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ESTATE FARM MANAGEMENT IN MALAWI:
Considerations for Policy
Formulation

by James Fitch
Institute for Development Anthropology

and
Joe Carvalho
USAID/REDSO/ESA

with the assistance of
Benson Phiri
USAID/AFS/Malawi

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EXECUTIVE SUMMARY

The estate sector plays a vital role in Malawian agriculture. Private estates control substantial amounts of land and provide income earning opportunities for a large number of laborers and tenant farmers. Estates have been given special export marketing privileges, and products produced on estates have accounted for some 70% of total national exports. During the past decade the expansion of burley tobacco production on estates has been dramatic, with burley and flue-cured tobacco from estates now accounting for almost 45% of the country's foreign exchange.

The growing scarcity of communal land for smallholder production serves to underscore the importance of efficient management of land and other resources controlled by estates, especially when it is considered that most estate lands were taken from the communal sector.

Because of their larger size, estates have an advantage in securing finance and are often able to utilize higher levels of fertilizer and other inputs than smallholders. However, the profitability of estate production has depended heavily on privileged access to export markets which is now being eroded.

Furthermore, the profitability of estate production has depended on access to a large pool of landless labor and underemployed smallholders. This labor has not always been well paid. In the case of burley production, many of these laborers have been engaged as tenants. In some instances, tenants appear to have received very low levels of compensation, and a government policy of setting a maximum price has probably contributed to this.

The estate sector has been going through a period of rapid change, brought on by the expansion of burley production and due to a sharp increase in the number of smaller sized estates. The government is now moving to permit smallholders to produce burley, which had generally not been allowed before. This, together with the fact that prospects for continued expansion of burley exports are uncertain, makes it advisable for estates to seek ways to diversify production.

Improved management of resources on estates is important, if they are to continue to prosper and make the best possible contribution to the overall economy. Smaller estates, perhaps because most are still relatively new, are found to have management problems. Many of them do not have adequate finance and do not apply the levels of inputs or use the improved technologies which are found on older, larger estates. Labor and tenants tend to receive lower compensation on smaller estates, due in part to the fact that smaller estates are not able to provide sufficient amounts of other production inputs, and living conditions for labor tend to be worse on smaller estates.

Larger estates, which account for a major proportion of estate land area, are found to devote less of their land area to crops than smaller estates. This may reflect some qualitative difference in land resources, but it also suggests that policy makers should seek ways to encourage larger estates to use their land more intensively.

Comparative advantage analysis and linear programming conducted in the present study verifies that there are viable alternatives to the production of tobacco. However, there is a need for continued technical research to identify suitable crops, particularly those which can successfully be grown in rotation with tobacco. Furthermore, economic research is needed to more clearly identify domestic and international marketing opportunities for such crops as cotton and groundnuts and to update measures of comparative advantage.

Linear programming analysis conducted in the present study is used to estimate the productive value of estate lands and to estimate the value of tobacco quotas which the government issues to estate owners. The analysis serves to underscore the relatively high profitability of tobacco as compared to other crop options.

To support the improved management of resources, particularly among smaller sized estates, it is recommended that a program of management training for estate managers be established at a suitable training facility in Malawi. The focus of this program should include labor management and basic accounting procedures.

Tenants who grow burley tobacco do not have a clearly defined legal status and have little recourse when they have a disagreement with the estate. It is recommended that a regulatory body be established to address tenant complaints and that the government consider requiring that each estate put the terms of its "tenant agreement" in writing.

An analysis of a typical estate-tenant agreement shows that tenants tend to bear a high proportion of the risks associated with crop production. Tenant returns for labor appear to be low whereas returns to the estate for its land appear to be relatively high. It is difficult to find justification for Ministry of Agriculture's practice of setting a maximum price for tenants to receive for their tobacco.

Not only do estates appear to have the capacity to pay somewhat higher compensation to their tenants and laborers, but doing so should return them dividends in the form of reduced tenant turnover rates.

1. Introduction.

The leasehold estate sector controls significant proportions of Malawi's natural and human resources, and estate production of tobacco, tea, sugar and other commodities account for about 70% of the country's foreign exchange earnings. While expanded production by estates has provided obvious benefits to the national economy over the past two decades, questions have been raised about the efficiency of estate production and about the direction which future government policy for the estates should take.

Estate lands constitute a form of private ownership and as such provide different incentives and opportunities for farming than the communally held smallholder farms which predominate in Malawian agriculture. Because of their generally larger size and possibly due to incentives which are associated with private ownership, estates may provide opportunities for capital accumulation and for the utilization of improved technologies which are absent in the communal sector. But it is also possible that estates may under-utilize resources, or they may tend to build capital at the expense of underpaying labor. A clearer understanding of these issues is required to formulate effective policies for estate agriculture.

In 1990, a study of the estate sector was made, based on a stratified random sample of 119 estates selected from throughout the country. The report of that survey by Mkandawire, Jaffee and Bertoli [1990] (hereafter referred to as the MJB report), was instrumental in dispelling many myths and in generating information about the estate sector which had not previously been available. It was successful in determining land use patterns on estates of differing sizes, as well as in determining cropping patterns and labor use. The purpose of the present study is to make an analytic review of estate decision-making and thus to gain a more accurate standing of the nature and efficiency of estate resource management practices. The study is intended for use in support of USAID's Agricultural Sector Assistance Program (ASAP) for Malawi.

1.1 Background.

Before addressing the estate sector per se, it is necessary to consider the more general context of the Malawian economy. The reality of Malawi's economy is that the domestic market is limited, given the fact that incomes are quite low¹ and that there has been very little urbanization. Most people still live on smallhold farms where they produce their own subsistence needs.

¹According to World Bank statistics, Malawi's GDP averaged \$176 per capita in 1987, which placed it fourth from the bottom of a list of 38 African countries.

The high cost of accessing world markets is also a serious detriment to Malawi's economic progress. The country is landlocked, and its most direct links to world markets have been disrupted since 1982 by civil war and unrest in neighboring Mozambique. This has caused a shift to reliance on routes through Tanzania, Zimbabwe and South Africa, resulting in much higher import costs and much lower export prices.

Population growth rates are high², and pressure on the land is heavy: Malawi's population density was 63 persons per square kilometer in 1987, which compared to an average of 11 for 40 Sub-Saharan African countries in 1987 [Sahn and Arulpragasam 1990]. Population pressure has caused increasing amounts of natural forests to be cleared for cultivation and firewood, and deforestation has become a major national concern.

Although estates account for only 11% of the cropped area, they generated 25% of agricultural GDP in 1989 (Table 1.1). While the productivity of estate resources may be somewhat higher than that in the smallholder sector, the main part of this difference stems from the fact that estates have been given preference in growing high valued export crops.

Malawi's agricultural estates date back to the colonial era when the government initially permitted European settlers to obtain freeholds for the production of crops such as tea and tobacco. After independence legislation was enacted which permitted the continued establishment of estates by granting leaseholds, primarily on lands which had been in the communal sector.

The area in leasehold estates grew from 72,000 ha to over 819,000 ha between 1964 and 1990 while freehold estate land actually declined from 168,000 to 52,000 ha. During the same period communal land area declined from 8.2 to 7.1 million ha, due primarily to the expansion of leasehold estates, but also due to the expansion of public lands for national parks.

According to law it is only possible to establish a leasehold estate if the chief of the particular communal area gives his approval. Thus, in most cases estates have been established more in areas where traditional villages and smallholder agriculture were not intensively developed. In many areas such as Kasungu, where estate development has been heavy, and were areas with extensive natural woodlands and savannah remain intact, estate development was more a process of clearing new land than of

²The average annual rate of change was 3.08% during 1977-87, up slightly from the 3.06% rate experienced during the previous decade.

Table 1.1 Key Indicators for the Estate and Smallholder Sectors.

	Estates	Small- holders	Total Agri- culture	Total Malawi
	- - - - -	'000 W O R K E R S	- - - - -	- - - - -
Labor force, 1987 [a]	266	2,139	2,405	2,952
Income per Worker, 1987	MK 704	MK 398		
Exports as proportion of national total	68.6%			100%
GDP, 1989 (K million)	79.6	241.0	320.6	930.5
Share: of total	8.6%	25.9%	34.5%	100%
of Agriculture	24.8%	75.2%	100%	
Annual growth in GDP:				
1974-80	8.6%	2.5%	3.5%	4.9%
1981-83	7.7%	-1.1%	0.7%	0.4%
1984-86	-0.3%	3.0%	2.2%	3.3%
1987-89	8.0%	1.2%	2.1%	3.2%
Total area, 1988 (ha)	740,900	7,066,200		
Area Cropped (ha) [b]	175,900	1,488,000		
Percent of total area	24%	21%		
Percent of crop area in:				
Maize	34.1%	66.7%		
Tobacco	39.4%	2.2%		
Groundnuts	2.5%	11.8%		
Other	24.0%	19.3%		
Number of holders	14,671	1,352,520		
Avg. size of holding (ha)	51.0	5.2		
Average Cropped Area per Holding	12.1	1.1		

Source: Labor force and income per worker are as reported in Sahn, Arulpragasam and Merid [1990, Table 3]. Export and GDP data are from MJB [1990, Tables 1.6, 1.7 and 1.8], and total land area is from MJB [Table 1.1]. Area cropped for estates is from 1989 estimates of MJB [Table 2.5], whereas the smallholder crop area is based on MOA statistics. The number of estates (holders) is based on 1989 data in MJB [Table 2.1], whereas the number of smallholders is based on Kydd [1989, Table 1]. Crop area percentages for estates are based on Kydd [Table 2]. Average holding size and average crop area per holding are calculated from the above.

[a] Estate sector labor is tenant and "permanent hire" only. Does not include day labor, most of which is hired from the smallholder sector.

[b] Excludes land devoted to fallow and planted woodlots.

displacement of smallhold farms. Nevertheless, smallholders have been displaced in some areas, and having land in estates means that it is not available for smallhold farming.

While most leaseholds, like the freeholds which had been formed before them, were originally quite large, there has been a steady trend toward granting smaller leaseholds. Whereas the average size of leasehold estates granted before 1970 was 345 ha, the average leasehold granted in 1989 was just 26 ha, and the cumulative average for all of these estates in the latter year was 51 ha. While the value of estate production and exports have expanded dramatically, this has come at the expense of removing land from the customary (smallholder) sector where the holding size has been declining. Currently, the average land area available per smallholder is 5.2 ha, which is only a tenth of the average estate holding size.

As the MJB study demonstrated, the estate sector is quite diverse. By law, the minimum size is 10 ha. Whereas estates of less than 20 ha account for 47% of estates by number, they amount to only 12% of total estate area. In contrast, the 60 estates in the largest size category account for only 0.4% of the number but 25% of all estate lands -- their average size is 3,454 ha.

Socially and politically, the owners of large estates in other countries have often been criticized on the grounds that they do not use their land intensively or efficiently enough, or because they use abusive feudalistic structures to organize their labor. In countries such as Egypt and Chile, governments have resorted to land reform and redistribution to remedy these ills.

It has sometimes been observed that estates attain higher crop yields than smallholders, and this has led some observers to conclude that estates are therefore somehow more efficient than smallholders. As Lele and Agarwal [1989] point out, however, this may not be a valid conclusion in many circumstances. Estates may attain higher yields merely because they have superior access to inputs or because available technologies are better suited to their circumstances. In the case of maize, for example, it may be larger estates' superior access to finance, and therefore to fertilizer, which permits them to adopt high yielding varieties.³

Differences between the estate and smallholder sectors have often been reinforced by government policies which give special export marketing privileges to estates while forcing smallholders to focus more on crops for the domestic market and to sell their

³It has also been observed by Kydd [1989] and others that the hybrids available in Malawi have been dent varieties, whereas flint varieties work better with local food preparation practices and that they store better in traditional storage facilities.

products to the Agricultural Marketing and Development Corporation (ADMARC) at administered prices. However, differences between smallholders and estates have recently been blurred by government policies which have resulted in many former smallholders receiving leasehold titles to their land and receiving quotas permitting them to sell burley tobacco.

The estate and smallholder sectors do not operate in isolation since they often share the same labor force. Whereas jobs have been created on the estates which provide work for the rural landless and for smallholders with insufficient land, it has been demonstrated that many estate workers are paid less than the minimum wage, that estate workers and tenants often have poor living conditions, and that the terms of employment and food for subsistence are often insecure [Mkandawire, Jaffee and Bertoli 1990; Nankumba 1990; and Sahn, Arulpragasam and Merid 1990].

Although the MK 704 average GDP per worker in the estate sector compared favorably with the MK 398 average for the smallholder sector in 1987, recent analysis by the World Bank indicates that 67% of laborers and 64% of tenants are classified as being in poverty, which is somewhat higher than the 60% poverty incidence in the smallholder sector [World Bank, 1990]. The Bank's study points out that the higher incidence of poverty in the estates is partly a result of larger family size among estate tenants and laborers. Presumably, the fact that the incidence of poverty is higher despite a far more favorable average GDP is a reflection of a highly skewed distribution of income within the sector.

Another important issue is the estates' heavy dependence on a relatively few export crops, particularly tobacco. In 1989, some 39% of total estate area was in tobacco, which accounted for an estimated 56% of the total value of estate production and 45% of the nation's total value of exports. Setting aside long run concerns about the demand in a world where the awareness of the health risks of tobacco use is increasing, such heavy dependence on a single commodity places the country's economy at the mercy of international price fluctuations as well as under risks from weather and disease. Not only would diversification to other crops help to reduce these risks, but it offers the promise of putting more estate land to use and creating more employment opportunities within the estate sector.

Several types of policy have been suggested as ways to improve the performance of the estate sector. Recently, the government has increased leasehold rents for estate lands and has moved to improve the system for rent collection. Currently, there is discussion as to how rents might be differentiated to reflect different classes and qualities of estate lands. Raising rents and improving collection is expected to increase the incentive for estate owners to put more land under cultivation.

Many of the reforms being promoted by the World Bank and other donors are aimed at breaking down the bimodal, compartmentalized nature of Malawi's agricultural structure, and these will place the estate and smallholder sectors into more direct competition. The government is continuing to register smaller estates and to provide them with burley quotas while either reducing the quotas of larger estates or holding them in check.

The heavy reliance on the use of tenants in the burley estates raises some important questions. What contributions to the production process are being made by the landlord, and what is the tenants real role? In addition to the land, does the landlord provide all of the capital and all of the farming knowledge? Do the tenants contribute farming skill and make important decisions on their own account, or are they merely a source of labor for the estate owner, who serves as the primary decision maker? Is the structure of the landlord tenant agreement conducive to efficient resource utilization? Is it fair to the tenant?

One factor which appears to have had an important effect on the relationship between landlords and tenants has been the government policy of setting the maximum price which estates can pay tenants for the tobacco which they produce. Some officials in the Ministry of Agriculture, where this policy is set each year, believe that the Ministry should set a minimum rather than a maximum price, and that changing this policy would work to the benefit of the tenant.

There is a growing interest in improving the well being of estate tenants and laborers, particularly following concerns raised in recent studies by Nankumba [1990], Dickerman and Bloch [1989], and the MJB study. Possible measures to accomplish this include enforcement of existing minimum wage regulations, pushing for the organization of medical and educational services that would reach estate workers, and requiring that tenants be provided with a formal written contract.

The MJB study was successful in filling many gaps in knowledge about estates and about the factors which condition their decision making. Other recent studies by Agmark [1989] and Duncan [1990] provided extensive information about the costs and returns to tobacco production on estates of different sizes, organizational characteristics and with differing levels of investment.

It is necessary to have a clearer understanding of the decision making environment in which estate owners and managers operate. While the previous studies are valuable, they do not fully explain why it is that estates do not utilize their land resources more fully. Why do estates in general, and large estates in particular, put such a small proportion of their lands into crops? Why have estates stayed mainly with tobacco and a selected

few other export crops? Why are estate yields not higher? Why are tenant turnover rates so high? Why don't more estates grow maize for sale? These are some of the issues that the present study proposes to address.

1.2 Purpose and Objectives of Study.

The purpose of this exploratory study is to develop a more accurate picture of estate decision-making and to examine the efficiency of resource use within the estates. The study is designed to be a follow-on to the 1990 Estate Survey and to be conducted in conjunction with a parallel effort to understand tenant and labor relations and conditions on a small number of estates selected for detailed case studies.

Terms of reference for the study call for meeting several specific objectives. These are: (1) developing illustrative farm budgets for estates of different size categories; (2) analysis of the anticipated impacts of some major proposed policy changes; and (3) developing judgments about the anticipated changes in resource allocation and incomes on the estates chosen for case studies.

Estate budgets, together with other information on estate resource availability and requirements, will be used to set up exploratory linear program models for estates. Budgets and linear programs will be used to address specific questions relating to estate farm management. These include: (1) evaluating how land utilization and product mix are likely to change as prices of products and inputs vary; and (2) to explore how labor demand and utilization are likely to change with changes in policy, changes in product mix and intensification of land use.

1.3 Study Methods and Report Organization.

The study design called for visiting a sample of eight estates in the Kasungu District, purposely selected from the 24 estates that were surveyed in that region in the 1990 Estate Survey. The fact that information from the earlier survey was available for the estates chosen made it possible to select units that were known to represent different sizes and a variety of other circumstances. The estates selected were chosen for case studies, to be used to gain further insights into the circumstances which estate managers face, and to be used to obtain information for constructing representative estate budgets.

One of eight agricultural districts nationwide, Kasungu District was chosen for the case studies because it contains a large proportion (57%) of the country's leasehold estates

and because Kasungu's estates produce more than 50% of the country's most valuable crop, burley tobacco. Thus, it is believed that while case studies of Kasungu estates may not be representative of conditions on all estates nationwide, they will generate better understanding of a significant proportion of the estate sector.

During the same general time period that the Farm Management Team for this study was visiting with estate managers or owners, a separate Tenant and Labor Survey Team was preparing to conduct interviews with a sample of four tenants and four laborers from each of eight estates. It was hoped that it would be possible to utilize the same eight estates in both cases, but limited time and the logistic difficulties of arranging interviews made this impossible. In the end, the Farm Management Team visited five of the same estates from the list chosen for the Tenant and Labor Survey and it visited with three other estates that were taken from an alternative list when difficulties were encountered in connecting with estate managers on the list used for the other survey.

