

(a) Labour availability
(b) Crop enterprise.

Using the labour availability criterion, the households could be subdivided into two broad categories, viz:

(a) Female-headed households
(b) Male-headed households.

And, using the crop enterprise criterion, three main groups could be identified:

(a) Those predominantly growing tobacco.
(b) Those predominantly growing improved maize varieties.
(c) Those not growing the two above crops but also engaged in agricultural production as own operators.

The idea behind the stratification emerged during the process of the survey, and was thus applied to the survey data after the survey was completed, and not before, since it was not contemplated at the time. It is very important to recognise this fact, since the resulting typologies were not affected in any way through any deliberate manipulations of the sample design by the researcher, but were inferred from the survey results. Their analysis therefore is very revealing of the
circumstances in the area. The result of this post-survey stratification was 4 more or less clearly cut typologies of households as follows:

1. **Female-headed Households** (Typology I) - i.e., where the female head is either widowed, divorced, separated or unmarried. Or where the husband has migrated abroad or elsewhere in Malawi, and does not make regular remittances to the household.

2. **Male-headed Households Growing neither tobacco nor Improved Maize** (Typology II) - but engaged in agricultural production as an own operator either full-time or part-time.

3. **Tobacco Growers** (Typology III) - i.e., where the male household head was a full-time farmer with an established tobacco growing tradition (i.e., grown tobacco for at least 3 years prior to the survey).

4. **Improved Maize Growers** (Typology IV) - that is, where the male-headed household predominantly grew improved maize varieties (where this took up the largest proportion of cultivated land), but no tobacco.

These typologies were not perfectly closed categories, nevertheless, each typology had certain recognisable characteristics as Table 5.0 indicates. The following section will be devoted to a description of the survey results, while the next chapter will provide a more detailed analysis of the results, especially with regard to sources of inter-household differences in incomes.
Table 5.0 Summary Characteristics of Household Typologies in LLDP 1980/81.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Household Typology</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>Average Farm Size (ha.)</td>
<td>0.87</td>
</tr>
<tr>
<td>Average Household Size</td>
<td>3.31</td>
</tr>
<tr>
<td>Average Family Labour Force (AEs)</td>
<td>1.36</td>
</tr>
<tr>
<td>Average Total Maize Output (Kg.)</td>
<td>480</td>
</tr>
<tr>
<td>Average Total Household Reported Cash Income (K)</td>
<td>54.20</td>
</tr>
</tbody>
</table>

II. A Summary of the Main Characteristics of the Household Typologies.

Before describing the survey results in full, a brief description of the characteristics of the various household typologies will be given, as they were observed.

(a) **Typology I (Female-headed Households)**

The survey included 26 households (16.5% of sample), which were headed by females. These households were mainly composed of elderly women (over 45 years) either living alone or with their unmarried children. These households are at the bottom end of the income scale for a number of reasons. Firstly, their main handicap appears to be the absence of the traditional male head, which means that they have less family workers (as the average family workforce is made up of an adult male and an adult female plus say one or two children of working age (over 15 years). This
results in these households having lower cultivated areas. As Table 5.9 indicates, the survey results show that this category of households had a mean cultivated area of 0.9 hectares, and an average family workforce of 1.36 adult equivalents, as against an average cultivated area of 1.6 hectares and average workforce of 2.05 adult equivalents.

Secondly, the main pre-occupation of this group was subsistence food production to meet their family food requirements. None of the 26 female-headed households interviewed grew tobacco, and only 2 participated in growing improved maize varieties. The survey indicated that this group cropped an average of 5.3 bags (about 480 kg.) of maize - the staple crop in the area. With an average household size of 3.31 persons, and assuming that each person requires about 230 kg. of maize grain per year to subsist on, the total food requirements of an average household in this category come to about 760 kilograms of maize grain, which exceeds the average food supply available. This implies that quite a considerable number of households in this category may be having food deficits for a considerable part of the year. The consequence of this is that most of these households are likely to hire out labour to other households or seek non-farm sources of income (during the food deficit period - which happens to be the time when farm labour is in greatest demand) and this is likely to aggravate their labour problems.

Not surprisingly, this category had the second lowest share of household income coming from crop sales (58.8%) with 25% coming from business (mostly beer brewing), 10% from sale of livestock and their products and 6% from employment (largely casual labour - ganyu, on other's farms, see table 5.1.
Table 5.1  Reported Cash Income per Household by Household Typology and Source

<table>
<thead>
<tr>
<th>Source</th>
<th>Household Typology</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>Crop Sales (K.)</td>
<td>31.76</td>
</tr>
<tr>
<td>Livestock/Poultry (K)</td>
<td>5.30</td>
</tr>
<tr>
<td>Business, etc. (K)</td>
<td>13.84</td>
</tr>
<tr>
<td>Employment etc. (K)</td>
<td>3.40</td>
</tr>
<tr>
<td>Total (K)</td>
<td>54.3</td>
</tr>
</tbody>
</table>

Average Income
For Group as % of Overall Total 5.2 6.7 40.6 47.5 100.0

No. of Respondents as a percentage of Total (%)

16.5 20.2 27.8 35.8 100.0

Notes: (a) Includes Transfers.
The likelihood of this group improving its farm output and farm income is limited first by the labour deficiency, which tends to restrict cultivated areas— as is indicated by the very low hectarages associated with it. Secondly, the low cultivated areas, as already pointed out, mean that the credit rating of this group, on the "ability to repay" criterion was very low, thereby restricting its access to inputs. As a matter of fact, only 2 out of the 26 female-headed households included in our survey, reported to have taken credit in the 1980/81 season, and in both cases it was for groundnuts seeds. The majority of the female-headed households, when queried about their low use of farm inputs, replied that it was not because they were refused credit as such, but that they themselves felt that given their labour constraint and small hectarages, their ability to produce a surplus over and above their family requirements, and therefore be able to repay credit, was minimal. Hence, they were afraid to take credit because of the high risk involved if they failed to meet repayment (such as having their livestock or some other possession impounded by the project officials). The end result was that this category of households hardly took up any of the innovation "packages" offered, and therefore their farm output and farm incomes remained low.

During the survey, it was noted that most of the crop sales reported by this category came from groundnuts. This was very puzzling given the fact that the groundnut enterprise was labour intensive, (twice as many hours /ha/year) and provided the least returns to labour, and that the female-headed households had the lowest family labour forces. At first glance, there seems to be little economic sense for a labour deficient household to grow groundnuts. However, this paradox can be explained in several ways. First, by considering the production options available to these households. As already pointed out, none of these households participated in the tobacco enterprise. This may be partly because of the long established tradition in the area of regarding tobacco production as a male enterprise, which brings in an element of bias towards male growers when it comes to quota allocations, but more importantly
the labour demands associated with this enterprise are far beyond the labour supply capacities of these households as implied in the linear programming model to be presented latter in this paper. In addition, it could be argued that hybrid maize (as a cash crop), represents a more risky innovation as well as being outlay intensive (in terms of seed and fertilizer) so that in the absence of extra resources to cover it, is best left alone. Secondly, and more important, it could be argued that although the groundnut enterprise is relatively labour intensive, in terms of total annual labour requirements, its labour profile (see table 6.11) suggests that those labour requirements are fairly evenly spread throughout most of the year, with no sharp peak requirements. For example, thinning and weeding, the most time specific operations, take up only 18% of the labour requirements, while for maize these operations take up about 37% of the total labour requirements. This implies that for groundnuts, a greater proportion of the labour required goes into operations such as harvesting (lifting from the ground), shelling, grading etc, operations where timeliness is not absolutely crucial, and can therefore be done over a fairly long period. Women farmers due to their heavy commitment to domestic chores, are inclined to minimise peak demands on their labour time from non-domestic activities. Hence they tend to take on enterprises which if combined with the more or less compulsory maize enterprise, will minimise the labour peaks. Groundnuts production, due to its relative flexibility in labour allocation, as opposed to say, hybrid maize, whose most time specific operations are labour intensive, becomes the favourite crop. This is supported by the LP model.

**Typology 11** (Male-headed households growing neither tobacco nor improved maize).

This group of farmers (20% of sample) resembled the female headed households in its "non-adoption" of the packages offered in LLDP. This group had a slightly higher average family labour force (1.85 adult equivalents as against 1.36 for the female-headed one), due to the presence of the adult male.
It appears that these growers did not grow tobacco mostly due to the labour constraint as was pointed out for the former group. This labour deficiency, as in the former case, imposes a double bind on the households. First, it limits their ability to engage in either tobacco or say, hybrid maize production and meet subsistence food requirements at the same time, as will be illustrated later by the LP model. Secondly, the labour deficiency results in smaller cultivated area (an average of 1.18 hectares for this group, compared to 2.0^\text{ha} for the tobacco growers.

The survey indicated that this group of households had average total reported cash income of K57.5 per household, which was 22.9% and 25.3% of that of the tobacco growers and improved maize growers respectively. Less than 25% of the average cash income for this group came from sale of crops – especially minor crops such as sugar cane, tomatoes and other vegetables, etc., and not from sale of maize, as quite a number of these households indicated that they usually had food deficits. About 32% of their cash receipts came from livestock and poultry sales. The implication of this is that their limited opportunities to earn income from crops made them resort to selling chicken, goats, etc, which, it could be argued, was not without adverse nutritional effects on their members. This group had the highest proportion of its reported cash income coming from employment. This was largely casual agricultural employment either on other households' farms or on agricultural estates, signifying that this group was the main supplier of the hired labour required by groups II and IV. Just like the female-headed households, these households expressed the view that they did not have confidence in their ability to repay credit associated with the "packages" offered in the project. They therefore opted to meet their food deficits by hiring out labour, rather than taking high yielding innovations with all the risks associated with them.
Typology III (Tobacco Growers)

This group consisted mainly of farmers who had been growing tobacco (mainly dark fire-cured) as their main cash crop for some time. One main characteristics of this group was the large cultivated areas. The survey results indicated that they farmed on average, 2.03 hectares per household, some 2½ times that of the average female-headed households. Naturally, such large hectarages required large labour forces, and the average family labour force (in adult equivalent) for this group was 2.7. That is, tobacco growers had on average 1.33 family workers per hectare as compared to 1.51 for the female-headed ones. Table 5.0 also indicates that this category of households had the largest size, ie, 6.2 persons as compared to 4.8 persons per household for the whole survey.

It is quite interesting to note that despite the large family labour forces, the tobacco growers also made use of a substantial amount of hired labour in their farms. The average expenditure on hired labour of K15.88 per household for this group suggests that, at the average rural wage rate of K0.10 per hour, the average household used about 160 man hours of hired labour, for agricultural purposes.

The 1977/78 sample survey of smallholders in LLDP, indicated that credit in the project area was significantly biased towards tobacco growers. This was mostly because they were associated with the criterion of credit worthiness (ie. large hectarages). Our survey supported the same hypothesis as already indicated. It appears that credit was deliberately channeled to tobacco growers in an attempt to boost its exports (as it is the foremost foreign exchange earner for the country). However, since its production is controlled by allocation of annual quotas - usually to existing producers who successfully met their quota requirements the previous season, or those who have indicated that they have adequate resources, ie, labour and land, and possess the required managerial ability there is an element of continued support of a particular clientele, with the result that only those few privileged to grow it are assured of the benefits.
It is interesting to note that despite the relatively high gross margins associated with the tobacco enterprise (about 3 times those for local maize) farmers in the area have not specialized in its production. This appears to be for two main reasons. First, the crop has enjoyed a remarkable increase in its price on the world market, and some of this price increase (although not very much) has worked its way through the domestic prices. As a result, there has been a general rise in the number of producers within the last decade. The project authorities have reacted to this increasing demand from the farmers to grow the crop by reducing the level of quotas given to individual farmers from an average of between five and six thousand pounds (2270 kg to 2720 kg) to an average of one to two thousand pounds (450-900 kg) per grower - an aspect which has had some positive distributional effects. The second reason for this lack of specialization appears to be the high premium placed on own food production by the farmers, plus the fact that their privileged access to credit (on account of being tobacco producers), allows them to secure credit for improved maize as well, which boosts their subsistence food supplies.

The tobacco growing households reported an average of K251.75 in cash receipts for the 1980/81 season. Most of this (95.4%) came from crop sales, (especially tobacco), with only 3.8% coming from livestock and poultry sales and less than 1% from business enterprises. The fact that none of the tobacco growing households reported any income from employment, supports the earlier view that as the tobacco enterprise was very labour intensive and at the same time provided the highest revenue, it fully and gainfully occupied the households' available family labour on the family farm. The high gross margins associated with the tobacco enterprise, coupled with heavy labour requirements, raises the opportunity cost of labour migration (or hiring out labour), thus resulting in the nil receipts from off-farm employment. This is reinforced
by the advantageous position of this group with respect to farm credit.

**Typology IV - (Improved Maize Growers).**

This group of households may be said to have emerged in the area over the past decade or so. It appears to be usually headed by say, businessmen, tradesmen, returned migrants, people who have retired from paid employment, and in some cases, ex-tobacco growers - all of whom are engaged in agricultural production either part-time or full time. There are two main varieties of improved maize grown in the area, ie the hybrids (eg, MH12) and the composites eg, (UCA). The composites give a higher yield per hectare than the local maize varieties (about 2 times) and are easily processed into *ufa* (pounded maize flour) for *nsima* (hard maize flour porridge), the traditional dish in the area. The hybrids on the other hand, give much higher yields per hectare than the local varieties (about 3 times). However, in addition to storage problems associated with them, they are difficult to process for *nsima*. As a result they are almost exclusively grown as a commercial crop to be hammer-milled to be used for commercial purposes (eg brewing beer) or for mass consumption in the urban areas.

The 1977/78 sample survey (1979) indicated that few of the farmers in the area grew the hybrid variety (8% of the sample). A closer investigation indicated that improved maize growers, in general, are the more "progressive" in terms of following proper crop husbandry methods (eg correct fertilizer application, timely weeding, pest control etc). Our survey indicates that this group of farmers tends to have larger than average cultivated areas (although slightly lower than the tobacco growers.)

In terms of labour availability, the family labour forces for this category are more or less the same as those for the average household in the area. These households indicated the highest reliance on hired labour, as evidenced by their average expenditure on hired labour of K16.80 (an equivalent of about 170 man hours). This could be due to the fact that the improved maize varieties unlike the local varieties,
require a close adherence to proper planting times and all round timeliness of operations. This means that the peak labour demands could well be beyond the capacities of the family workforces, requiring that they be supplemented by hired labour. Thus, although this group have on average, lower family workforces than the tobacco growers, their ability to hire labour (which is enhanced by their non-farm income) allows them to perform the timely operations associated with the improved maize enterprise.

The survey indicated that the improved maize growers (not growing tobacco) had more or less the same level of reported cash income per household as the tobacco growers. However, it is the composition of the incomes of those groups (in terms of sources) which was of great interest. As table 6.1 indicates, crop receipts accounted for 62% of the reported cash receipts for these people (compared to 95% for the tobacco growers). Receipts from business etc (which were almost nil for the tobacco growers) constituted 26% of the cash income for this group. As hinted earlier, most of the household heads in this group were men who either retired from paid employment, or returned migrants or business and tradesmen. As such they tended to have other sideline activities in addition to farming. Probably as a result of this, they displayed the highest cash expenditure on improved seeds and fertilizers, ie an average of K45.00 per household compared to K24.60 for the tobacco growers. This reflects the fact that while the tobacco growers were largely dependent on LLDP credit for inputs, the improved maize growers, probably due to the diversity in their cash income resources, used cash purchases to counter the imbalances.
2. DESCRIPTION OF SURVEY RESULTS.

A. Household Characteristics

1. Household Size

The mean household size among the 158 households surveyed, was found to be 4.7 persons. While the mean household size did not differ very much among the administrative units covered by the survey [see table 5.1(a)], it differed considerably among the various typologies of households as table 5.1(b) indicates.

Table 5.1(a) Mean Household Size by Administrative Unit.

<table>
<thead>
<tr>
<th>Administrative Unit Number</th>
<th>4</th>
<th>14</th>
<th>29</th>
<th>33</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Households</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interviewed</td>
<td>40</td>
<td>39</td>
<td>39</td>
<td>40</td>
<td>158</td>
</tr>
<tr>
<td>Mean Household Size</td>
<td>4.8</td>
<td>4.9</td>
<td>4.6</td>
<td>4.7</td>
<td>4.7</td>
</tr>
</tbody>
</table>

Table 5.1(b) Distribution of Household Size by Household Category.

<table>
<thead>
<tr>
<th>Number of Members in Household</th>
<th>1</th>
<th>11</th>
<th>111</th>
<th>1V</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( % of Households )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2</td>
<td>34.6</td>
<td>29.1</td>
<td>6.8</td>
<td>14.1</td>
<td>18.4</td>
</tr>
<tr>
<td>3-4</td>
<td>42.3</td>
<td>22.6</td>
<td>18.2</td>
<td>29.8</td>
<td>27.3</td>
</tr>
<tr>
<td>5-6</td>
<td>23.1</td>
<td>25.9</td>
<td>34.1</td>
<td>36.9</td>
<td>31.7</td>
</tr>
<tr>
<td>7-8</td>
<td>_</td>
<td>13.2</td>
<td>27.3</td>
<td>17.5</td>
<td>17.1</td>
</tr>
<tr>
<td>9-10</td>
<td>_</td>
<td>6.5</td>
<td>6.8</td>
<td>1.8</td>
<td>3.8</td>
</tr>
<tr>
<td>11 and over</td>
<td>_</td>
<td>_</td>
<td>6.8</td>
<td>_</td>
<td>1.3</td>
</tr>
</tbody>
</table>

100.0 100.0 100.0 100.0 100.0
Table 5.1(b), clearly indicates that category I households (female-headed), with a mean household size of 3.3 persons per household, were the smallest, while category III (tobacco growers) were the largest, with a mean household size of 6.2 persons per household. Less than 25% of category I households had more than 3-4 members in them, while about 75% of category III households had more than 3-4 members. Categories II and IV households had more or less the same mean size (4.6 and 4.7 persons, respectively).

11. Main Occupation of Household Head.

The survey results indicated that the various household typologies differed in their involvement with farming. Overall, 85% of the household heads interviewed reported that they were full-time own-farm operators, while 13% combined farm activities with other non-farm activities, and 2% were engaged in full-time non-farm activities, relying entirely on the labour of other family members and/or hired people to do the farm work (see table 5.1(d). However, 98% of group III household heads claimed to be employed full time on their own farms - which tends to reflect both the labour intensive nature and the profitability of the tobacco enterprise.

81%, 87% and 77% of categories I, II, and IV also reported to be fully engaged in own farming. It is interesting to note that while part-time farmers in groups I and II mostly combined farming with casual employment on other peoples' farms and/or petty trading (such as brewing beer, selling handicrafts, etc), the part-time farmers in group IV were largely engaged in business enterprises (such as transport, retail trading, etc) and other off-farm employment activities.
III. Age of Household Head.

The mean age of the household heads surveyed was 46.7 years (table 5.1c). 55% of them were below 50 years old, 37% were between 50 and 70 years and 8% were over 70 years old. There were marked differences in age distribution among the various typologies. For example, category 1 (female-headed) heads tended to be the most elderly (mean age 57.5 years), with over 75% of them in the 50 and above age group. This reflected the fact that these households were mostly headed by elderly single women, most of them either widowed or divorced (constituting 80% of the group) as table 5.1(f) indicates.

On the other hand, group IV (improved maize growers) comprised of the youngest farmers (mean age 40.6 years). 53% of these farmers were below 40 years old. The tobacco growers, though considerably older than the improved maize growers, tended to be a little younger than the group 11 farmers, although the age gap between the two groups was not very large. (table 5.1 (c).

Table 5.1(c) Age of Household Head.

<table>
<thead>
<tr>
<th>AGE GROUP</th>
<th>1</th>
<th>11</th>
<th>111</th>
<th>IV</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 20 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29 years</td>
<td></td>
<td>16.1</td>
<td>11.4</td>
<td>24.6</td>
<td>15.8</td>
</tr>
<tr>
<td>30-39</td>
<td></td>
<td>22.6</td>
<td>20.5</td>
<td>28.1</td>
<td>20.2</td>
</tr>
<tr>
<td>40-49</td>
<td>23.1</td>
<td>6.5</td>
<td>20.5</td>
<td>22.8</td>
<td>19.0</td>
</tr>
<tr>
<td>50-59</td>
<td>42.3</td>
<td>22.6</td>
<td>27.3</td>
<td>10.5</td>
<td>22.6</td>
</tr>
<tr>
<td>60-69</td>
<td>7.7</td>
<td>22.6</td>
<td>15.9</td>
<td>4.0</td>
<td>15.2</td>
</tr>
<tr>
<td>70 and over</td>
<td>26.9</td>
<td>9.7</td>
<td>4.5</td>
<td></td>
<td>7.6</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Average</td>
<td>57.5</td>
<td>48.1</td>
<td>47.3</td>
<td>40.6</td>
<td>46.7</td>
</tr>
<tr>
<td>n</td>
<td>26</td>
<td>31</td>
<td>44</td>
<td>57</td>
<td>158</td>
</tr>
</tbody>
</table>
Table 5.1(d) Main Occupation of Household Head.

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own Farm Full-time</td>
<td>80.8</td>
<td>87.1</td>
<td>97.7</td>
<td>77.2</td>
<td>85.4</td>
</tr>
<tr>
<td>Others' Farm Full-time</td>
<td>15.4</td>
<td>12.9</td>
<td>2.3</td>
<td>19.3</td>
<td>12.7</td>
</tr>
<tr>
<td>Part-time Farm</td>
<td>3.8</td>
<td>-</td>
<td>-</td>
<td>3.5</td>
<td>1.9</td>
</tr>
<tr>
<td>Other Non-farm</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

IV. Level of Formal Education.

59% of the farmers surveyed had never attended any formal schooling, 39% had had some primary education and only 2% had completed primary education. It was mostly the younger farmers who had attended school. This is reflected in the way level of formal education attained by household head is distributed among the various household typologies, as table 5.1(e) indicates.

It was pointed out above that the improved maize growers (category IV), tended to be the youngest. Here the evidence indicates that, they also tend to be the relatively more educated, as 61% of the farmers in this group attended some primary school leaving only 33% who had had no formal schooling. This compares with 15%, 16% and 41% of the groups I, II, and III, respectively, who attended some primary school (there being none who completed primary in these groups).

V. Membership of Farmers' Club.

The survey results indicated that quite a respectable proportion of farmers (64%) belonged to farmers clubs. However the distribution of club membership among the household typologies was very uneven. In category IV (improved maize growers), 93% of the farmers belonged to farmers' club and in group III (tobacco growers), the proportion was slightly lower (82%). For groups I and II, only 12% and 29% of the farmers claimed to belong to farmers' club.
It should be mentioned that, currently, farmers' clubs are considered by the majority of farmers as vehicles for farm credit, since the new credit policy in the whole country is to provide credit through farmers' clubs (or other recognised groups) rather than through individuals. This has meant two things. Firstly, those farmers, who for one reason or the other, do not intend to take farm credit do not bother to join the clubs. Secondly, as the responsibility of credit repayment, under this system, becomes a group responsibility (as any group which defaults is refused credit the following year), acceptance of club membership very much depends on an individuals' potential to repay credit. This potential is mostly based on the individuals' past success in producing a marketable surplus of those crops for which input credit is readily available, ie improved maize and tobacco (and to some extent groundnuts). It is therefore not surprising to see that it is mostly improved maize growers and tobacco producers (who happen to be relatively young and educated) who gain access to these clubs.

It is only fair to mention that the project management is trying hard to change this image of the farmers' clubs, by encouraging the clubs to take up more diversified roles. For example, they are encouraged to take up welfare aspects, such as raising funds to help needy club members. They are also encouraged to take group approach to the agricultural development problem, by considering the club as a vehicle through which farmers can learn from one another and teach each other better methods of agriculture. In other words, the objective is to instil a spirit of self-help and togetherness among the club members. If this succeeds, a remarkable breakthrough will have been made in the smallholder development strategy of the country.
Table 5.1(e) Level of Formal Education Attained by Household Head

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Attended School</td>
<td>84.6</td>
<td>83.9</td>
<td>59.1</td>
<td>33.3</td>
<td>58.9</td>
</tr>
<tr>
<td>Some Primary</td>
<td>15.4</td>
<td>16.1</td>
<td>40.9</td>
<td>61.4</td>
<td>39.2</td>
</tr>
<tr>
<td>Completed Primary</td>
<td></td>
<td></td>
<td></td>
<td>5.3</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

n= 26 31 44 57 158

Table 5.1(f) Marital Status of Head of Household

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married - non-polygamist</td>
<td>3.8</td>
<td>74.2</td>
<td>65.9</td>
<td>77.2</td>
<td>61.4</td>
</tr>
<tr>
<td>Polygamist</td>
<td>11.5</td>
<td>9.7</td>
<td>29.5</td>
<td>15.8</td>
<td>17.7</td>
</tr>
<tr>
<td>Divorced</td>
<td>30.8</td>
<td></td>
<td>2.3</td>
<td></td>
<td>5.7</td>
</tr>
<tr>
<td>Widowed</td>
<td>46.2</td>
<td>16.1</td>
<td>2.3</td>
<td></td>
<td>11.4</td>
</tr>
<tr>
<td>Never married</td>
<td>7.8</td>
<td></td>
<td></td>
<td>7.0</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

n= 26 31 44 57 158

Table 5.1(g) Membership of Farmers Club

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>11.5</td>
<td>29.0</td>
<td>81.8</td>
<td>93.0</td>
<td>64.0</td>
</tr>
<tr>
<td>NO</td>
<td>88.5</td>
<td>71.0</td>
<td>18.2</td>
<td>7.0</td>
<td>36.0</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

n= 26 31 44 57 158
B. FARM CHARACTERISTICS.

1. Farm Size

The mean size of cultivated area among the households interviewed was 1.66 hectares. With a mean household size of 4.7 persons, the above figure implies that the mean cultivated hectarage per capita among the sampled households was 0.35 hectares. The size distribution of the farms indicate that well over 75% of the households' cultivated farms are less than 2 hectares. However, a more interesting picture emerges when we consider the size distribution of farms among the households. It was observed that 96.2% of category I households had cultivated farms of less than 2 hectares, while the corresponding proportions for the other groups were 90.3%, 65.9% and 70.2% for categories II, III, and IV respectively (see table 5.2(a)). This implies that category I households, had on average, the smallest farms (average 0.9 ha), followed by category II (average 1.2 ha), while category III households had the largest farms (average 2.1 ha), followed by category IV households (average 2.0). A similar pattern was exhibited when average per capita hectarage was considered, except that category IV households had the highest per-capita hectarage (0.41 ha), followed by category III households (0.33 ha).

However, the size distribution of cultivated areas among the households does not necessarily reflect the access to land of the various households. Table 5.2(b) indicates that among category I households, who have the smallest farms, only 69% of the households had cultivated all the land available to them. This contrasts with 84%, 93% and 86% for categories II, III, and IV, respectively, suggesting that the size of the cultivated area is determined by other factors in addition to land availability per se. We shall examine this issue in Chapter 6.
Table 5.2(a) Size Distribution of Cultivated Land per Household and Category - 1980/81.

<table>
<thead>
<tr>
<th>FARM SIZE</th>
<th>HOUSEHOLD CATEGORY (% of Households)</th>
<th>1</th>
<th>11</th>
<th>111</th>
<th>IV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 0.4 ha.</td>
<td></td>
<td>23.1</td>
<td>9.7</td>
<td>2.3</td>
<td>5.3</td>
<td>8.2</td>
</tr>
<tr>
<td>0.4 - 1.0 ha.</td>
<td></td>
<td>57.1</td>
<td>48.4</td>
<td>15.9</td>
<td>33.3</td>
<td>35.4</td>
</tr>
<tr>
<td>1.1 - 1.8 ha.</td>
<td></td>
<td>15.4</td>
<td>32.2</td>
<td>47.7</td>
<td>31.6</td>
<td>33.5</td>
</tr>
<tr>
<td>1.9 - 2.6 ha.</td>
<td></td>
<td>3.8</td>
<td>6.4</td>
<td>15.9</td>
<td>15.8</td>
<td>12.0</td>
</tr>
<tr>
<td>2.7 - 4.8 ha.</td>
<td></td>
<td>-</td>
<td>3.2</td>
<td>18.2</td>
<td>8.8</td>
<td>8.9</td>
</tr>
<tr>
<td>5.9 and over</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5.3</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Mean hectarage/household (ha) 0.9 1.2 2.1 2.0 1.7
Mean hectarage/capita (ha) 0.26 0.28 0.33 0.41 0.35
n= 26 31 44 57 158

Table 5.2(b) Land Cultivated - as Proportion of Total Land Available to Household.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>11</th>
<th>111</th>
<th>IV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>All the land</td>
<td>69.2</td>
<td>83.9</td>
<td>93.2</td>
<td>86.0</td>
<td>84.8</td>
</tr>
<tr>
<td>More than half the land</td>
<td>23.1</td>
<td>13.0</td>
<td>6.8</td>
<td>12.3</td>
<td>12.0</td>
</tr>
<tr>
<td>less than half the land</td>
<td>7.7</td>
<td>3.1</td>
<td>-</td>
<td>1.7</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

n= 26 31 44 57 158
Table 5.2(c) Change in Amount of Land Used by Household during the Past 5 years.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>11</th>
<th>111</th>
<th>1V</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE</td>
<td>30.8</td>
<td>61.3</td>
<td>61.4</td>
<td>73.7</td>
<td>60.8</td>
</tr>
<tr>
<td>YES - gave away</td>
<td>23.1</td>
<td>-</td>
<td>6.8</td>
<td>1.8</td>
<td>6.3</td>
</tr>
<tr>
<td>YES - lent away</td>
<td>38.5</td>
<td>38.7</td>
<td>29.5</td>
<td>21.0</td>
<td>29.7</td>
</tr>
<tr>
<td>YES - acquired</td>
<td>7.7</td>
<td>-</td>
<td>2.3</td>
<td>3.5</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 5.2(d) Adequacy of Land Available for Household Needs

<table>
<thead>
<tr>
<th>Household Category</th>
<th>1</th>
<th>11</th>
<th>111</th>
<th>1V</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>42.3</td>
<td>38.7</td>
<td>47.7</td>
<td>28.1</td>
<td>38.0</td>
</tr>
<tr>
<td>NO</td>
<td>57.7</td>
<td>61.3</td>
<td>52.3</td>
<td>71.9</td>
<td>62.0</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

11. Land Availability.

The issue of land availability and its effect on farm size in LLDP is not clear from our survey results. Table 5.2(c) indicates that overall, 36% of the households interviewed had experienced a decline in the amount of land available to them during the previous 5 years, largely through giving some away to relatives and adult children (6%) and for lending it away usually to better-off relatives needing more land (30%). Only 3% of the sample reported having augmented their land holdings, either by farming virgin land or acquiring it from relatives, etc, during the 5 year period. This strongly suggests that land pressure is eminent in the area.

When availability of land to the various categories is considered, it is seen that those households with the smallest
cultivated areas (e.g., category I) tended to have some considerable proportions of their available land holdings uncultivated (Table 5.2(b), as mentioned above. At the same time table 5.2(c) indicates that most of category I households (62%) had experienced a decline in the amount of land available to them, during the 5 year period, this compared with 39%, 36% and 23% for categories II, III, and IV. This clearly indicates that the poorer households had less land available to them then, than five years past. The age structure of the household typologies seems to offer a partial explanation for this aspect. Table 5.1(c) indicates that category I households are in general headed by older people, followed by category II ones, while the household heads of categories III and IV tend to be relatively younger. This suggests that categories I and II are at a point in the family cycle where the more energetic members of the family (adult children) are leaving or have left the household to start their own households. This results in the high proportion of households in this category giving away land to others - hence leading to a decline in land availability to the category. At the same time, the link between availability of labour (family) and farm size is revealed. It is seen that as these categories lose their energetic members, their ability to cultivate land effectively declines, and this results in their tendency to lend their land away to relatives and friends (as opposed to outright giving away - as they intend keeping such land for younger children).

Table 5.2(d), which indicates the adequacy or inadequacy of land available to family needs, supports most of the points raised above. In the first place, the table shows that a considerable proportion of the households surveyed (62%) considered the land available to them as inadequate for family needs - thus suggesting the rising pressure on the land. On the other hand, the fact that category I households (with the smallest cultivated area) had the second largest proportion of households who considered their land as adequate for household needs, supports the view that such households were at a point in time, in the family life cycle which represented both reduced workers and consumers. This suggests that their small cultivated area were a result of reduced labour availability as well as reduced consumption requirements.
However, the data does not allow us to say which of the two factors is stronger.

Table 5.2(d) also provides a very interesting case. That is category III has the largest proportion of households who indicated that they had adequate land for their needs (48%), while category IV, had the smallest proportion (28%). The family cycle aspect cannot be applied here as a full explanation of the observed pattern, largely because the difference in the mean ages of the household heads of the two categories is not that large — i.e. 47 years for group III and 41 years for group IV. A more likely explanation appears to be the type of enterprises the two household categories engage in. As pointed out previously, category IV households are engaged in production of improved maize, and are the more commercially oriented households. As such, they tend to have a higher craving for land, so as to enhance their income positions further. On the other hand, category III households were predominantly engaged in production of tobacco. Although some of them grew improved maize, their engagement in this enterprise appeared to be largely for subsistence purposes. And, as tobacco production was subject to quota limitations, their cash income positions could not be substantially affected by the availability of extra land. More important, it appears that due to the heavy labour demands associated with the tobacco enterprise, tobacco producing households had less spare labour than the hybrid maize producers (whose peak labour demands were more amenable to hired labour due to the associated sharp peak). As a result, most of the tobacco growing households (48%) felt satisfied with the sizes of their farms.

It therefore appears that a household's size of cultivated land was dependent upon three main factors, namely:

1. Labour availability.
2. Degree of commercialization (as determined by the type of crop enterprise undertaken).
3. Physical availability of land.

While it can be said that the third factor was largely outside the influence of the individual household, the other two were very much determined by the households' resources.
We shall return to consider them in more detail in Chapter 6.

C. LABOUR AVAILABILITY.

1. Family Labour

Family labour is the predominant source of labour for farm work among the smallholder households in LLDP, and indeed, for most of the smallholding community in Malawi. According to our survey, 68% of the households interviewed reported that they depended entirely on family labour for agricultural work during the 1980/81 season. The remaining 32% supplemented their family labour with hired labour. No household was found to be fully dependent on hired labour for farm work.

Household size is the main indicator of family labour availability. As indicated above, the mean household size was found to be 4.8 persons. However, while household size can be taken as a proxy to availability of family labour, it should be borne in mind that it does not give an indication of the quality of labour available as this depends on other factors. Age composition of the household labour force is one such factor. In table 5.3(a) household labour available is presented in adult equivalents—that is after adjusting the household size by the age composition of the members following the conversion table below:

<table>
<thead>
<tr>
<th>Age group</th>
<th>less than 10 years</th>
<th>10-14</th>
<th>15-19</th>
<th>20-59</th>
<th>60+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult equivalent coefficient</td>
<td>NIL</td>
<td>0.25</td>
<td>0.75</td>
<td>1.0</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Note that the coefficients do not distinguish quality of labour along sex lines. This is largely due to the fact that the present writer does not agree with the procedure of many researchers which upholds this distinction. The author's observation in LLDP indicated that in households where female and male workers were present, the men and women engaged themselves equally in the most labour demanding exercises, such as, weeding, banding, manure or fertilizer application, harvesting, etc. Gone seem to be the days when men felled trees and tilled the land while women tended, harvested and processed the crops. Today men and women are found working side by side, say in the tobacco barn, grading their crop, a job which was exclusively for men. As
such, there seems no justification for grading agricultural labour along sex lines.

Table 5.3(a) Size Distribution of Family Labour Available to the Household (in Adult Equivalents).

<table>
<thead>
<tr>
<th>Adult Equivalents</th>
<th>TYPOLOGY (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>0- 1.5</td>
<td>30.7</td>
</tr>
<tr>
<td>1.6-2.5</td>
<td>50.0</td>
</tr>
<tr>
<td>2.6-3.5</td>
<td>15.4</td>
</tr>
<tr>
<td>3.6-4.5</td>
<td>3.9</td>
</tr>
<tr>
<td>4.6 and over</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

Average AE/household  

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=</td>
<td>26</td>
<td>31</td>
<td>44</td>
<td>57</td>
<td>158</td>
</tr>
</tbody>
</table>

Table 5.3(a) indicates that the average household had a work force of 2.1 adults equivalents. This implies that the typical family workforce comprised of the two spouses - plus one or two children of working age. However, about 20% of the sample had only 1½ workers (AEs) or less, while only 14.5% had more than 3.5 workers. Almost half the sample had between 1½ and 2½ workers.

The table clearly indicates that Group I households, because of the absence of the male spouse, had the smallest family workforces (average of 1.4 AEs). It is evident that for this group, male absenteeism had a serious consequence on family labour availability. Groups II and IV had mean labour forces which were more or less equivalent to the mean available labour force for the whole sample, ie, 1.9 and 2.0 respectively - suggesting that in a majority of cases, such households had only the two spouses available to work. This implies that the children from such households did not usually stay to work on the household farm once they grew up. Discussions during the interviews suggested that for group II households, because of their weak economic position, the grown up children either tended to break away from the nuclear family to start their own families, or go
away from home in search of work - usually of the unskilled type. For group IV households, on the other hand, the children tended to be relatively better educated and therefore moved from the farm into urban employment. Group III households had the largest average family labour forces available (average 2.7 AEs), a direct result of the large family sizes associated with this group. Again discussions during the interview tended to suggest that migration of members from these households tended to be minimal due to the improved income prospects offered by the tobacco enterprise. However, as the survey did not specifically seek to explore the reasons why other households had fewer members in residence than others, an omission which is now deeply regretted, the above explanation should be interpreted as speculative. More research is definitely needed in this very important area, before more forceful conclusions can be formed.


As indicated above, about 4 of the sample reported that they had used one type of hired labour or the other for agricultural purposes during the 1980/81 season. Due to lack of precise records regarding labour hiring, it was not possible to find out the exact duration for which labour was hired. But most of the labour was hired during December and January (the crop establishment period) for weeding purposes (reported by 54% of the households hiring labour). Temporary labour (ganyu), of a piece work nature, was the most popular type of labour hired (reported by 68% of the households hiring labour), reflecting the seasonal nature of the type of work involved. 46% of those hiring labour reported paying cash for labour, 38% paid in kind while 16% paid for their hired labour for both in cash and in kind. The average expenditure on hired labour, for those hiring households was K32 per household.

Looking at the various household typologies, it is observed that only 15% of the households in category I reported hiring labour during the 1980/81 season for agricultural work, paying for it largely in kind. For group II only 13% reported to have hired labour also paying mostly in kind for it. Given that category I households had the smallest family forces (1.4 AEs),
it would be expected that these households would tend to supplement their family labour with hired labour. The fact that the available evidence suggests that this was not the case seems to indicate the very weak economic position of these households. In addition, it gives a pointer to the fact that these households plus category 11 households are the main sources of hired labour in the area, and evidence provided in table 6.1 indicates that temporary employment is very important source of cash income for these households.

Group 111 households had the highest proportion of labour hiring households (52%), despite their very large family labour forces as indicated in table 5.3a. This is partly due to the large cultivated areas associated with this group and partly due to the fact that the tobacco enterprise is very labour intensive.

It is interesting to note that quite a substantial proportion of households in this category 27.4% paid their labour either in kind, or both in cash and kind, with 25% having paid in cash. This could largely be due to the fact that this group of farmers does grow a substantial amount of maize in addition to tobacco, and obtains higher output levels than the average farmer, due to their privileged access to input credit. As they consider tobacco to be their main cash earner, they tend to use maize as payment for such needed labour on their tobacco plots - which the marginal farmers, usually with food deficits at the particular time of the year, prefer to cash. This is supported by the evidence provided by Kydd (1982) which indicates that a very small proportion of farm cash income for tobacco growers (less than 10% of total farm receipts) came from maize. (9)

Group IV households have the second largest proportion of labour hiring households (32%), and the majority of them (72% of the labour hirers) paid for their hired labour in cash. This strongly suggests their diversified cash earning opportunities and their greater degree of commercialization.

Unfortunately, the only indicator available from our survey which gives a measure of the extent of use of hired labour by the various household categories is the total expenditure on hired labour, presented in table 5.3(d). Given that different types of hired labour (say child labour as opposed to adult labour)
command different prices at different times of the year (due to the differences in activities performed), total expenditure on hired labour may not provide a very satisfactory measure of amount of hired labour used by a household. However, due to the time and financial limitations on our study this shortcoming could not be helped, suffice it to say that any tentative conclusions emerging from such a measure should be viewed within those limitations.

From table 5.3(d), it is quite evident that categories 1 and 11 made the least use of hired labour. Those who hired labour in these two categories spent on average K7.1 and K5.2 per cultivated hectare, respectively, to supplement their family labour forces, which for the two categories averaged 1.6 workers per cultivated hectare. This contrasts with average expenditures on hired labour of K12.9 and K23.4 per cultivated hectare, to supplement average workforces of 1.2 and 1.1 workers per cultivated hectare, for categories 111 and 1IV, respectively. Such evidence strongly suggests that the ability of those households in categories 111 and 1IV to hire labour had a very strong bearing on their cultivated hectares and farm incomes. We shall take up this issue in more detail in the next chapter.

Table 5.3(b) Types of Labour Hired.

<table>
<thead>
<tr>
<th>Types of Labour Employed</th>
<th>(%) of Households</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>None Hired</td>
<td>84.6</td>
</tr>
<tr>
<td>Temporary labour hired</td>
<td>11.5</td>
</tr>
<tr>
<td>Permanent labour (more than 6 months)</td>
<td>-</td>
</tr>
<tr>
<td>Customery labour hired</td>
<td>3.9</td>
</tr>
<tr>
<td>Mixture</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
</tr>
<tr>
<td>n</td>
<td>26</td>
</tr>
</tbody>
</table>
Table 5.3(c) Form of Payment For Hired Labour.

<table>
<thead>
<tr>
<th>Form of Payment</th>
<th>Household Typology (% of households)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>Nil (no labour hired)</td>
<td>84.6</td>
</tr>
<tr>
<td>Cash</td>
<td>7.7</td>
</tr>
<tr>
<td>In kind</td>
<td>7.7</td>
</tr>
<tr>
<td>Both</td>
<td>-</td>
</tr>
</tbody>
</table>

| n=               | 26  | 31  | 44  | 57  | 158 |

Table 5.3(d) Household Expenditure on Hired Labour.

<table>
<thead>
<tr>
<th>EXPENDITURE</th>
<th>% of Households</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>Nil</td>
<td>84.6</td>
</tr>
<tr>
<td>Less than K5</td>
<td>3.8</td>
</tr>
<tr>
<td>K5 - 10</td>
<td>3.8</td>
</tr>
<tr>
<td>K11 - 20</td>
<td>7.6</td>
</tr>
<tr>
<td>K21 - 50</td>
<td>-</td>
</tr>
<tr>
<td>K51 - 100</td>
<td>-</td>
</tr>
<tr>
<td>K101 and over</td>
<td>-</td>
</tr>
</tbody>
</table>

| 100.0        | 100.0    | 100.0     | 100.0     | 100.0     |

| Average cost/household (K) | 6.38 | 6.25 | 27.80 | 46.80 | 31.50 |
| Average Expenditure per cultivated ha(K) | 7.1 | 5.2 | 12.9 | 23.4 | 18.6 |
| n=               | 26  | 31  | 44  | 57  | 158  |
D. INPUT USE AND FARM CREDIT.

I. Farm Inputs Applied on Crops.

The most widely used inputs in LLDP in the 1980/81 season were fertilizers and farm manure (on maize and tobacco), sulphur dust (on groundnuts) and pesticides (on maize and tobacco). Table 5.4(a) indicates that 40% of the households sampled reported to have used fertilizers during the year, 24% used both manures and fertilizers, 4% used manures only while 31% reported that they had not applied any farm input to their crops. On the whole, a reasonably high proportion of households in the sample (69%), used farm inputs of one type or the other. The distribution of input use among the various typologies highlights the typical problem for groups I and II. As table 5.4(a) indicates, 65% and 61% of category I and II households, respectively reported that they had not used any inputs. This contrasts with 2% and 21% for categories III and IV, respectively.

Table 5.4(a)  Types of Inputs Used by Household Typologies.

<table>
<thead>
<tr>
<th>TYPE OF INPUT</th>
<th>HOUSEHOLD TYPOLOGY (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>None</td>
<td>65.4</td>
</tr>
<tr>
<td>Fertilizers</td>
<td>26.9</td>
</tr>
<tr>
<td>Manures</td>
<td>7.7</td>
</tr>
<tr>
<td>Fertilizers &amp; Manures</td>
<td>_</td>
</tr>
<tr>
<td>Other</td>
<td>_</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
</tr>
<tr>
<td>n=</td>
<td>26</td>
</tr>
</tbody>
</table>

Table 5.4(b) indicates that 33% of those interviewed expressed the view that they felt that they were using adequate amounts of inputs on their crops. Of those who felt dissatisfied with their level of input use, 26% said the price of inputs was too high, 18% said they were not given enough credit and 22% cited other reasons, the commonest one being that they were afraid
either to take credit or to increase their level of credit for fear of the likely consequences to befall them if they failed to meet their credit commitments. Groups 1 and 11 had the largest proportion of households blaming high prices (50% and 39% respectively) and expressing unease with taking credit (27% and 36% respectively). Most of groups 111 (55%) and IV (39%) households expressed satisfaction with the levels of inputs they were applying to their crops. Of those who did not, the main complaint was inadequacy of credit (54%).

Table 5.4(b) Reasons for Using Less Inputs than Required:

<table>
<thead>
<tr>
<th>Reason</th>
<th>Household Typology (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>None</td>
<td>50.0</td>
</tr>
<tr>
<td>Prices too high</td>
<td>15.4</td>
</tr>
<tr>
<td>Inadequate credit</td>
<td>7.7</td>
</tr>
<tr>
<td>Other</td>
<td>26.9</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
</tr>
<tr>
<td>n=</td>
<td>26</td>
</tr>
</tbody>
</table>

II. Credit

The results of the survey indicated that LLDP was the only source of input credit for the smallholder community in the project area. However, the author is of the opinion that some of the poorer farmers who did not qualify for LLDP credit were able in some circumstances, to obtain input credit via their wealthier friends and / or relatives. It is possible for example that some better off farmers with access to input credit might have taken inputs on credit, over and above their requirements and channeled the rest to their poorer relations. Such secondary credit could not be recorded by our survey as both recipients and donors were not keen to divulge such information for fear of reprisals from the project credit staff.
Table 5.4(c) shows that 57% of the households interviewed got farm credit from LLDP during the 1980/81 season. However, the table indicates that this credit was very unevenly distributed among the household typologies. For example, only 2 of the 26 category 1 households (8%) got credit, while the corresponding proportion for category 11 households was 22.6%. This compares with 77% and 88%, for categories 111 and 1V, respectively. This clearly indicates that typologies 1 and 11 farmers got very little credit, accounting for less than 10% of the credit recipients. This bias in credit allocation towards categories 111 and 1V households is quite evident in table 5.4(f).