A list of questions was used to guide the interview process with estate managers, and this is included as Appendix A to this report. These questions were merely used to guide and stimulate discussion and were not intended to be used as a questionnaire. Brief case descriptions of several of the estates visited are included in Appendix B.

The field visits were used mainly as a means of gaining first hand understanding about conditions on estates and about the thinking of estate managers, to supplement information already contained in the 1990 Estate Survey. There was not sufficient time to make any detailed examination of estate records or to do in-depth analysis of cost of operation. However, the visit was used as an opportunity to ask questions about these important quantitative aspects of estate management -- and especially about the timing of labor use -- in order to be able to do a better job of developing estate budgets based on prior studies and existing sources of information.

Budgets for the analysis in Chapter 3 were derived from several sources. The previous work of Agmark [1989] and Duncan [1990] were very useful for tobacco and maize production, and the previous diversification studies by the World Bank [1984] and by Richard Anderson and Associates [1984] were useful in developing budget information on potential diversification crops such as groundnuts, cotton, sunflower, macadamia nuts, and cashews.

For many potential estate products, such as forage and livestock and for domestic crops such as beans, it was not possible to find suitable estate budgets, and it became necessary to utilize information obtained through the Ministry of Agriculture (MOA) for

the smallholder sector. Where possible, the study team adapted this information (for example, by increasing input and yield levels) so that it would more closely reflect practices and experience reported by estates. However, reliable information on labor use and timing was particularly difficult to find, and there were wide and startling differences among alternative sources in cases where more than one was available. In these instances, the study team had to make assumptions and estimates that cause the findings to be tentative at best.

The organization of the study is straightforward. Chapter 2 contains a more detailed discussion and analysis of existing patterns of resource use in the estates, based on prior studies and as supplemented by the field visits to the eight case study estates. In several instances, the study team was able to obtain information by running special tabulation and analysis of the data set from the 1990 Estate Survey which was made available by Mkandawire, Jaffee and Bertoli. Chapter 3 presents the budget and linear programming analysis, and Chapter 4 presents a final discussion of policy strategies, drawing in the findings and analysis of the preceding chapters.

2. Resource Management Patterns and Practices .

The way in which a sector utilizes its resources ultimately determines how well it performs and how well it contributes to the national economy. This chapter looks at resource use and related decision making in the estate sector in a number of different ways. First, attention is turned to motivation for estate ownership and resource management. Then, the structure and organization of estates are considered as factors which will affect the way in which estate resources are managed. Availability of finance, as well as marketing organization and regulations are also examined since these can be expected to have a strong influence on sector performance. Patterns of land and labor utilization are considered, together with the types of capital investment and technology employed.

2.1 Motivation for Estate Ownership.

The growth of Malawi's estate sector has been motivated by several factors, among which profit appears to have been important. During the past decade, the production of burley tobacco has been quite profitable. From 1979 to 1989, the number of leasehold estates expanded 13-fold and estate area tripled. Coinciding with this, the number of licensed burley tobacco producers expanded ten-fold and the area devoted to burley grew to five times its 1980 size (Table 2.1). Prior to 1990 only the estates were granted licenses to grow burley. Thus, estate ownership was the necessary avenue to gaining access to the lucrative burley market.

Although the desire to get into the burley business is strong, burley is not the only crop which estates grow. As Table 2.2 shows, burley and flue-cured tobaccos take up 39% of the total estate crop area, but tree crops -- tea, coffee, and macadamia nuts -- take up another 13%, and sugarcane uses 9%. Altogether, export crops take up more than 60% of the area and account for more than 85% of the value produced by the estate sector. Thus, cash cropping for export represents a major motivation in the estate sector.

Government licensing regulations have served to limit the production of export crops to the estates sector in most cases. This has provided a strong incentives for smallholders to obtain leaseholds which carry export marketing privileges with them. According to officials of the Tobacco Control Commission, the tobacco market regulatory body, quota in the amount of 11.8 million kg was given to 4,679 new leasehold growers for the current growing season. Total quota for 1990-91 is reported to be 65 million kg, up from about 55 million kg in 1989-90.

Table 2.1 Historical Patterns of Estate Development and the Expansion of Burley Tobacco Production.

Year	ALL LEASEHOLD ESTATES:			TOBACCO ESTATE LABOR:	
	Number	--Area (hectares)-- Total	Average	Permanent Workers	Tenants & Families[a]
1980	1,321	273,100	207	97,200	47,200
1989	14,355	759,400	53	91,000	168,600
Change (Annual)	987% 30.4%	178% 12.0%	-74% -14.1%	-6% -0.7%	257% 15.2%

Year	Number of Burley Growers	Area in Production (ha)	Average Area per Grower	Production (metric tons)	
				Total	Per Ha
1980	723	13,800	19.1	16,700	1.210
1989	7,504	66,700	8.9	61,200	0.918
Change (Annual)	938% 29.7%	383% 19.1%	-53%	266% 15.5%	-24%

Year	Area in Production (ha)	Production (tons)	
		Total	Per Ha
1977	8,661	10,262	1.185
1978	10,576	10,593	1.002
1979	13,766	14,902	1.083
1980	13,803	16,686	1.209
1981	15,989	18,804	1.176
1982	23,310	27,602	1.184
1983	39,389	41,537	1.055
1984	26,946	29,979	1.113
1985	31,503	30,372	0.964
1986	28,240	30,190	1.069
1987	34,521	36,789	1.066
1988	51,898	45,544	0.878
1989	66,700	61,200	0.918

Source: Mkandawire, Jaffee and Bertoli [1990] and Agmark [1989].
[a] MJB assume that total tenant family labor equals 2.5 times the number of registered tenants.

Table 2.2 Cropping Pattern and Crop Value on Estates in 1989.
National Estimate

	Number of Estates	Crop Area (ha)	Pro- duction (tons)	Value (million Kwacha)	Percent of	
					Area	Value
Burley	7,846	54700	61200	226.5	31.1%	39.0%
Tea	27	16100	37200	95.4	9.2%	16.4%
Sugar	2	15200	162200	65.3	8.6%	11.2%
Flue-cured	800	14600	19800	99.8	8.3%	17.2%
Coffee	72	4900	6500	15.5	2.8%	2.7%
Macadamia	35	1900	200	5.4	1.1%	0.9%
Cotton	36	1000		2	0.6%	0.3%
Maize		60000		64	34.1%	11.0%
Other crops		7500		7.5	4.3%	1.3%
TOTALS	8,818	175900	287100	581.4	100.0%	100.0%

Source: Table 2.5 in Mkandawire, Jaffee, and Bertoli [1990].

Note: Export crops are at export value as in the original table, and estimated market values for domestic crops have been added, as have the percentage calculations. Other crops include groundnuts, fruits and vegetables, beans, soybeans, and others.

Table 2.3 Estate Cropping Pattern by Size Class, 1990 Survey

	ESTATE SIZE CATEGORY				Total Sample
	0-15 ha	15.01 -30 ha	30.01 -100 ha	100+ ha	
	T O T A L	C R O P	A R E A	i n	S A M P L E
Hectares	342	693	1,584	7,772	10,391
	- P E R C E N T o f T O T A L A R E A -				
Burley Tobacco	40.7%	42.5%	50.5%	49.2%	48.2%
Flue-cured	2.4%	0.0%	0.7%	2.4%	1.8%
Hybrid Maize	29.4%	20.9%	26.8%	22.9%	23.9%
Local Maize	18.2%	29.9%	17.0%	16.3%	18.0%
Groundnut	4.0%	2.2%	2.7%	2.3%	2.5%
Fruit/Veg/Legu	4.6%	3.1%	1.5%	2.3%	2.4%
Other	0.8%	1.3%	0.9%	4.7%	3.3%
	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Mkandawire, Jaffe and Bertoli [1990]

Quota systems are intended to bring about more orderly marketing and to avoid over-production which would lead to low prices. However, in the process of doing this they often generate a special privilege to those who receive the quota. That is, quotas can be quite valuable to those who receive them. Nevertheless, quota systems can be very difficult to administer. As OPEC's experience demonstrates. In order to sell excess product and to increase their individual profits, some producers will always agitate to have their quota increased or attempt to circumvent the quota system entirely. Quotas can be very difficult to manage during periods of excess supply, and when demand is weak and production must be curtailed.

In contrast to tobacco, domestic crops such as maize do not require any special permission to grow or market. Although maize is the main domestic crop grown on the estates, and while it takes up 34% of their total area, it only accounts for an estimated 11% of value. Most of the maize grown on estates is used to satisfy worker subsistence requirements and is therefore not marketed. In the 1990 Estate Survey, estate managers reported selling 26% of their maize production. However, the smaller estates indicated that their proportion of sales (37%) was somewhat higher than that of the larger estates (24%). Thus, production for the domestic market does not appear to be a major motivation for estates. In producing export crops, estates normally have not had to compete with smallholders.

Estate cropping patterns present an interesting contrast to the crop area allocation of the smallholder sector. Whereas smallholders have 67% of their land in maize and another 12% in groundnuts, estates have only 34% in maize and just 2.5% in groundnuts (see Table 1.1). Undoubtedly, government marketing regulations have kept smallholders out of most kinds of tobacco, but the need to first meet their subsistence requirements means that smallholders often find it difficult to produce for cash sale and export. It is apparent that smallholders are producing primarily for the domestic market. Whereas 39% of the estate crop area is in tobacco, only 2.2% of the smallholder area is used for tobacco.

Access to finance has also been a motivation for estate ownership. Finance in the smallholder sector has been limited, probably due to a number of factors. These would include absence of clear title and the relatively high transactions cost for servicing small loans. The estate sector does not suffer from these limitations. It is common for owners of tobacco estates and other export crops to obtain production finance from commercial banks, while this is not common among smallholders. Commercial banks have also engaged in longer term development loans for estates, in some cases.

Security of title is an important aspect of estate ownership. While Dickerman and Bloch [1989] are skeptical of claims that having secure title is necessary before farmers will innovate, invest and generate marketable surpluses, they acknowledge that type of thinking was originally responsible for motivating the government laws which have made it possible for individuals to obtain land titles.

As Mkandawire, Jaffee and Bertoli observe, the desire for secure title is a factor which often motivates smallholders to register their estates due to a "...perceived or real threat of insecurity in view of the large-scale estates that are alienating customary land around them. The registering of estates has thus combined the search for improved market access with a search for more secure land tenure" [1990, p.26].

2.2 Structure and Organization of Estates.

The size of estates varies widely (Table 2.4), as does their organizational structure. As shown in Chapter 1, the average size of estate has been declining because most newly formed estates have been quite small. However, even the smallest estates are usually at least 10 ha in size, since this is the legal minimum. This is too small for the owner to farm and develop by himself, and he must get outside help in the form of labor and perhaps other resources.

Of the 119 estates visited in the 1990 survey, 88 (74%) indicated that the owner's primary occupation was farming. Only among estates of greater than 100 hectares was farmer ownership somewhat less important (57%). In this larger size category, 18% were reported to be owned by corporations, while corporate ownership was not encountered for smaller sized units. A scattering of estates of all sizes were reported to be owned by businessmen (10%) and civil servants (8%).

While only 5 of 119 estates visited in the survey were listed as corporations, the largest estates which control substantial land area are often organized as corporations. Some of these are owned by private citizens, but often with participation by the Malawian government and foreign companies. Two of the largest estate companies, Press Farming and General Farming, are owned by the Press Group, which is a large holding company said to be owned by influential Malawian stockholders. In the 1970s the Agricultural Development and Marketing Corporation (ADMARC) took profits which it made by selling smallholder crops and farm inputs and invested these in the estate sector. Many of these investments were not profitable, and recent government policy has been for ADMARC to divest from estate ownership.

Table 2.4 Breakdown of Estates by Size Category, 1989.

Size Category (hectares)	Number of Estates	Share of Total Number of Estates	Total Area (hectares)	Share of Area
-----	-----	-----	-----	-----
0 - <10	232	1.6%	1,670	0.2%
10 - <20	6,650	45.8%	93,820	13.0%
20 - <30	3,044	20.9%	72,990	10.1%
30 - <50	2,223	15.3%	83,650	11.6%
50 - <100	1,275	8.8%	86,940	12.1%
100 - <200	559	3.8%	75,690	10.5%
200 - <500	359	2.5%	10,922	1.5%
500 - <1000	130	0.9%	88,160	12.2%
1000 and up	60	0.4%	207,250	28.7%
-----	-----	-----	-----	-----
TOTAL	14,532	100%	721,092	100.0%

Source: Developed by Mkandawire, Jaffee and Bertoli from Agricultural Development District files.

One of the primary foreign investors in estates is the Commonwealth Development Corporation (CDC) of Britain. CDC participates in the estate sector both through share ownership and in some cases by providing direct management⁴. While CDC's main investment in Malawi has been in the production, it has recently acquired Spearhead Estates, which had been in receivership, and it has also acquired several units which were divested by ADMARC. Annual crops such as burley are grown on such estates as they are acquired, but CDC's longer run plans call for moving the suitable lands into tea, macadamia nuts and coffee.

While the hiring of professional managers is common on the larger estates, the 1990 Estate Survey dispelled the myth of absentee ownership for the majority of estates. Among estates of less than 100 hectares, 58% were managed by the owner, whereas 57% of estates with 100+ hectares had salaried managers. Where smaller estates were run by hired managers, most reported that the owner was still actively involved in the decision-making process.

In analyzing the structure and performance of estates, the MJB study and others have placed a heavy emphasis on estate size. However, it is important to realize that age (number of years in business) may also be an important factor in explaining differences which are often observed among estates. To verify this point, the study team analyzed a few selected variables from the 1990 survey according to the age of estate. As examples, it was found that estates founded prior to 1979 (which had an average size of 372 ha in the sample) reported average fertilizer applications of 1132 kg per ha and that they had average burley yields of 1108 kg per ha. By comparison, estates which were founded after 1986 (36 ha average size) reported average fertilizer use of just 528 kg per ha and burley yields of 915 kg per ha.

It may be that such performance differences are found among estates not because the estates are smaller or larger but because they are newer or older. Currently, it may be that many smaller estates are experiencing financial or labor management problems just because they have not been in business long enough to gain the necessary experience. It may be that larger estates do better at managing certain resources, not because they are larger but because they have been around longer and have had more experience.

⁴The managing director for CDC in Malawi indicated that their total commitment to the estate sector in Malawi is 40 million Pounds Sterling.

2.3 Capital Requirements and Estate Development Finance.

Of the estates in the 1990 survey, more than 60 percent indicated that they were originally formed from undeveloped customary areas, indicating that they probably had to clear land in order to farm. Land clearing is one of the estate's first investment needs and is reported to cost from K1,000 to K2,000 per hectare, depending upon the nature of the land to be cleared. However, in many areas, including Kasungu which was visited for the case studies, virgin land is now becoming scarce. The owner of one estate which produces burley reported that the flue-cured tobacco estates would pay to clear his land for the wood.

In about 13% of the estates visited in the 1990 Estate Survey, it was reported that the estate had been purchased from a prior owner. This suggests that a land market is beginning to develop in Malawi and that land will increasingly be viewed as an investment cost. Cleared, arable land has a positive value that people will pay for.

Malawian agriculture is highly labor intensive, and the level of investment in labor saving equipment on smaller estates is generally low. The 1990 Estate Survey showed that only 35% of estates in the 100+ ha category and 10% of those in the 30-100 ha class have tractors, with none of the smaller estates having them. Ploughs (either tractor or ox-drawn) were available on 27% of all estates, including 11% of the estates of less than 30 hectares and 67% of estates in the 100+ hectare category.

The absence of tractors and, to a great extent, ploughs on the vast majority of smaller estates shows that most land preparation is still done by hand labor, with a hoe. Interviews with estate managers indicated that land preparation for burley and maize normally takes the tenants and permanent workers of the estate up to two months time in October-November, while they are also busy raising the young tobacco seedlings in the nursery area.

Investing in trucks for transportation, which was found on a few small estates and on over 50% of 100+ hectare estates, is more common than tractor investments. Most of the larger estates which were visited in Kasungu had their own trucks for fetching supplies and for hauling their crop to market, whereas the smaller estates all had to rely on hiring transport. There are a relatively few pieces of specialized equipment that is required for growing estate crops. One item that is common is a baling press which is required in tying dried tobacco which is sent to market.

A requisite on tobacco estates is to construct drying barns for burley tobacco or brick kiln buildings for flue-cured tobacco. Burley drying barns are relatively simple pole sheds, normally constructed with poles cut from trees in surrounding wooded areas. They are thatched with grasses that normally grow in adjacent

uncultivated areas. It is now common for thatching to be underlain with plastic sheeting to save time in roof construction while preventing leaking. Flue-cured tobacco kilns are more substantial structures which are normally made of brick, and investment is consequently far higher for flue-cured than for burley.

Housing is another investment which can be substantial. In the case of burley production with tenants, the tenant is expected to build his own barn, or at least to maintain the one he inherits from a prior tenant. Pole wood for barn construction is becoming scarce in some areas of the country, particularly in the more populated southern region. Even in Kasungu, only 29% of estates said that they get their pole wood from their own estates. One larger estate owner indicated that he did not want to clear more woodland for crop production because this would diminish his wood supply for burley growing.

The Agmark study, which contained detailed investment budgets for estates of differing sizes, estimated that the per hectare investment cost for burley estates vary from K1,500 to K2,000 per hectare⁵, about 40% of which is for buildings. The remaining 60% is for moveable equipment, including hand tools, shop equipment and tractors on the larger estates. But the Agmark study included only K110 per hectare for land clearing, which is considered to be far too low. Therefore, it is believed that a more realistic estimate of investment costs would be K3,000 to K4,000 per hectare, when land clearing is involved. For flue-cured tobacco estates, investment costs are about double the figure for burley, reflecting the much greater initial costs of the flue buildings.

The levels of initial investment required for tobacco production, while not insignificant, do not seem to be particularly high, especially considering that the annual budgets for producing tobacco can exceed these amounts.

Where do estate owners get the funds to finance their investments? In the 1990 Estate Survey, 45% of the estates indicated that their startup funds had come from farm earnings. This was particularly true of the medium sized and smaller estates, many of whom had farmed in the smallhold sector before obtaining their leasehold. Others indicated that they had gotten startup money from employment income (38%) and from other businesses (24%), but only a small proportion (8%) indicated that they had used bank loans. Thus, while estates are thought to have an advantage in securing bank finance, this does not appear to have been a big factor in their actual development.