According to this table, 65% and 45% of categories 1 and 11 households, respectively, had never received any credit from LLDP (at least for the five consecutive years prior to our survey). This compares to only 7% and 5% for categories 111 and 1V households, respectively. On the other hand, the table indicates that 5% and 25% of categories 111 and 1V households, respectively, had been in receipt of LLDP credit for each of the previous 5 years prior to the survey.

<table>
<thead>
<tr>
<th>Table 5.4(c) Source of Farm Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>LLDP</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>n=</td>
</tr>
</tbody>
</table>
Table 5.4(d) Type of Inputs Obtained on Credit

<table>
<thead>
<tr>
<th>Household Typology (%)</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>92.4</td>
<td>77.4</td>
<td>22.7</td>
<td>12.3</td>
<td>41.1</td>
</tr>
<tr>
<td>Fertilizers</td>
<td>-</td>
<td>13.0</td>
<td>40.9</td>
<td>17.5</td>
<td>23.4</td>
</tr>
<tr>
<td>Improved seeds</td>
<td>3.8</td>
<td>6.4</td>
<td>-</td>
<td>21.1</td>
<td>7.6</td>
</tr>
<tr>
<td>seeds/fertilizers</td>
<td>3.8</td>
<td>3.2</td>
<td>36.4</td>
<td>47.4</td>
<td>27.2</td>
</tr>
<tr>
<td>others</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.7</td>
<td>0.7</td>
</tr>
<tr>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

n= 26 31 44 50 93

Table 5.4(e) Size Distribution of Credit Among the Households taking credit.

<table>
<thead>
<tr>
<th>Amount of Credit</th>
<th>Household Typology (%)</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>K5 - K10</td>
<td></td>
<td>-</td>
<td>-</td>
<td>2.9</td>
<td>10.0</td>
<td>6.5</td>
</tr>
<tr>
<td>K11 - K20</td>
<td>100.0</td>
<td>71.4</td>
<td>17.6</td>
<td>24.0</td>
<td>26.9</td>
<td></td>
</tr>
<tr>
<td>K21 - K50</td>
<td></td>
<td>-</td>
<td>28.6</td>
<td>52.9</td>
<td>42.0</td>
<td>44.1</td>
</tr>
<tr>
<td>K51 - K100</td>
<td></td>
<td>-</td>
<td>-</td>
<td>14.7</td>
<td>16.0</td>
<td>14.0</td>
</tr>
<tr>
<td>K100 and over</td>
<td></td>
<td>-</td>
<td>-</td>
<td>11.8</td>
<td>8.0</td>
<td>8.6</td>
</tr>
<tr>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

n= 2 7 34 50 93
Table 5.4(f) Number of Times Household took Credit in 5 years.

<table>
<thead>
<tr>
<th>Number of Times</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>65.4</td>
<td>45.2</td>
<td>6.8</td>
<td>5.3</td>
<td>23.4</td>
</tr>
<tr>
<td>1</td>
<td>11.5</td>
<td>9.7</td>
<td>2.3</td>
<td>5.3</td>
<td>16.3</td>
</tr>
<tr>
<td>2</td>
<td>11.5</td>
<td>16.1</td>
<td>6.8</td>
<td>24.6</td>
<td>15.8</td>
</tr>
<tr>
<td>3</td>
<td>3.8</td>
<td>16.1</td>
<td>11.4</td>
<td>26.3</td>
<td>16.5</td>
</tr>
<tr>
<td>4</td>
<td>3.8</td>
<td>9.7</td>
<td>15.9</td>
<td>14.0</td>
<td>12.0</td>
</tr>
<tr>
<td>5</td>
<td>3.8</td>
<td>3.2</td>
<td>56.8</td>
<td>24.6</td>
<td>25.9</td>
</tr>
<tr>
<td>n=</td>
<td>26</td>
<td>31</td>
<td>44</td>
<td>57</td>
<td>158</td>
</tr>
</tbody>
</table>

Most of the credit was used for either seed/fertilizer (reported by 48% of the households) or fertilizer packages (reported by 39% of the sample). Only 13% of the households reported to have used credit for purchasing improved seeds (and that was mostly groundnut seeds). No other inputs were reported to have been obtained on credit. The average amount of loan per credit taking household was K41.2 [see table 5.4(e)]. In general terms, the distribution of credit (terms of loan size) among the credit recipients was more or less a normal one, with the majority of households (44.1%) having loans which fell within the K21 - K50 range. This reflects the fact that during the 1980/81 season, there was an element of credit rationing among the applicants, which arose out of an increasing desire by LLDP to increase the credit clientele and at the same time to reduce the dependence of the better-off farmers on credit, thereby inducing them to increasingly rely on purchasing inputs on cash. This aspect is supported by the evidence presented in table 5.4(b) which shows that 55% and 39% of categories III and IV households (the most credit worthy ones) expressed the feeling that LLDP was giving them less input credit than their credit needs. During the interviews, quite a number of these households said that they had been given less inputs on credit than they had applied for. In view of the evidence presented in table 5.4(f), this is a very welcome development in the project area. It is hoped that more and more of the wealthier farmers, will not only be subjected to some form of credit rationing, but will eventually
be weaned off, to give chance to the more needy farmers to get inputs on credit. However, this author does not pretend that this is an easy task, for there are many obstacles. For example, most of these better-off farmers, represent the powerful and more enlightened rural people. As such, they are the likely people to hold offices in the various local groups (such as farmers clubs and Village Planning Committees) through which LLDP works to enhance local participation. Access to credit and other facilities offered by LLDP, are the main incentives which ensures their co-operation in the Project's efforts. Therefore reducing the amount of benefits accruing to them may not be without some repurcusions to the project success, but if this results in greater participation among the poorer households, it will have been a worthy price to pay, and its long term benefits may well outweigh the short term dis-advantages.

111. Cash Purchases of Inputs.

Our survey results indicate that not all farm inputs used in LLDP were obtained on credit. A substantial number of households (comprising 38% of the sample), bought inputs for cash. 50% of those who made cash purchases of inputs bought fertilizers, 32% bought both fertilizers and improved seeds and 15% spent cash on farm implements (especially the ox-cart - for farm transport). Cash purchases of improved seeds were negligible. This appears to have been due to two reasons. The first is that, improved seeds were available mostly as seed/fertilizer packages (either on credit or for cash), to ensure their success. The second is that, there were usually supply problems involved, which prevented availability of improved seeds on cash. Those that were available were usually provided as seed/fertilizer packages, to give the extension personnel a leverage on the farmers.
Table 5.4(g)  Type of Inputs Purchased on Cash

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Household Typology (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Fertilizers</td>
<td>100.0</td>
</tr>
<tr>
<td>Insecticides/pesticides</td>
<td>—</td>
</tr>
<tr>
<td>Improved seeds</td>
<td>—</td>
</tr>
<tr>
<td>Farm Implements</td>
<td>—</td>
</tr>
<tr>
<td>Fertilizers and Improved seeds</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

n= 4 5 27 24 60

As expected, categories 1 and 11 households participated least in buying inputs on cash, as they comprised only 15% of the households making cash purchases of inputs, and the average cash outlay per household (purchasing inputs) in these two categories was K10.2, the equivalent of 1½ bags (50 kg/bag) of say Sulphate of Ammonia fertilizer. On the other hand, category 111 households comprised the largest proportion (45%) of cash purchasers of inputs, spending most of their cash on fertilizers. The average cash outlay per household (purchasing inputs on cash) for this typology was K37.7. Category 1V households tended to buy mostly seed/fertilizer packages [see table 5.4(g)].

Overall, it can be said that the proportion of households using inputs is quite high (69%). Credit was the main source of these inputs (reported by 59% of sample), supplemented by cash purchases (reported by 38% of sample). However, the survey results have indicated that categories 1 and 11 households participate minimally in the use of inputs, with only 16% of them getting credit and the same proportion buying inputs on cash. In the next chapter, we shall examine in more detail the factors that might be responsible for this state of affairs.
Table 5.4(h) Cash Outlays on Farm Inputs

<table>
<thead>
<tr>
<th>Amount of Cash</th>
<th>Household Category (%)</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td></td>
<td>84.6</td>
<td>83.8</td>
<td>38.6</td>
<td>57.9</td>
<td>62.0</td>
</tr>
<tr>
<td>Less than K5</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.9</td>
<td>0.6</td>
</tr>
<tr>
<td>K5 - K10</td>
<td></td>
<td>11.5</td>
<td>9.8</td>
<td>2.3</td>
<td>5.3</td>
<td>6.3</td>
</tr>
<tr>
<td>K11 - K20</td>
<td></td>
<td>3.9</td>
<td>6.4</td>
<td>29.5</td>
<td>14.0</td>
<td>13.9</td>
</tr>
<tr>
<td>K21 + K50</td>
<td></td>
<td>-</td>
<td>-</td>
<td>8.2</td>
<td>12.3</td>
<td>9.5</td>
</tr>
<tr>
<td>K51 - K100</td>
<td></td>
<td>-</td>
<td>-</td>
<td>2.3</td>
<td>1.9</td>
<td>1.3</td>
</tr>
<tr>
<td>K101 and over</td>
<td></td>
<td>-</td>
<td>-</td>
<td>9.1</td>
<td>7.0</td>
<td>5.1</td>
</tr>
</tbody>
</table>

100.0 100.0 100.0 100.0 100.0

n = 26 31 44 57 158

Main Constraints to Farming Operations.

Each of the households interviewed was asked to state what was considered as the most limiting constraint on the household's prospect from farming. The largest proportion of the households (37%) claimed that land shortage was their main problem. This was followed by lack of funds for farm inputs (28.5%), labour shortage (19%) and other (10%). The prominence of the land shortage factor highlights the eminence of the rising pressure on the land in the area. However, it needs some careful consideration. At face value, this finding is at variance with the hypothesis advanced in this study, ie, that land availability per se, is not the main limiting factor to most households, for increasing their farm incomes, but rather that labour is. Nevertheless, when the main constraints faced by each of the categories are examined, the predominance of the labour factor can be established. For example, although land shortage features predominantly among the better-off households (categories III and IV), the labour availability problem is still relevant to these households. As indicated earlier on, these two groups are associated with a high level of labour hiring. This implies that the availability of cheap labour (from the poorer households) masks the labour availability problem of those households (especially since
it was assumed in the appraisal projection of ILDP that households would use family labour for farm work. More important, this aspect of hiring labour merely transfers the labour problem from the better-off households to the poorer ones, making the situation of the latter group more serious. At the same time, table 5.4(i) indicates that labour shortage and lack of farm inputs predominate among the poorer households. A closer investigation reveals that these two factors (labour availability, and lack of inputs) are closely causally linked, with the direction of causality running from labour availability to lack of inputs (especially those provided on credit). This implies that even those households who said lack of farm inputs was their main constraint, it was actually lack of adequate labour (through its link to availability of inputs on credit), which was at the centre of the matter. It therefore appears that the labour availability situation in the area, warrants more attention. It is for this reason that most of the next chapter will be devoted to a discussion of this issue.

Table 5.4(i) Major Constraints on Households' Farming Activities.

<table>
<thead>
<tr>
<th>Constraint</th>
<th>Household Typology (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>Land shortage</td>
<td>26.9</td>
</tr>
<tr>
<td>Shortage of funds for input</td>
<td>34.6</td>
</tr>
<tr>
<td>Labour shortage</td>
<td>38.5</td>
</tr>
<tr>
<td>Inadequate extension</td>
<td>-</td>
</tr>
<tr>
<td>Low farm prices</td>
<td>-</td>
</tr>
<tr>
<td>Other (a)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

(a) includes those who said they faced no constraints at all.
E. Household Incomes

The estimation of incomes for rural households in most rural societies present many difficulties mostly due to the predominance of subsistence production. Most of the rural households produce and consume goods and services that do not pass through formal marketing channels. This presents a problem of valuing such commodities. Even where the commodities are marketed, or where "imputed values" are agreed upon, for the non-marketed output, the records to establish precisely how much of say commodity was produced, marketed and/or consumed by the household during a given period, do not exist. Besides, the goods and services involved are not homogeneous in terms of quality - thereby rendering any attempts at valuation, using "imputed values", more or less useless. As such, any estimates of rural household incomes, in such circumstances, are at best, mere indicators of what the prevailing income position might have been.

This study faced precisely the same problems in trying to provide an estimate, of the existing pattern of income distribution in LLDP (which is necessary in order to evaluate the impact of the programme in the area). As such, the results presented below, should be regarded as a mere indicator of the situation, and should be interpreted cautiously. Three main indicators of household income were selected, namely:

(a) Subsistence income - ie estimated total output of maize (the main staple food in the area), per household, for the year 1979/80.

(b) Farm-income = Estimated sales from crops and livestock (including poultry), for the 1979/80 season.

(c) Non Farm Income - Estimated cash receipts from non-farm sources such as off-farm employment, business and transfers.

1. Subsistence Income.

In LLDP, and indeed, for most of rural Malawi, it is the pride and wish of every household head to be self-sufficient
in basic foodstuffs. As such, it could be said that it is
the primary objective of all farm households in LLDP to
provide themselves with adequate maize (the main staple), for
the year. This proposition is strengthened by the fact that all
farm households in the area grew maize for own consumption.
While it is recognised that other minor crops such as cassava,
sweet potatoes, finger millet, etc, are used for subsistence
purposes (usually to supplement maize), because they were not
grown by all the households, they were left out, from the food
self-sufficiency indicator. Their absence, therefore, under-
estimates the food self-sufficiency position, especially of
those households using them substantially. However, as
indicated in chapter 2, these minor crops form a very insigni-
ficant proportion of the farming system in the area. Table
5.5(a), therefore, presents the size distribution of total
maize output levels per household, according to household
typology.

Table 5.5(a) Total Maize Output (harvested in the 1979/80
season).

<table>
<thead>
<tr>
<th>Total maize output (200 lb bags)</th>
<th>Household Typology (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>Less than 2.5</td>
<td>19.2</td>
</tr>
<tr>
<td>2.5 - 5</td>
<td>30.8</td>
</tr>
<tr>
<td>6 - 7.5</td>
<td>34.6</td>
</tr>
<tr>
<td>8 - 10</td>
<td>11.5</td>
</tr>
<tr>
<td>11 - 20</td>
<td>3.8</td>
</tr>
<tr>
<td>Over 20</td>
<td>_</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

Average output per household (kg)

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>480</td>
<td>600</td>
<td>1780</td>
<td>1940</td>
<td>1390</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>31</td>
<td>44</td>
<td>57</td>
<td>15*</td>
</tr>
</tbody>
</table>

\[15\]
### Table 5.5(b) Types of Livestock and Poultry Kept.

<table>
<thead>
<tr>
<th>Type</th>
<th>Household Category (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>None</td>
<td>19.2</td>
</tr>
<tr>
<td>Local cattle</td>
<td>3.8</td>
</tr>
<tr>
<td>Goats/sheep/pigs etc</td>
<td>26.9</td>
</tr>
<tr>
<td>Chicken, ducks, etc</td>
<td>34.6</td>
</tr>
<tr>
<td>Goats &amp; chicken etc</td>
<td>11.5</td>
</tr>
<tr>
<td>Local cattle, goats, chickens etc</td>
<td>4.0</td>
</tr>
<tr>
<td>Other</td>
<td>_</td>
</tr>
</tbody>
</table>

100.0 100.0 100.0 100.0 100.0  

n= 26 31 44 57 158

(a) includes dairy cattle - owned by only 1 household.

### Table 5.5(c) Reported Cash Receipts From Livestock and Poultry Sales.

<table>
<thead>
<tr>
<th>Receipts</th>
<th>Household Typeology (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Nil</td>
<td>69.2</td>
</tr>
<tr>
<td>Less than K5</td>
<td>15.4</td>
</tr>
<tr>
<td>K5 - K10</td>
<td>7.8</td>
</tr>
<tr>
<td>K11 - K20</td>
<td>_</td>
</tr>
<tr>
<td>K21 - K30</td>
<td>3.8</td>
</tr>
<tr>
<td>K31 - K50</td>
<td>_</td>
</tr>
<tr>
<td>Over K50</td>
<td>3.8</td>
</tr>
</tbody>
</table>

100.0 100.0 100.0 100.0 100.0  

Average per household in each category (K) 5.3 18.3 9.6 18.0 13.6

n= 26 31 44 57 158
Table 5.3(d) Reported Cash Receipts From Crop Sales 1979/80 season.

<table>
<thead>
<tr>
<th>Receipts</th>
<th>Household Typology (%)</th>
<th>1</th>
<th>11</th>
<th>111</th>
<th>IV</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td></td>
<td>38.5</td>
<td>38.7</td>
<td>4.5</td>
<td>8.8</td>
<td>18.4</td>
</tr>
<tr>
<td>Less than K5</td>
<td></td>
<td>3.8</td>
<td>0.6</td>
<td></td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>K5 - K10</td>
<td></td>
<td>3.8</td>
<td>9.7</td>
<td></td>
<td>1.6</td>
<td>3.2</td>
</tr>
<tr>
<td>K11 - K20</td>
<td></td>
<td>11.5</td>
<td>12.9</td>
<td></td>
<td>7.0</td>
<td>7.0</td>
</tr>
<tr>
<td>K21 - K30</td>
<td></td>
<td>3.8</td>
<td>6.5</td>
<td>6.8</td>
<td>14.0</td>
<td>8.9</td>
</tr>
<tr>
<td>K31 - K50</td>
<td></td>
<td>11.5</td>
<td>16.1</td>
<td>11.4</td>
<td>12.3</td>
<td>12.6</td>
</tr>
<tr>
<td>K51 and over</td>
<td></td>
<td>27.1</td>
<td>16.1</td>
<td>77.3</td>
<td>56.1</td>
<td>49.3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Average/household (K)</td>
<td></td>
<td>31.7</td>
<td>20.5</td>
<td>240.2</td>
<td>140.6</td>
<td>126.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26</td>
<td>31</td>
<td>44</td>
<td>57</td>
<td>158</td>
</tr>
</tbody>
</table>

Table 5.5(e) Reported Cash Receipts From Business and Self-Employment.

<table>
<thead>
<tr>
<th>Receipts</th>
<th>Household Typology (%)</th>
<th>1</th>
<th>11</th>
<th>111</th>
<th>IV</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td></td>
<td>42.3</td>
<td>64.5</td>
<td>90.9</td>
<td>61.4</td>
<td>67.1</td>
</tr>
<tr>
<td>Less than K5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K5 - K10</td>
<td></td>
<td>7.7</td>
<td>9.7</td>
<td></td>
<td>3.5</td>
<td>4.4</td>
</tr>
<tr>
<td>K11 - K20</td>
<td></td>
<td>15.4</td>
<td>6.5</td>
<td>2.3</td>
<td>5.3</td>
<td>6.3</td>
</tr>
<tr>
<td>K21 - K30</td>
<td></td>
<td>26.9</td>
<td>6.5</td>
<td>6.8</td>
<td>8.8</td>
<td>10.8</td>
</tr>
<tr>
<td>K31 - K50</td>
<td></td>
<td>3.8</td>
<td>9.7</td>
<td></td>
<td>3.5</td>
<td>3.8</td>
</tr>
<tr>
<td>K51 and over</td>
<td></td>
<td>3.8</td>
<td>3.2</td>
<td></td>
<td>20.8</td>
<td>7.6</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Average/household (K)</td>
<td></td>
<td>13.8</td>
<td>11.4</td>
<td>2.0</td>
<td>58.5</td>
<td>26.1</td>
</tr>
<tr>
<td>n=</td>
<td></td>
<td>26</td>
<td>31</td>
<td>44</td>
<td>57</td>
<td>158</td>
</tr>
</tbody>
</table>
Table 5.5(f) Receipts From Permanent and Temporary Employment

<table>
<thead>
<tr>
<th>Household Typology (%)</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>69.2</td>
<td>64.5</td>
<td>95.5</td>
<td>87.7</td>
<td>82.3</td>
</tr>
<tr>
<td>Less than K5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K5 - K10</td>
<td>26.9</td>
<td>12.9</td>
<td></td>
<td>5.3</td>
<td>8.9</td>
</tr>
<tr>
<td>K11 - K20</td>
<td>3.8</td>
<td>12.9</td>
<td></td>
<td>1.8</td>
<td>3.8</td>
</tr>
<tr>
<td>K21 - K30</td>
<td>3.2</td>
<td></td>
<td>1.8</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>K31 - K50</td>
<td></td>
<td>6.5</td>
<td></td>
<td>1.8</td>
<td>1.9</td>
</tr>
<tr>
<td>K51 and over</td>
<td></td>
<td></td>
<td>4.5</td>
<td>1.8</td>
<td>3.8</td>
</tr>
</tbody>
</table>

100.0 100.0 100.0 100.0 100.0

Average/household (K) | 3.4 | 7.7 | 10.5 | 6.0 |

n= | 21 | 31 | 44 | 57 | 158 |

11. Reported Cash Income.

The pattern of income distribution, emerging from the survey results [tables 5.5(a) to 5.5(e)] will be discussed in detail in chapter 6, suffice it to say at the time that the income differential (reported cash income) between the better-off households and the poorer households in the region, is of the order of about 4:1. Although this does not represent a very acute distributional problem in the area, it still indicates that after a decade of the development effort in the area, about 2/5 of the farmers are getting incomes which are lower than they might have been getting if they participated and benefitted fully from the programme.
Notes - Chapter V.

1. A Household is defined as a group of people who usually take all their food from a common pot, i.e., a group of people who eat together. (They do not have to sleep in the same dwelling unit but in a majority of cases they do).

2. The following table illustrates how each of the 4 units was selected at random from the 40 units within LLDP.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Number of Households in Unit</th>
<th>Range of Random Numbers assigned.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>450</td>
<td>1 - 450</td>
</tr>
<tr>
<td>B</td>
<td>276</td>
<td>451 - 726</td>
</tr>
<tr>
<td>C</td>
<td>1054</td>
<td>727 - 1780</td>
</tr>
<tr>
<td>D</td>
<td>848</td>
<td>1781 - 2628</td>
</tr>
<tr>
<td>E</td>
<td>561</td>
<td>2629 - 3189</td>
</tr>
</tbody>
</table>

To select two units from units A to E, using the PPS method and an appropriate table of random numbers, two random numbers between 1 and 3189 are selected. If say the numbers selected are 8 and 1945, then the units selected are A and D. In this way each unit has a chance of selection proportional to its size (as measured by number of households).

The same procedure was used for selecting the villages. As for the individual households, all the households in a selected village were numbered consecutively, from 1 and the 10 households whose numbers corresponded to the first 10 random numbers drawn, were selected.

3. The head of the household is defined as that member of the household, male or female, upon whom the major decisions regarding resource allocation fell. In the cases where an adult male was resident in the household he was assumed to be the household head in keeping with the local tradition of letting the adult male make such decisions. However, it is recognised that in some cases such an assumption may not be right, especially where the male and female members of the household specialize in different crop enterprises, such as tobacco production for the males and groundnuts or food production for the females, although such a tendency seems to be on the decline in LLDP.


8. Previous work on this tends to value male labour higher than that of women (see, for example Collinson, M.P. (1972), *Farm Management in Peasant Agriculture*, Praeger, New York.

CHAPTER VI

AN ANALYSIS OF THE SURVEY RESULTS.

In the previous chapter, we looked at the main characteristics of the survey population. It was found that despite the apparent homogeneity of the rural households, there were basic differences in their farming systems which were reflected in their income positions. It was also found that certain household characteristics regarding such factors as labour availability, access to credit, access to non-farm income sources, etc, could be associated with particular crop enterprises and total income positions. This facilitated the grouping of the survey population households into a limited number of typologies which could be subjected to a more penetrating analysis.