⁵To derive a cost per hectare, the total investment was divided by the number of cleared hectares, which is the total area suitable for growing crops, including fallow area. It is not based only on the area suitable for tobacco production.

While prior farming profits have been an important form of estate finance, it is also obvious that many estates are building equity by reinvesting retained earnings. This has been a typical in farm development all over the world. Farm owners often live frugally for years on end, while they put every spare Kwacha back into the farm. The apparent circumstances of most estate owners visited in the study team's field work would have been consistent with this kind of a "bootstrap estate development" approach.

While estate owners are obviously making personal sacrifices, they also count on the support of their workers and tenants to build their estates. One farm the team visited had just completed some new brick kiln buildings for burley tobacco, which had been paid for with cash earned on last year's crop. The owner had not counted on the bank reducing his operating loan for this year's crop nor on his limited maize supply due to a poor crop last year. Thus, he currently had run out of maize to feed his tenants and permanent workers, mid-way through tobacco harvest. He felt bad, he said, not to have food to provide at a time when the work was so difficult.

The National Bank of Malawi reports that it has loan programs that can be used for estate investments such as tobacco kilns, tractors and even land clearing. Such loans need to be justified by analysis of repayment capacity and the borrower is normally expected to put up 50% of the value of the investment from his own funds.

Most of the growers interviewed in Kasungu seemed to think mainly in terms of paying for their investments with cash earned as they go. In many years they have been able to generate cash from their tobacco crop. However, several of the estates visited appeared to be quite strapped for cash operating funds, at least at present. This shortage of cash was limiting the amount of seasonal labor they could hire and, as in the case noted above, the amount of maize they could buy to feed tenants and permanent workers. It would not seem that such estates would have the capacity to expand or deepen their investments very rapidly.

When estate owners were asked what they would invest in or acquire if they had additional funds, two items were mentioned. The first item to be mentioned was normally a pickup truck. Those who already owned trucks said they would like to buy tractors. One owner of a 127 ha estate indicated that he would buy a tractor with a bank loan, if one were available, but he did not think that this was possible.

2.4 Operating Finance and Cash Flow.

Estates, which is to say larger farms, are expected to have an advantage over the smallholder sector in terms of access to commercial bank finance for operating loans. This is a phenomenon which is not unique to Malawi. To begin with, larger farms do not need to devote a great proportion of their output to subsistence needs and thus are normally able to market most of what they produce. This means that it is easier for larger farms to generate the cash which is needed to repay loans. Furthermore, the transaction costs and organizational requirements for servicing smallholder loans are quite high, whereas the ability of small farms to pay banks for these costs is low. In contrast, larger farms are better able to bear these costs.

Available data shows that the amount of funds which Malawi's commercial banks loaned to agriculture actually declined by 56% from 1980 to 1989 [MJB 1990, p.26]. Bankers who were contacted by the study team indicated that this had been a period during which lending standards had been tightened in order to eliminate a large number of non-performing loans from their portfolios.

Of the estates contacted in the 1990 survey, 46% indicated that they had obtained bank credit in that year. The proportion with loans varied considerably among the size classes, however, as Table 2.5 indicates.

The smaller farms reported the lowest proportion of loans, with less than 30% of farms receiving bank credit. The proportion using credit in the 100+ hectare class was not as high as in the 30-100 hectare class, suggesting that the largest farms have more recourse to their own sources of operating money. In general, the average amount of operating finance does not appear to have been enough to finance 60% of the estates' full operating costs, which is the banks' stated loan limit. Rather, it appears as though most of the loans were of the shorter term "bridge loans" which are made at harvest time.

Of the estates surveyed in 1990, 34% of the entire sample indicated that they had not applied for loans, but 54% of the less than 15 hectare size category had not applied. Forty percent of the sample indicated that they had credit difficulties, with 17% indicating that their loan funds arrived late.

The estates themselves are in the credit business, advancing money to their tenant farmers during the course of the growing season and recouping it again after harvest from the tenant's tobacco sales. If the estate does not have access to enough operating money to meet the tenant's loan needs, then it is obviously more difficult for the tenant to produce a good crop.

Table 2.5 Commercial Bank Credit Reported by Survey Estates

	0-15	15-30	30-100	100+	Total
Percent receiving loans	29.6%	42%	64.5%	46.4%	100%
Average credit per hectare of crop area	K356	K181	K370	K386	K386

Source: 1990 Estate Survey Data

During the study team's visits to estates in the Kasungu area during March 1991, which was mid-way through tobacco harvest, there were signs of severe cash shortage on several of the estates visited. Inevitably, such cash shortages seem to fall hardest on the tenants and other workers, who at times even end up without enough to eat. Not only did the team see cases where tenants were going without food and necessities, but some estate owners reported that they did not pay their permanent workers' salaries until after the crop had been sold. Thus, even the permanent workers were being asked to help the estate owner finance the crop.

2.5 Labor Force Utilization.

The organization of labor is an important issue because of the labor intensity of burley and the other high valued cash crops grown on estates in Malawi. Unlike farms in the smallhold sector, estates require large amounts of non-family labor. Estate owners and managers spend valuable time recruiting and managing labor.

According to the 1990 survey, for estates smaller than 15 hectares, as well as on those of the 15-30 hectare size class, only 20% of the permanent labor force was coming from the owner or manager's family. The importance of family labor declined to 10% for estates in the 30-100 ha size class, and family labor was insignificant for estates larger than 100 ha.

Estates hire both permanent and temporary workers. The 1990 survey showed that even estates in the smallest (under 15 hectare) size category hired an average of more than 13 permanent workers, including tenants. Estates of 100+ hectares averaged just under 145 permanent workers and tenants. There were an average of 15 permanent workers per hectare of crop area.

In burley growing estates, rather than hiring permanent workers, the common practice is to use families of tenant farmers. Under this system the estate may produce some burley itself with its own permanent workers, or it may contract the growing of the entire burley crop out to the tenants. The estate loans the tenants land, farm inputs, food and sometimes provides a house. The tenants grow the crop with their own labor, often supplemented by added labor that the estate hires for them.

After the crop is harvested, dried and graded by the tenant, the estate then further grades the tobacco and ships it to the auction floor. It pays the tenant according to the number of kilograms produced, with the price varying according to the grade of tobacco⁶. The value of the inputs, subsistence goods and hired labor the tenant has received are subtracted from the total value which the tenant receives for the crop which he has produced.

It is a common practice for the estate to let the tenant use additional land on which to grow maize and other food items, although this is not always done. Some estate owners said that they do not give tenants land for food crops because this detracts their attention from tobacco production. In those cases where tenants are provided with such land, the estate sometimes provides seed and/or fertilizer on account for the tenant to use in growing maize. The smaller farms visited by the study team tended to provide fewer inputs to the tenant for this purpose. In most cases the estate reported providing lower levels of inputs to the tenant than it was using for its own maize production.

For the estates surveyed in 1990, tenant families constituted 62% of the total labor force, with the proportion being somewhat greater on the larger estates and less on the smaller ones. Thus, tenant labor is the main work force for estate (burley) production in Malawi.

While it is clear that tenants are providing a major portion of the labor on burley estates, their other contributions to the production process are less well understood. Are tenants being hired for their production skill and farming knowledge, and are they carrying out the role of decision maker, or are they merely workers who follow the instructions of estate owners and managers?

⁶Grading is a process which takes significant amounts of time, in addition to the time which the tenant spends in harvesting and drying the tobacco. Normally, the tenant grades the tobacco first, and the estate spends additional time grading on its own account. Estates complain that a certain amount of their tobacco is rejected when it reaches the auction floor, and that they must bear the cost of regrading and selling at a lower price. Tenants complain that estates sometimes do not grade fairly when the tenant's tobacco is purchased.

Are they tenant farmers or merely sharecrop laborers?⁷ Is it a case the tenant is renting land in exchange for a share of the crop which he produces on it, or is it a case where the landowner is hiring farm labor in exchange for a share of the crop. Ultimately, it is a question of which of the two parties has the farming skills and makes the decisions.

During the study team's field investigation in Kasungu, estate owners were asked why they choose to engage tenants rather than just hire regular farm workers to grow kuryley. The most consistent answer seemed to be that this is the best way the estate has to keep the labor it needs for the full season. Otherwise, there is too much risk of a worker leaving mid-way through the season and of the landlord not being able to replace him or her before serious losses have been encountered.

Estate owners cited other benefits to using tenants. When a tenant family signs on, it assumes part of the risk but also gains access to potentially higher earnings. This provides a level of commitment and motivation which would normally be missing in a hired worker. Furthermore, tenants come as families, which provides a ready pool of labor in the form of wives, relatives and children which can be drawn upon as the demands of tobacco ebb and flow through the season. The manager might otherwise spend many more hours in locating part-time labor to fill in gaps, without the tenant family.

Based on the results of discussions with the eight estates which were visited in Kasungu, it appears that the primary motivation of estates in engaging tenants is to obtain labor. In most cases, it is the estate owner or manager who is making the primary farming decisions, and the tenant serves more as a worker than a decision maker. It was generally not a case where tenants are renting land from the estate.

In some instances it may actually be less expensive for an estate to obtain its labor by engaging tenants, but tenancy can provide an opportunity for both parties to benefit, if they operate

⁷ In the economic literature on tenancy, some writers draw a distinction between "sharecroppers" and "sharetenants". Sharecroppers, a term which has its origins in the post bellum South (United States), were farm laborers with little capital and presumably with limited farming knowledge. In return for their labor, they were paid with a share of the crop. In contrast, sharetenants are farmers who rent land in exchange for a share of the crop which they produce on it. They have capital and farming skills and rely little if any on the landowner for decision making.

in good faith and if they strike a fair bargain to begin with⁸. But there is a serious question as to how often these circumstances occur. Some tenants do well while others come away from the season owing the landlord money [MJB]. Estate owners interviewed by the study team freely admitted that some tenants end the season with nothing left to their account. By the same token, some tenants were reported to have finished the season with K 2,000 or even K 3,000 in cash, after paying off the landlord for the inputs and subsistence items he provided them on credit.

The fact that increasing numbers of tenants have been willing to take up the challenge of producing Malawi's expanded burley crop is evidence in itself that there must be benefits to being a tenant. Nevertheless, one cannot remain long in the burley areas without hearing about the problems of tenant farming. Estate owners admit that some tenants do not make any money, and they complain that tenants take the fertilizer which they are provided and sell it for cash, or that they sell a part of the tobacco to another estate.

Some estate owners expressed misgivings about the nature of their relationship with tenants. One larger burley grower in the Kasungu area was quite outspoken in his criticism of the way in which the tenant system works:

"We don't take good care of our tenants... We deplete them like the soil... Some estate owners expel the tenant when they see that he has a good crop... Estate owners need to be educated about how to manage tenants... We lose tenants because we don't treat them properly... If you keep tenants you get better production and you have lower expense... Everybody would be better off if we looked after the tenants... It would help if the government announced standards. There are no regulations to protect tenants."

The same person explained that some tenants are defenseless in dealing with the estates, especially those who cannot read and write. Those who are literate make better tenants because "they can defend themselves". Being able to read and write, and do simple arithmetic, is important because it enables the tenant to follow and understand his financial dealings with the landlord.

⁸Nankumba's conclusion on this score is as follows: "...the basic terms of the tenant contract are beneficial to both tenants and landowners, but that the benefits are skewed in favor of the landowners. Tenants provide most of the labor and bear most of the risk in the production of the tobacco crop, and yet they receive only a fraction of the auction floor sale price, have not job security, are typically provided with poor housing and few social service amenities, and have little leverage in negotiating or enforcing their contracts" [1990,p.vi].

All of the estates visited by the study team claimed that they keep individual tenant accounts, but it was clear from a cursory review of several of these that the quality of the accounting is on some estates is quite poor. Some require that the tenant sign by each item he draws, acknowledging that he has received an item and the amount of charge, but this is of little help to the illiterate person who must acknowledge with a thumb print. The larger estates have clerks who devote much time to keeping records. One indicated that it has the tenant keep a duplicate account book to verify that the estate's accounting is accurate.

Only one of the eight estates visited by the study team reported having a written agreement with its tenants. Other studies have reported similar findings⁹. Without a written contract, if there is some dispute, the tenant has no real legal recourse, because it becomes his word against a landlord who normally has much higher social status.

The District Commissioner of Kasungu told the study team that he frequently receives complaints from tenants who claim that landlords have cheated them and have even refused to pay. He said that there is no legal recourse in such cases since there is no law which regulates landlord-tenant relations. Some members of the Agriculture Adjustment Project Working Group pointed out that tenants do not have a clearly defined regulatory or legal status. It has not been established whether they are to be treated as labor, which could give them the right to pursue complaints through the Ministry of Labors regulatory procedures, or whether they are considered to be farmers, which may give recourse through the courts. Because this distinction is not clear, it appears that tenants have no real place to turn when disagreements arise with estate owners.

It is difficult to compare the costs of the different kinds of labor. The basis for paying hired workers varies -- some are paid in cash, others in kind, and many receive both. Tenants are hired as families, where the number of persons and time commitment through the year varies. As reported by estate managers and owners in the 1990 survey, tenant families received an average of K 621 cash, after deduction of an average K 704 in expenses for the crop.

Assuming that half of the expense account was for fertilizer and other inputs, which would seem to be a reasonable amount for the levels which most estates are providing, this means the tenant family received K 352 in subsistence goods, which brings their

⁹Similarly, Nankumba reports that only one of 17 estates that he visited in 1987 had a written contract with tenants [1990, page v].

total income to K 973 for the year. Assuming that the typical tenant family provides 5 adult equivalent labor units, this implies an average annual wage per person of K 389, which was comparable to the average smallholder income reported in 1987 (See Table 1.1).

If one assumes a 250 day work year, which may be on the low side, this implies an average daily wage of K 1.55, which was lower than the official minimum wage prevailing in 1990.

The MJB report also analyzes the wages of permanent workers that were reported by estates in the 1990 survey. Their analysis shows that half of permanent workers received less than the minimum monthly agricultural wage of K 45 for that time period. One third of such workers actually received less than K 30 per month. Expressed on an annual (12 month) basis, these wages are in the same general range as the K 389 average calculated for tenants.

If the average tenant does no better than a permanent worker why would he or she assume all of the extra burden and work that being a tenant seems to entail? One answer may be that tenants don't really know what they're getting into when they agree to take a tenancy¹⁰. The ones who have an unfavorable experience and "learn the hard way" probably contribute to the heavy tenant turnover rate which many estates report. But the tenants who are well informed and recognize the odds in advance -- probably through past experience -- must be risk takers who choose to be tenants because they recognize that there is potential of high returns.

Tenants and workers obviously do better on some estates than others. In the 1990 survey estates of less than 15 hectares reported cash settlements to tenants which averaged K373, a full 40 percent less than the overall survey average of K 621. In one of the study team visits to Kasungu, one small estate reported paying its permanent worker just K 200 per year, plus food. Both anecdotal and survey evidence make it clear that larger estates tend to be more generous with their labor.

Larger estates tend to be more generous with their tenants, perhaps because they have better financial resources to work with. The average credit offered to tenants by large (100+ hectare) estates was K 758, which was 69% higher than the K 449 offered on estates with under 15 hectares. As we have seen, the larger estates tend to have better equipment (tractors), and they also offer amenities which can make the lives of tenants and workers more pleasant and more productive. A larger Press Farming estate visited by the survey team had permanent houses for its workers,

¹⁰In Kasungu the townspeople tell stories of people from other areas who were recruited to come and work on what they were told would be a regular-paying job, only to learn that the "job" was a tenancy and that the pay would only come when the crop was harvested.

which stood out in stark contrast to the mud and bamboo shacks that tenants on most estates build for themselves. The same estate said that its policy was to pay tenants medical costs and to pay for their funerals when they die¹¹.

Among the estates visited by the survey team, there was strong interest in improving conditions so that tenants will want to return. Estate owners recognize that tenants who return bring back valuable know-how that they have learned from their prior experience. Generally, estate owners acknowledged that tenants who have several years of experience are more productive and that they earn more money. Thus, it appears that as some tenants stay on an estate and learn how to grow tobacco, they are probably learning how to become farmers.

Given the prevalence of production with tenants, it follows that having a good landlord tenant agreement is crucial not only to Malawi's burley industry but to the national economy as a whole. To determine the best structure of such agreements, it is necessary to view them from two perspectives, both of which are important. Many of the comments in the discussion above refer to the aspect of fairness and justice, which is important. But it is equally important that such agreements are structured so as to promote productive behavior by both parties.

It may be preferable for the Ministry of Agriculture or some other responsible government agency to write up contract guidelines rather than to specify a formal contract. Or if there is to be some kind of formal contract specified by the government, there should be provisions for altering it to meet circumstances which differ on farms of different sizes in different regions.

Aside from the issue of the contract, the Ministry of Agriculture currently sets an annual maximum price for burley tobacco, based upon a review of prices recommended by the Tobacco Association of Malawi (TAMA). The criteria which the Ministry uses in reviewing TAMA's submission are rather narrow in scope. That the Ministry should set a maximum price in conjunction with TAMA in effect makes the Ministry party to a cartel¹² arrangement which is designed to reduce the price paid to the tenant below that which would otherwise be negotiated in a free market. This is not a fair practice for the Ministry to engage in, especially given the fact that the tenant is the weaker, more disadvantaged of the parties.

¹¹In Nankumba's survey, one estate with a low tenant turnover rate was described as the one with "...the highest average 1987 tobacco yield, the best housing and provision of social services, and no record of complaints by either tenants or management" [op. cit. p. vi].

¹²The more precise economic term would be oligopsony.

2.6 Land Use Patterns.

The 1990 Estate Survey determined that, as an average, about 38% of estate area was in cropland, including some 11% which was fallow (Table 2.6). Another 18% was wooded area, which included planted or replanted woodlands. The largest single category of land was "other", which included rocky areas, hills and bogs, and generally unutilized areas, and this accounted for 32% of the total area. It was the impression of the survey team that about half of the "other" lands might ultimately be useable for farming.