In this chapter, an attempt will be made to trace the inter-relationships of the factors affecting total household income, which were suggested in the analysis undertaken in the previous chapter. In particular, to see how the current rural development effort has interacted with these factors and therefore contributed to the shaping of the observed pattern of income distribution in the area. As already pointed out, this analysis will focus on the examination of inter-household differences in reported cash receipts, particularly those from the farm enterprise (sale of crops). Because of the semi-subsistence nature of the economy under review, the analysis of the cash receipts will be supplemented, wherever possible, by an analysis of a subsistence income component, mostly in the form of the household's available food supplies (largely maize, the staple food in the area). The omission of asset values from the analysis is regretted. However, because the focus of the analysis is on innovation adoption, it is largely the household's ability to purchase farm inputs, which is supposedly linked to the household's total cash receipts (including those from assets such as cattle, goats, grinding mills, etc.), which is crucial. Although the households do not keep detailed records of their cash receipts, it is believed that due to the limited nature and sources of the income flows, the respondents
were fairly accurate in their reports. However, as pointed out in chapter V, the lack of accurate information meant that the data, could only at best, be presented as ordinal scale data. This imposed a limitation on the nature of the statistical analysis which could be undertaken.

In order to put the discussion of the sources of interhousehold differences in income in a theoretical perspective, a number of models, which highlight the relationships between household farm income (especially that from sale of crops) and the key factors affecting it, will be presented. The purpose of this part of the analysis will be to render the findings emerging from the survey applicable to similar circumstances.

1. **Interhousehold Differences in Incomes Analysed**

In order to explain the interhousehold differences in income observed in the survey area, a number of associated variables were selected, i.e;

(i) Cultivated area.
(ii) Family size (in standard consumption units).
(iii) Size of family labour force.
(iv) Total expenditure on hired labour.
(v) Amount of input credit taken.
(vi) Cash outlays on inputs.

Table 6.1 below summarises the levels and sources of household incomes of the household typologies observed in LLDP.
Table 6.1. Reported Average Cash Receipts by Household
Typologies and Sources.

<table>
<thead>
<tr>
<th>Source</th>
<th>Household Typology (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Crop sales</td>
<td>58.5</td>
</tr>
<tr>
<td>Livestock etc.</td>
<td>9.8</td>
</tr>
<tr>
<td>Business</td>
<td>25.5</td>
</tr>
<tr>
<td>Employment</td>
<td>6.2</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Average total Receipts/household  
K54.23  K57.53  K251.75  K227.49  K171.67

Group total as % of total income  
5.2  6.7  40.6  47.5  100.0

% of Respondents in group  
16.3  20.1  27.8  35.8  100.0

n=  
26  31  44  57  158

A. Factors Associated With Crop Revenue.

The general proposition in this study is that farm income (from sale of crops) is a function of a number of interrelated factors many of which cannot be easily quantified (eg. soil quality, weather, a farmer's managerial expertise, etc.). However, such factors apart, a number of quantifiable factors can be identified. Fig. 6.1 summarises these factors and the suspected general nature of their interrelationships. Using the survey data, we shall try to establish the existence of these interrelationships and if possible to try to determine their strength as well as their direction of operation by testing the hypotheses which were outlined in Chapter I.
I. The Relationship Between Farm Income and Crop Enterprise Undertaken.

Our first hypothesis concerns the relationship between farm enterprise (type of crops grown) and farm income, ie:

A household's level of total revenue from sale of crops is likely to be closely associated with the type of crop enterprise undertaken (ie. adoption or non-adoption of innovations offered by the project .................Ia.

As pointed out in chapter IV, the main crops grown in LLDP are tobacco, groundnuts and maize, and the main innovations introduced in the area to boost farm incomes have been improved seed varieties of maize and groundnuts, and fertilizers and insecticides for tobacco and improved maize. Thus working under the assumption that farm households will try to maximise revenue from the farm enterprise , it is expected that they will adopt the cultivation of those crops supported by the project (in the form of providing input credit and extension advice).

The survey data have indicated that those households who grew tobacco (typology 111), had the highest gross farm receipts (an average of K240), followed by the improved maize growers (typology ■■■■), who reported gross farm receipts averaging K141. On the other hand, those households who did not participate in either the tobacco or improved maize enterprises (typologies I and 11) had the least gross farm receipts, averaging K31 and K21 respectively - see table 5.5d. Such evidence indicates that those households who took up the main innovations introduced by the project and used complementary inputs as recommended by the extension personnel, did obtain higher revenue from sale of crops than those that did not. This was supported by the results of a chi-squared analysis, between crop revenue and use or non-use of inputs, which yielded a chi-squared value of 36.2, with 2 degrees of freedom and significant at the 1% level. A Cramer's V of 0.49, indicated that the relationship between the two variables was quite substantial.
Table 6.2 Relationship Between Crop Revenue and Use of Inputs.

<table>
<thead>
<tr>
<th>Crop Revenue (K)</th>
<th>Use of Inputs</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used Inputs</td>
<td>Did Not Use Inputs</td>
</tr>
<tr>
<td>0 - 10</td>
<td>12</td>
<td>23</td>
</tr>
<tr>
<td>11 - 75</td>
<td>38</td>
<td>21</td>
</tr>
<tr>
<td>76 and over</td>
<td>59</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>109</td>
<td>49</td>
</tr>
</tbody>
</table>

Chi-square = 36.2, 2 degrees of Freedom, significant at the 1% level.
Cramer's V = 0.49

11. Innovation Adoption and Access to Credit.

The observation that the adoption of innovations is closely associated with higher crop revenue raises the question: What factors are associated with innovation adoption? This question entailed the examination of the characteristics associated with innovation adopters (or for that case, non-adopters) and an attempt to determine whether those factors found to be associated with innovation adoption were causally linked with it.

The survey data indicated that farm credit was the main source of finance for farm inputs. This observation led to the hypothesis that:

"The adoption of the innovations offered is likely to be closely associated with a household's access to seasonal credit.................................1b.

It was observed that among those who reported to have used farm inputs (69% of the sample) only 16% reported to have obtained them purely on a cash basis, while the rest either got them solely on credit or supplemented what they got on credit with cash purchases.

Table 6.3 Source of Finance For Farm Inputs.

(\%)

<table>
<thead>
<tr>
<th>Source of Finance</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash only</td>
<td>16</td>
</tr>
<tr>
<td>Credit only</td>
<td>29</td>
</tr>
<tr>
<td>Cash and Credit</td>
<td>55</td>
</tr>
</tbody>
</table>

\[\text{n} = 109\]
Thus it appears that most of the people who used inputs (or innovated) did so mainly through the help of credit. Table 5.4f, presented earlier indicated that there was a very high "repeat" tendency among the credit takers. This implies that even those people whose incomes had risen substantially over the years because of using innovations, still relied on credit for inputs. For example, in 1980/81, when provision of input credit to individuals was abolished in LLDP, it was observed that most of the old credit clientele opted to join the farmers' clubs which became the only vehicle through which input credit could be obtained. Such evidence tends to suggest that in the relationship between innovation adoption (use of inputs) and access to credit, the direction of causality ran from "credit" to "adoption". However, there is need for caution here. While the above observations may be true, they do not provide conclusive evidence that access to credit induces innovation adoption. It is possible that the observed phenomenon reflects some other aspect, such as inefficiencies in the input delivery system for cash purchases. It is common knowledge in Malawi that farm inputs are not always available in time or in adequate quantities at the ADMARC local markets, for sale to the smallholding community. It is a usual phenomenon to see farmers queuing at the ADMARC local depots a week or so after the rains have fallen and planting is well under way, trying to procure inputs. Such problems are largely attributed to transport bottlenecks, storage problems at the depots etc. On the other hand, ADMARC seems to place priority on input orders from say, LLDP, the Government Loans Board, or any other development agencies, and of course, the estate sector. In such circumstances it is a rational reaction on the part of the farmers who wished to secure supplies of inputs to apply for input credit than risking to buy them on cash. In such a case, purchasing inputs on credit is just a matter of convenience occasioned by the inefficiencies in the marketing system. For the marginal farmer, with very little cash to spare, the fact that inputs are usually made available at the ADMARC local markets only during the planting season, when other needs for cash are pressing, such as school fees for children (schools open in October), clothing, food needs, medicines etc, mean
that he may not be able to purchase them. Although the access of such a farmer to credit may be restricted (on account of his economic status) it could be that if the inputs were available say at the time of crop marketing, within a reasonable distance from his home, he could have opted to buy some so as to improve his next crop yield. In this case, although his inability to take up innovations may seem to be associated with his lack of access to input credit, another constraint would appear to be the lack of an efficient input delivery system.

This study does not intend to pursue the issue of input marketing in Malawi, suffice it to say that there is room for improvement in the way ADMARC discharges its responsibility as the sole distributor of farm inputs to the smallholder sector. And, there is need to re-examine the need for ADMARC's monopoly in this field, especially given the transportation and storage problems which it appears to encounter, as well as the fact that input subsidization, which would appear to justify ADMARC's monopoly in input distribution, does not appear to feature much in ADMARC's input pricing policies. However, the issue of input marketing has been brought up to highlight the danger involved in assuming causality from an association relationship. For example, the observation, in Malawi, that innovation adoption is closely associated with input distribution on credit, has led to the familiar accusations that government elitist policies have encouraged the channelling of resources through input distribution (eg. allocating of input credit) to a few "progressive" elements in the rural community. (1) This study points out that, although such a conclusion may have some elements of truth, it has the effect of preventing a more rational analysis of the situation. The above example has clearly indicated that innovation adoption can be constrained by inefficiencies in the input delivery system, which are not necessarily a result of deliberate Government policy, and yet there have been very few analyses of ADMARC's input distribution practises, despite the prominent position ADMARC occupies with regard to smallholder innovation adoption through its role as sole distributor of inputs to the smallholder sector.
The Relationship Between Input Credit and Cultivated Area.

The fact that access to credit and crop revenue were closely associated implies that the way input credit was distributed in the area had an influence on the pattern of innovation adoption and therefore income distribution, and it therefore warrants a closer investigation. The guiding principle in credit allocation in LLDP is the ability to repay criterion. The record of credit repayment in the project area shows that a very high recovery rate (over 90%) was consistently achieved from phase II (1972/73) onwards. Such a record suggests very stringent selection criteria which ensured that those who were offered credit would be able to repay their loans. Our purpose at this stage is to investigate the criteria upon which credit distribution lay. Here we shall investigate the hypothesis that:

A household's access to seasonal credit is closely associated with its cultivated area.

Evidence provided by the survey data indicates that credit recipients (58% of the sample) cultivated, on average, 45% more land than those that did not receive credit. In addition when the relationship between cultivated area and input credit was investigated it gave a chi-squared value of 16.8 (significant at 1%, with 2 degrees of freedom).

Table 6.4: The relationship Between Total Input Credit Taken and Total Cultivated Area.

<table>
<thead>
<tr>
<th>Total Cultivated Area</th>
<th>Less than K11</th>
<th>K11 and over</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 0.4 ha</td>
<td>10</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>0.4 - 1.2 ha</td>
<td>53</td>
<td>56</td>
<td>109</td>
</tr>
<tr>
<td>1.3</td>
<td>8</td>
<td>28</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>71</td>
<td>87</td>
<td>158</td>
</tr>
</tbody>
</table>

Chi-square = 16.8, significant at 1%, with 2 degrees of freedom.
These findings tend to support the above hypothesis. However, it must be pointed out that the nature of the data does not allow us to probe more deeply into the problem, say to establish the direction of causality. As such, our conclusions on this aspect will tend to be speculative. It seems that the relationship between access to credit and total area cultivated tends to operate in both directions.

In the first place, due to the risk minimisation aspect of credit allocation, large cultivated area is regarded as a collateral for credit. That is, because of the priority accorded to subsistence production by all the smallholder households in the area, availability of a marketable output, from which credit repayment is supposed to be made, depends on a large cultivated area. That is, those households with large cultivated hectarages are regarded as being in a better position to produce marketable output, which will enable them to repay credit than those with small cultivated areas on which subsistence crops are likely to predominate. Consequently, credit tends to be readily available to those with larger cultivated areas. On the other hand, a household's access to credit, for whatever reason (such as being a farmer's club official, etc.,) increases the household's prospects of achieving a larger output (through higher productivities - land and labour, as a result of using inputs). At the same time it increases the household's need for cash, to pay off its loan commitment. This acts as an incentive to produce a marketable surplus, inducing it to cultivate a large hectarage to ensure that this new requirement is met. And where such a household may not have enough land to meet the new demand, it usually resorts to borrowing some from its neighbours and/or relatives who for one reason or the other (usually lack of labour), are unable to fully utilize all the land available to them. However, this can only happen if the household can mobilize the necessary labour required for the degree of operation necessitated by the available credit. Thus although
the relationship tends to operate in both ways, labour availability, in the final analysis becomes the operative constraint, as access to credit alone does not ensure adoption of innovations.

The proposition regarding the relationship between credit and cultivated area is well supported by the evidence provided by Kinsey (1974), who observed an inverse relationship between credit worthiness and loan size. He found out that those households which had displayed a 100% credit repayment record had significantly large holding sizes than those who had displayed a 50% or so repayment record. At the same time, he observed that those households who received project credit cultivated 33% more land, and had 84% more agricultural income than those who did not get credit. Such results indicate that during the early phases of LLDP, when a liberal credit policy was pursued, households who cultivated small hectarages were found to have difficulties with credit repayment. This led to a more stringent credit rating policy which resulted in the exclusion of the majority of small farmers from getting credit. The fact that credit was only provided for producing marketable crops (especially those marketed predominantly through ADMARC) meant that unless a household had enough resources over and above those required to meet family subsistence needs, it was unlikely to commit itself to grow cash crops. The author was informed by some Project Officers involved with credit that at least up to the 1979/80 season, availability of funds did not constitute a constraint to their lending operations (as this period was characterised by the existence of unused up funds on the credit fund at the end of each year). The problem was finding those people who were prepared, and who qualified to take up the "credit packages" offered. In other words, credit availability was not restricted by an act of credit rationing as such, necessitated by lack of funds, but by the household's ability to produce a marketable surplus, as expressed by the household's total cultivated area. This implies that for us to have a clear understanding of the constraints to innovation adoption and therefore higher farm incomes in LLDP, we need to look more closely at the factors associated with the cultivated area.
IV. The Relationship Between Cultivated Area and Crop Revenue.

Before embarking on a detailed examination of the factors associated with cultivated areas, we shall try to establish the nature of the relationship between cultivated area and crop revenue, in order to explore the hypothesis that:

Total farm income (crop revenue) is closely associated with the size of the cultivated area ..........2a.

This is the hypothesis upon which the credit rating policy seems to be based. The hypothesis was tested in a number of stages. The first stage involved the establishment of the suspected relationship. This was tested by a chi-squared analysis which gave a chi-squared value of 11.7, significant at 5%, with 4 degrees of freedom, thereby supporting the existence of the relationship.

Table 6.5 Cultivated Area and Crop Revenue.

<table>
<thead>
<tr>
<th>Hectarage</th>
<th>Income Group</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Less than K30</td>
<td>K31 - 75</td>
<td>K76 and over</td>
<td>Total</td>
</tr>
<tr>
<td>0 - 0.8 hectares</td>
<td>32</td>
<td>11</td>
<td>7</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>0.9 - 1.6 hectares</td>
<td>10</td>
<td>11</td>
<td>14</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>L.7 and over</td>
<td>5</td>
<td>4</td>
<td>6</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>26</td>
<td>27</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Chi-squared = 11.7, significant at 5% 4 degrees of freedom.

Next we investigated if variations in farm size had an impact on crop revenue. The crop revenue data was transformed by multiplying the group means by the associated group frequencies, to make it amenable to an analysis of variance exercise. The survey population was then broken down into a number of categories based on farm size and the mean crop revenues of the various farm sizes were compared. This exercise revealed that variations in farm size had a substantial impact on crop revenue (F value = 11.8 significant at 1%). In addition a correlation exercise gave an $R^2$ value of 0.28, which implied
that 28% of the linear variation in crop revenue could be explained by variations in cultivated area alone. Such findings tend to lend support to the hypothesis postulated above. More important, they indicate that the innovations being advocated in LLDP are more of an extensive nature than of an intensive one, i.e., they are of a type which depends on availability of adequate land for their adoption.\(^5\) This aspect has a very important bearing on how widely they can spread, in a situation where cultivation technology is basically of the hoe culture, and where land pressure is rising fast.

B. Farm Size and Its Determinants.

The observation that cultivated area was positively correlated with crop revenue implies that those who cultivated large hectarages were more likely to get higher farm revenue than those who did not. However, in the previous chapter, it was argued that there were hardly any institutional barriers to a household's access to farm land. It therefore appears that under such circumstances, we would expect a more even distribution of farm income among the households. And yet, the data reported in chapter V indicated that quite a substantial proportion of the households got very little income from sale of crops, and in the previous section of this chapter, it was indicated that this was largely because such people cultivated small hectarages which did not allow them much in the way of marketable surpluses. Such findings imply that the observed interhousehold differences in farm income go beyond the aspect of land availability as such. This section therefore explores a number of interrelated factors which are thought to have a bearing on a household's total cultivated area.

1. Labour Availability.

As pointed out in chapter I, one of the major aims of this study is to re-examine the assumption that basically subsistence oriented households do possess surplus family labour resources which can be usefully tapped, through the development effort, into expanding smallholder cash production. This will be done by examining the relationship between the labour demands of the various innovations introduced by the development effort in
LLDF and the labour supply situations of the various household typologies. Since the survey results have revealed that use of hired labour for agricultural work does take place on a substantial scale in the area, we shall try to assess the role of both family and hired labour in cash crop production.

(a) Family Labour.

The data analysis in chapter V revealed that the main cash croppers in the area were the tobacco growers and the improved maize growers (typologies III and IV), while the other two categories (I and II) were predominantly subsistence farmers. In addition, it was revealed that the cash croppers tended to have larger family labour forces than the subsistence croppers. This tended to indicate that available family labour was somehow related with innovation adoption. A chi-squared analysis between innovation adoption (as represented by those households who grew either tobacco and/or improved maize - as adopters and those who did not grow them - as non-adopters) and available family labour, supported this view, ie Chi-squared = 26.96, with 4 degree of freedom and significant at 1% level.

<table>
<thead>
<tr>
<th>Family Labour Available (AEs)</th>
<th>Crop Enterprise</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tobacco Growers</td>
<td>Improved Maize Growers</td>
</tr>
<tr>
<td>Less than 2</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>2 - 3</td>
<td>28</td>
<td>44</td>
</tr>
<tr>
<td>3 and over</td>
<td>12</td>
<td>3</td>
</tr>
</tbody>
</table>

Chi-squared = 26.96, 4df., significant at 1%.
However, it has been argued above, that innovation adoption in the area was closely associated with cultivated area, mostly because input credit, the main source of finance for farm inputs, was distributed on the "ability to repay" criterion. Since innovation adoption is here seen to be linked with available family labour, it would be expected that available family labour and total cultivated area, are closely related, and therefore that among the non-labour hirers those taking innovations would have large family labour forces and larger cultivated areas, while those households not adopting innovations would have smaller family labour forces and smaller cultivated areas. These relationships are explored in the table below.

Table 6.7 Availability of Family Labour and Adoption of Innovations (among non-labour hirers)

<table>
<thead>
<tr>
<th>Family Labour Available (ABs)</th>
<th>Adoption of Innovations</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adopted</td>
<td>Did not Adopt</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>Less than 2</td>
<td>13</td>
<td>22</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>More than 2</td>
<td>54</td>
<td>19</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>67</td>
<td>41</td>
<td>108</td>
<td></td>
</tr>
</tbody>
</table>

Chi-squared = 14.6, significant at the 1% level, with 1 df.

These results clearly indicate that large family labour forces are closely associated with innovation adoption. This is particularly so with respect to the tobacco enterprise, whose labour requirement is quite high more or less throughout the whole year, and therefore not particularly suited to casual labour which seems to be the most readily available form of hired labour in the area.
The fact that about 70% of the households surveyed reported having used only family labour on their farms during the 1980/81 season, indicates that family labour is the most predominant form of farm labour in the area. It was therefore expected that this form of labour would have a very substantial impact on farm size. The following hypothesis was therefore put forward:

For a peasant household solely dependent on family labour for agricultural work, the size of its cultivated area is closely associated with the number of family workers available to it (measured in adult equivalents).\[2b\]

This hypothesis was tested for those households who hired no labour. A simple correlation exercise revealed that there was in fact a weak relationship between family labour available to the household and total cultivated area (\(R = 0.24\), significant at the 1% level). This was rather surprising, and therefore warranted further investigation. To this effect we investigated the relationship between cultivated area and household consumption needs (as represented by family size - in standard consumption units). This was found to be quite substantial (\(R = 0.46\), significant at 1%). This tended to indicate that the allocation of the labour resource by these households to the farm enterprise is to some extent determined by their family consumption needs.\[^{6}\]

This finding is consistent with recent studies in similar cases.\[^{7}\] However, it appears that the lower correlation coefficient obtained in this study, for the relationship between family size and farm size (ie \(R = 0.46\), as compared to \(R = 0.4 - 0.65\) reported by Hunt, for Mbere), coupled with the lack of a strong relationship between farm size and family labour, reported earlier, point to one underlying factor which is important in our situation. That is, it reflects the fact that in LLDP, non-labour hiring households (who are predominantly the poorer and non-innovating households) tend to have a lower dependence on the farm as a source of cash income, as was indicated in the previous chapter. This is reflected in the relatively large proportion of non-farm income in their total incomes positions. For example, as much as 32% of the total income of the 26 female headed households (only 4 of whom hired labour), came
from non-farm income sources. This tends to imply that such households tend to allocate their labour resources to the farm enterprise up to the point where they can satisfy their subsistence requirements, allocating any surplus labour to other activities outside the farm. More important, the results highlight the important fact that most of these non-labour hiring households are actually the suppliers of hired labour to the relatively better off farm households and estates, on a casual or seasonal basis. This therefore tends to weaken the association between both family size and family labour and cultivated area.

(b). Hired Labour.

As already pointed out, 32% of our sample reported hiring labour for agricultural work. Of these, 82% grew either tobacco and/or improved maize varieties. This implies that labour hiring was very closely associated with innovation adoption. To explore this relationship, a number of hypotheses were examined, the first of which was:

A household's cultivated area is likely to be related to the household's ability to hire labour (measured by total expenditure on hired labour) ..................2c.

This hypothesis implies that those households who hired labour were likely to cultivate larger hectarages and therefore more likely to adopt innovations than those who did not.

The survey data indicated that, on average, those households who hired labour cultivated 85% more land than their non-labour hiring counterparts (ie they cultivated an average of 2.4 ha. against 1.3 ha. for the ether). A chi-squared test indicated that there was a highly significant relationship between labour hiring and cultivated area (Chi-squared = 15.1, with 3 degrees of freedom and significant at the 1% level). In addition, for this group of households, total cultivated area and expenditure on hired labour were substantially correlated (R = 0.40 significant at 1%).
Table 6.8 Relationship Between Labour Hiring and Cultivated Area.

<table>
<thead>
<tr>
<th>Cultivated Area (ha)</th>
<th>Number of Households</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hired Labour</td>
<td>Did not hire labour</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>up to 1 hecatare</td>
<td>15</td>
<td>54</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>1.1 - 1.8</td>
<td>15</td>
<td>38</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>1.9 - 2.6</td>
<td>9</td>
<td>10</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>2.7 and over</td>
<td>12</td>
<td>5</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>51</td>
<td>107</td>
<td>158</td>
<td></td>
</tr>
</tbody>
</table>

Average ha/household: 2.4, 1.3, 1.7

Chi-squared = 15.1, significant at 1%, with 3 df.