To say that 11% of the total land area is in fallow makes it appear as though the land is not being intensively used. However, the Ministry of Agriculture's official recommendation for growing tobacco is to grow it one year in four, followed by maize and then to leave it fallow for two years. If that rotation were to be more strictly adhered to, then the fallow area would actually have to increase.

As Table 2.6 demonstrates, there are wide differences in land use between different regions of the country. In the less densely populated north (Rumphi) the cropped area forms a much smaller percentage of the total land area in estates, and the wooded and "other" categories are much larger. The proportion of cropped area was found to be highest in Lilongwe, in the center of the country. The cropped area was also high (35%) in Kasungu, while wooded areas and land in the other category were relatively low. This reflects what was observed on Kasungu estates during recent visits with estate owners there--namely, that there is not much land left which can be developed for cropping.

The issue of maintaining wooded areas is receiving increased attention. A certain amount of woodland is necessary for tobacco production, in addition to meeting needs for firewood and other purposes. Burley requires a steady supply of poles for barn construction and repair whereas flue-cured tobacco production requires large amounts of firewood. Estates which were interviewed in Kasungu still seemed to be getting most of their pole wood and firewood from nearby.

If tobacco quotas continue to increase and more land is thus put into production in the Kasungu area, and if more natural woodland is taken out of trees and planted to tobacco, the wood supply could pose a severe limitation. There is already a recognition in the flue-cured tobacco industry that it will be necessary to find ways to make kilns more efficient so as to help reduce the demand for firewood.

Table 2.6 Estate Land Use Patterns, by Farm Size Class and Agricultural Development District.

	ESTATE SIZE CATEGORY				Total Sample
	0-15 ha	15.01-30 ha	30.01-100 ha	100+ ha	
- T O T A L A R E A I N S A M P L E -					
Total Sample	342	693	1,584	7,772	10,391
- - P E R C E C T o f T O T A L A R E A					
Cropped	52.5%	45.6%	37.8%	23.2%	25.3%
Fallow	14.3%	12.0%	19.9%	10.0%	10.7%
Wooded	11.7%	16.8%	16.6%	19.4%	17.8%
Grazing	1.1%	6.8%	1.5%	2.5%	2.4%
Bldgs/roads	7.5%	7.5%	7.5%	7.5%	7.2%
Other	12.9%	12.0%	16.8%	37.4%	36.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Use	- - AGRICULTURAL DEVELOPMENT DISTRICT - -				
	Kasungu	Rumphi	Salima	Lilongwe	Machinga
- - T O T A L A R E A I N S A M P					
Total Sample	1,176	3,425	2,141	2,035	2,060
- - - P E R C E C T o f T O T A L A R					
Cropped	35.0%	20.6%	22.2%	42.6%	19.4%
Fallow	16.8%	7.4%	15.8%	17.1%	4.4%
Wooded	16.5%	22.8%	18.7%	6.6%	19.8%
Grazing	3.2%	0.5%	0.8%	9.2%	0.3%
Bldgs/roads	7.5%	7.5%	5.8%	7.6%	7.5%
Other	21.0%	41.2%	36.7%	16.8%	48.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Mkandawire, Jaffee and Bertoli [1990], based on Estate Survey.

There is a government regulation requiring that estates plant 10% of their area to trees. According to the survey in 1990, however, not all estate owners had done so. As one drives through the Kasungu area, it is easy to observe a lot of replanted area on the large estates, but there is little indication that the smaller estates have been planting their share of trees. There seems to be very little information about the economics of replanting wooded areas--how much it costs, and how much the payback is likely to be.

From a management perspective, the estate has numerous options which must be considered putting the estate area to use. As the discussion has already indicated, clearing new land for growing crops is likely to be costly, either because of the clearing cost per se or because of the wood production which may have to be given up. Within the land that the estate has cleared, it must decide how to allocate the area to buildings, crops, fallow, and grazing area for livestock.

2.7 Crop Alternatives.

The major objective in estates is obviously to grow crops for commercial sale. As noted in section 1 above, burley tobacco is the main profit-maker for most estates, although there is specialization in tree crops for export in some areas.

2.7.1 Tobacco. Burley tobacco production has been highly profitable during most of the past decade, which has contributed to the expansion of the estate sector more than any other factor. Burley has made significant gains in production as compared to flue-cured over the past decade. This has been attributed to the much higher capital intensity of flue-cured, due to the need for expensive kiln buildings, and to its heavy requirements for kiln wood in an era when Malawi's wood supplies are beginning to get scarce.

While there is interest in diversification in order to avoid some of the well known problems of monoculture, the continued profitability of burley makes it difficult for farmers to turn their attention to other crops.

The burley production season is long and extremely arduous. The commitment to a good crop normally starts during the nursery period, in August or September through November; it continues through ground preparation and ridging (October-November), transplanting of seedlings from the nursery (November-December), weeding, fertilizer application and further ridging (December-January), suckering and topping the plant (January- February); harvesting and drying (late January through April); and grading and marketing (April through August). Flue-cured tobacco follows a similar schedule for growing, except that the labor requirement

is said to be somewhat higher at curing time due to the operation of the kilns.

The responsibility for the various burley production tasks differs from estate to estate. For example, the study team visited one estate where the permanent workers grew all of the nursery, whereas the tenants alone did grow the nursery on another. Most activities are done by the tenants except at peak periods when the estate's permanent labor will help out or the estate will bring in temporary worker to help, such as during harvest and grading time. After the tenant does his grading and turns the tobacco over to the estate, normally by June, the estate's permanent workers will continue to grade and ship the tobacco until mid or late August.

Since the burley production cycle is so time consuming and relatively steady throughout the year, it does not leave workers much time for other crops, although other crops take very little time compared to burley. This can be seen by comparing the burley labor calendar to that for some potential alternative crops.

Table 2.7 shows labor schedules for several alternative crops, in addition to burley. This kind of information is difficult to obtain in Malawi. The information for burley and maize shown in Table 2.7 was based on field interviews with estate owners in the Kasungu area. For other crops, data was adapted from that used by the Ministry of Agriculture's Planning Department in its annual cost of production studies. Annual data from MOA was distributed on a month by month basis by taking information from several older MOA village farmer surveys.¹³ Data on sunflowers was developed by the study team, based on information provided by researchers at Chitedzi Research Station.

Although other crops require only 15-30% as much labor as burley, their peak time requirements tend to coincide with those of burley. Thus, growing them together tends to compete with burley growing. This can best be illustrated graphically, as shown in Figures 2.1 and 2.2 for maize and sunflower in comparison to burley.

Rotational considerations for burley are another factor that has probably kept out other crops. A particular concern is nematodes, which can cause burley yields to plummet. There does not seem to be consistent information available to farmers on this score. For example, some researchers and growers claim that the groundnut plant can host nematodes (eelworms), whereas others said this was not the case. Two crops which are being promoted heavily are sunflower and soybeans.

¹³One of the most useful of these was the Ministry of Agriculture's study of Chisasa village [1972].

Table 2.7 Labor Requirements for Alternative Crops.

	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
.....days per hectare, adult.....												
BURLEY TOBACCO:												
Tractor Plough	106	77	94	93	14	80	131	145	145	145	145	31
Hand Hoe	105	98	116	80	104	99	138	128	136	113	113	24
LOCAL MAIZE:												
Tractor Plough	0	1	1	0	7	35	35	0	0	8	8	0
Hand Hoe	0	0	24	24	21	45	23	0	0	6	0	0
HYBRID MAIZE:												
Tractor Plough	0	1	1	0	27	35	35	0	0	16	16	0
Hand Hoe	0	0	24	24	21	64	23	0	0	6	0	0
SUNFLOWER:												
Tractor Plough	0	1	1	0	0	27	30	30	0	8	24	0
Hand Hoe	0	0	24	24	0	21	54	23	0	8	20	0
BEANS (on MAIZE)	0	0	0	0	40	64	0	30	0	0	0	0
GROUNDNUTS	15	3	1	2	15	18	16	12	2	8	40	32
COTTON (Timing?)	15	6	2	4	30	36	32	24	36	31	80	32

 Source: Based on field interviews in Kasungu, and on smallhold data from various sources, adjusted by study team.

Figure 2.1 Labor for Burley & Hyb. Maize

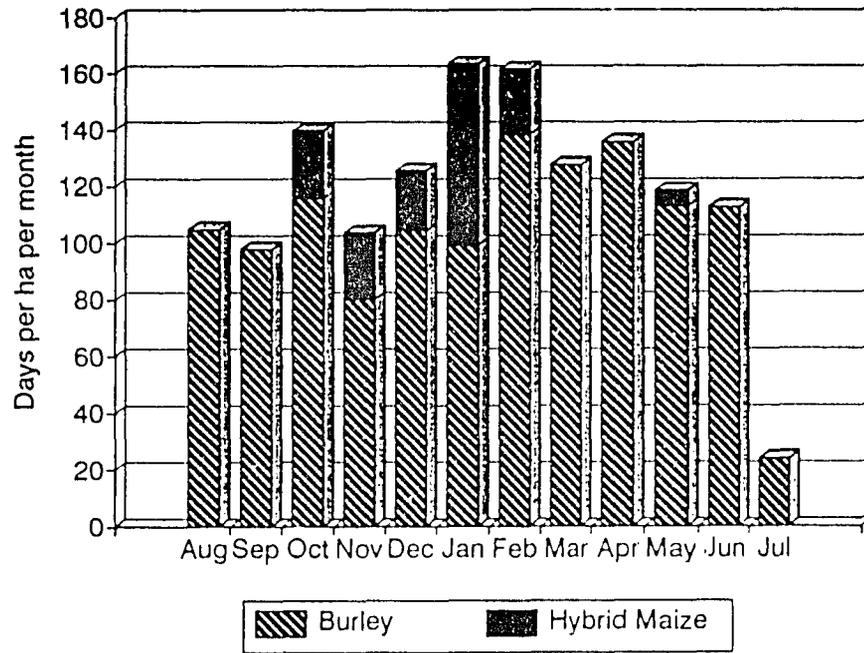
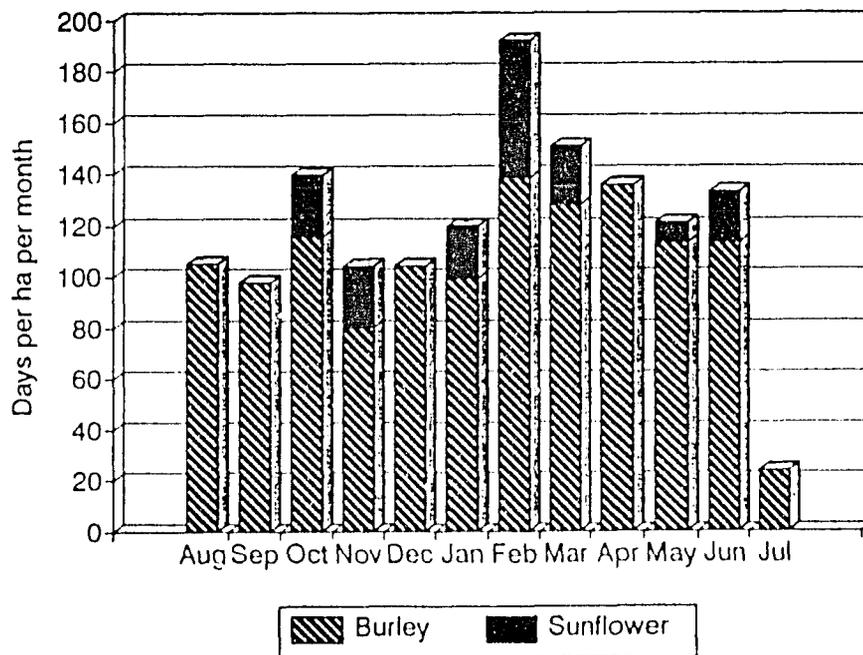


Figure 2.2 Labor for Burley & Sunflower



There seems to be a consensus that sunflower can host nematodes, but there is less certainty about soybean. Two virus problems of burley, wildfire and bushytop, can be transmitted by insects such as aphids and whitefly, which can be hosted in potential rotation crops.

As noted earlier, the official recommendation of the Ministry of Agriculture is to have two years of fallow in a four year cycle with one year of burley, normally followed by maize. It is costly to keep land idle, and this recommendation may have been made without much thought of the economics involved.

Burley technology varies widely among estates of different sizes. Larger estates fumigate soils in their nursery with methyl bromide to prevent nematodes, but this is a difficult practice for smaller estates to manage. Instead, they follow a procedure of building a fire with cornstalks and wood on the nursery area, before seeding. Larger estates with good mechanization go so far as to apply ethyl di-bromide (EDB) gas to fumigate the fields against nematodes before transplanting. While these practices are expensive, they are said to have a significant impact on yields.

Based on a review of the variability of yields reported by estate owners in the 1990 survey, and based on discussions with growers and industry experts in March 1991, the study team concluded that on estates with the best technology and management, burley yields will exceed 2000 kg per hectare with fair regularity. Such results would probably come from the recommended four year rotation with fallow, but they would still entail high levels of fertilizer and pesticide application. With national average yields of about 1.1 tons per hectare, however, it is obvious that such estates are not common.

At the other extreme of the yield and technology spectrum would be farms which are growing burley several years continuously without resting the land. They would use relatively low amounts of fertilizer and little if any pesticide. Their yields would vary from 1000 kg per acre in the first year that they crop a field down to perhaps 600 or 800 kg per acre by the time several years have passed.

Rhodes grass is being used as a fallow cover crop by some large estates. The catambora (sp?) variety can also serve as a seed crop for export and could also be grazed by livestock. There is a giant Rhodes grass which is reportedly a much better forage for livestock, however, but it is said not to suppress nematodes. Little is known about the economics of the Rhodes grasses or about the associated use of forage-livestock activities as burley rotations. However, given the fairly limited market for livestock and meat at the income levels which currently prevail in Malawi, this is not likely to be an area with very deep potential.

The Challenge of Tobacco Marketing. The continued successful

marketing of burley and other tobaccos presents some serious challenges. Malawi's tobacco markets have been segmented, with some varieties (burley and flue-cured) largely reserved to the estate sector and with dark-fired and sun/air tobaccos being assigned to smallholders.

While the estates were free to sell their tobacco at commercial auctions, smallholders were required to market through ADMARC, which has often paid very low prices and then used the profit from its tobacco sales to balance other accounts. Burley, with its private trading system, has expanded rapidly, whereas the market for dark-fired tobacco, which has been handled by ADMARC, has stagnated.

To regulate the expansion of burley production, which increased at an average annual rate of over 15% per year during the 1980s (Table 2.1), MOA and the growers' association (TAMA) devised a system of issuing marketing quotas which limit the amount of burley each producer can market. The size of the quota has varied by estate size and other factors which are less clear. In the past few years, most estates which have received a quota for the first time have received 2,500 kg. Some estates which are larger and which have been growing burley for a long time have quotas that exceed 100,000 kg per year.

There have been two basic problems with the quota system: (1) it has provided the mechanism for keeping smallholders out, since only leasehold estate owners have been eligible to apply for quota, and (2) the system has been managed in an unpredictable and apparently arbitrary manner, so that producers are not always able to plan and make effective decisions¹⁴. Furthermore, there have been several thousand new leasehold owners who have applied but have not yet been given quotas¹⁵.

Not only has the system been unfair to smallholders, it is difficult to defend from the point of view of efficiency. Burley is a crop which smallholders are apparently able to grow more

¹⁴For example, in interviewing farmers at Kasungu, the study team encountered one who had his quota decreased by 5,000 kg and another who had his quota decreased by a similar amount, but neither one knew just why.

¹⁵Officials of the Tobacco Control Commission informed the study team that quota totaling 11.8 million kilograms had been issued to 4,679 new leasehold growers for the current marketing season. As of about a year ago, there were reported to have been over 6,000 leasehold estate owners who had applied for quota but had not yet received it. This suggests that there still may be over 2,000 waiting to receive it.

efficiently than the dark-fired tobacco which they have normally been limited by government marketing regulations.¹⁶

There have been some obvious abuses of the quota system. Some growers have managed to gain ownership of more than one estate, which has enabled them to secure multiple quotas. Furthermore, some quota holders have purchased burley from smallholders, rather than growing it on their own. Growers have often over-produced and marketed more than their quota states. In some years, over-quota amounts are sold at a penalty price which is well below the market price. Growers cannot always be sure what to expect.

Currently, under pressure from international donors, the government has decided to issue burley quotas to several thousand smallholders, reportedly in amounts of 100 kg each¹⁷. This, together with the requirements of issuing quota to new estate holder applicants, is apparently necessitating the redistribution of existing quota from some estates to others.

Quota is in demand because it has value. As long as burley prices hold up and growers can continue to make good money with the crop, more growers will want to enter the industry and those who are already in will want to expand. But Malawi's production probably cannot continue to expand at the rate it has been expanding and still manage to preserve a good price and maintain good quality. Duncan [1989], carrying on further with analysis that was begun in the Agmark study, concluded that in the near term the country probably cannot safely extend beyond 75,000 kilograms, and not over 100,000 kg in the longer term. Quota for the current marketing year is 65,000 kg.

If smallholders and new leaseholder applicants are to be issued more quota, it may be necessary to redistribute existing quota, which has already been done on some occasions [Agmark, 1989, p.69]. Therefore, it becomes paramount for growers in the estate sector who lose quota to find alternative production opportunities which are profitable.

¹⁶According to a study by Lele and Agarwal, smallholders are apparently able to produce burley for a lower domestic resource cost than they are able to produce dark-fired tobacco. The cost differential is particularly marked when full marketing and overhead costs are taken into account. In some comparisons, smallholder costs for producing burley were lower than estate costs of production [1989, Table 9].

¹⁷The Tobacco Control Commission reported that 3 million pounds of quota was issued to smallholders in the current season, in addition to the additional amount that was issued to leasehold estate applicants.

Furthermore, if smallholders are to receive quota, it is necessary to devise a system for letting them market their product. Until now, ADMARC is planning to be the marketing agency and has already announced a price which is 45% of the average burley auction price for the past three years. The rationale for paying smallholders less than the estates -- who receive the full auction price, less marketing costs -- is not clear. In fairness to the smallholders, it is desirable to open the marketing of their tobacco up to competition. But it would cause chaos at the auction to have thousands of smallholders each show up at sale with a separate 100 kg bale of tobacco.

Thus, what is required for smallholder tobacco is an efficient assembly process. Such processes are handled effectively by traders and brokers in other countries. One option would be to permit estates to legally buy from smallholders. This has been discussed, but there are fears that this might present an opportunity for leakage of tobacco from one tenants on one estate to another. If smallholder tobacco is not marketed in an orderly process and competently graded, it could end up watering down the quality and reputation of Malawian burley, to the detriment of all growers.

2.7.2 Maize. Maize is currently the main rotation crop for tobacco. Although Malawi estate farmers place a substantial proportion of their land into maize, it is used mainly to feed the workers on the estates themselves, and only about a quarter of the estate maize production is marketed. It was noted earlier that small estates tend to market more of their maize than the larger estates do. The estate sector is progressive in its planting of higher yielding maize varieties: the 1990 survey showed that 57% of estate maize was hybrid, compared to about 10% or less in the smallholder sector.

Although sporadic export opportunities do arise when there are crop shortages in nearby countries, Malawi is not a consistent exporter of maize, and there are no obvious opportunities for it to become one. Maize has been promoted heavily as a smallholder crop, and it is relatively cheap for smallholders to grow with unpaid family labor. In most years, smallholder production has met domestic consumption needs. ADMARC has traditionally controlled the marketing of maize and has tried to keep its buying price low so that it can supply consumers as cheaply as possible. Maize is the main subsistence crop of smallholders and is also one of their main cash crops. Since the needs of the commercial market can normally be met by smallholders, it is not likely that the estate sector will be able to find any significant economic advantage in trying to specialize more in maize, although there is always a market for maize when it is produced.

Tenants on some estates are given a plot of land to grow their own maize. Although this can be a real benefit to the tenant, the

estate interviews in Kasungu indicated that many estates do not provide much in the way of inputs for tenants to grow their maize. Thus, yields reported for tenant lands were quite low. Estate production could be increased by providing tenants better support in their maize growing.

2.7.3 Groundnuts. Like maize, groundnuts are an important crop in the smallholder sector, but they account for only 4% of the area in the estate crop rotation. Groundnuts are a substitute for maize in the crop rotation, and it is common for smallholders to shift from maize to groundnuts when the price is advantageous. Since smallholders normally plant close to 200,000 hectares of groundnuts, the 5,000 or so hectares planted by the estates is not large.

Groundnuts require more labor than maize and would appear to run into more direct competition for labor with tobacco than maize does. This in itself may explain why the estate sector grows so few groundnuts. Nevertheless, as tobacco demonstrates, more labor can be hired at peak periods when the incentives are right, and groundnut incentives can be improved.

While groundnuts have traditionally been an export crop for Malawi, this trade has been lackluster in recent years for several reasons. Groundnuts are relatively low valued per unit of weight as compared to many other export crops, and they have thus suffered due to Malawi's transportation difficulties. Furthermore, world market prices have not been particularly good, and the Chalimbana variety which Malawi grows has fallen out of favor with European buyers of confectionery nuts, who now prefer smaller, more easily blanched nuts. MOA researchers are collaborating with ICRISAT and other international centers to find suitable new varieties that can replace Chalimbana and that will be acceptable to farmers (Mills Associates, 1988).

Ongoing economic reforms have included plans to open up the groundnut trade to private buyers, but so far ADMARC has continued to play a dominant role in groundnut marketing. By setting groundnut prices and leaving them at the same rate for several years running, ADMARC often destroys the incentive for farmers to grow groundnuts. Thus far, private traders in Malawi are not well organized or equipped to handle the marketing of many commodities, and in the case of groundnuts ADMARC continues to be a key player. As reforms proceed, however, opening groundnuts to private trade and competition can be expected to improve the incentives for producing them by the estate sector.

2.7.4 Oilseed Production. Groundnuts and other crops such as sunflower and soybeans are potential sources of edible oil, and Malawi is an importer of oils. The Manipintar variety of groundnuts is superior to Chalimbana for oil production, but it is

not widely grown in Malawi. The National Oil Company, an ADMARC subsidiary, has regularly pressed cottonseed to produce a crude raw oil which is then re-sold to private companies for further refining. However, cottonseed alone is not enough. Lever Brothers do have local processing capacity, but they have been reluctant to expand in view of what they see as a limited local market. In 1988 a new processing facility was added by the privately-owned Capital Oil Refiners (CORI) at Blantyre, and this is adding a new degree of competition to the market.

During the current growing season, Lever Brothers has been actively engaged in promoting sunflower seed production, which it plans to buy for local processing into oil. To avoid disease problems, sunflowers need to be planted in January, several weeks after the planting of tobacco and maize. This might give sunflower an advantage over maize. It is clear that there is a potential niche for sunflowers. They can potentially reach higher yields and produce more oil than groundnuts and require less labor. Before they will succeed in large scale on the estates, however, it will be necessary to find a nematode resistant variety that can coexist with tobacco.

Soybeans have been promoted by MOA in the past few years. They have the same problem of being a potential host for nematodes harmful to tobacco, and it would be necessary to find a nematode resistant variety. As with sunflowers, such varieties are said to exist, but they have yet to be tried or adapted in Malawi. Soybeans require a fairly sophisticated solvent extraction process before they are a cost effective source of edible oil, and at Malawi's stage of development such a facility is not likely to be built. Therefore, soybeans are viewed as being economically less viable than sunflowers as an oilseed.

Some varieties of soybeans are useful as a nutritious human food, particularly due to their high protein content. There is a need for such foods in the Malawian diet, and research is required to identify suitable varieties as well as to establish their acceptability to the Malawian consumer.

Malawi's current consumption of edible oils is put at less than 4,000 tons per year, and it is not expected to expand too rapidly, given current income levels and lack of urbanization. Thus, it is believed that all of Malawi's oil requirements for the foreseeable future could be provided with less than 10,000 ha of crop area, either groundnuts or sunflowers. If the market develops to this extent, however, it is a niche that the estate sector might well fill. Estates have larger blocks of land and have the potential of meeting processors needs more easily than smallholders.

2.7.5 Cotton. Malawi has a good climate for producing cotton, and the country's overall cotton area expanded from about 32,000 to 52,000 ha between 1980 and 1987. In addition to meeting the requirements of the domestic market, cotton would appear to have potential for expanded export [Lele, van de Walle and Gbetibouo, 1989].

Cotton may represent a more acceptable rotation crop for tobacco than sunflower and soybeans because it reportedly does not serve as a host to harmful nematodes. Cotton production also has the advantage that it uses a lot of labor, at least when it is not mechanically harvested, and it could thus be a good generator of employment.

Traditionally, cotton has been considered a smallholder crop in Malawi, and between 1962 and 1982, cotton production was even prohibited on estates. A limited amount of cotton has been produced by estates since then. However, the current marketing regulations for cotton are not clear. The study team received some reports that estates are still required to market cotton through ADMARC, which implies that the price may be well below its real value in international trade.

A recent study of cotton in the MADIA countries by Lele, van de Walle and Gbetibouo underscores the role of marketing arrangements and institutions which act to coordinate the farming, ginning and spinning phases of the production process [1989]. A thorough study of marketing and institutional arrangements may be required in order to understand why cotton has thus far not done well as an estate crop in Malawi.

2.7.6 Wheat is a crop that has some potential in the estate sector, in places where the opportunity exists to irrigate. Current production was only supplying 6-7% of national demand in 1984, and thus there would appear to be real opportunity for import substitution. While wheat can be grown successfully under rainfed conditions in a few upland zones, it is a winter season (May-December) crop that cannot do well most places without supplemental moisture. Estates that do grow wheat under irrigation report yields of 3-4 tons per acre, with national consumption running at 17,000 mt. Suitable smallholder area is limited. Wheat should provide a good opportunity for estates which have areas which could be developed for irrigation without going to great expense

2.7.7 Tree Crops. There are several tree crops which already serve an important role in the estate sector and some which have good potential for expansion. Tea, coffee, macadamia nuts, and cashews are crops which are already being grown in varying degrees.

Tea is one of Malawi's oldest estate crops and has continued to expand steadily, if slowly, through the years. Because it is well established, the tea industry enjoys three different marketing channels (local auction, consignment to London auction, and direct sale), which provides growers with some alternatives, and the trade is mainly handled by the private sector. The only drawback to tea marketing is that international prices can fluctuate widely, and the seller has no control over this. Areas suitable to tea production are limited to a few regions, and most of 90% of the country's production comes from 26 specialized estates located in such areas. Thus tea cannot be expected to take up a very large proportion of future expansion in the estate sector.

Some tea is also grown by smallholders who are supported by the Smallholders Tea Association. This organization may provide a model that could be used by smallholder tobacco growers.

Macadamia and cashew nuts are both grown in Malawi and can do well under specific micro-climatic conditions found along certain parts of the lake area. Of the two, macadamia is newer to the country and is a relatively new commodity on world markets. Cashew production has been going down worldwide, and thus Malawi may be in a good position to fill a part of the gap in international supplies. Current procedures are for Malawi to ship its cashews to India for further processing, and if the country seeks to expand, serious consideration should be given to establishing a local processing facility.

Coffee has been grown in Malawi for a long time and has at times suffered setbacks from diseases. It is adapted to several regions of the country. Countries who market coffee in the world market normally do so under quota which is issued by the International Coffee Organization. While Malawi was producing at well under its quota level in the early 1980s, the World Bank [1984] report estimated that it would soon be meeting quota with trees that had already been planted. The Bank's opinion was that it would not be easy to get additional quota from the ICO. Since the 1984 report was written, the international coffee marketing agreement has collapsed and prices have recently plummeted. In view of the intense competition in coffee production worldwide, it may be a difficult time to try to expand coffee production.

According to estate owners, supplemental irrigation is essential for tea production, and it is desirable for coffee production. Thus, availability of water for irrigation also serves to limit the area in which tree crops can be grown in some cases.

2.8 Livestock Production in the Estates.

Livestock do not play a major role in most estates. Of the land use reported by estates in the 1990 survey, grazing area accounted for only 6%. Nevertheless, cattle can use areas that may be classified as woodland, fallow, or "other" in the survey, and they undoubtedly graze on residues in crop areas that have been harvested. Furthermore, livestock production should be considered as a means of intensifying estate production because of its potential to utilize land which cannot be cropped.

The proportion of estates having animals varied, depending on the type of livestock, as seen in Table 2.6. About 40% reported having cattle and 36% had goats, while only 18% reported sheep. The nine estates¹⁸ in the smallest size (15 hectares and smaller) who reported having cattle had an average cattle density of 0.99 head per hectare of total estate area. This compared to .33 for cattle-holding estates in the next smaller size category (15-30 hectares), and to 0.18 for the weighted average of the entire sample. Thus, livestock do appear to play a major role in smaller estates.

Since it is considered to take two to three hectares of natural (uncultivated) grazing area per head of cattle under Malawian conditions, the density of cattle on the smaller estates is surprisingly high, even considering that they are probably able to utilize crop residues or in some cases graze on communal lands. With an average herd size of 13 animals for small estates, there is evidently a considerable degree of livestock specialization among those estates which do have cattle.

Some estate owners interviewed by the study team at Kasungu indicated that they permit tenants to keep sheep or goats but not larger animals. In some areas, problems with grazing of livestock from adjacent communal land areas were reported.

Poultry were found on 60% of the estates in the 1990 survey but on 70% of those in the smallest size category. The average size of flock was about 33 birds. It is assumed that poultry is probably fed with some maize grown on the estate, but this is not known for certain. It is not known to what extent poultry are used for consumption on the estate or which proportion would be consumed by tenants or estate owners. While poultry cannot be a significant factor in land use, per se, it could provide an important source of supplemental protein to estate workers and tenant. Larger scale flocks could be of commercial importance.

¹⁸Out of a total of 27 estates in the sample for this strata.

Table 2.8 Livestock on Leasehold Estates.

	ESTATE SIZE CATEGORY				Weighted Average
	0-15 ha	15.01-30 ha	30.01-100 ha	100+ ha	
	- - - - - Percent of Farms With Livestock- - - - -				
Cattle	33.3%	39.4%	54.8%	42.9%	40.3%
Goats	29.6%	36.4%	48.4%	35.7%	36.1%
Sheep	7.4%	12.1%	16.1%	25.0%	16.8%
Poultry	70.4%	60.6%	74.2%	67.9%	61.3%
	- - - - - Average Size of Herd or Flock- - - - -				
Cattle	13	7	10	13	10
Goats	8	10	9	21	12
Sheep	12	6	15	48	23
Poultry	34	21	23	74	33
	- - - - - Average Herd Densities- - - - - (animals per hectare of estate area)				
Cattle	0.33	0.13	0.11	0.019	0.073
Animal Units	0.38	0.17	0.13	0.034	0.091

Source: Based on Table A44 in Mkandawire, Jaffee and Bertoli.

2.9 Support for Improved Technology and Estate Management.

Until recently, there has been no extension service to provide for the special needs of the estate sector, and the MOA's regular extension service has not had the capacity to cover estates either. About three years ago a separate Estates Extension Service was formed with a limited staff, and it is now in the process of being set up to operate with the help of Britain's ODA and the EEC . The agency is currently in the process of hiring several people to fill key positions. In the near future, however, there are plans to have a staff of at least 12 agents and specialists operating through regional offices, but this will not be enough to service estates of all kinds throughout the country.

While donors are initially providing funds for vehicles and training, Estates Extension ultimately plans to operate with a "cess" (fee) that will be collected from tobacco growers. This has been met with skepticism on some parts because it is thought that this source of funding will cause the organization to become a "tobacco extension service" that will not address the more diverse needs of the estate sector.

Having the Estates Extension Service meets a very real need. Given the limited number of personnel, it will be absolutely essential to prioritize the activities of the agency correctly from the outset. The need for identifying and testing suitable rotation crops for tobacco should be considered, as well as possible alternatives for tobacco on estates that do not have sufficient tobacco quota to specialize fully in that crop.

With respect to training on production practices, the Extension Service must devise a strategy that will help estate managers to convey appropriate information to tenants. Considering the relatively large number of smaller estates which have been established within the past five to ten years, the Service will need to place high priority on identifying the special needs of small estates and on developing ways to reach smaller estates.

It is only through developing improved management practices that estates will learn to do a better job of working with their tenants and laborers. Thus, in addition to focusing on agricultural technology, the Estate Extension Service should give priority to management training for estate managers and owners, including personnel management and basic accounting practices.

Private companies have a role to play in improving estate management. Currently, the National Bank provides an Estate Management Service in which professional managers provide farm management services, including financial management and accounting, to estate owners. The cost of this service is likely to make it unattractive to smaller estates, but it has a definite niche to fill among larger and perhaps medium sized estates.

3. The Economic Structure of Estate Management.

Good estate management requires not only an adequate set of resources, it requires good information. Since the estate manager and tenants are both making decisions, it is essential that they both have information. But information about the choices which the two parties face in their day to day decisions is limited. It is limited by the fact that transportation is difficult, and there are no regular daily newspapers available in the most rural areas. Casual observation suggests that less than a third of the tenants have any formal education or can read and write. Few have radios. As discussed in the preceding chapter, there has not been an extension service responsible for working with the estates until quite recently, and even this is not fully operational as yet.

Information available to government policy makers is also limited. First, there are very few reliable, readily available statistical indicators which serve to indicate what is happening in Malawi's rural areas in general and in the estates, in particular. Secondly, there has been no regular system of assembling costs of information for the primary estate products. While the MOA maintains a regular cost series for smallholder crops, this is really not directly applicable to the estates.

Thus, the policy maker currently has a very incomplete understanding of the profitability of the various estate production alternatives or of the implications which various policy measures -- such as changes in burley quota, changes in the buying price which estates pay tenants for burley, or modifications in the prices of competing products -- are likely to have on economic performance in the estates.

The purpose of this chapter is to assemble information which is available about some of the main issues which the estate sector faces, and then to use this information to examine the structure of some of the key economic decisions that estate managers and tenants must make. This report is written for the policy maker who is trying to understand the estate resource allocation process.

Because the basic information for this kind of analysis is quite limited in Malawi, data was taken from several previous studies [World Bank 1984; Agmark 1989; and Duncan 1990], and this was revised, where necessary, to reflect conditions which the study team found when it visited Kasungu estates in March 1991.

3.1 Cropping Alternatives and Comparative Advantage.

In the preceding chapter we discussed possible cropping alternatives for the estate sector in terms of how such alternatives might fit into a rotation with tobacco and thus use available land and labor. There was also a discussion of the

domestic market potential of several alternative crops, such as the oilseeds.

Alternative crops are of interest from the point of view of providing opportunities for intensification of resource use, such as land and labor, and thus as a means of increasing estate and labor incomes. However, alternative crops are also of interest from the point of view of diversification. Malawi is heavily dependent on tobacco production at a time when tobacco use is receiving increased criticism worldwide due to health considerations. While the growth in tobacco demand and tobacco exports has been favorable to tobacco production during the past decade, this trend may well not continue into the future. Diversification would help to protect itself against the risk of a downturn in demand for tobacco.¹⁹

A useful way to evaluate alternative crops is from the point of view of comparative advantage. The World Bank's 1984 study, "Malawi: Agricultural Diversification," took a detailed look at the alternatives currently or potentially available to Malawian estate and smallholder farmers. The bank's study was probably the most detailed piece of work of its kind which has attempted to get at the comparative advantage issue for Malawi. While the report was done several years ago and it would be preferable to have more up-to-date information, it is believed that the general pattern of the findings in the study are still valid. The exception to this would be cases in which basic world relative price relationships have changed, such as is believed to be the case with groundnuts.

Simply stated, comparative advantage analysis attempts to answer two fundamentally related questions: which commodities should a country attempt to produce for itself or perhaps even export, and in which cases would it be better off to import goods from abroad? Simply speaking, the commodities which should be produced and/or exported are the ones for which the country is a relatively efficient producer. To evaluate relative efficiency, the Bank's study used domestic resource cost analysis to rank alternative products. The findings are summarized in Table 3.1.