On the other hand, when the relationship between farm size (cultivated area) and family size was examined, for the labour hiring households, it was found to be a bit weaker than that between cultivated area and expenditure on hired labour, (ie R = 0.32, significant at 1%), while that between cultivated area and available family labour was even much weaker (R = 0.24, significant at 5%). These results can be interpreted to mean that farm production by these households is not necessarily geared to family subsistence needs, thus suggesting a higher degree of commercialization, ie production for the market, and/or that these households placed greater reliance on hired labour for their agricultural production, allowing their family workers either a higher degree of leisure, or to engage in other off-farm activities which yielded higher returns to labour.

The first proposition was supported by the finding that among the labour hirers, crop revenue and expenditure on hired labour were closely related, ie chi-squared = 11.62, significant at 1%, with 1 degree of freedom.
Table 9 Crop Revenue and Expenditure on Hired Labour.

<table>
<thead>
<tr>
<th>Expenditure on hired labour</th>
<th>Crop Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less than K20</td>
</tr>
<tr>
<td>Less than K150</td>
<td>16</td>
</tr>
<tr>
<td>K150 and above</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>22</td>
</tr>
</tbody>
</table>

Chi-squared = 11.62, 1 DF, significant at 1%.

The finding that cultivated area, among the labour hirers was closely related to expenditure on hired labour, tended to support the view that these households placed a greater reliance on hired labour (ie, chi-squared = 15.1, significant at 1%, with 3 df freedom). The finding that the survey data provided evidence to the effect that the relationship between farm size and expenditure on hired labour (among the labour hirers) was statistically significant, while evidence regarding the statistical significance of the relationship between farm size and family labour force was not forthcoming, implies that hired labour had a larger impact on cultivated area than family labour. Unfortunately, because our data were largely of the nominal and ordinal nature, it was not possible to estimate the functional relationship between cultivated area and hired and/or family labour. Therefore our conclusions regarding cultivated area and these two factors will tend to be speculative.

As indicated earlier, the households who reported hiring labour, almost exclusively hired this labour during the peak season (ie. a 3-4 week period in December/January) when the crops must be rescued from the weeds, and when the weather is favourable for the job, ie dry and sunny so that the uprooted weeds can dry. This means that during this peak period, a household which is able to raise say K10 for hired labour, which at the assumed wage rate of K0.10 per hour, is equivalent to 100 man hours, which equals the entire labour demands of 1 hectare of local maize for the whole month of January, will
be in a better position to clear its farm of weeds in time than say a household which gets an extra family worker during the peak season, who can only provide 5.6% of his estimated potential annual labour input during the 3 - 4 weeks period (which works out at about 50-80 man hours, assuming a 5½ hour working day, for 5 days a week). Because December and January crop labour demands are a critical factor in this type of farming, the available labour during this period will be the operative constraint to the household's farming activities (as represented by the size of the cultivated area). This is why a household's ability to hire labour during this peak season is closely associated with the household's total cultivated area.

11. Factors Associated With Labour Hiring And Cash Purchasing of Inputs.

The important finding that a household's ability to hire labour has an important bearing on the size of its cultivated area, and consequently, on its ability to adopt innovations leads us to our next hypotheses, and that is:

The household's ability to hire labour is closely related to the household's access to non-farm income earning opportunities (measured by total non-farm receipts)........2d.

and that:

Cash purchases of inputs are likely to be associated with a household's level of non-farm income ..............3.

The main argument here is that in the initial stages of development, farm incomes are generally too low to provide funds for hiring or purchasing inputs. As such, it would be expected that a household's ability to hire farm labour or purchase inputs would be likely to be associated with its non-farm receipts. This implies that only those households which have access to non-farm income earning opportunities are likely to buy farm inputs and hire the labour required to enable them to take up the innovations which are inherently linked with large hectarages. To test these hypotheses, we looked at the relationship between non-farm income receipts and total
total expenditures on hired labour and cash purchases of inputs.

For the purposes of this study, "farm income" is defined as that income which accrues to the household from sale of farm products produced on its own farm, while "non-farm income" is defined as that income which comes from sources other than sale of farm products. Two main sources of non-farm income were identified, i.e., employment (both temporary and permanent employment) and business (including self employment—such as carpentry and bricklaying).

The survey data indicated that the various categories of households differed in their sources of non-farm income. For example, the labour hirers, who were predominantly tobacco and improved maize growers, reported an average of K316 in household receipts for the 1980/81 season. Of this 17% came from non-farm sources, mostly business and self employment. The non-labour hirers, on the other hand, reported an average household income of K104, of which about 30% came from outside the farm, mostly wage labour and off-season activities.

The evidence from the survey suggests that this differential in sources of non-farm income for the various households had an important bearing on their farming activities. For example, only 4 of the 26 female headed households in the sample reported having hired labour during the 1980/81 season and a similar number reported having purchased inputs on cash. Beer was the main source of funds for these outlays. The data indicates that for these households, non-farm income contributed about a third of total household income. It appears that such income played a very important role in supplementing their farm produce in the way of providing subsistence requirements such as food (during the hunger gap). Such income did not serve as a means for hiring labour or purchasing farm inputs, and played no substantial part in raising farm incomes. Thus although it would be expected that these labour deficient households would tend to make up for this deficiency by hiring labour, their desperate economic position dictated that they in fact hire out labour to meet their subsistence requirements.
For the labour hiring households, the situation was complicated by the fact that they were divided into two main groups which displayed different characteristics with respect to non-farm income. On the one hand, were the improved maize growers who were associated with a high degree of non-farm income earnings, which made up about 31% of average total household receipts. On the other hand were the tobacco growers who reported very little, in terms of non-farm receipts.

For the improved maize growers, about 4 of whom reported hiring labour, the available data indicated that there was a close relationship between income from business sources and revenue from sale of crops (Chi-squared = 12.2, significant at the 1% level, with 2 degrees of freedom). This suggested that non-farm income could have been an important source of funds for buying inputs and or hiring labour. However, there was no substantive evidence to indicate that non-farm income was closely related to either expenditure on hired labour or expenditure on cash purchases of inputs. Instead, the data indicated that there was a close relationship between crop revenue and expenditure on inputs (Chi-squared = 6.8, significant at 1% with 1 degree of freedom). These results indicate that although non-farm income may have given these households extra funds which could have been used for purchasing inputs and hiring labour, it was mostly income from sale of farm produce which was crucial in the households' farming activities.

For the tobacco growers the available data suggests that non-farm receipts hardly had anything to do with their farming activities. The data presented in the previous chapter indicated that the main source of inputs for these households was credit from LLDP, and that about half of those who hired labour paid for it in kind. It therefore appears that the privileged access to credit, of these households, enabled them to get high revenue from their farming enterprises, as well as enabling them to have food surpluses which proved useful in hiring labour.
Overall, it appears that non-farm income played a positive role in the farming operations of the improved maize growers by providing them with extra funds for hiring labour and purchasing inputs. On the other hand, its role was different among the poorer households for whom it acted as a supplementary resource for meeting subsistent requirements which could not be fully met through their farming operations. Because most of such income originated from sale of labour to other households, in a way it had a negative impact on the farming operations of the poor households. Thus it appears that whether non-farm income helps a household to innovate or not, will depend on the overall economic position of the household.

2. Summary of Data Analysis.

On the whole it appears that labour availability and access to input credit were the two main factors that influenced the households decision to adopt innovations, and therefore affected its total income from sale of crops. However, the results suggest that the two factors were not independent of each other. Labour availability (especially the hired component) appears to have had a much greater impact on a household's ability to adopt innovations because of its effect on cultivated area, which in turn affected access to input credit. This interrelationship seems to create a vicious circle. That is labour deficiency leads to a small cultivated area, which in turn leads to lack of access to input credit, this leads to low farm income levels, that lead to a labour deficiency (due to inability to hire labour to supplement family labour).

Fig. 6.2 The Vicious Circle of Rural Poverty.
Attempts by these smaller and poorer households, to break out of the vicious circle by way of adopting the innovations up to a size commensurate with their labour and financial resources, are hampered by LLDP's practice of prescribing minimum packages for the innovations it offers. However, we shall consider this aspect in more detail, in a subsequent section of this chapter. In the section that follows an attempt will be made to illustrate, using the survey data, the impact of the interrelationship between labour availability and access to input credit on total farm incomes, with the help of Fig 6.3, inorder to put the above discussion in its perspective.

A. Observed Pattern of Income Distribution According to Labour and Credit Availability.

The connection between both labour and credit availability on the one hand, and cultivated area (and therefore crop income) on the other, is well demonstrated in the tree diagram below.

For the purposes of constructing this tree diagram, the households were classified on two criteria (after the survey) viz:-

(a) Labour Availability
(b) Access to credit.

In the first stage, two categories of households were formed. The first group consisted of those households who were considered to have "inadequate" labour available to them, ie. those with less than 2 adult workers and hired no labour. This category tended to include most of the female headed households (due to the absence of the adult male) living either alone or with juvenile children, and some of those male headed households where either the male had no female spouse, or if the female spouse was present, both spouses were well advanced in age, and their labour valuation, on adult equivalent scale, was less than unity (individually). The other group consisted of those households who can be considered to have had "adequate" labour available to them, ie those that had at least two adult family workers and/or hired labour. This group included mostly the tobacco and improved maize growers. Next, the households were subdivided into those who took credit and those who did not.
The tree diagram below shows how cultivated area and reported cash receipts from sale of crops (in terms of group averages) were distributed among the groups.

**Fig. 6.1 Effect of Labour and Credit Availability on Crop Revenue.**

\[
\text{All households} \\
X_1 = 1.66 \text{ ha.} \\
Y = K126
\]

"Adequate" Labour

1a, \( X_1 = 2.1 \text{ ha} \) \( Y = K147 \)

1b, \( X_1 = 0.8 \text{ ha} \) \( Y = K65 \)

"Inadequate" Labour

(107)

(51)

(75)

(32)

(17)

(34)

\[
X_1 = 2.2 \text{ ha} \\
Y = K202
\]

\[
X_1 = 1.7 \text{ ha} \\
Y = 124
\]

\[
X_1 = 1.4 \text{ ha} \\
Y = K141
\]

\[
X_1 = 0.6 \text{ ha} \\
Y = K27
\]

(2a, Taking credit) \hspace{1cm} (2b, No credit) \hspace{1cm} (2c, Taking credit) \hspace{1cm} (2d, No credit)

\( X_1 \) = average hectarage per household.

\( Y \) = Average Crop Revenue per household.

From the diagram it can be seen that those households, which had no labour constraints, cultivated on average 163% more land, and consequently had 126% more cash receipts from sale of crops, than those with "inadequate labour". In addition 70% of those "adequate" labour had access to input credit, as compared to only 33% of the other group. In fact, those with "adequate labour constituted 82% of the credit recipients.

Such findings support our earlier hypothesis regarding the interrelationships between labour
availability, cultivated area and access to credit. More important, the data in the diagram indicates that, labour availability had a greater impact on total household revenue from sale of crops than access to credit. That is, amongst those households who had adequate labour, the differential in crop revenue between those who took credit and those who did not was 63%. On the other hand, the differential in crop revenue among those with "inadequate" labour taking credit and those not taking credit was 42%.

This tends to imply that where labour is available, farm income is not significantly constrained by lack of credit. However, where there seems to be a labour shortage, lack of credit tends to depress farm incomes even more. This seems to be indicative of the fact that labour availability is very closely associated with uptake of the innovations offered in the project area. This implies that once a household had decided upon adoption (after having examined its labour availability situation) both credit and extension advice are almost automatically forthcoming from the project to ensure the success of the innovations. On the other hand, those households who do not adopt innovations, largely because they lack the labour with which to adequately tend the new and improved crops, are unlikely to get any credit or extension advice, since these are usually provided as "packages". In the absence of any innovation packages especially suited to the households with smaller labour forces, it seems that such households will always be left out of the innovation stream. They will continue to follow their old farming methods, and therefore will be faced with declining yields as the soil gets exhausted, thereby reducing their ability to provide their own basic subsistence needs. This will force such households to rely increasingly on non-farm sources of income, or hiring out labour.

The main argument for including the credit programme in LLDP, as already pointed out was the understanding that lack of modern inputs, caused by low income levels among the smallholders was mainly responsible for the low level of farm productivity in the area, and that the provision of credit would enable a large
proportion of the smallholding community to gain access to modern inputs and thereby raise their output levels. To ensure effective use of credit, the "supervised" approach was adopted. At the same time, the main services of credit provision, input supply, extension and marketing were linked, presumably to ensure optimal results, thus the "package approach" was used.

So far our analysis has indicated that there were several problems associated with the strategy. First, the linking of the major services created some problems, largely because each of the components had a separate objective. For example, in the interests of extension, it was desirable that as large a number of farmers as possible should be put in touch with the new inputs. Provision of credit, to as large a group as possible was therefore necessary. On the other hand, from the point of view of the credit programme, it was essential that if the programme was to be self-financing, lending had to be done very prudently to minimise defaults. The early experience of LLDP indicates that there were conflicts between the various objectives. For example, the "extension" objective was vigorously pursued during the first phase of the project (1968/9 - 1971/72). But as mentioned in chapter iv, this led to high default rates, thus threatening the viability of the credit fund. More importantly, there were no attempts to assess the situation among the smallholders themselves to find out exactly what their requirements were. In an attempt to boost groundnuts production, for example, although improved seeds, and complementary inputs (eg. sulphur dust) and knowledge of improved husbandry methods were made available to the farmers, the output of the crop continued to decline. This was found to be largely due to the heavy labour demands and poor returns to labour associated with the crop. It was not until later that the labour bottleneck (especially during harvesting and processing for the market) was appreciated, and technical innovations to ease it (eg. introduction of the groundnut lifter), were brought in. However, without any significant improvements in the producer prices, such innovations only meant higher production costs and lower net returns. Consequently,
such innovations were not taken up by the farmers, in fact, they can be seen today, standing idle at the unit centres, while the labour bottleneck persists. (11)

Thus, the high default rates associated with the liberal credit policy that was pursued in the early years, in an attempt to spread innovations, coupled with the failure, on the part of the project to cater for the needs of the farmers that would arise from adoption of the "packages" offered (in terms of extra labour demands associated with the required timeliness of operations, storage problems, food supplies, etc.), led to the emergence of a credit scheme that tended to favour only those who were relatively better off (in terms of resources, etc.), and therefore able to qualify for credit, as well as willing to take on the extra risks associated with credit.

The consequence was that, it was mostly the smaller and poorer farmers who were left out of the innovation bandwagon. First, because they had smaller labour forces (and unable to supplement such with hired labour due to their low income positions), which resulted in their relatively smaller cultivated hectarages, which rendered them credit risks. Secondly, the "packages" available, which in most cases had a minimum size attached to them, may have been too large for their resources. Thirdly, as the credit was geared to the production of certain marketable crops, it meant that there was an implicit assumption that the credit recipient had to produce for the market. Thus taking credit amounted to a commitment to produce an amount of output equivalent to the value of the loan (at the minimum), and with the pre-occupation of the poorer households on meeting subsistence requirements, such a prospect might have proved too much of a gamble.
B. Effect of Crop Enterprise on Household Incomes.

Another factor which was found to be very closely related with the household's level of crop cash receipts was the type of crop enterprise undertaken by the household. Because of the limited size of our sample, it was not feasible to incorporate the effect of the crop enterprise into the tree diagram developed earlier on, so as to complete the picture of how the three factors of labour availability, access to credit and type of crop enterprise undertaken, might be operating in the area, in influencing the pattern of income distribution. Instead, a simple linear programming model will be used here, to try to complete the picture.

I. The Linear Programming Model.

The main objective of the LP model is to try to demonstrate how, in the situation under review, the labour constraint does significantly contribute to the determination of the cropping pattern a household is able to adopt. Using the information given in the above typologies of households regarding family sizes, family labour forces, etc, an attempt will be made to present a model of the optimal farm pattern for each typology under various assumptions.

The main assumption is that each household intends to maximize revenue from sale of crops, subject to:

(a) A food self-sufficiency constraint.
(b) A labour constraint.
(c) A land constraint.
(d) A financial constraint.

(a) Food Self-Sufficiency Constraint.

Observations in the survey area indicate that it was the wish of all farmers to be self-sufficient in food, an aspect which is consistent with the risk aversion strategy of small-holder farmers. The absence of any complete specialisation in cash crop production among the small scale producers in LLDP, supports this assumption. It was therefore assumed that each household would produce enough local maize (the main staple
in the area) to meet its food requirements. It has been estimated that on average the consumption requirements, in this area of an adult person (measured in consumption units) are 230 kilograms of maize grain.\(^{(12)}\) Thus, the annual total food requirements for each household typology was obtained by multiplying 230 kg. by the average number of persons (in s.c.u.) per household in the group. The yield of local maize was assumed to be 1100 kg/ha.\(^{(13)}\) It was assumed that all households would cultivate local maize for subsistence purposes and that any surplus would be sold.

(b) Labour Constraint.

(i) Family Labour - The availability of family labour was calculated on a monthly basis, since the labour requirements data for the various crops was also provided on a monthly basis. It was assumed that each working member of a household would be capable of providing, on average, up to 125 man hours per month, for agricultural work. This represents about 5 hours a day for 25 days a month. Hence the total monthly family labour supply for each household typology was obtained by multiplying 125 by the average number of workers per household typology. Such a figure should be regarded purely as an estimate, as it is recognised that the actual amount of hours which the family workers will be willing to work in the family farm will depend on a number of factors such as the relationship between the number of workers in the family and the requirements of the household to be fulfilled: from farm output etc.

(ii) Hired Labour. - As indicated earlier, about one third of the households surveyed reported to have used hired labour (mostly casual labour) for agricultural work during the 1980/81 season. Observations indicated that most of this labour hiring was done during the peak seasons, i.e. November to January (the crop establishment period) and to some extent - May and April (the harvest period). It was further observed that the wage paid for this labour varied with the type of operation being undertaken and the time of the year the labour was hired - reaching a peak in December and January. In the absence of
reliable data on the exact nature of the trend in the rural wage rate, the legal minimum rural wage rate (that paid on established agricultural estates) was used as the basic rate at which households could either buy or sell labour. During the 1980/81 season, this was at K0.50 per working day, (about $0.60). Assuming a 5 hour working day, this works out at K0.10 per man hour. However, the actual wage rate paid during the critical period, (December - January) is likely to be much higher than this, as our LP model suggests. Thus the above figure should be viewed as being purely for illustrative purposes.

(c) Land Constraint.

Our survey indicated that the average holding size in the region was 1.67 hectares. The 1977/78 survey undertaken by LLDP reported a mean holding size of 1.94 hectares per house-
hold. (14) Allowing for the growing population in the area, our survey figure was fairly reasonable. The survey also indicated that well over half of the households had holdings which were below the mean size. Since the main thesis of the study was that land did not constitute the main constraint to farming activities in the area for the majority of households, all households were assumed to have equal access to farm land (up to a maximum of 8.0 hectares). In this way, the effects of land availability, on farm incomes, was isolated, so that the effects of the other factors, ie. labour availability, financial availability and crop enterprise, could be appropriately investigated.

It was also assumed that households would try to maximize revenue from sale of crops, ie maize, tobacco and groundnuts. Due to the absence of the exact knowledge regarding the labour requirements for hybrid maize, it was assumed, in the model, to have the same labour requirements as local maize. However, this assumption is not accurate, since hybrid maize is associated with extra labour requirements for such processes as fertilizer application, pest control, etc., which make it relatively more labour intensive than local maize. (15) This leads to the need for caution in interpreting the results.
(d) Financial Constraint.

Finally, it was assumed that each household would be willing to purchase inputs (either on credit or cash) and hire labour to supplement its family labour force, whenever necessary. However, both activities were subject to financial availability. Thus two financial constraints were built into the model, one for each activity.

(i) Input Purchase Constraint - Input purchases (either on credit or cash) have to be met from household income. Although credit purchases have to be met from future household income, current household income provides a very powerful indication of how much income the household expects to earn during the coming year, as such, it plays a vital role in deciding how much credit the household can afford to take. For this purpose, it was assumed, in our model, that households would be willing to spend up to 50% of their current income to buy those inputs which were considered vital for raising household farm income. The proportion of 50% was arbitrarily chosen, and it is felt that it could be a bit on the high side. However, in the absence of any household income - expenditure data in the area to establish the investment habits of the people, the 50% figure was used to illustrate the extent to which lack of financial capital (for inputs) could be a constraining factor to farming activities of the various households. (16)

(ii) Hired Labour Constraint - Similarly, any expenses incurred on hired labour have to be met from household income. For this constraint, it was assumed, also arbitrarily that a household could spend up to 25% of its current household income on hiring labour to supplement its family labour force especially during the peak labour season.

The financial requirements, of each crop (per hectare) (for both inputs and hired labour) were derived from the gross margins data presented in table 6.10.
II. Crop Enterprises Considered.

(a) Gross Margins.

In this analysis, only the main crops grown in LLDP are considered, namely, tobacco, maize and groundnuts. This is because these are the only crops for which project support (in the form of input credit and extension services) is available.

However, the maize enterprise has been divided into three, ie:

1. Local maize for subsistence (X1)
2. Local maize for sale (X2)
3. Improved maize varieties (X3).

Table 6.10 gives the gross margins associated with the above crop enterprises.

Table 6.10 Gross Margins in LLDP, 1977/78 (at ADMARC Farm-gate Prices).

<table>
<thead>
<tr>
<th>Crop Enterprise</th>
<th>Local maize</th>
<th>Hybrid maize</th>
<th>Groundnuts</th>
<th>Tobacco</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area (ha)</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Yield (kg/ha)</td>
<td>1100</td>
<td>3779</td>
<td>315</td>
<td>500</td>
</tr>
<tr>
<td>Farm gate Price (K/kg)</td>
<td>0.0496</td>
<td>0.0496</td>
<td>0.33</td>
<td>0.4408</td>
</tr>
<tr>
<td>Gross Revenue</td>
<td>54.56</td>
<td>187.44</td>
<td>103.95</td>
<td>220.40</td>
</tr>
<tr>
<td>Variable costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood (K)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4.00</td>
</tr>
<tr>
<td>Seeds (K)</td>
<td>1.24</td>
<td>17.30</td>
<td>22.22</td>
<td>-</td>
</tr>
<tr>
<td>Fertilizers (K)</td>
<td>-</td>
<td>48.19</td>
<td>-</td>
<td>69.19</td>
</tr>
<tr>
<td>Hired labour (K)</td>
<td>-</td>
<td>14.83</td>
<td>-</td>
<td>15.00</td>
</tr>
<tr>
<td>Transport (K)</td>
<td>-</td>
<td>4.94</td>
<td>-</td>
<td>1.75</td>
</tr>
<tr>
<td>Total</td>
<td>1.24</td>
<td>85.26</td>
<td>22.22</td>
<td>98.94</td>
</tr>
<tr>
<td>Gross margins (K/ha)</td>
<td>53.32</td>
<td>102.18</td>
<td>81.73</td>
<td>130.46</td>
</tr>
<tr>
<td>Gross margins/man hour (K)</td>
<td>0.07</td>
<td>(N/A)</td>
<td>0.05</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Source: LLDP Project Completion Report, Phase III Annex V(e) Tables (i) and (ii).

(a) - Calculated using the labour data in Table 6.5.
(b) Labour Demands.

Table 6.11 gives the labour demands associated with each crop. The table indicates that the tobacco enterprise is associated with the heaviest labour demands, followed by groundnuts and then maize. In addition it shows that the labour demands associated with the local maize enterprise are fairly spread out throughout the year, save for the pronounced peak in December/January. The labour demand schedule for groundnuts has two peaks, a sharp one in December and a flat one between May and July, while tobacco exhibits a fairly heavy labour demand schedule throughout the year, with its trough in August/September and its peak in March/April.

Table 6.11 Crop Monthly Labour Demands - (Man hours/hectare) in LLDP, 1977/78.