In domestic resource cost analysis, the cost of the domestic resources required to produce a commodity (measured in Kwacha) is compared to the amount of foreign exchange (measured in dollars)

¹⁹While the need to diversify is clear, diversification is not necessarily a process which is free of pitfalls. As Lele points out, African "...countries which tried to diversify too quickly in the 1970s and pursued at best a policy of benign neglect towards their existing agricultural activities, have done poorly in relation to those who actively developed their existing sectors, while methodically pursuing a long-run diversification strategy" [1989, p.15].

which is saved by producing the commodity domestically, rather than importing it. The resulting values, expressed as a ratio of the cost in domestic resources to the value generated in foreign exchange, is then compared to the (shadow) rate of foreign exchange for the country's currency. If the domestic resource cost (DRC) is less than the exchange rate (K 1.33 per dollar in 1984), then there is considered to be a comparative advantage in producing the commodity.

The results shown in Table 3.1 indicate that it is particularly the tree crops -- Macadamia, tea, cashews, and rubber -- in which the Malawi has a comparative advantage. Most of these are crops which are grown in Malawi's estate sector. In the first case shown in Table 3.1, for example, it was estimated to take only K 0.27 in domestic resources to produce \$ 1 worth of Macadamia nuts. Obviously, this was quite attractive at a time when it was taking K1.33 to buy a dollar on the foreign exchange market.

Suitable locations for tree crop production tend to be confined to specific ecological zones. For example, Macadamia is said to be well suited for about 16,000 ha of land in the Nkhata Bay region, and rubber is also confined to a small district in that zone. Cashews is another crop that does well in areas close to Lake Malawi. Thus, these may not be crops which would serve as broad replacements for tobacco, but they are viable in some areas.

Most tree crops have the characteristic of being relatively long term investments which do not begin to produce positive cash flows until several years after they are planted. Sometimes it is possible to alleviate this problem by interplanting annual crops among the trees during their early years. Nevertheless, tree crops normally have greater investment requirements than annual crops, which can present obstacles for smallholders and smaller estates.

Other crops that looked particularly good in the DRC analysis were wheat, groundnuts, tobacco of various kinds, and sunflowers. These were commodities which were discussed in Chapter 2 as possible replacements for tobacco, or at least as candidates for diversification and possible rotation with tobacco. Of these, one important limitation is that wheat will probably require investment in some kind of supplemental irrigation. While it is believed that places where supplemental irrigation is possible may be fairly common, no information on this was available for use in the following analysis. Although wheat is not considered it may well be quite attractive in the long run, where supplemental irrigation is possible.

Table 3.1 Summary of Findings of 1984 Agricultural Diversification Study.

CROP:	Assumed Yield (kg/ha)	Domestic Resource Cost (DRC) (K/\$)	Return to Land (K/ha)	Labor required (days/yr)	Return to labor (K/day)
----	-----	-----	-----	-----	-----
Macadamia	6,250	0.27	8,143	125	41.82
Tea (smallholder)	6,165	0.28	6,165	300	3.28
Cashews	900	0.40	544	57	4.60
Wheat (estate)	4,200	0.40	940		20.05
Groundnuts, chalimb	800	0.71	316	218	2.03
Rubber	1,500	0.48	1,167	180	2.79
Wheat (smallholder)	1,500	0.48	393	100	4.48
Sun/Air Tobacco	600	0.67	760	450	2.27
Burley (smallhold)	700	0.74	693	582	1.77
Flue-cured Tobacco	1,500	0.64	1,954		6.57
Cotton (smallholder)	1,000	0.70	471	300	1.58
Burley (estate)	1,450	0.64	1,502		4.51
Sunflower	3,000	0.58	522	213	2.92
NDDF Tobacco	600	0.80	623	400	2.14
Coffee	700	0.66	768	567	1.22
Guar Beans	1,500	0.71	211	120	2.26
Cotton (estate)	1,500	1.03	186	80	5.10
Sorghum	3,000	0.80	99	80	1.88
Groundnut, Manipint	750	1.05	78	125	1.32
Beans	750	1.04	75	140	1.32
Maize w/beans	2,050/350	1.06	79	175	0.89
Maize, composite	2,400	1.79	neg.	120	0.00
Rice, HYV ('90 Prices)	4,000	0.88	376	250	1.97
Rice, HYV ('82 Prices)	4,000	1.39	neg.	250	0.38

Source: World Bank [1984].

Notes: - At the time the Bank's study was conducted, the official exchange rate for the Kwacha was K 1.33 = US\$ 1. Therefore, the interpretation of the domestic resource cost coefficients (DRC's) was that a DRC of less than 1.33 was favorable. Therefore, the items at the top of the above list were considered to have the highest comparative advantage at the time of the study.

- The World Bank's list of cropping options was longer than the above; the study team chose to drop their high management options (e.g. Flue-cured Tobacco at 2,500 kg/ha) as being unattainable as an average in the near future.

- The return to land figure above is a net return after a charge for labor has been removed. Therefore, it was necessary to add back the labor charge to the return before dividing to derive the return to labor.

While estate grown cotton does not rank particularly high according to the World Bank study (Table 3.1), it is believed that this appears to have been because the study assumed that cotton harvesting would be mechanized. Nevertheless, it is possible for estates to use more labor intensive means of growing cotton, and this may well make cotton economically more attractive as an estate crop. As noted in Chapter 2, cotton has certain advantages over soybeans and sunflowers as a rotation crop for tobacco, and therefore it should be taken into consideration.

3.2 Costs and Returns on Estates of Different Sizes.

To get a picture of the current economics for different crops, budgets were prepared for growing a fairly extensive list of crops on estates of different sizes. The study team made a considerable effort to find the best current information available on production costs. For tobacco production and for certain rotation crops, budgets were initially taken from the Agmark study. For other crops, the MOA's smallholder budgets were modified to reflect the different conditions and possibilities which exist on the estates. In some cases, such as for sunflowers, information for constructing a basic budget was taken from MOA research personnel. Wherever possible, the budget information was verified and adjusted to reflect what the study team learned from its interviews with estate managers in the Kasungu area during March, 1991.

These are shown in Tables 3.2 and 3.3 for what are considered to be typical "smaller" and "larger" estates. The primary difference between the two budgets is that the technology available on larger estates is assumed to include a tractor to assist in land preparation, and it is also assumed that somewhat fertilizer and chemical inputs are used for some crops. In general, yields are expected to be higher on the larger estates, but so are costs.

The budgets for larger and smaller farms demonstrate the extent to which burley tobacco dominates alternative crops. Direct monetary returns to burley are six to ten times higher than returns for hybrid maize, which appears to be the next most lucrative crop. Of course, burley takes far more labor than the other crops. Labor is not shown as a cost item in the two budgets because it is often not paid directly, at least not in the case of the burley tenancy. Other items not included in the budgets would be management and supervisory labor costs which are a fixed expense in the case of most larger estates. However, the cost of these items is taken into account in the linear programming analysis described below.

Table 3.2 Indicative Budgets for Smaller Estates

	Burley 1 in 4	Burley 1 in 2	Burley unrest.	Maize Local	Maize Hybrid	Maize- Bean	Beans	Groundnut Chilim.	Sun- flower	Cotton
Yield (kg/ha)	1100	850	700	1600	2750	1600/350	600	520	1200	800
Price	5.17	5.17	5.17	0.27	0.27	.27/.55	0.55	0.89	0.55	0.80
Gross receipts	5,687	4,395	3,619	432	743	625	330	463	660	640
Fertilizer	670	603	536	101	101	101	101	0	67	134
Seed	27	27	27	7	61	87	80	86	27	9
Chemical	204	229	254	11	8	11	0	0	0	223
Capital replacement	130	120	100	25	47	25	14	24	38	65
Transport	220	170	140	0	0	12	10	16	19	21
Marketing	550	425	350							
Land rent	63	40	40	40	40	40	40	40	40	40
Operating interest	180	157	1	14	22	24	20	13	15	45
Direct expense	2,044	1,772	1,588	198	278	299	265	178	205	537
Gross Margin per Ha	3,643	2,623	2,031	234	465	325	65	285	455	103
Labor (days/ha)	1309	1265	1193	96	132	288	166	164	121	328
Gross Margin per Day	2.78	2.07	1.70	2.44	3.52	1.13	0.39	1.74	3.76	0.31

Source: Calculations of the study team, based on data from Agmark [1989], MOA Planning Division, World Bank [1984] and interviews with estate owners.

Notes: - These budgets were developed to apply to estates with less than 17 cropped hectares.

- The land rent is K 20 per ha for the entire estate, but only 50% is cropped, therefore the rent is doubled for the cropped area, except on the 1 in 4 burley, which requires fallow, making the implicit rent higher.

- "Burley 1 in 4" refers to the rotation in which 1 year of burley is followed by another crop (normally maize) and two years of fallow. "Burley 1 in 2" refers to burley every second year, with another crop in between, and "unrestricted" means no restrictions on how burley and other crops may be grown. The land rent is K 20 per ha for the entire estate, but only 50% is cropped, therefore the rent is more than quadrupled for the cropped area, except on the 1 in 4 burley, which requires fallow, making the implicit rent higher.

Table 3.3 Indicative Crop Production Budgets for Larger Estates

	Burley 1 in 4	Burley 1 in 2	Burley unrest.	Maize Local	Maize Hybrid	Maize- Bean	Groundnut Beans	Chilim.	Sun- flower	Cotton
Yield (kg/ha)	1350	1100	900	1600	3600	1600/350	750	1200	1800	1000
Price	5.17	5.17	5.17	0.27	0.27	.27/.55	0.55	0.89	0.55	0.80
Gross receipts	6,980	5,687	4,653	432	972	625	413	1,068	990	800
Fertilizer	670	670	670	101	201	101	134	134	268	134
Seed	27	27	27	7	61	87	80	86	27	9
Chemical	204	229	254	11	15	11	0	161	224	223
Capital replacement	210	210	210	25	67	25	24	47	54	90
Transport	270	220	180	0	77	12	13	36	30	21
Marketing	675	550	450							
Land rent	120	86	86	86	86	86	86	86	86	86
Operating interest	206	191	179	14	42	24	25	46	60	48
Direct expense	2,382	2,183	2,057	244	550	346	362	595	748	611
Gross Margin per Ha	4,598	3,504	2,596	188	422	279	51	473	242	189
Labor (days/ha)	1260	1215	1142	144	163	288	166	164	174	328
Gross Margin per Day	3.65	2.88	2.27	1.30	2.59	0.97	0.31	2.88	1.39	0.58

Source: Calculations of the study team, based on data from Agmark [1989], MOA Planning Division, World Bank [1984] and interviews with estate owners.

Notes: - These budgets were developed to apply to estates with more than 100 cropped hectares.

3.3 Exploratory Decision-Making with a Linear Program.

To investigate the issues which the estate manager faces, the budgets shown in Tables 3.2 and 3.3 were incorporated into a series of linear programming (LP) models, designed to represent the basic realities faced by estate owners and managers. Livestock activities²⁰ were included in the LP models to add further dimensions of reality, and to simulate alternative uses for land, labor and investment funds. The livestock activities included a simple poultry laying operation, beef fattening, and dairy cows. It was recognized that these activities would not be viable for estates located in remote areas, and thus they were limited out of some runs of the model. LP was then used to simulate the impacts of changes in land availability, prices, burley quotas, and finance on managers' decisions.

The formulation of the LP models is that estates have the production possibilities represented by the basic crop budgets shown in Tables 3.2 and 3.3²¹. These possibilities are limited by constraints on the availability of resources, such as land and capital, as well as by technical limitations such as requirements of certain crop rotations. Further, the model requires that the estate be able to provide food (maize) for its workers, in addition to payments in money. Maize may either be purchased or produced on the estate. Subject to these possibilities and constraints, it is assumed that the estate's objective is to maximize profit.

3.3.1 Case of the Larger Estate. Table 3.4 summarizes the results from the LP model runs for a larger estate. Here the estate was assumed to be limited to 135 ha of land which can be cropped. It is initially assumed that the estate has a burley quota of 60,000 kg and that it can borrow up to K 105,000 in loan funds from a bank, at 18% interest. After a basic run of the model is made with these constraints on resources as initial conditions, subsequent alternative runs were made in which key resources are restricted, one at a time.

In the base scenario the estate grows its full quota of burley on 47 ha of land, with 37 ha in a "1 in 4" rotation (1 year of burley, 1 year of another crop, and 2 years of fallow), and with the balance in a "1 in 2" rotation, where burley would be totaled with another crop in each successive year. In the base case the estate makes a profit of K 156 thousand per year.

²⁰Due to time limitations, budgets have not been shown here.

²¹In addition, a medium sized estate was modeled, with technological possibilities lying in between the two shown in Tables 3.2 and 3.3.

Table 3.4 Summary Linear Programming Results, Larger Estate

Constraints:	Units	Base	Alt 1	Alt 2	Alt 3	Alt 4
Crop Area Avail.	ha	135	90	135	135	135
Burley Quota	kg	60,000	60,000	45,000	60,000	60000
Loan Limit	K	105,000	105,000	105,000	50,000	105000
Poultry possible?		yes	yes	yes	yes	no
Crop area allocation:						
Burley (1 in 4)	ha	32.7	6.8	33.3	33.8	
Burley (1 in 2)	ha	14.4	45.0		11.5	54.6
Maize, Hybrid	ha	22.4	24.7	35.0	22.2	26.6
Groundnut	ha					
Sunflower	ha					53.8
Fallow	ha	65.5	13.6	66.7	67.5	0.0
Poultry	Birds	1274	1030	2022	0	0
Crop sales:						
Maize produced	kg	80,784	88,848	126,000	80,028	95,832
Maize consumed	kg	80,784	88,848	57,456	77,655	95,832
Maize sold	kg			68,544	2,373	
Maize purchased	kg					
Tobacco sold	kg	60,000	60,000	45,000	58,239	60,000
Loan funds used	K	105,000	105,000	105,000	50,000	93,720
Shadow values:						
Crop land	K/ha	564	577	414	418	457
Loan funds	%	41%	41%	41%	50%	0
Tobacco quota	K/kg	0.03	nil	0.43	0	1.07
Profit: Total	K	156,895	131,477	153,943	134,447	142,749
Per Crop Area	K/ha	1,162	1,461	1,140	996	1,057
Labor:						
Tenant families		78	86	55	75	92
Permanent laborers		70	77	50	68	81
Casual laborer days		997	1096	1255	959	4190
ALTERNATIVES:						
Alternative 1		Restricted crop land.				
Alternative 2		Restricted Burley Quota.				
Alternative 3		Restricted finance.				
Alternative 4		Restricted poultry (non-farm) investment opportunities.				

The shadow value of land is K 564 per ha, which represents the additional profit the estate could make if it had another hectare of crop area. The total fallow land in this scenario is 65.5 ha, representing the grower's decision to keep substantial area in reserve, to insure continued high yields on future tobacco crops.

In Alternative 1 the estate's land is assumed to be limited to 90 ha, which is 45 less than in the base scenario. In this case, the manager decides to put most of his tobacco land in a two year rotation (45 ha), leaving only 6.8 ha in the higher yielding "1 in 4" rotation. Fallow is reduced to just 13.6 ha in this case. Because the estate opts to go for more intensive use of its land (growing tobacco on more land but with yields reduced because the limited farm area is now cropped more frequently), its tenant requirement is increased from 78 to 86 families, and permanent laborers increase from 70 to 77. Thus, as land becomes relatively scarce, the land which is available must be cropped more often and more labor is used.

Note that the shadow value of land has increased to K 577 per ha in this scenario, representing the higher value as the availability becomes restricted. Maize area is increased to 24.7 ha from 24 in the base run, but maize is still not grown to sell. The estate just grows what it needs for its own workers, which it prefers to buying maize at the official K 0.36 per kg, but it does not opt to produce additional maize for sale, which would bring only the official \$ 0.27 per kg selling price.

Alternative 2 shows the impact of restricting the burley quota, which in this case is reduced by 25% from 60,000 kg to 45,000 kg. Now, the estate decides to produce all of its burley with the "1 in 4" rotation, while leaving 66.7 ha in fallow. The number of tenants is reduced to 55 families, and maize requirements for feeding workers are reduced from 80,784 kg (base scenario) to 57,457 kg. In reaction to the burley quota restriction, the estate decides to increase its maize area from 24 ha (base scenario) to 35 ha, and it produces a surplus of 68,544 kg of maize for sale. The loss in profit (now K 154 thousand, down from K 157 thousand in the base scenario) which the estate suffers from having its burley quota reduced is surprisingly small.

Alternative 3 shows the impact of severe financial restraints, with the estate's bank loan limit now reduced to K 50 thousand, which is less than half the K 105 thousand available in the base scenario. The first effect of this restriction is that the estate decides to drop its livestock activity, which had been raising poultry. Although the estate increases its "1 in 4" burley area to 33.8 ha, the amount of burley grown in the "1 in 2" rotation is reduced to 11.4 ha, and the estate is only able to produce 58,239 kg of burley, less than its 60,000 kg quota. This result underscores the importance of finance in burley production.

In Alternative 4 the option to raise livestock (poultry) is eliminated, thus restricting the estate from what is in effect a non-farm type of investment. Now the estate decides not to use its full bank loan. Without the possibility of investing in poultry, which is quite profitable according to the budget, the estate now decides to grow all of its burley with the "1 in 2" (54.6 ha) rotation and to raise 53.8 ha of sunflowers. It opts to grow sunflowers rather than to produce surplus maize for market.

In this case, the shadow value of the burley quota is increased to K 1.07 per kg, which serves to illustrate the fact that the burley quota is quite valuable to the estate. This result indicates that in the absence of other profitable investment opportunities (such as poultry) the estate would be willing to pay up to K 1.07 per kg for additional quota.

3.3.2 Smaller estate. Table 3.5 summarizes the results from the LP analysis for a smaller estate. Here it is assumed that the estate has just 17 ha of land area which can be cropped, that it has a burley quota of 7,400 kg, and that its available bank finance is K 13,500 per year. As noted previously, its budgets reflect lower levels of technology and input requirements than the larger estate (Table 3.2).

Here the results vary somewhat from those for the larger estate. In the base run the estate decides to grow burley more intensively (7.14 ha in the "1 in 2" burley rotation, and 1.14 ha in the "1 in 4"), and to grow maize for subsistence requirements while growing sunflower for market. The budgets assume that sunflowers will sell for K 0.55 per kg, based on information from oil manufacturer representatives. This is evidently more attractive than producing maize to sell K 0.27 per kg.

Alternative 1. When available crop area is restricted to 11 ha to simulate greater scarcity of land, the estate decides to restrict its production of burley to 5,923 kg, which is less than its 7,400 quota. Sunflower production is eliminated entirely. Maize is still grown to meet labor food requirements, and most of the tobacco is still grown in the lower yielding "1 in 2" rotation, leaving very little land (27 ha) in fallow.

When the burley quota is restricted in Alternative 2, the reaction is to shift more land to the higher yielding "1 in 4" rotation, while still growing some sunflower for market.

Table 3.5 Summary Linear Programming Results, Smaller Estate

Constraints:	Units	Base	Alt 1	Alt 2	Alt 3	Alt 4
Crop Area Avail.	ha	17	11	17	17	17
Burley Quota	kg	7,400	7,400	5,500	7,400	7,400
Loan Limit	K	13,000	13,000	13,000	8,600	13,000
Poultry possible?		yes	yes	yes	yes	no
Crop area allocation:						
Burley (1 in 4)	ha	1.14	1.13	4.25	1.14	0.16
Burley (1 in 2)	ha	7.32	5.50	0.97	7.32	8.50
Maize, Hybrid	ha	2.71	2.10	1.60	2.71	2.83
Groundnut	ha					
Sunflower	ha	3.64		1.68	3.64	2.83
Fallow	ha	2.19	2.27	8.50	2.19	2.84
Poultry	Birds	170	264	304	58	0
Crop production and sale:						
Maize produced	kg	7,453	5,775	4,400	7,452	7,783
Maize consumed	kg	7,453	5,775	4,400	7,452	7,783
Maize sold	kg			0	0	
Maize purchased	kg					
Tobacco sold	kg	7,400	5,923	5,500	7,400	7,400
Loan funds used	K	13,000	13,000	13,000	8,600	6,886
Shadow values:						
Crop land	K/ha	423	627	416	423	485
Loan funds	%	41%	41%	41%	41%	0
Tobacco quota	K/kg	0.63	nil	0.65	0.63	1.19
Profit: Total	K	22,536	19,044	21,337	20,751	20,046
Per Crop Area	K/ha	1,326	1,731	1,255	1,221	1,179
Labor:						
Tenant families		13	10	8	13	13
Permanent laborers		11	9	7	11	12
Casual laborer days		0	0	16	0	40
ALTERNATIVES:						
Alternative 1		Restricted crop land.				
Alternative 2		Restricted Burley Quota.				
Alternative 3		Restricted finance.				
Alternative 4		Restricted poultry (non-farm) investment opportunities.				

3.3.3 Elimination of Burley Quota. Runs with a model for a medium sized (31 ha of land which can be cropped) were used to investigate what happens if an estate loses its quota or fails to receive a quota²². The results are presented in Table 3.6.

In the base scenario it is first assumed that the estate would have a normal quota of 13,500 kg. Here the estate grows virtually its entire crop area in the more intensive but lower yielding "1 in 2" rotation. While it raises maize (4.8 ha) to meet the food requirements of its own workers, the estate raises sunflower as a commercial crop (16 ha), while leaving only a fraction of a hectare in fallow.

In Alternative 1 scenario, it is assumed that the estate has no burley quota at all. Now the estate places virtually all of its land in sunflower (25.4 ha) after planting just 1.17 ha to maize to meet the food requirements of workers. The labor force is 9 permanent workers and 984 days of hired daily workers. No tenants are utilized because the model is specified to use tenants only in cases where burley is grown. In the base scenario, 21 tenants and 11 permanent workers had been employed.

In this case, the shadow price of burley increases to K 52 per kg, which is far higher than the K 0.04 per kg shadow value for the base scenario. This result is quite dramatic. What this says is that an estate without quota should be willing to pay up to K 52 per kg to acquire quota. This result confirms that, as expected, quota can be quite valuable to estate owners. Nevertheless, the estate owner's profit is still K 19 thousand in this scenario, which is not too much less than the K 25 thousand earned in the base scenario, where there was plenty of quota. This result suggests that there are adjustments which estate owners can make to replace tobacco without major losses, when necessity dictates.

Alternative 2 shows what happens when burley prices are reduced from the K 5.17 assumed in all other cases to K 3.70, which is similar to what growers received in 1989. Here the assumption is that the estate knows (or expects) the low price in advance and has time to react accordingly. The estate now decides to produce just 9,628 kg of burley, which is less than its 13,500 quota, and to specialize more in sunflower than in the base scenario (15.6 ha compared to 11.6 ha). By knowing in advance, the estate is able to adjust and avoid major loss.

²²The budgets for the medium sized estate are similar to those shown in Tables 3.2 and 3.3. Crop yields and input costs lie in between the extremes presented in the other two models.

Table 3.6 Linear Programming Results, Medium-sized Estate.

Constraints:	Units	Base	Alt 1	Alt 2	Alt 3
Crop Area Avail.	ha	31	31	31	31
Burley Quota	kg	13,500	0	13,500	2,400
Loan Limit	K	24,000	24,000	24,000	24,000
Burley Price	K/kg	5.17	5.17	3.70	5.17
Poultry limited?		no	flock=1	flock=1	flock=1
Beef limited?		no	no	beef=2	beef=2

Crop area allocation:

Burley (1 in 4)	ha	0.03		1.11	2.00
Burley (1 in 2)	ha	13.47		8.30	
Maize, Hybrid	ha	4.84	1.17	3.83	1.58
Groundnut	ha				
Sunflower	ha	12.61	25.40	15.55	24.32
Fallow	ha	0.05	4.43	2.21	3.10
Poultry	Birds	232	200	200	200
Beef fattening	head		17	2	2
Dairy animals	head			3	7

Crop production and sale:

Maize produced	kg	16,940	4,095	13,405	7,452
Maize consumed	kg	16,940	4,095	11,868	7,452
Maize sold	kg			1,537	0
Maize purchased	kg				
Tobacco sold	kg	13,500	0	9,628	2,400
Loan funds used	K	24,000	24,000	24,000	20,502

Shadow values:

Crop land	K/ha	395	323	320	373
Loan funds	%	41%	15%	7%	0%
Tobacco quota	K/kg	0.04	2.52	0	2.32
Profit: Total		22,536	19,044	21,337	20,751
Per Crop Area	K/ha	727	614	688	669

Labor:

Tenant families		21	0	14	2
Permanent laborers		11	9	7	11
Casual laborer days		0	984	16	0

ALTERNATIVES:

- Alternative 1 Fails to receive Burley quota.
- Alternative 2 Burley price reduced to K 3.70 per kilogram.
- Alternative 3 Burley quota severely restricted.

3.4 Sensitivity to Price Changes for Alternative Crops.

In the preceding analysis, the prices of the various crop options were held constant. With this price structure it is clear that tobacco is the dominant crop, which is to say that it is far more profitable for estates to produce tobacco than any of the options which were considered. In addition to tobacco, the programming analysis verifies that profit maximizing estates will grow maize to meet the subsistence needs of their workers. Additional maize is produced for cash sale under some circumstances, typically when the tobacco quota is restricted. In most cases, however, sunflower is a more attractive cash crop than maize, assuming that it can be sold for K 0.55 per kg, which is currently being offered by vegetable oil processors.

According to the linear program -- with the assumptions of crop yield and prices shown in Table 3.2 and 3.3 -- estates would not choose to produce groundnuts, cotton or beans as cash crops, rather than sunflower. Presumably, if the prices of these other crops were increased, they would be chosen rather than sunflower. To explore this possibility, a number of price sensitivity runs were made with the linear program.

Based on price sensitivity runs with the linear program for the medium sized estate, when the price of groundnuts is increased by 26%, from K0.89 to K1.12 per kg, this crop replaces sunflower as the next best cash crop after tobacco. At this price level for groundnuts, tobacco production was decreased by 14% and the area in fallow was reduced by 84%.

Similarly, when the price of cotton was increased by 63%, from K0.80 to K1.30 per kg of seed cotton, this crop replaced sunflower as the secondary cash crop. However, tobacco production was reduced by only 4% and the fallow area was reduced by 20% in order to accommodate the production of cotton.

It took a doubling of the price of beans, from K0.55 to K1.10 per kg, for this crop to replace sunflower.²³ In this case, the reduction in tobacco production was less than 1%, but the fallow area was reduced by 20%.

The results of the price sensitivity analysis indicate that while estates will produce other crops and thus diversify their activities when price incentives are strong enough, it takes substantial increases in the prices of other crops before they will replace sunflowers or before they will displace much tobacco. The analysis also indicates that if the prices of other crops are high

²³As the price of beans was increased, they first entered as an interplant with maize. At higher prices, however, beans were produced as a solo crop.

enough, estate owners will reduce the amount of land they have in fallow in order to grow the other crops, even when this works to the detriment of tobacco yields.

3.5 Analysis of Tenant and Grower Returns.

The preceding LP analysis examines estate decisions on the growing of burley and other crops, and it shows estate incomes, but it does not show how much income the tenant receives. To examine the returns to the tenant, account statements were prepared to illustrate what tenants and estate owners are expected to receive, given certain assumptions about price, yield and the terms of the particular tenancy agreement. Table 3.7 illustrates one such statement of accounts, separating the total account for the burley between tenant and estate owner.

The tenant's net income depends not only on the amount of tobacco which his plot yields but in most cases estate owners pay according to the grade of tobacco which is produced. As discussed in Chapter 2, each year the MOA announces a maximum price to be paid to the tenant for tobacco, and this official maximum price varies according to grade. Duncan [1990, p.42] made a historical analysis of the weighted average of the official prices and compared this to the average auction floor price paid to growers²⁴. According to Duncan's analysis, the average price paid to the tenant varied from 19% to 40% of the auction floor price, but it averaged 29% over an 11 year period.

Duncan's analysis and the analysis presented here assume that the way the estate grades the tenant's tobacco is the same as the average grades received when the tobacco sells on the auction floor. However, what is not known is how accurately the estates grade the tenant's tobacco when they buy it from him. In fact, estate may not be accurate in grading, and if so the present analysis could be somewhat inaccurate.

Other than due to yield, price and grading, there are many facets of the tenancy agreement that can cause the tenants income to vary. The hypothetical example shown in Table 3.7 uses what the study team considers to be a typical arrangement, based on practices followed by most -- but not all -- estate owners interviewed in Kasungu. In this arrangement, the estate owner charges the tenant for fertilizer at a rate which is somewhat higher than he pays when he purchases the fertilizer.

²⁴In his analysis Duncan discounts the estate's price for grading losses but he does not indicate what percent of grading loss is assumed.

Table 3.7 Comparison of Hypothetical Tenant and Estate Returns
Case 1 - Good Tenant Performance, Typical Agreement.

	Quantity per 0.6 ha	Unit Price or Cost	Total Value	Tenant Account	Estate Account
.....Kwachas.....					
REVENUES:					
Tobacco Production	kg	0	5.17		
Tenant Payment	kg	0	1.40	0	
Estate Net on Sale	kg	0	3.77	0	0
TOTALS			0	0	0
EXPENSES, CASH:					
Fertilizer	bags	6	67.00	402	442 (40)
Seed	grams	9	1.80	16	16
Chemicals	K		122.00	122	122
Capital replacement	K		126.00	126	40 86
Transport	kg	0	0.20	0	0
Marketing	kg	0	0.50	0	0
Operating interest	K		109.00	109	109
Leasehold rent	K		24.00	24	24
Paid labor:					
Supervisory	K		96.00	96	96
Estate direct	days	35	1.75	61	61
Estate reimbursed	days	68	1.75	119	119
TOTAL EXPENSE:			1,075	617	458
NET RETURNS			(1,075)	(617)	(458)
IN-KIND CONTRIBUTIONS:					
	Quantity		AVERAGE RETURNS:		
Tenant labor	days	619	Per day	Per	
Estate's Land	hectares	0.6	K (1.00)	hectare	
				K	(763)
TENANT'S CASH ACCOUNT:					
	Quantity	Price	Amount		
Credit for Burley	kg	0	1.40	0	
Less Input Charges (above):				-617	
Less maize supplied	bags	8	36	-288	
NET CASH TO TENANT FAMILY AFTER HARVEST:			K	-905	

Source: Calculations of the Study Team

In most cases the estate owner said he charges the higher price to reflect the cost of transporting the fertilizer to the estate. Normally, this markup seemed to be about 10% or less, but in a few cases it was much higher.

The estate may charge the tenant for the tobacco seed used in the nursery or it may prorate a portion of the entire cost of the nursery to him²⁵. In Table 3.7 it is assumed that a cost for just the seed is made. Normally the estate charges the tenant for the hoes, sickles, watering cans and any other tools which it issues him. This is the purpose of the K 40 charge listed as "capital replacement" in Table 3.7, but this amount may be low.

In his analysis, Duncan assumed a charge of K 62 for such equipment. Many estates also charge the tenant for chemicals which are applied, but most of the estate owners interviewed at Kasungu claimed they do not do so.

Most estates interviewed reported charging the tenant for hired labor, and the rate charged for this can vary. Even where it charges for hired labor which is used directly by the tenant on his own tobacco, the estate probably also incurs some general costs for labor tasks of a more general nature which cannot be passed on to the tenant. In Table 3.7 it is assumed that the estate charges the tenant for 68 days of hired labor but that the estate also employs its own laborers for another 35 days and incurs supervisory (paid manager) costs in the amount of K 96 per tenant which is not charged against the tenant's account.

In the example shown in Table 3.7 it is assumed that the tenant is a relatively productive one who produces 900 kg of burley on his 0.6 ha plot -- this is equivalent to 1500 kg per ha, which is 40 to 50% above the national average yield for burley. The tenant price is K1.40 per kg, which gives him a sale credit of K 1,260, from which is subtracted K617 in charges, leaving a net return to the tenancy of K643 before taking out any charge for food or other personal items. After the charge for food he walks away with K 355 in cash. Dividing the K643 by the estimated 619 days of adult equivalent labor provided by the tenant and his family shows an average daily return of K1.04 per day. This is lower than the current daily minimum wage of K1.75 but is better than what some estate owners reported they are paying to temporary workers, which is at times little more than some grain or flour for the day's meal.

²⁵One estate owner located near Wimbe said that he charged the tenant K 90 for the nursery, even though he admitted that the tenant worked in the nursery every day for about three months.

The estate owner receives K 2,969 from his sale of tobacco, after taking out the cost of buying it from the tenant. After non-reimbursed expenses of K 1,032, the estate owner is left with a net of K1,939. This works out to a net of K3,228 per hectare of land, which is quite a good return, considering the shadow values for land which were estimated in the linear programming analysis.

The result for the same tenant could be quite different with differing conditions of tenancy agreement. Table 3.8 illustrates a case where the estate owner charges the tenant K50 for chemicals and K90 for supervisory or management costs²⁶. This reduces the tenant's return to his labor to K0.80 per day and boosts the estate owner's earnings to K3,472 per hectare.

Not all tenants are fortunate enough to obtain 900 kg of tobacco from their plots. Estate owners in Kasungu reported production which ranged from 300 kg to over 1500 kg per tenant. In Table 3.9 it is assumed that the tenant's yield is only 500 kg but that he is operating under the terms of the same "typical" tenancy agreement used in Table 3.7. Now the tenant's net from the crop drops down to K230, equivalent to K0.37 per day of labor. After the cost of his subsistence maize is taken out, the tenant is left owing the estate K58 for the year²⁷.

²⁶One estate owner from Kasungu indicated that he charges his tenants K150 each for management and supervision, to cover his general cost of operation. Others indicated that they levy an interest charge against their tenants, but nobody was prepared to say how much the interest charged actually was. There were many other charges which occur on some estates, that could have been included in the analysis to illustrate higher estate charges.

²⁷Some estate owners said that when a tenant sees that he will end up owing money for a year, the tenant and his family may pull up and leave quietly in the night, without settling accounts. However, one estate owner indicated that they had two tenants still with him who had ended up owing him money in the preceding year--they were going to pay from this year's crop proceeds.

3.8 Comparison of Hypothetical Tenant and Estate Returns
Case 2 - Good Tenant Performance, Higher Estate Charges

	Quantity per 0.6 ha	Unit Price or Cost	Total Value	Tenant Account	Estate Account
		Kwachas.....		
VENUES:					
Tobacco Production	kg	900	5.17		
Tenant Payment	kg	900	1.40	1,260	1,260
Estate Net on Sale	kg	788	3.77	2,969	2,969
TOTALS				4,229	1,260 2,969
EXPENSES, CASH:					
Fertilizer	bags	6	67.00	402	442 (40)
Seed	grams	9	1.80	16	16
Chemicals	K		122.00	122	50 72
Capital replacement	K		126.00	126	40 86
Transport	kg	900	0.20	180	180
Marketing	kg	788	0.50	394	394
Operating interest	K		109.00	109	109
Leasehold rent	K		24.00	24	24
Paid labor:					
Supervisory	K		96.00	96	96
Estate direct	days	35	1.75	61	61
Estate reimbursed	days	68	1.75	119	119
TOTAL EXPENSE:				1,649	763 886
NET RETURNS				2,580	497 2,083

IN-KIND CONTRIBUTIONS:	Quantity	AVERAGE RETURNS:		
		Per day	Per hectare	
Tenant labor	days	619	K 0.80	-----
Estate's Land	hectares	0.6		K 3,472

TENANT'S CASH ACCOUNT:	Quantity	Price	Amount	
Credit for Burley	kg	900	1.40	1260
Less Input Charges (above):				-763
Less maize supplied	bags	8	36	-288
NET CASH TO TENANT FAMILY AFTER HARVEST:			K 209	

Source: Calculations of the Study Team

Table 3.9 Comparison of Hypothetical Tenant and Estate Returns
Case 1 - Poor Tenant Performance, Typical Agreement.