<table>
<thead>
<tr>
<th>Month</th>
<th>Local Maize</th>
<th>Groundnuts</th>
<th>Tobacco</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>49</td>
<td>12</td>
<td>261</td>
</tr>
<tr>
<td>November</td>
<td>86</td>
<td>40</td>
<td>116</td>
</tr>
<tr>
<td>December</td>
<td>99</td>
<td>272</td>
<td>252</td>
</tr>
<tr>
<td>January</td>
<td>111</td>
<td>79</td>
<td>370</td>
</tr>
<tr>
<td>February</td>
<td>49</td>
<td>175</td>
<td>252</td>
</tr>
<tr>
<td>March</td>
<td>10</td>
<td>25</td>
<td>455</td>
</tr>
<tr>
<td>April</td>
<td>59</td>
<td>40</td>
<td>514</td>
</tr>
<tr>
<td>May</td>
<td>96</td>
<td>237</td>
<td>321</td>
</tr>
<tr>
<td>June</td>
<td>72</td>
<td>274</td>
<td>348</td>
</tr>
<tr>
<td>July</td>
<td>54</td>
<td>222</td>
<td>195</td>
</tr>
<tr>
<td>August</td>
<td>49</td>
<td>104</td>
<td>35</td>
</tr>
<tr>
<td>September</td>
<td>32</td>
<td>10</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>766</td>
<td>1490</td>
<td>3215</td>
</tr>
</tbody>
</table>


N.B. Original figures were in man hours per acre (1 ha = 2.47 acres).
The Linear Programming Results.

The LP exercise was set up for three different situations; viz:

(a) Where all households faced a labour constraint (being restricted to using family labour only but no financial constraint was specified)

(b) Where all households were subject to a financial constraint, for purchase of inputs, and the labour constraint could be overcome by hiring as much labour as the household required.

(c) Where both the labour constraint and financial constraint were in operation, i.e., the purchase of inputs and hire of labour were subjected to specified financial constraints.

The formats of the LP model, for each category of households and under each of the three basic conditions are summarised in the appendix to this chapter. This section only concerns itself with the discussion of the results.

(a) With Labour Constraint But No Financial Constraint.

Two main results are apparent under this condition, and these are:

1) All household typologies were seen to cultivate farms below the maximum hectarage stipulated in the model (8 ha.).

2) Both tobacco and local maize (for sale) did not enter the optimal solution.

The above results indicate that after meeting subsistence requirements, all the household typologies were left with some labour to grow a cash crop of one type or the other. However, which cash crop could be undertaken, very much depended on its labour demands, especially during the critical months. The results indicate that December and January were the two months when crop labour demands imposed the heaviest burden on the family labour force. January labour was particularly critical (as indicated by the high shadow price of labour, of K0.88 per hour, as against the minimum rural wage rate of K0.10 assumed
A sensitivity test of the model indicated that in all cases, the groundnut enterprise (with a gross margin of K81.73 per hectare) would remain in the solution as long as its gross margins/hectare remained within the range K72.45 to K279.69. At the same time, hybrid maize would also remain in the solution as long as its gross margins per hectare did not go outside the K44.92 - K114.84 range (its gross margins per hectare were K101.80). This indicates that the solution was not particularly sensitive to the price of maize (in the downward direction) and price of groundnuts (in the upward direction). On the other hand, in all cases, the solution appeared to be highly sensitive to labour availability. For example, for the female headed households, with an assumed current supply of 170 man hours of family labour available per month, the solution would change if the labour available in December dropped below 152 man hours, or went above 179 man hours. For January, the critical range was 106 - 190 man hours. This clearly shows that the amount of family labour available during these two months was very critical to the cropping pattern undertaken by the household. The LP exercise indicated that under the above mentioned assumptions, the tobacco enterprise would not enter the solution as the available family labour, in all categories, was not sufficient to cope with it. Thus the only feasible enterprises were maize and groundnuts. The observation that it was optimal to grow some groundnuts for sale, rather than specializing in hybrid maize production for cash (which after all, offered higher returns to labour), tends to support the point made earlier concerning the difference between labour intensity per se, and the spread of the labour demands. In addition, it was hinted above that the labour demands of hybrid maize, were underestimated, thus making groundnuts the most feasible cash crop for the majority of households. In fact, 82% of the households grew the crop (although not all of them grew it especially for cash purposes) as a means of optimising the use of the family labour force.
Table 6.12 Proportion of Households Growing Groundnuts in LLDP, 1980/81.

<table>
<thead>
<tr>
<th>Category</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion (%)</td>
<td>77</td>
<td>74</td>
<td>86</td>
<td>84</td>
<td>82</td>
</tr>
</tbody>
</table>

As already pointed out, December and January are the months when households in the area face the heaviest demands for labour. This is particularly worrisome for this happens to be the wet season in the country. As Chambers (1982) observed, for tropical countries in general, this season is likely to be a time when poor households, face severe food shortages, high exposure to infections (eg. Malaria and abdominal diseases) and malnutrition. All these have the effect of reducing the family labour supply. Thus in effect, the position of most of the poor households in terms of family labour supply is likely to be worse than the one depicted in the model.

Table 6.13 Crop Enterprises in The Feasible Solution When Labour Input is Constrained to Family Labour Only And Financial Constraining is Assumed Away.

<table>
<thead>
<tr>
<th>TMG (K)</th>
<th>1</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimal Activities (ha)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Local maize for subsistence) X1</td>
<td>0.69</td>
<td>0.87</td>
<td>1.35</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>(Local maize for cash) X2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>(Hybrid maize) X3</td>
<td>0.78</td>
<td>1.12</td>
<td>1.51</td>
<td>1.21</td>
<td></td>
</tr>
<tr>
<td>(Groundnuts) X4</td>
<td>0.09</td>
<td>0.12</td>
<td>0.18</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>(Tobacco) X5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1.56</td>
<td>2.11</td>
<td>3.04</td>
<td>2.34</td>
<td></td>
</tr>
</tbody>
</table>

Constraints: Jan(0.05) Jan(0.05) Jan(0.05) Jan(0.05) Dec(0.88) Dec(0.88) Dec(0.88) Dec(0.88)
(b) Without Labour Constraint, But With Input Purchasing Constrained.

In the second stage of the analysis, the labour constraint was removed by allowing the households to hire as much labour as they required (with the availability of the means to finance it, ignored for the time).

The LP results indicated that all households would, in the absence of the labour constraint, find it optimal to increase their farm revenues by expanding their tobacco hectarages until they hit the land constraint, given that they had adequate finances to meet the financial requirements of the tobacco enterprise. However, due to the operation of the financial constraint, the results indicated that the financially deficient households would tend to limit the hectarages of the outlay intensive enterprises (tobacco and hybrid maize) in favour of the local maize enterprise.

The results indicate that the poorer households categories 1 and 11, would find it optimal to devote all their land and labour resources to the local maize enterprise, and a bit to groundnuts, as their financial resources could not allow them to meet the financial requirements associated with either the hybrid maize or tobacco enterprises. On the other hand, for those households with relatively more financial resources (categories III and IV), they would find it profitable to grow tobacco, in addition to the local maize and groundnut enterprises.

It is interesting to note that within the conditions specified in the model, the hybrid maize enterprise does not enter the optimal solution at all. This tends to indicate that at the given cost-price relationships, the hybrid maize enterprise is less profitable than its local counterpart. As Table 6 indicates, local maize offered a higher return per Kwacha than the hybrid maize enterprise. In addition, it appears that the higher yield obtainable from hybrid maize was not high enough (at the given farm-gate prices) to compensate for the higher costs associated with it. For example, the incremental revenue from a hectare of hybrid maize (over a hectare of local maize) was K132.68, while as the incremental
costs required to realize this incremental revenue were K84.02 (see table 6.10). Thus given adequate land and labour resources, it is optimal for a household to undertake the local maize enterprise rather than the hybrid one. This indicates that the cost-price relationship (of the hybrid maize enterprise) is counter to the projects desire to expand hybrid maize production. If the hybrid maize enterprise is to be taken up by many farmers, then it must be seen to be more profitable than local maize. This suggests that revising the price policy for maize, to achieve a cost-price relationship whereby investment in the hybrid maize enterprise (in terms to amount of revenue earned per Kwacha spent) is more profitable than in the local maize enterprise. This is because, although the returns to labour from the hybrid maize enterprise may be higher than those from the local maize enterprise (in the region 1.28:1, if for the sake of argument we assume that hybrid maize requires 25% more labour per hectare per year, than the local maize, because hybrid maize is far more intensive in its financial requirements than local maize), it is the relationship between the returns to finances, of the two enterprises, which will be the main deciding factor regarding which enterprise will be undertaken, especially among those households where the financial constraint is the most binding constraint.

The LP results also indicated that for those households with relatively more financial resources for purchasing inputs (whether in the form of cash resources or access to seasonal credit), the tobacco enterprise featured in their optimal solution, in addition to local maize and groundnuts. This suggests that, if it was not for the quota controls, its production would have been much higher than is the case at the moment.
Table 6.14 Crop Enterprise In Feasible Solution When A Financial Constraint (for Input Purchasing) is Introduced, But Labour Constraint Removed.

<table>
<thead>
<tr>
<th>Household category</th>
<th>1</th>
<th>11</th>
<th>111</th>
<th>1V</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMG (K)</td>
<td>329.96</td>
<td>327.87</td>
<td>378.55</td>
<td>383.98</td>
</tr>
<tr>
<td>Optimal Activities (ha)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Local maize - for subsistence) X1</td>
<td>0.69</td>
<td>0.87</td>
<td>1.35</td>
<td>0.99</td>
</tr>
<tr>
<td>(Local maize - cash) X2</td>
<td>6.92</td>
<td>6.70</td>
<td>4.47</td>
<td>5.05</td>
</tr>
<tr>
<td>(Hybrid maize) X3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(Groundnuts) X4</td>
<td>0.39</td>
<td>0.43</td>
<td>1.28</td>
<td>1.13</td>
</tr>
<tr>
<td>(Tobacco) X5</td>
<td>-</td>
<td>-</td>
<td>0.90</td>
<td>0.63</td>
</tr>
<tr>
<td>Total</td>
<td>8.00</td>
<td>8.00</td>
<td>8.00</td>
<td>8.00</td>
</tr>
</tbody>
</table>

Constraints

<table>
<thead>
<tr>
<th>(Shadow prices bracketed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fin A (1.51)</td>
</tr>
<tr>
<td>Land (40.33)</td>
</tr>
</tbody>
</table>

(C) With Both Labour and Financial Constraints Operating.

In the final stage, in addition to the financial constraint associated with purchasing inputs, households' hiring of labour was subjected to a financial constraint. That is, households could only spend up to 25% of the current incomes on hiring labour for agricultural work.
The results indicate that the total hectarage cultivated by each of the average households in each typology was the same (when the financial constraint regarding hiring labour was introduced) as for the situation where only family labour was used. This tends to support the view that households hired labour not for ground preparation work, but largely for weeding purposes. However, it was interesting to note that there was a change in the composition of the optimal crop enterprises. Whereas under situation (a), the hybrid maize enterprise featured in the optimal solutions of all the household typologies
with the introduction of the financial constraint (regarding input purchases), the hybrid maize hectarages of categories I and II households dropped by 74% and 82%, respectively, in favour of the local maize enterprise, which required minimal financial resources. In contrast, categories III and IV households, because of their greater financial resources, experienced drops of 26% and 16% in their hybrid maize hectarages respectively, as a result of introducing the financial constraint with regard to input purchases. This indicates that the availability of finances, to purchase inputs (cash or credit) has a larger impact on the poorer households' ability to take up innovations, than on the relatively better off ones.

At the same time, the introduction of the financial constraint, to restrict labour availability, had the effect of restricting the cultivated area drastically, to levels manageable by the family labour forces as indicated above. More important, the results indicated that the removal of the labour constraint, would have an income equalisation effect, as all households would tend to take up a land extensive system of cultivation (subject to land availability). As Table 6.14 indicates, as long as there is no labour constraint, the financial constraint has a minimal effect on the total farm revenue of the various households. However, where the labour constraint is in operation, as in table 6.13 the financial constraint tends to reinforce the income differences, by limiting the access of the labour deficient households to higher yielding crop varieties, as was observed in the tree diagram analysis presented above.
3. Models of Innovation Adoption in LLDP.

It has already been pointed out that most of the innovations introduced in the LLDP (e.g. monocropping, new and improved seed varieties, etc.), were of the labour intensive type in relation to traditional crops. At the same time, the need for self-sufficiency in foodstuffs, coupled with the fact that the distribution of inputs through the credit systems was based on the "ability to repay" criterion meant that only those who were able to cultivate large hectarages took up the innovations. These aspects had a significant impact on the way productivity and income improvements were distributed among the households as the reported cash income data indicated. In this section, an attempt will be made to illustrate how under the circumstances underlined above, the pattern of income distribution observed in the area may have emerged, by making use of a number of models.

A. Labour Availability and Innovation Adoption in LLDP

I. The Semi-Subsistence Farm Family Model.

Here, a modified version of the model developed by Fisk (1975), will be used to show how a basically subsistence production family unit, is likely to respond to the introduction of a relatively labour intensive innovation.\(^{(18)}\)

The model is built on the underlying assumption that land availability is not the binding constraint to the family farm income. Nevertheless, it is recognised that although households may not be institutionally constrained in their access to farmland, in the short run, the supply of farmland available to a household may be regarded as fixed. As such, this model adopts the Fisk approach of regarding the land factor as constant, so as to enable the effects of the other factors to be appropriately investigated. In the original Fisk model, technology and capital are also assumed to be constant, the only variable input being family labour. However, in the model presented here, both capital and technology vary (between households) as a result of the development effort being undertaken, which provides extension and credit services and encourages the use of modern inputs. In order to keep the analysis at a manageable level, the production of only one crop (maize) is considered.
Graph 6.1 Income Function of Semi-Subsistence Households Growing a Traditional Crop.

Graph 6.2 Income Function of Semi-Subsistence Households Growing a Modern Crop.
Graph 6.1 depicts the situation represented by the Fisk model, i.e., where land, capital and technology are constant—which is akin to households growing a traditional crop, such as local maize under traditional methods of production. OP represents the production possibility curve of households of varying sizes (subject to diminishing returns due to the fixity of the land). OS represents the subsistence requirements of the various households. Under these circumstances, OP represents the income function. And as the graph indicates, under such circumstances, there is very little scope of a marketable surplus for most of the households.

In graph 6.2, we introduce a modern innovation, such as hybrid maize, which is meant to boost production of a marketable surplus. It is here argued that the additional labour demands associated with the new innovation (such as early and timely planting, weeding, fertilizer application and soil conservation measures, etc.) and the stipulation of a minimum size of the package, require a critical minimum labour effort, say L2 below which such an innovation may not be taken. Under such circumstances, the income function of the households would be kinked, i.e., O0'O''P'. The graph indicates that the production possibility curve, with the new innovation becomes O''P'. It can be seen that a household with a relatively small labour force, say L1, which is below the critical labour required for the minimum prescribed package (i.e., 10 kg of hybrid maize seed for 1 hectare), can only be able to grow the traditional crop giving it a very small marketable output. This tends to agree with the observation that only those households with either large family labour forces, or able to hire labour, grow the crop, while those with labour deficiencies, such as the female headed households (typology 1) do not grow it. It is very important to realize that this aspect of a critical minimum level of labour input required for the adoption of hybrid maize arises from both the stipulation of the minimum package that is a household should be able to raise the labour required to cope with 1 hectare of hybrid maize, and the fact that
hybrid maize is relatively more labour intensive than local maize.

On the one hand, a household with a labour force larger than the critical level required for the adoption of hybrid maize, taking up the hybrid maize enterprise will enable it to obtain a larger marketable output, say $O_C'$, which would have been nonexistent with the local variety, as at this point the household output $C$, just equalled its consumption requirements $S_3$. The above model demonstrates that labour availability could be quite a crucial constraint to innovation adoption in the circumstances under review. For example, for those households with a labour deficiency (to deal with the minimum stipulated package), provision of inputs, say through credit, unless accompanied by some form of labour saving technology, is unlikely to induce them to innovate. While as, for those households with adequate labour supplies (family and / or hired), access to inputs is more likely to enhance their adoption of such innovations. This explains why our survey results have indicated that it is mostly those households with either large family labour forces or with the ability to hire labour, that have adopted the innovations introduced in LLDP. And, as already pointed out, the advocating of such an adoption pattern has the likely consequence of inducing a rural labour market, whereby a group of "progressive" farmers rely increasingly on hiring the labour of the poor households. The mechanics of such a situation will be demonstrated in the next model.

II. The Emergence of a Rural Labour Market.

The position of the smaller and poorer households is made worse by the nature of the output market. As already pointed out, although ADMARC offers one price to all smallholder producers for all varieties of maize, throughout the year, there are in fact differences in the prices which different farmers get for their output due to the disjointed nature of the market. As indicated earlier, ADMARC purchases only a small proportion of the smallholder maize crop (about 40%), the rest being sold through private channels, where the price ranges from say K3-50 per 200lb. bag (91 kg), soon after harvest (May/June), to about K13-50 or more, during the rainy season (December/January). The ADMARC markets do not open until mid-July
(except for tobacco, which open in April). The majority of the poor households sell most of their maize soon after harvest to raise badly needed cash for such things as clothing, etc., as this happens to be the slack season and there are hardly any non-farm income earning opportunities available. Ironically, these households end up buying maize during the hungry gap when its price is very high, usually using funds earned from wage labour, which seems to be in high demand at this time of the year.

For the larger farmers, the ADMARC price acts as their minimum guaranteed price. In the first place, they can afford to wait until the free market price has risen before selling their produce, at about 3-4 times the price obtained by the smaller farmers. Alternatively, they are able to sell in bulk (individually or in groups) direct to ADMARC depots or to industrial users, at higher prices. For example, in the 1980/81 season the author came across a number of farmers in Unit 4, who had co-operated to deliver a lorryload of maize to Chibuku Products (a local brewery) at K10 per bag, while the smallholder price paid at the ADMARC local markets was K6.50 per bag. Although they paid K1 per bag for transport, they still ended up with a much better deal. Thus the larger farmers tend to obtain a higher return to labour, from their maize enterprises than the smaller farms. It could be argued that this differential in returns enables the larger farmers to take on the higher yielding varieties, for it compensates them for the higher costs associated with input purchases. More importantly, the returns to labour from the maize enterprise, to the larger households, are much higher than those to the smaller and poorer farmers (due to the higher output prices and higher yields per hectare associated with the improved maize varieties). This implies that the gross margins from the maize enterprise presented in table 6.10, which were based on ADMARC farm-gate prices, overstate the gross margins obtained by many of the poor farmers, while they understate those obtained by the larger and better-off farmers. The implication of this aspect is that due to the
disjointed product market and the differences in technologies used by the various typologies of farmers, they face differing marginal returns to labour from their maize enterprises, and they operate on different production functions. As long as this differential is large enough, a labour market is likely to emerge among the rural people. The model below, will be used to illustrate how this is likely to take place.

The model to be employed is that developed by Nakajima (1970) and modified by Kydd (1978). In the model we shall look at how a "non-adopting household" and an "adopting household" will react to the presence of a labour market. In the discussion above, it was argued that the introduction of a relatively labour intensive innovation such as hybrid maize, is likely to trigger off a rural labour market, especially if the adopting households cannot fully meet the crop labour demands from their family labour forces, and at the same time, if there exists a group of people who for one reason or the other, cannot participate in the new innovation, and have very limited off-farm employment opportunities.

(a) The introduction of a rural labour market

Let us assume that a rural household can either sell or purchase some quantity of labour if it so desires, at a wage rate determined by the market. If we further assume that the household has no asset income, the equation for the household's income function (following Nakajima, 1970), will be:

\[ Y = Y_s + Y_m \]

\[ Y = Y_s + P_x f(X, B) + W(L-X) \]

where \( Y \) = total household income.

\( Y_s \) = subsistence income.

\( Y_m \) = monetary income.

\( P_x \) = farmgate price of product.

\( X \) = total labour input on farm.

\( L \) = total family labour utilized on the farm and outside the farm.

\( B \) = total land cultivated by the household.

\( W \) = wage rate
Graph 6.3 Reaction of a Semi-Subsistence Household To a Labour Market in a Non-innovating Situation

(a)

(b)
In the graph 6.3, OP represents the production possibility curve of a household with a total labour force of \( L \), producing say local maize (non-innovating). The slope of the line CQR represents the wage rate. Point Q, where the production possibility curve touches the wageline, represents the most preferred point of farm production for the household, while point R, where the wage line touches the indifference curve, represents the most preferred total family income position. Points Q' and R', in the bottom part of the diagram, represent the equilibrium points of total labour input on the farm and total labour input on and outside the farm, respectively. The diagram indicates that given the total workforce of \( L \) units the most optimal strategy for the household would be to employ \( X \) units on the farm and hire out \( L - X \) units, at the going wage rate. In other words, at the existing level of technology, it would pay the household to hire out any labour units over and above the number of units at which the marginal revenue of labour on the farm equals the going wage rate (or to hire in labour up to that point if its own labour force is less than the equilibrium quantity \( X \)).

Now if we introduce a labour intensive technology, as in the case depicted in graph 6.4, the position changes. In the first place, the most preferred point of farm production (at which the wage line touches the new production possibility curve) becomes Ql, with the corresponding labour input of \( X_l \). This indicates the total labour input required to attain the preferred farm production position is much larger than that in the previous situation, meaning that since the household has a smaller labour force than \( X_l \), to take advantage of the new innovation, it will have to hire some labour at the going wage rate.

Another point illustrated by the graph is that even households with large workforces, if taking up the innovation, will be inclined to hire in labour (because of their higher income positions, made possible by the innovation) in preference for leisure. If there is a large group of innovators, competition for labour is likely to arise, and this may push up the wage rate. It could be argued that the advocacy of a labour
intensive technology may well prove to be a useful tool for improving the incomes of the rural poor, if it leads to higher rural wages. However as it has already been pointed out, the poor households who usually hire their labour usually do so out of need rather than choice. This means they have a very low bargaining strength. Due to the differentiated product market, the poorer farmers get lower returns to labour than their better-off and innovating households. For these poor farmers, the decision to hire out labour depends on the comparison between the marginal revenue product of labour on their farms and in wage employment. For the innovators, the decision to hire labour rests on the differential between the marginal product of the hired labour on the farm and the wage rate. Because productivity is very low on the farms of the poor households, the basis of their wage demands is low. The position is further weakened by the fact that most of these households are badly in need of food at the time their labour is in demand, as such, they tend to be price takers rather than makers, thus making the situation exploitative. (23)

It should be added that, because of the labour intensity of the innovations, the innovating households will have two options, either to use labour saving technology or to hire labour. The decision as to which option will be followed will depend very much on the relative costs of the two options as well as the degree of substitutability between labour and labour saving techniques. But as already indicated, the type of innovations being considered in the case under review, appear to be those where labour saving technology (at least the available range) is less suitable. Hence the most likely option for the innovator is to hire labour. This decision is aided by the output pricing system, which makes investment in labour saving technology less profitable while at the same time keeping returns to labour in peasant agriculture (especially among the non-innovators) low, thereby keeping the rural wage rate low.
While the model does not pretend to state that the peasant farmers do actually sit down and perform the elaborate calculations implied in the model, it illustrates how, under the assumptions specified and implied in the model, households with different resource endowments are likely to react to changes in their economic environment, brought about by the introduction of a particular type of development strategy, given that the peasant farmers are rational in their allocation of resources in pursuing a given objective, or set of objectives, for which ample evidence is cited in the literature. (24)

Evidence from the survey does tend to support the model, as it indicated that those households not taking the innovations (categories 1 and 11) tended to rely substantially on hiring out labour to improve their household income positions, while at the same time, those households who took up the innovation package in the area, tended to be associated with a greater degree of labour hiring (in addition to their larger than average family labour forces).
4. A Summary.

What the analysis of the survey data has shown so far is that while both average yields and average household incomes may have risen substantially in the project area, such a rise may not have been uniform across the various household typologies. The analysis has indicated, for example, that categories 1 and 11 households (female headed households, and those male headed households growing neither tobacco nor improved maize), because of their relative lack of adequate labour and their restricted access to input credit (which appears to be a direct result of their labour deficiency), may not have benefitted much from the current development effort, which in essence, depends a great deal on the adoption of inherently labour intensive innovations to raise farm productivities and farm incomes. Such a finding is consistent with results obtained in other parts of the world where the encouragement of innovation adoption among the smallholder farmers has been adopted as the main strategy for raising rural incomes. (25) The study has indicated that the main problem of the poor households (ie. those in groups I and II), appears to be lack of cash to buy family necessities, which stems from their low farm productivities.

Because they cannot improve their farm income positions due to the reasons given above, these households usually resort to non-farm sources of income. However lack of cash earning opportunities in the rural areas (coupled with limited opportunities in the relatively small urban sector), forces most of these households to sell their crops early in the season when prices are very low, thereby opening up a "hunger gap" before the next harvest. The consequence of this aspect is that such households out of sheer necessity to survive, are forced to hire out their labour, badly needed on their own farms, to richer households and/or to agricultural estates, during the peak agricultural season. This tends to further aggravate their household income positions. Castro (1981), observed that those who engaged themselves in wage labour in rural areas, tended to be the poor villagers. Because wage levels are usually low (due to the low bargaining power of such
people), these households are unable to accumulate and are chronically poor. Although time series data were not available to adequately prove this point, in our case, the results of the cross-section data reported in chapters V and VI, strongly support this point.

It therefore appears that unless some corrective measures are undertaken, such a strategy of development is likely to open up the income gap between the "poorer" and "richer" households, with the former getting more and more dependent on wage labour. In the concluding chapter we shall try to explore the various ways through which such a situation can be averted.
Notes - Chapter V


3. *Ibid*.

4. *Ibid*.

5. It has recently been observed that, increasing commercialization, among the Malawian small scale farmers, goes hand in hand with increasing use of land. This tends to support the view taken in this study that the innovations being advocated by the extension services are mostly of the land extensive type, and therefore labour intensive (given the predominance of hoe culture cultivation in the area). See Kliest, T.J. (1981) "Development Policy and the Small Farmer in Malawi: The Growth of Inequality", in *The Rural Agricultural Sector*. Institute of British Geographers - Developing Areas Study Group (Papers Presented at the Newcastle Upon Tyne Meeting - April, 1980) P 30.

6. This idea was advocated by Chayanov. See, Chayanov, A.V. (1966), *op cit*.


11. A similar fate has befallen the mechanical maize shellers which were introduced in LLDP to ease the labour bottleneck associated with processing the maize grain for the market. These shellers were made available to the farmers on hire basis, i.e. K0.30 per bag, but very few farmers hardly make use of the facility. The smaller and poorer farmers hardly have the amount of maize which would warrant the hiring of a sheller, to be shelled at any one time. The larger farmers, on the other hand, prefer to use the cheap labour offered by the poorer households, for which they usually pay in kind.


For example, the World Bank (1981 b), notes that high yielding variety technology may increase seasonal demand for labour so that adoption is less attractive for those with limited labour or those operating in areas with less access to labour markets. The Bank cites evidence from a study in India by Harris (1972), which found that shortages of family labour explained non-adoption of high yielding varieties in India. See Harris, B. (1972) "Innovation Adoption in Agriculture – The High Yielding Varieties Program", in Modern Asian Studies, Vol. 6 No. 1 PP 71-98, cited in World Bank (1981 b), op cit, PP 10-11.

The assumption that about half of gross farm receipts are used to purchase off-farm inputs, appears from time to time in the literature. See for example, Freebairn, J.W., et al (1982), "Distribution of Research Gains in Multistage Production Systems", in American Journal of Agricultural Economics, February 1982, P 39.


See Kinsey, (1974), op cit, P 112. – This estimate applies to LLDP and probably other project areas. In other non-project areas where the marketing structure is less well organised, the proportion of smallholder maize output sold to ADMARC is likely to be lower, although it is fair to point out that the situation has been improving with improvements in the rural transport network.


This view is consistent with the findings of Kiray in Turkey, where the introduction of high yielding varieties of cotton proved incompatible with endogenous factors of some farmers, as it was found that many small households could not earn sufficient income from the new varieties. This was largely due to the fact that the new variety matured in such a short time that small farmers constrained by their family labour could not complete the harvesting operation in time. As a result, they were forced to work part-time for larger farmers. – cited in Norman, D.W. (1978),
"Farming Systems Research to Improve the Livelihood of Small Farmers", in American Journal of Agricultural Economics, Vol. 60, No. 5, P813.

22. The depressed farm output prices, which make investment in agricultural implements (in the smallholder agricultural sector) less profitable, coupled with the rural wages policy, which is designed to provide labour, relatively cheaply to the estate sector, reinforces this decision.

23. Because of the high risk associated with obtaining food at the market, it would take a very high wage rate to persuade these households to abandon subsistence production all together and become full time farm labourers.


26. Castro, A.P. (1981), "Indicators of Rural Inequality", in World Development, Vol. 9, No. 5, PP 401-427. He cites the findings of Feder (1971), Griffin(1979) and Deere and Janvry (1979), to support this point.
CHAPTER VII

POLICY IMPLICATIONS, RECOMMENDATIONS AND CONCLUSIONS.

As indicated in the introductory chapter, this study has attempted to assess the impact of a smallholder agricultural development strategy on the alleviation of rural poverty. LLDP, one of the pioneer experiments in smallholder agricultural development (both from the point of view of the World Bank and the Malawi Government), has been used as a case study. However, before drawing conclusions from the evidence emerging from our Smallholder Agricultural Households Survey in the LLDP, it is important to point out some of the outstanding characteristics of the survey area.

The Lilongwe district, in which LLDP is situated is unique in a number of respects. Firstly, its natural factors, ie. good soils, moderate temperatures, and reliable rainfall, make it an area of great agricultural potential, especially for smallholder crops. That is, of the total land area available in Lilongwe (about 615,000 hectares), 67% is rated as cultivable and this constituted about 7.8% of the cultivable land in the country. As table 6.1 indicates, the 1968/69 National Sample Survey of Agriculture estimated that during the 1968/69 cropping season, Lilongwe District alone, was responsible for more than 20% and 30% of the total Malawian production of maize and groundnuts, respectively, and that average yields of both crops were the highest in the country (see table 7.1). This indicates that even before the project was underway, the quality and intensity of smallholder agricultural production in the District were higher than the national average.

Secondly, as a result of the area's agricultural potential, it has been a major recipient of agricultural efforts of varying intensities right from colonial times. In addition to LLDP, the Colby School of Agriculture, Chitedze Experimental Station and the Bunda College of Agriculture are all situated in the district. And more recently, the establishment of the new Capital City in the district, and its subsequent expansion, have added impetus to the modernising influence of external factors.
(especially the availability of a growing and expanding market for food crops and the availability of off-farm employment opportunities in close proximity to the farm) on peasant production in the area. More important, Lilongwe has enjoyed the privilege of being one of the few places in the country where smallholder agricultural production of cash crops (e.g., tobacco and groundnuts) was tolerated and even encouraged during the colonial era, due to its distance from the Shire Highlands, where European settler agriculture was concentrated and also due to the fact that the crops involved were those which did not compete directly with settler crops. This has meant that both land and labour in the area were available for smallholder agriculture in contrast to, say the Shire Highlands where settler plantations of tea, tung and coffee took up most of the land and labour available. The consequence is that in the Lilongwe area the smallholder farmer has had a relatively long experience in peasant cash crop production. Thus the current agricultural development effort has been more or less built upon an existing structure and along the lines of adapting an already existing farming system and improving on it.
### Table 7.1 Smallholder Production, Yields and Hectarages of Maize and Groundnuts in Lilongwe Districts Compared with National and Regional Totals 1968-69.

(a) Maize

<table>
<thead>
<tr>
<th></th>
<th>Area (ha)</th>
<th>Yield (kg/ha)</th>
<th>Production (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(ha)</td>
<td>(%)</td>
<td></td>
</tr>
<tr>
<td>All Malawi</td>
<td>1068</td>
<td>(100.0)</td>
<td>1019.2</td>
</tr>
<tr>
<td>Northern Region</td>
<td>110.2</td>
<td>(10.3)</td>
<td>817.6</td>
</tr>
<tr>
<td>Central Region</td>
<td>463.2</td>
<td>(43.4)</td>
<td>1176.0</td>
</tr>
<tr>
<td>Southern Region</td>
<td>496.8</td>
<td>(46.3)</td>
<td>918.4</td>
</tr>
<tr>
<td>Lilongwe</td>
<td>153.1</td>
<td>(14.3)</td>
<td>1523.2</td>
</tr>
</tbody>
</table>

(b) Groundnuts

<table>
<thead>
<tr>
<th></th>
<th>Area (ha)</th>
<th>Yield (kg/ha)</th>
<th>Production (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(ha)</td>
<td>(%)</td>
<td></td>
</tr>
<tr>
<td>All Malawi</td>
<td>449.2</td>
<td>(100.0)</td>
<td>448</td>
</tr>
<tr>
<td>Northern Region</td>
<td>35.8</td>
<td>(8.0)</td>
<td>481.6</td>
</tr>
<tr>
<td>Central Region</td>
<td>216.4</td>
<td>(48.2)</td>
<td>660.8</td>
</tr>
<tr>
<td>Southern Region</td>
<td>197.1</td>
<td>(43.9)</td>
<td>212.8</td>
</tr>
<tr>
<td>Lilongwe</td>
<td>186.3</td>
<td>(41.4)</td>
<td>963.2</td>
</tr>
</tbody>
</table>


### Table 7.2 ADMARC's Purchases of Tobacco and Groundnuts From Customary Land, 1950-1974. ('000 metric tons)

<table>
<thead>
<tr>
<th>Period</th>
<th>Tobacco</th>
<th></th>
<th>Groundnuts</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Malawi</td>
<td>Lilongwe</td>
<td>All Malawi</td>
<td>Lilongwe</td>
</tr>
<tr>
<td></td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td>1950-54</td>
<td>47.2</td>
<td>26.5</td>
<td>16.5</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(56.2)</td>
<td>(59.3)</td>
<td>(39.5)</td>
</tr>
<tr>
<td>1955-59</td>
<td>50.8</td>
<td>30.1</td>
<td>54.2</td>
<td>16.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(59.3)</td>
<td>(30.1)</td>
<td></td>
</tr>
<tr>
<td>1960-64</td>
<td>50.1</td>
<td>23.8</td>
<td>117.9</td>
<td>36.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(47.5)</td>
<td>(30.5)</td>
<td></td>
</tr>
<tr>
<td>1965-69</td>
<td>60.8</td>
<td>27.2</td>
<td>168.2</td>
<td>56.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(44.8)</td>
<td>(34.8)</td>
<td></td>
</tr>
<tr>
<td>1970-74</td>
<td>70.7</td>
<td>35.9</td>
<td>161.8</td>
<td>49.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(50.7)</td>
<td>(30.6)</td>
<td></td>
</tr>
<tr>
<td>1950-74</td>
<td>279.6</td>
<td>143.5</td>
<td>518.9</td>
<td>166.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(51.3)</td>
<td>(32.1)</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** ADMARC Reports, and Department of Agriculture Reports - See Compendium of Agricultural Statistics, Tables 6, 7a, and 7e(1c) PP 8 and 21. **NB.** Original data given in short tons.
In the light of the above evidence, it is clear that LLDP is not a typical underdeveloped area. This implies that any success of the project cannot be necessarily duplicated elsewhere in the country where conditions may be different from those obtaining in LLDP. Nevertheless, the analysis has indicated the general constraints to smallholder productivity and the conditions under which a smallholder agricultural development strategy can reduce rural poverty. Such knowledge is valuable in that it may indicate how rural development efforts in other areas in the country could be appropriately planned and implemented.


The analysis of smallholder agricultural development in Malawi has revealed that during the colonial and federal eras there was a general neglect of smallholder agricultural development in favour of estate agriculture, which was in the hands of European settler farmers and companies. Government fiscal, marketing and pricing policies were manipulated in such a way that provided the estate sector with cheap labour. The consequence of this neglect of smallholder agriculture was that peasants were forced either to work on the settler farms, often at low wages and unfavourable conditions, or to migrate to South Africa, Zimbabwe or Zambia, an aspect that created severe labour bottlenecks in the smallholder sector, and thus threatened even subsistence production.

Attempts to reverse the situation in the 1950's met with very little success because of the coercive methods used by the agricultural department to revolutionize smallholder agriculture. Some of the methods of agricultural production that were being introduced had little economic rationality, and the use of coercion, at a time when political awareness was at its highest, meant that there was widespread resistance to their adoption.

The coming of political Independence in 1964, saw an abandoning of the coercive approach to agricultural modernization. Instead, the Department of Agriculture, sought to teach the people better methods of farming through persuasion and example.
Thus, in the late 1960's, a smallholder agricultural development strategy was adopted which concentrated efforts and resources on a few geographical places and or "progressive" farmers, to produce tangible results in the shortest time and therefore initiate a demonstration effect throughout the smallholding community. However, by the mid 1970's it was clear that the approach was not cost effective and it was not egalitarian. A new approach to agricultural development, under the auspices of the National Rural Development Programme (NRDP) was launched in the late 1970's. This Programme aims to achieve a broad based agricultural development.

While all these efforts at finding a viable smallholder agricultural development strategy have been going on in the post-independence era, the dual structure of the agricultural sector inherited at Independence has been maintained. Available evidence indicates that the role of the estate sector has been consolidated and strengthened over the past decade or so.\(^{(2)}\) It is only fair to state that while experiments with small scale agricultural development have been going on, the estate sector has provided the economy with badly needed foreign exchange earnings (some of which have been used to finance the Integrated Rural Development Programmes), and therefore enabled Malawi to maintain a very respectable rate of growth in GDP over the past decade or so. This contrasts remarkably with the growth records of other developing countries which radically altered the structures of their agricultural sectors soon after Independence, such as Tanzania. According to World Bank estimates (World Bank 1981 b), during the 1960-70 decade (the decade when both countries attained their Independence), the average annual growth rate of GDP for the whole economy (in real terms), for Malawi was 4.9% while that for Tanzania was 6.0%.\(^{(3)}\) However, between 1970 and 1979, Malawi's average annual growth rate rose to 6.3% while that for Tanzania fell to 4.9%.\(^{(4)}\) It is interesting to note that during the later decade, Malawi registered an average annual growth rate of over 4% in its volume of agricultural production, while that of Tanzania was only between 1 and 2%.\(^{(5)}\) As already indicated, the high growth rate in Malawi's
agricultural production during the period under review was spearheaded by rapid growth in the estate sector. Tanzania, on the other hand, put all its stakes on the "villagisation" and "collectivisation" schemes, with the consequence that when these failed to achieve increases in agricultural production, as many studies have indicated, the result of this failure was severely felt by the whole economy, as reflected in the lower rate of GDP growth.

While such evidence provides some rationale of the prudence of adopting the dual agricultural development strategy (estate development and smallholder agricultural development), it should not mask the lessons learned from the pre-independence era. As already pointed out, over-emphasis on the estate sector during that period led to government policies (fiscal, marketing pricing and wages) which were geared to allocating resources (mostly land and labour) away from the smallholding to the estate sectors with disagreeable effects especially on rural wellbeing. As mentioned earlier, the two sectors compete for resources of land, labour and capital finance. While available evidence indicates that the estate sector expanded over the last decade or so, largely by making use of idle resources, there is a growing feeling that this may no longer be the case. Kydd and Christiansen (1982), for example, argue that during the period of rapid estate expansion, in the post-independence era, wage and smallholder producer price policies have combined to channel both labour and finances to the estate sector, which has also been favourably treated with respect to land allocation. Thus although the dual strategy may have served Malawi well over the past decade or so, in terms of maintaining agricultural growth, it could at best be a temporary solution to the country's long term development needs.

It therefore appears that if NRDP is to succeed in substantially improving the income positions of the smallholding community, there is a great need to carefully weigh the impact of the estate sector on smallfarm development, both from the point of view of resource allocation as well as access to markets. It is said that smallholder farm development offers the best opportunity to improve rural welfare in cases where
the smallholder community predominates, and that evidence indicates that smallholder production of most of the crops now produced by the estate sector, actually enhances higher output (due to the inherent efficiency of small farms in their use of inputs as opposed to large farms), it may therefore be in the interests of the country to concentrate its agricultural development efforts on the smallholder sector. This would entail running down estate production of some crops (e.g. burley tobacco which is largely produced on the estates on a visiting tenancy system), and handing them over to smallholders. This would have the effect of increasing employment opportunities within the agricultural sector, since smallholder agriculture tends to be more labour intensive than estate agriculture. In addition it would have positive distributional effects that would aid local industry (especially those involved in the manufacture of mass consumption goods) rather than channeling most of the income generated from agriculture to large farmers and estate owners who tend to have a high propensity to import goods from abroad.

2. A Summary of The Main Findings Emerging From The Survey Data Analysis.

In analysing the survey data, the main objective of the exercise was to trace out the interrelationships among the factors that were thought to be associated with household incomes from the farm enterprise, in an attempt to identify the main sources of interhousehold differences in incomes observed in the area. The analysis has been carried out at two levels. The first level is what may be termed as a descriptive analysis of the data. At this level, the aim was to isolate typologies of households which displayed similar characteristics so that a comparative study of the various typologies could be undertaken. This has proved to be a very valuable exercise. It has indicated that the often professed homogeneity of the rural population in the area is merely a superficial one. The households have been seen to fall into a number of distinct typologies with distinct characteristics regarding farming systems, farm sizes, income levels, family sizes, etc. More important, this
analysis has revealed that, the development effort undertaken in the area has had differing impacts on the different typologies. For example, it has indicated that tobacco farmers and improved maize growers are earning substantially higher incomes from their farming enterprises than say, the female-headed households, who are seen to hardly participate in tobacco and improved maize production, but to rely increasingly on wage labour and/or petty trading, not only to meet their ordinary cash requirements, but even to supplement their subsistence food requirements. Such findings are of crucial importance in influencing the future direction of development policy, for they clearly indicate that the present development strategy, if not altered, is likely to lead to producing a polarised rural community, which may not have been contemplated by the policy formulators, as indicated in the policy statements discussed in chapter III.

The second level of analysis is a statistical one. Here the main concern has been to find out the main factors that are associated with crop revenue. The hypotheses stated in the introductory chapter were explored. The hypothesis that a household's level of total revenue from sale of crops is likely to be associated with the type of crop enterprise undertaken (i.e. adoption or non-adoption of innovations), was well supported by the data. This implied that the adoption of innovations was a key to higher farm incomes. Similarly, the hypothesis concerning the association between innovation adoption (defined by use of modern farm inputs) and access to credit was also supported by the survey data. It was found that those who adopted the innovations introduced by LLDP, mostly did so with the help of credit. Although the evidence supported the hypothesis, because the nature of the data did not allow us to confirm the existence of causality in the relationship, some reservations regarding the impact of credit on innovation adoption were expressed. It was argued that the pattern of input credit distribution (although it correlated with that of innovation adoption), could have been influenced by other factors, related or unrelated to innovation adoption. Inefficiencies in the
marketing of inputs (by ADMARC), were cited as one of the likely factors that could have contributed to the suppression of cash purchases of inputs, thereby making access to credit more closely related to uptake of innovations.

The evidence that households with larger hectarages had more access to credit than those with smaller ones, supported the hypothesis regarding the relationship between farm size and access to credit (hypothesis 2a). Such evidence tended to indicate that credit distribution was based on the "ability to repay" principle, implying that the pattern of credit distribution, and therefore innovation adoption, had its roots, not only at the macro level (deliberate Government policy to foster elitist development), as it has usually been claimed, but also at the micro-level, i.e. it had also to do with the determinants of farm size at the household level. Of the two hypotheses put forward to explore the determinants of farm size, at the household level, the one pertaining to the relationship between farm size and family labour force (hypothesis 2b) was not adequately supported. On the other hand, the hypothesis regarding the relationship between cultivated and hired labour (hypothesis 2c), was supported by the available evidence. Such a finding was indicative of the fact that, in the circumstances under review, because of the sharp seasonality of the crop labour demands, and the inherent labour intensity of the crop enterprises supported by the development effort (e.g. tobacco, groundnuts and improved maize varieties), it was only those households who could raise the peak labour requirements (mostly through the help of hired labour), who were in a position to take up innovations. Thus, smaller and poorer households, with inadequate labour resource to meet the peak labour demands of the new innovations, at least at a level high enough to produce a marketable surplus, over and above their subsistence requirements, tended to be left out of the innovation bandwagon.

In an attempt to explore the factors associated with a household's ability to hire labour, we looked at the hypothesis that expenditure on hired labour was closely associated with non-farm income receipts (2d). However, the hypothesis could not be substantiated as the evidence was mixed. The largest group of households hiring labour (tobacco growers), were found to have the least proportion of non-farm income in their total household incomes and paying their hired labour largely in kind than cash. For this
group of households, it appears that their ability to produce maize surpluses, made possible by their privileged access to input credit, as discussed in chapter V, enabled them to hire labour. As already indicated, most of those people who hired out their services, did so in order to supplement their depleted food supplies, to these people, payment in kind, which was usually in the form of maize, was the most preferred one given that at the time of the year, food prices were very high. On the other hand, the other group of labour hirers (the improved maize growers), depended largely on cash to pay for their hired labour. For this group, whose non-farm income receipts were mostly from trades, business enterprises and more secure forms of employment, the relationship between the expenditure on hired labour and non-farm income receipts was quite substantial. This implied that their access to non-farm income sources, enabled them to hire the labour required by the crop enterprises they undertook.

Finally, the hypothesis that cash purchases of inputs are likely to be associated with a household's level of non-farm income receipts was not supported. This could either reflect the inefficiencies in the input marketing system referred to earlier, or it could reflect the fact that because input credit is readily available, once a household's likelihood to produce a marketable surplus is established (usually by referring to its previous record, or looking at the size of the area it cultivate the previous season), households find it more prudent to reserve any cash they might have, for hiring labour during the peak season.

Overall, the analysis has indicated that labour availability played a very important role in the household's ability to adopt the innovation "packages" offered by the project. It has indicated that in the 1980/81 season, a substantial proportion of the households surveyed in LLDP (about 70%) had adopted the innovations offered, that is, they had undertaken such enterprises as tobacco, improved maize (hybrids and/or composites) and improved groundnuts, and used recommended inputs and followed crop husbandry methods as stipulated by the extension
staff. This is a commendable achievement on the part of LLDP. However, the evidence arising from the survey tends to indicate that the "non-adopting" farmers who are mostly female-headed households, are not likely to be brought into the line of adopters under the current development strategy which tends to foster the adoption of relatively labour intensive innovations (by tying input credit to particular crop enterprises). This is reinforced by the lack of innovation packages (such as smaller input "packages") which are appropriate for the small and poor farmers.

The analysis has indicated, for example that, the female headed households, who are unable to participate in the new innovations (largely because of the labour bottleneck) and are constrained by household commitments to venture into non-farm employment opportunities (such as moving from their homes in search of work, say on the estates etc), tend to hire out their labour to better-off, "innovating" households, at relatively depressed rural wage rates. It therefore appears that the income gap between the so called "innovators" and "non-innovators" is likely to widen as the former get more and more commercialised while the latter tend to become more marginal agricultural producers, depending increasingly on wage income. Such a trend seems to be contrary to the present rural development policy, (as stated in NRDP, Strategies, Policies and General Features: 47), which seems to stress the need for the smallholding community to be self-sufficient in basic foodstuffs and become increasingly producers of marketable surpluses rather than agricultural labourers. Such a contradiction highlights the conflict between estate development and smallholder development embodied in the dual agricultural strategy. If the smallholder agricultural development effort is to achieve its objective, that is, to initiate a broad based agricultural development, by enabling the labour deficient and poor households to participate in innovation adoption, it is imperative that the labour availability problem is appropriately considered when designing innovation "packages". However, before examining the various alternatives which can be employed in enhancing the income positions of the poor "non-innovating"
households, it must be stressed that there is need for more intensive research into the problems of the poor households. For example, there is need for a more careful assessment of the family labour availability situation among the female-headed households to find out the factors that determine labour allocation between various competing needs such as subsistence crop production, cash crop production, non-farm income earning opportunities (e.g., beer brewing etc), and household chores (including child care). Such studies should be geared to identifying the labour bottlenecks of such households with a view to suggesting remedial policies.

It is only after such studies are undertaken that appropriate innovation "packages" can be designed for such households. It is also important to find out how such poor households fare with regard to access to various social services such as health, education and other amenities. For it is the feeling of the present writer that these under-privileged households may have limited access in such areas, due largely to sociological barriers, and this may have the effect of reducing the chances of the children from such households breaking out of the poverty trap. The writer is of the opinion that more research in these areas is warranted if rural development is not to continue to be spotty and selective in its effects.

3. Propositions for Improving the Lot of the Poorer Households.

1. Reducing the Labour Bottle-necks.

As it has already been pointed out, the main factor that prevents the poor households from taking up innovations offered in LLDP appears to be labour shortage, especially during the peak seasons. The survey results have indicated that this labour bottleneck imposes a double bind on the poor households. That is, it restricts their cultivated areas as well as restricting their access to credit. It therefore appears that removing the labour constraint of these households is likely to have the effect of greatly enhancing their farm income positions. A number of options are available for this task.
(i) **Mechanisation.**

In a situation where labour is seen to be a bottleneck, mechanisation appears to be one of the options which can alleviate the problem. This was recognised by the project authorities right from the start, when medium term credit was made available to farmers to purchase oxen and ox-drawn implements etc. However, it has been pointed out that the main limitation of using mechanical implements to improve the labour situation in LLDP seemed to stem largely from the inappropriateness of the available mechanical implements to those farming processes where the labour constraint was critical (such as weeding), and the depressed farm output prices that do not provide an incentive to farmers to invest in labour saving innovations. It therefore, appears that unless appropriate mechanical implements are introduced (such as mechanical weeders, etc) and an appropriate output price structure instituted, which will make investments in such implements profitable, mechanization *per se*, is likely to offer no solution to the labour shortage problem.

(ii) **Hired Labour.**

To the extent that labour availability is an important constraint to higher farm output for a majority of households (as the LP model suggested), hired labour has become an important element in enhancing agricultural output in the area. However, development of peasant agriculture based on hired labour has serious distributional implications. In a situation where there is a willing labour force (outside the beneficiary group) ready to provide the hired labour, such as a landless class or an influx of immigrants (as was the case in Malawi, up to the early 1960's, when there was an influx of immigrants from neighbouring Mozambique seeking agricultural work in Malawi, especially in the southern region), this may not have serious distributional effects among the beneficiary community, but in a situation where some of the peasant community that is part of the beneficiary group of the development effort provides the hired labour, as is the case in LLDP, serious distributional implications are likely to arise. For
it is likely that those households who are on the margin and cannot fully meet their consumption requirements from their own farms, will hire out their labour to wealthier households (and/or agricultural estates) especially in a situation where non-farm income earning opportunities are limited. This is supported by the relatively high proportion of cash income arising from selling labour, associated with categories 1 and 7 households (i.e., female-headed households and male-headed households neither growing tobacco nor improved maize varieties). It is therefore seen that unless special programmes (supplementary to the smallholder agricultural development effort) are specifically designed to improve the lot of these people, a smallholder agricultural development strategy that depends substantially on hired labour to spread adoption of innovations is likely to accelerate rural differentiation.

Boesen and Mohele (1979) have described how in a Tanzanian situation where labour was a bottleneck, liberal availability of credit (including cash loans for hiring labour) enabled households to take up the innovations offered. This led to a boom in the peasant production of flue-cured tobacco. However, a change in political climate, which led to the abolition of cash loans, and the restriction of hiring labour, coupled with adverse price movements in the price of tobacco, dealt a severe blow to the boom, leading eventually to a change in land use pattern, that is from emphasis on tobacco production (which is relatively labour intensive and therefore required hired labour) to more emphasis on the production of subsistence crops such as maize (which are relatively less labour intensive and therefore more easily handled by family labour). For example, in the estimation of the gross margins for tobacco and improved maize in LLDF the principal crops from which the programme's benefits are expected to arise, hired labour is included (see Table 6.), indicating that it is officially recognised that the adoption of these crops is strongly linked to a household's ability to hire labour, thereby, clearly indicating that the poor and labour deficient households cannot participate in them, except as providers of hired labour to
others. In the absence of any close supervision of the rural wage rate structure (not only on the established agricultural estates, but also in the smallholder sector), such a strategy is likely to compound the plight of the poorer households.

iii. Alternative Cropping Patterns.

As previously indicated, monocropping is a major husbandry recommendation in LLDP. However, it has been argued (Norman, 1975) that, although in terms of total annual man hour inputs crop mixtures may require more labour per hectare, in a situation where the timing of the processes associated with various crops coincide (as is the case for weeding of maize and, say groundnuts), this incremental labour requirement may not be very high, and could well be compensated for by other advantages associated with intercropping. In addition, in a situation where subsistence production seems to be a very important objective of smallholders, monocropping could well undermine this objective. It increases the risk associated with crop failure. For example, results from the LP model have indicated that an average female headed household could (under the given set of assumptions) be able to provide its subsistence requirements from 1.46 hectares of pure stand maize and be able to have a marketable surplus, if the assumed yield of 1100 kg/ha is met. However, in adverse conditions (i.e. via incidence of crop diseases or inadequate rainfall) where the yield could be reduced by say, 50%, the 1.46 hectares of pure stand maize may only just meet the subsistence requirements of the household, with hardly anything left to sell for cash. If the 1.46 hectares were usefully interplanted with other crops, which are not prone to the particular crop diseases, or are draught resistant, such as cassava, sweet potatoes, legumes, etc. the prospects of the household could be brighter.

It should also be pointed out that the monocropping requirement limits the diversification of the farm enterprise. In the case of LLDP, this means only such crops as improved maize, tobacco and groundnuts which enjoy project support, will be grown by most households. This is supported by the evidence that on average, 63.4% of cultivated land in LLDP (1969/70 to
1978/79), was planted with maize, 20.7% and 11.1% with groundnuts and tobacco respectively, leaving only 5% for other crops. Self-sufficiency in food does not necessarily mean only having enough maize (the main staple food in the area), it also means having other food crops (vegetables, fruits etc) to provide a properly balanced diet. Thus, if monocropping is rigidly adhered to by all farmers in the area, it may lead to a shortage of other food crops such as cassava, sweet potatoes, pulses and vegetables. And indeed, the writer observed that these crops were in short supply both in the urban and local markets in Lilongwe. Supplies of these crops in the area usually came in from other regions such as Dedza, Ntcheu, etc., although the potential to produce them locally in adequate supplies does exist.

It therefore appears that there is need for more research to establish crop combinations which could be usefully interplanted, and to find methods of intercropping amenable to modern technology, eg, alternate row planting of different crops in order to alleviate the labour bottleneck and enhance food self-sufficiency (in terms of a properly balanced diet) among the marginal farmers.

Our survey results have indicated that the poorer households (typologies 1 and 11) because of their smaller labour resources, lie at the bottom end of the income scale. Their position is made worse by the fact that input credit is tied up with the cropping pattern which is determined by the household’s labour availability situation. Since the crops for which input credit is readily available (tobacco and improved maize) are inherently labour intensive, it implies that the main hope for the poorer labour deficient households (within a smallholder agricultural development strategy) to improve their lot lies in their finding crop enterprises which have relatively low labour requirements (especially during the peak season). It appears that one possibility would be to encourage such households to grow crops like pulses, vegetables, sugar cane, sweet potatoes, etc. As pointed out above, the writer observed that, because of the monocropping requirement, and the bias of credit and extension towards particular crops such as tobacco and
improved maize, these minor crops tend to be absent from a
great deal of the holdings in the area, with the consequence
that they are imported from other areas. The survey revealed
that a good number of the poorer households (especially typology
11) relied to some extent on selling say, tomatoes, sugar-cane,
vegetables, etc., to boost their cash incomes. Unfortunately,
these crops hardly receive any credit or extension support from
the project. This lack of interest for other crops, on the part
of the project is reflected in the absence of any serious
research efforts in the production techniques of minor crops
apart from beans, on which substantial research work has been
carried out mostly at Bunda College of Agriculture (University of
Malawi). The present writer is of the opinion that some of these
minor crops could with adequate project support, say in the form
of input credit, research services, and marketing co-ordination,
meet the needs of a good number of poor households. For one
thing, they are both less labour intensive, in that some of them
are essentially off-season crops (eg. vegetables). Experience
from other parts of the world have indicated that with proper
price incentives small plots of minor crops can substantially
boost household incomes. At the same time, it could be
useful to encourage the poorer households to keep small livestock
such as goats and pigs, by extending animal husbandry advice,
and probably credit to include such small livestock, rather than
restricting these to large livestock as appears to be the case
at the moment.

11. Non-farm Activities Aimed at Raising the Incomes of the Poor
Households.

It appears that, both from innovation theory and principles
of financial management (pertaining to credit programmes), there
is no easy way through which the poorest section of the rural
community will benefit from a rural development strategy that
depends largely on adoption of innovations in a smallholder
context. And yet, if agricultural output is to rise in the
developing countries (which is essential to sustain the rapidly
growing populations) new innovations will have to be adopted.
That means resources will continue to be channelled towards
those sections in the rural community which demonstrate the
ability to use them effectively, hence by-passing the poorer section. Evidence from the socialist countries has indicated organisational innovations such as formation of group farms and co-operatives, etc., have their limitations in reconciling the problems of increasing agricultural productivity and achieving an even and fair distribution of development benefits. This means that rural development planners will have to come to grips with the fact that smallholder agricultural development per se, has its limitations in solving the problem of rural poverty. Thus there is need to seek for other alternatives of raising the incomes of those people for whom agriculture alone may not hold any promise. Even the so called "success" stories of rural development such as Taiwan and Japan, reveal that the observed improvements in rural incomes and rural well-being did not come entirely from improvements in agricultural productivity.

Chinn (1979), in his analysis of rural incomes in a major rice growing area in Taiwan, indicated that income from non-farm sources played a substantial role in reducing income inequalities in the rural areas. He found out that income differences evened out as participation in non-farm activities, especially sideline activities became more widespread overtime. His results suggested that non-farm sources of income allowed households with small holdings to close the income gap between themselves and large farmers by allocating some of their labour to non-farm activities. He cites similar findings for Japan and the United States.

These findings strongly stress the importance of the interdependence between the agricultural and non-agricultural sectors in the development process. More important, they indicate that, as the strategy of industrial development alone has failed to solve the rural poverty problem, smallholder agricultural development alone will not do it either.

Low (1981), using examples from Lesotho and Swaziland, has argued that in a situation where increases in farm output appear to be less independent of family labour transfers, than in Taiwan, etc. (due to lower level technology used) off-farm employment opportunities may have adverse effects on total farm output and therefore lead to a decline in real farm incomes.
His argument is that rising non-farm income opportunities in a situation of low-level and static technology, higher returns to labour in the non-farm than farming activities, will lead to a labour allocation pattern, whereby families find it more profitable to allocate more family labour to non-farm than to farm activities. And, without substantial changes in agricultural technology, this could lead to a decline in total agricultural output. (19)

However, although it could be true that in Lesotho and Swaziland there was a decline in the farm labour force, as a result of rising employment opportunities outside the agricultural sector, as happened in Taiwan and Japan, it should be noted that the circumstances were different. In the latter, cases, the decline in the farm labour force was due to rising opportunities in the domestic non-farm sector, whereas, in the former cases the decline in farm labour was largely due to increased migration to South Africa. Colclough (1980) indicated that in Lesotho about 1/4 of the labour force was working abroad during the period under review. (20)

In a situation where the labour transferred from agriculture is employed in domestic non-agricultural activities, demand for food and other agricultural products is likely to rise. With an appropriate agricultural pricing policy, it is possible to raise incentives among the remaining farm workforce to a point where they find it profitable to take up productivity raising innovations (especially labour saving ones), and this appears to have been the case in Taiwan and Japan. (21) In such a situation, an increase in non-farm employment opportunities is likely to act as a catalyst for the adoption of innovations, as such, technology need not remain static and output need not decline with a drop in the farm labour force. In the two Southern African countries, since the fall in farm labour was largely due to outward migration, the linkage effect between agriculture and industry was lost, especially since most of the earnings of the migrants (even when remitted to the two countries) are mostly spent on South African produced goods. As such, the demand for agricultural products from domestic
industry is not that high and incentives to take up labour saving innovations in the farm sector (to replace the labour lost to industry) may not be present. This is likely to lead to a decline in farm output as Low claims to have observed in the Southern African cases.

It therefore appears that Low's argument does not invalidate Chinn's conclusions regarding the role of non-farm income earning opportunities arising within the domestic economy. More important, Chinn is arguing for a rural development strategy that incorporates a non-farm activities component, to cater especially for those very poor households who for one reason or the other, cannot benefit from productivity raising innovations. A closer investigation of the problems facing the poorer households covered by our survey suggests that lack of purchasing power (to buy family necessities, including food, during the "hunger gap") appears to be quite a serious problem. This forces these households to:

(a) Sell their crops early in the season when prices are very low, and
(b) to hire out their family labour to other households or agricultural estates during the peak season (when demand for hired labour on the more progressive farms is very high), thereby further aggravating their labour problems and hence their farm income positions.

It therefore appears that, since these households are unable to raise their household incomes by adopting innovations, for the reasons already discussed, another alternative (to those given above) of raising their incomes would be to provide them with opportunities to earn income in close proximity to the farm. This could make a substantial contribution to the incomes of such households without jeopardising their subsistence food production (as it would reduce both the tendency to hire out labour and sell food early in the season to get cash). In such a case, the objective would not be to make these marginal farmers surplus producers, but to help them achieve self-sufficiency in subsistence food, while giving them the opportunity to earn cash for their other household needs from non-farm sources. (22)
It would therefore be necessary to identify non-farm activities in the rural areas which are geared to the village economy which require small inputs of time and family labour, in which the poor and labour deficient households could be encouraged to engage in (especially during the off-peak seasons), while continuing with their primary activity of agricultural production - as is the case with the Antyodaya Scheme in India. This scheme, which originated in the state of Rajasthan, India, came about because of the realization that virtually no scheme for the distribution of loans, grants and other forms of assistance designed to promote productive activities of direct benefit has significantly affected the poorest section of the rural society even when such programmes were specifically designed to assist them.

It was therefore thought that a change of strategy was necessary. Under this scheme, the aim was to help a man discover and start up his latent or lost earning capacity, and then let him try by himself. The approach was for each village to select its poorest five families, who would be eligible for "Antyodaya" aid. This aid was granted in the form of a grant (33%) and a low interest loan, with the funds coming from commercial banks. The recipients had to identify non-farm activities, which were geared to the various needs of the village economy, such as unmechanised means of transportation and tilling, rural crafts, cottage industries, repair and servicing agencies, etc. The size of the enterprises must be such that they do not interfere with the households' subsistence agricultural activities.

The programme achieved a remarkable degree of success. Chhabra (1982), reports that by the end of 1980, a total of about 217,000 farm families had been helped with loans amounting to about $27.6 million, with only 48,000 families receiving straight social security benefits, but the rest having been involved in self-generating activities. He reports that the scheme did not encounter any resistance from the existing village power structure, as the recipients were freely selected by the villagers themselves. In addition, Chhabra points out that
the banks reported an 80% repayment rate (on schedule), an aspect which is contrary to normal thinking which regards the poor as bad credit risks, and a proof of the financial soundness of the enterprises undertaken. Due to this good performance, the concept of "Antyodaya" has been incorporated in the national Integrated Rural Development Programme. This does not offer any social security benefits, but concentrates solely on credit coverage and skill development of the very poor people.

Conclusion.

It must be emphasized that the analyses in this study should not be interpreted to mean that the efforts of the smallholder development effort have not benefitted the rural population in the country. To the contrary, the evidence emerging from the study (within the limitations imposed by the available data) indicates that the efforts have been successful in inducing the spread of adoption of innovations by the smallholder community. In LDDP, for example, the survey results have indicated that about 60% of the sampled households participated in growing the recommended crops and followed recommended husbandry practices - mostly with the help of credit. The analysis has tried to indicate the likely reasons why the remaining 40% of the intended beneficiary group may not have adopted the innovations offered, and tried to suggest the various means by which the income positions of the poorer households could be enhanced. It has also tried to highlight areas of further research which could yield useful information about how to tackle the problem of rural poverty. By far, the largest contribution of the study is that both in designing and evaluating rural development programmes, it is very important to get more penetrating insights into the target population. In this respect, the study emphasizes the usefulness of identifying farm household typologies within the target population and then investigating the constraints faced by each typology separately so that the needs of each typology can be appropriately assessed. This is because in the past, there has been too much reliance on more broad generalisation of the characteristics of the target group. That is, the heterogeneity of rural households (as
regards resource endowments) has been largely ignored by basing most of the project design and evaluation on the "average" household within the target population. The result of this has been that most of the packages, designed for the "average" farmer have proved to be inappropriate to quite a number of households, and very little attempt has been made to tailor means to the needs of the various groups of farmers as planners lacked the appropriate information. It is therefore, hoped that the approach of identifying household typologies and analysing their characteristics will aid both project design and evaluation.
Notes – Chapter VII

   Table 1.

2. See, Kydd and Christiansen (1982), op. cit; Kliest (1980), op. cit; and Ghai and Radwan (1980), op. cit.

3. World Bank (1981 b), op. cit, P 144, Table 2.

4. Ibid.

5. Ibid. P 50

6. Most of the agricultural estates in Tanzania were turned into state farms, and the efficiency of these farms proved to be below that of the earlier estates which were under private enterprise. In addition, these farms are said to have proved to be capital intensive, export oriented and had less impact on the rural population. See, Desai, P.U. Mutalik (1976), "Ujamaa Villages. A Tanzanian Experience", in African Studies Review, Vol. 20; McHendry D.E. Jr. (1976), "The Ujamaa Village in Tanzania: A Comparison with Chinese, Soviet and Mexican Experiences in Collectivisation", in Comparative Studies in Societies and History, Vol. 18, No.3.


8. See Lele, Uma (1975), op. cit, PP 74-76.


10. See Boessen, J. and Mohele, T. (1979), op. cit, P 107

11. Ibid. PP 101-105


21. Chinn, for example, cites selective small scale mechanization, as one of the important factors that contributed to productivity growth in the Taiwanese case he studied. See Chinn (1979), *op cit*, P 300.

22. Ibid, P 300; see also Castro (1981), *op cit*, who cites evidence from Chimula, in Mexico, where 90% of the households produce only about 12% of the maize they consume annually, and engage in a number of non-farm activities, including seasonal wage labour on plantations etc, to supplement their farm incomes.


25. See Chabbre, Rami (1982), "Help for the Poorest in India", in *Development and Co-operation*, No. 4, P 31
APPENDIX I

The Linear Programming Model

For each of the household typologies, a linear programming exercise was undertaken. The inequalities involved were as follows:

Objective:  
Maximise total gross margins (TMG) from the five activities, ie.

\[
TMG = 0X_1 + 53.3X_2 + 102.2X_3 + 81.7X_4 + 130.5X_5
\]

For Typology I households (Female Headed), the constraint inequalities were:

(i) Labour (using the crop labour demands in table 6.11):  
Oct. 49X_1 + 49X_2 + 49X_3 + 12X_4 + 261X_5 \leq 170  
Nov. 
. 
. 
. 
Sep. 32X_1 + 32X_2 + 32X_3 + 10X_4 + 96X_5 \leq 170

(ii) Land  
\[ X_1 + X_2 + X_3 + X_4 + X_5 \leq 8 \]

(iii) Food  
\[ 1100X_1 + 0X_2 + 0X_3 + 0X_4 + 0X_5 \geq 960 \]

(iv) Finances A  
\[ 1.24X_1 + 1.24X_2 + 70.43X_3 + 22.24X_4 + 83.24X_5 \leq 19 \]
Finances B  
\[ 0X_1 + 0X_2 + 15X_3 + 0X_4 + 15X_5 \geq 9.5 \]

For Typology II households (non-tobacco and non-improved maize growing male headed households)

(i) Labour  
Oct. 49X_1 + 49X_2 + 49X_3 + 12X_4 + 261X_5 \leq 231  
Sep. 32X_1 + 32X_2 + 32X_3 + 10X_4 + 96X_5 \leq 231 

(ii) Land  
\[ X_1 + X_2 + X_3 + X_4 + X_5 \leq 8 \]

(iii) Food  
\[ 1100X_1 + 0X_2 + 0X_3 + 0X_4 + X_5 \leq 960 \]

(iv) Finances A  
\[ 1.24X_1 + 1.24X_2 + 70.43X_3 + 22.24X_4 + 83.24X_5 \leq 19 \]
Finances B  
\[ 0X_1 + 0X_2 + 15X_3 + 0X_4 + 15X_5 \geq 9.5 \]
APPENDIX I
(continued)

The inequalities for categories III and IV were set up in a similar manner. The complete LP Model was set up as follows:

<table>
<thead>
<tr>
<th></th>
<th>Crop Enterprises</th>
<th>Household Typologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1, X2</td>
<td>X3, X4, X5, I, II, III, IV</td>
<td></td>
</tr>
</tbody>
</table>

Maximise TMG: $0 + 53.3 + 102.2 + 81.7 + 130.5 \geq 170, 231, 331, 254$

Subject to:

i. Labour: Oct. $49 + 49 + 49 + 12 + 261 \geq 170, 231, 331, 254$
Nov. $86 + 86 + 86 + 40 + 116 \geq 170, 231, 331, 254$
Dec. $99 + 99 + 99 + 272 + 252 \geq 170, 231, 331, 254$
Jan. $111 + 111 + 111 + 79 + 370 \geq 170, 231, 331, 254$
Feb. $49 + 49 + 49 + 175 + 252 \geq 170, 231, 331, 254$
Mar. $10 + 10 + 10 + 25 + 455 \geq 170, 231, 331, 254$
Apr. $59 + 59 + 59 + 40 + 514 \geq 170, 231, 331, 254$
May $96 + 96 + 96 + 237 + 321 \geq 170, 231, 331, 254$
Jun. $72 + 72 + 72 + 274 + 348 \geq 170, 231, 331, 254$
Jul. $54 + 54 + 54 + 222 + 195 \geq 170, 231, 331, 254$
Aug. $49 + 49 + 49 + 104 + 35 \geq 170, 231, 331, 254$
Sep. $32 + 32 + 32 + 10 + 96 \geq 170, 231, 331, 254$

ii. Land: $1 + 1 + 1 + 1 + 1 \geq 8, 8, 8, 8$

iii. Food: $1100 + 0 + 0 + 0 + 0 \geq 760, 950, 1483, 1090$

iv. Finance:
A. $1.24 + 1.24 + 70.43 + 22.22 + 83.24 \geq 18, 19, 84, 76$
B. $0 + 0 + 15.00 + 0 + 15.00 \geq 9, 9.5, 42, 38$

Notes. X1 - Local Maize for food
X2 - Local Maize for sale
X3 - Hybrid maize for sale
X4 - Groundnuts
X5 - Tobacco
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