	Quantity per 0.6 ha	Unit Price or Cost	Total Value	Tenant Account	Estate Account
.....Kwachas.....					
REVENUES:					
Tobacco Production	kg	500	5.17		
Tenant Payment	kg	500	1.40	700	
Estate Net on Sale	kg	438	3.77	1,649	1,649
TOTALS				700	1,649
EXPENSES, CASH:					
Fertilizer	bags	4	67.00	268	(27)
Seed	grams	9	1.80	16	16
Chemicals	K		122.00	122	122
Capital replacement	K		126.00	126	40 86
Transport	kg	500	0.20	100	100
Marketing	kg	438	0.50	219	219
Operating interest	K		109.00	109	109
Leasehold rent	K		24.00	24	24
Paid labor:					
Supervisory	K		96.00	96	96
Estate direct	days	35	1.75	61	61
Estate reimbursed	days	68	1.75	119	119
TOTAL EXPENSE:				470	790
NET RETURNS				230	859
IN-KIND CONTRIBUTIONS:					
	Quantity		AVERAGE RETURNS:		
Tenant labor	days	619	Per day	Per	
Estate's Land	hectares	0.6	K 0.37	hectare	
TENANT'S CASH ACCOUNT:					
	Quantity	Price	Amount		
Credit for Burley	kg	500 1.40	700		
Less Input Charges (above):			-470		
Less maize supplied	bags	8 36	-288		
NET CASH TO TENANT FAMILY AFTER HARVEST:			K	-58	

Source: Calculations of the Study Team

Table 3.10 shows what happens to estate owner and tenant returns as crop production varies all the way from 700 to 2300 kg per hectare, which is to say from 420 to 1380 kg per 0.6 ha tenancy, again assuming the terms of the typical tenancy agreement. Here the tenant's income varies all the way from a K29 loss to a K1,315 gain for the year, or from a loss of K317 to a net of K1,027 after settlement of subsistence maize costs. This same information is shown graphically in Figure 3.1.

Table 3.10 and Figure 3.1 serve to illustrate a very fundamental fact of the tenancy agreement: the tenant is more at risk in the sense that his income fluctuates more with fluctuation in crop yield than does the estate's income. Taking the 900 kg production level as a point of departure, if the production drops to 780 kg, the tenant's income is reduced from K733 to K553, which is a drop of 25%. In contrast, the estate's income is reduced from K1,848 to K1,549, which is a drop of only 16%, far less than the tenant's percent of loss.

Given the variability which can occur in yields, it is no surprise that estate owners report that tenants often end up without receiving any money at the end of the year. To some extent, this is the result of inevitable fluctuations in weather and disease problems. At times it is probably also the result of lack of effort on the tenant's part.

But what the results of the 1990 Estate Survey indicate, and what the study team observed in its visits to Kasungu, is that the conditions provided to the tenant on many estates are not conducive to high levels of production. Thus, the tenant and his family suffer merely because they have been unfortunate enough to end up on an estate which is poorly managed, poorly financed, or both. Improving estate management in Malawi's burley estates can contribute in a significant way to improving the lives of many thousands of tenant families.

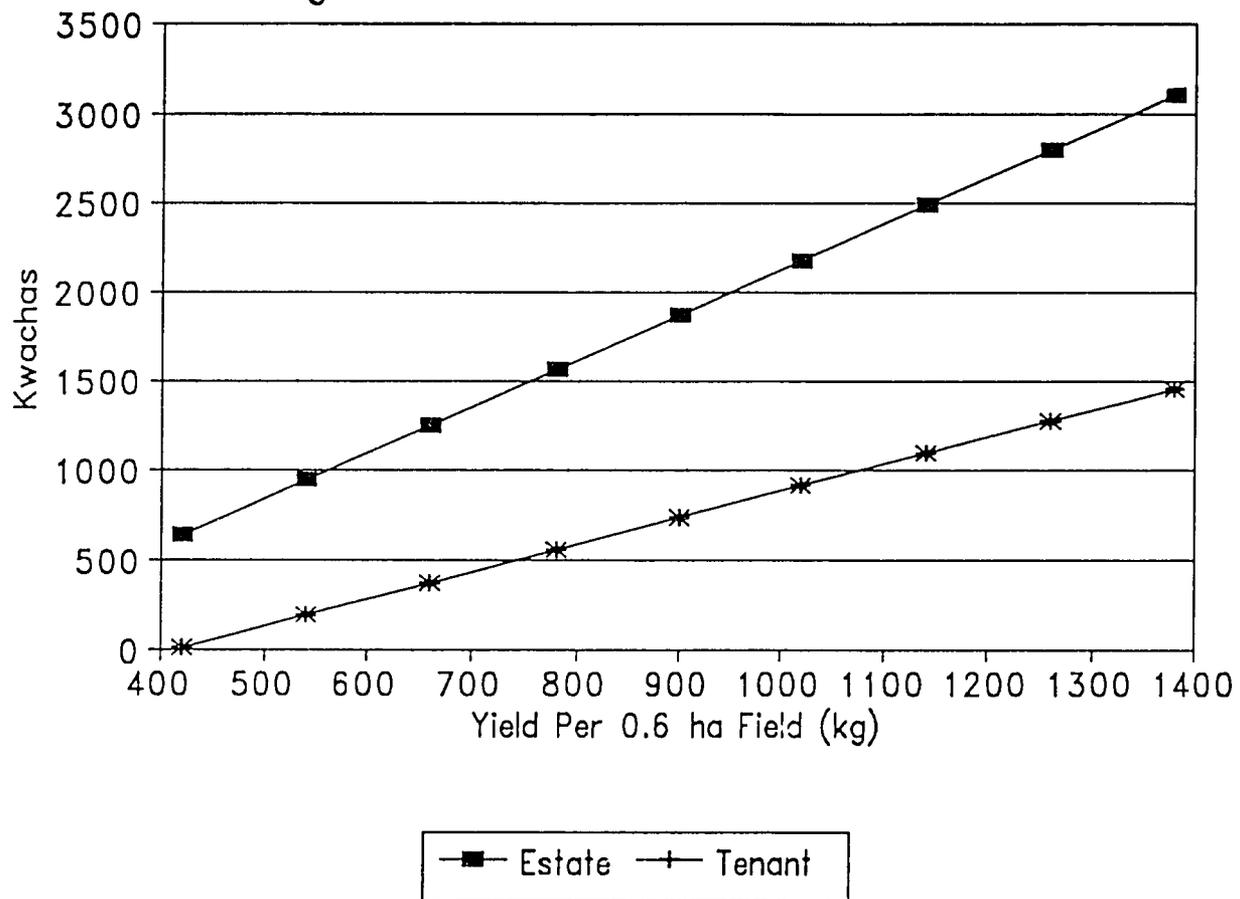
There is also the issue of the Ministry of Agriculture's prices policy and its impact on the tenant's income. By setting a maximum price, the Ministry reduces the forces of competition which might otherwise prevail and thus limits the income which a tenant earns.

Table 3.10 Variability of Tenant and Landlord Returns
with Changes in Crop Yield.

Yield per hectare	Result per 0.6 hectare field:				Yearend Net Cash to Tenant
	Production per field	Net return from crop to:			
		Estate	Tenant		
700	420	660	(29)	(317)	
900	540	979	139	(149)	
1100	660	1,298	307	19	
1300	780	1,618	475	187	
1500	900	1,937	643	355	
1700	1020	2,256	811	523	
1900	1140	2,576	979	691	
2100	1260	2,895	1,147	859	
2300	1380	3,214	1,315	1,027	

Source: Based on calculations shown in Table 3.7,
with yield being allowed to vary.

Figure 3.1 Variation in Net Returns



4. Principal Findings and Implications for Policy,

The estate sector plays an important role in Malawi's economy, with the production of burley tobacco being central to that role. Although the production of burley had been limited to estates and most smallholders were not permitted to grow the crop, that policy is now being altered. Many former smallholder farms have been allowed to register as estates so as to be able to produce burley, and the government is slowly opening burley production to smallholders per se.

Even without allowing smallholders to grow burley, the estates' heavy dependence on the crop would have argued for diversification to avoid the risks of monoculture. Growing worldwide awareness of the health risks associated with tobacco use will ultimately be reflected in the marketplace. Indeed, recent World Bank projections indicate that world imports of tobacco are likely to be much slower over the next decade than they have in the past decade and that real tobacco prices are likely to continue to fall.²⁸ Thus, if tobacco exports level off and smallholders continue to be allocated quota, large estates will inevitably need to look for alternatives to burley.

The discussion of comparative advantage and the linear programming analysis presented here indicate that there are viable alternatives to the production of burley. Nevertheless, technical problems do exist, such as possible incompatibilities of rotation crops due to nematodes and virus contamination.

It is recommended that the government be encouraged to continue its search for suitable varieties of such crops as sunflower and soybeans. In particular, it is important to conduct research for identifying nematode resistant varieties and adapting them to local conditions.

It is further recommended that encouragement be provided for studies that would serve to clarify both domestic and international marketing opportunities for new crops as well as for existing crops such as cotton. Such studies should provide updated measures of comparative advantage.

²⁸See World Bank, "Price Prospects for Basic Commodities", 1989.

Malawi's quota system for allocating marketing rights to burley tobacco is designed to avoid overproduction. The operation of the system has, at times, been confusing. The ground rules for the system are not widely understood, and estate owners do not know what to expect. It is not clear, for example, whether quota would have to be reallocated at some point, to accommodate the entry of smallholders, nor is it clear how any reduction of quota would be allocated, should there be a downturn in the world market. Uncertainty about such issues can lead to poor planning and inefficient investment decisions by growers.

It is recommended that the government make its quota allocation system more transparent, so that tobacco growers understand the rules of the game.

The fact that smallholders will not be permitted to produce burley tobacco presents certain marketing challenges. With individual quotas of 300 kg or less in most cases, the quantities they will have to market are too small to be handled directly in the auction process which estates utilize for burley. In the past, smallholder tobacco growers have marketed their crop through ADMARC, but that agency has normally purchased at prices which were far below the market.

To avoid the problems inherent in giving ADMARC a monopoly on handling smallholder burley, it is important to establish alternative, competitive marketing channels. One workable alternative might be to permit private brokers to handle the smallholder crop, under the supervision of the Tobacco Control Commission. It would be necessary to establish procedures, such as the issuing of quota certificates that could be endorsed to the broker, to ensure that the system does not lead to significant leakage of tenant tobacco from the estate sector.

It is recommended that USAID continue to push for the establishment of alternative, competitive market channels for smallholder tobacco, including the possible use of private brokers.

There are numerous problems with the treatment of tenants who grow burley tobacco in the estate sector as well as with estate laborers. Some of these problems undoubtedly arise because many of the estates are still new and undercapitalized, and because they have yet to develop the procedures that would permit them to do a better. Generally high levels of tenant turnover from year to year undoubtedly indicate that tenants are dissatisfied. High levels of turnover also mean that the process whereby tenants would learn to be more productive as they stay with a tenancy over a longer period of time is not working.

The analysis presented here verifies that estate earning levels, buoyed with profits from burley tobacco, are generally attractive whereas tenant and laborer levels of compensation appear to be quite low. Therefore, it seems that there is latitude for estates to pay higher levels of compensation to their workers. This could serve to benefit the estate by helping to reduce tenant turnover rates.

The nature of the agreements between estates and tenants and its implications for tenant compensation are issues which merit careful attention by government policy makers. Practices vary widely from estate to estate as to which production costs the tenant is charged for and how much he or she is charged. With most tenants being illiterate, it is not certain that having formal signed agreements would be practical under the terms of their tenancy agreements with the estates. If there are disputes, the tenant has no formal legal recourse. That is, there is no regulatory body to which tenants can take their complaints.

It is recommended that a regulatory body be established or that some existing body be legally assigned to address tenant-estate and estate-tenant complaints.

It is further recommended that the government consider requiring that each estate put the terms of its "tenant agreement" in writing and that this be filed with the tenant regulatory body so that there is a basis for determining whether the estates intended procedures have been followed, should a dispute arise.

The Ministry of Agriculture sets the maximum price which tenants can be paid each year, based on its review of price recommendations made by the Tobacco growers association, TAMA. Setting a maximum serves to weaken the tenant's bargaining position with the estate and undoubtedly contributes to tenant incomes which are relatively low.

It is recommended that the Ministry discontinue its practice of setting or condoning a maximum price. If anything, the Ministry should consider establishing a minimum or floor price. Alternatively, the Ministry could require the estates to pay the tenant a percentage share of the crop, which would give the tenant a chance to benefit from high priced years. In any case, each year the Ministry should perform a careful analysis of tenant earnings under the terms of tenant agreements which are known to be in use, to ensure that tenants are being fairly compensated.

Estates should be expected to make some contribution to the well being of rural workers by providing support for social services such as schools and medical facilities. One available mechanism for funding such services from the estates would be to earmark a portion of the land rent, which has recently been increased, for the support of rural social services.

It is recommended that the government be encouraged to earmark a portion of its estate land rent collections for the support of rural social services, including schools, to help meet the basic needs of estate workers.

The estate sector has grown rapidly and thus there are many new estates which are still struggling to get organized and to learn how to manage their resources efficiently. Two areas of particular need are in personnel and financial management. Ultimately, the Estate Extension Service will be able to provide support and training in these areas, but that organization is just getting started and has yet to develop a cadre of trained, competent farm management staff members.

It is recommended that a program to support management training for estate managers and for Estate Extension Service personnel be established at Bunda College or at some other suitable educational facility such as the Malawi Institute for Management.

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APPENDIX A

ESTATE FARM MANAGEMENT MODULE
QUESTIONS AND AREAS OF INQUIRY
for ESTATE MANAGER

Note: This is not a formal questionnaire, but more a list of topics to be covered.

1. Background of person (manager/owner/foreman) interviewed.

Name _____ Title _____ Age _____.
How long as manager of this estate (_____ years).
If not owner, is he a relative of owner (yes/no).
Education _____ Years experience as estate manager _____
Manager's family on estate: manager (1), other adult males _____
adult women _____, children _____, total _____.
Of these, how many men _____, women _____, and children _____
work in the farming of the estate?
Manager's experience in farming and growing tobacco.

2. Total size of estate _____ (ha/ac)
Total area in crops (including tenant
crops) _____ (ha/ac) Area which is currently in
fallow _____ (ha/ac)
Wooded: natural _____ ha, planted _____ ha,
total _____ (ha/ac)
Pasture/grazing area _____ (ha/ac)
Area in buildings and roads _____ (ha/ac)
Other area _____ (ha/ac)
Year in which estate was established _____.

3. Crops and cropping rotation.

Burley area cropped per tenant _____ (ha/ac)
Total tenant burley area _____ (ha/ac)
Burley area cropped by estate
(with family or hired labor) _____ (ha/ac)
a. Total burley area, tenant plus estate _____ ha
Maize area cropped per tenant _____ (ha/ac)
Total tenant maize area _____ (ha/ac)
Maize area cropped by estate _____ (ha/ac)
b. Total maize area, tenant plus estate _____ (ha/ac)
(Local maize varieties: _____% estate, _____% tenant)

c. Groundnuts grown by tenants, total _____ (ha/ac)
d. Groundnuts grown by estate, total _____ (ha/ac) (not tenant)
Other crops grown by tenants:
e. _____ (ha/ac)
Other crops grown by estate (not tenants):
f. _____ (ha/ac)
g. _____ (ha/ac)
Total area cropped on estate this year, including
area grown with tenant (a+b+c+d+e+f+g) _____ (ha/ac)

3. Crops and rotation (continued)

Other crops grown in past: _____ (ha/ac) _____ year.
 _____ (ha/ac) _____ year.
 Normal burley-maize rotation: _____
 Other rotation, groundnuts, etc. _____

4. Yields and fertilizer use:

BURLEY:

Burley produced per tenant last year: _____ kg to _____ kg
 Equivalent tenant burley yield: _____ kg/___ to _____ kg/___.
 Estate average (non-tenant) burley yield last year _____ kg/___.
 Fertilizer issued to each tenant for burley:
 Last year: _____ bags This year: _____ bags
 _____ bags _____ bags
 _____ bags _____ bags
 Average estate (non-tenant) fertilizer use for burley:
 Last year: _____ bags/___ This year: _____ bags/___
 _____ bags/___ _____ bags/___
 _____ bags/___ _____ bags/___

MAIZE:

Do tenants want a piece of land to grow their own maize, or
 to you have to encourage them to take it? _____
 Maize produced per tenant last year: _____ kg to _____ kg
 Equivalent tenant maize yield: _____ kg/___ to _____ kg/___.
 Estate average (non-tenant) maize yield last year _____ kg/___.
 Fertilizer issued to each tenant for maize:
 Last year: _____ bags This year: _____ bags
 _____ bags _____ bags
 _____ bags _____ bags
 Average estate (non-tenant) fertilizer use for maize:
 Last year: _____ bags/___ This year: _____ bags/___
 _____ bags/___ _____ bags/___
 _____ bags/___ _____ bags/___

OTHER CROPS:

(Designate)	Other crop: (_____)	Other crop: (_____)
Tenant yield, kg/___	_____	_____
Estate yield, kg/___	_____	_____
Tenant fertilizer:	_____	_____
_____, bag/___	_____	_____
_____, bag/___	_____	_____
Estate fertilizer:	_____	_____
_____, bag/___	_____	_____
_____, bag/___	_____	_____

5. Labor Use - days per tenant plot or per hectare:

	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
	---	---	---	---	---	---	---	---	---	---
Tobacco (indicate: per plot / per ha or per ac.)										
Fumigation	---	---	---	---	---	---	---	---	---	---
Nursery	---	---	---	---	---	---	---	---	---	---
Plough/ridge	---	---	---	---	---	---	---	---	---	---
Plant	---	---	---	---	---	---	---	---	---	---
Water	---	---	---	---	---	---	---	---	---	---
Fertilize	---	---	---	---	---	---	---	---	---	---
Top & sucker	---	---	---	---	---	---	---	---	---	---
Weed/cultivate	---	---	---	---	---	---	---	---	---	---
Pest control/spraying	---	---	---	---	---	---	---	---	---	---
Harvest	---	---	---	---	---	---	---	---	---	---
Dry/grade	---	---	---	---	---	---	---	---	---	---
Transport	---	---	---	---	---	---	---	---	---	---
Maize:	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
	---	---	---	---	---	---	---	---	---	---
Plough/ridge	---	---	---	---	---	---	---	---	---	---
Plant	---	---	---	---	---	---	---	---	---	---
Fertilize	---	---	---	---	---	---	---	---	---	---
Weed/cultivate	---	---	---	---	---	---	---	---	---	---
Pest control	---	---	---	---	---	---	---	---	---	---
Harvest	---	---	---	---	---	---	---	---	---	---
Transport	---	---	---	---	---	---	---	---	---	---
Other crop _____:										
Plough/ridge	---	---	---	---	---	---	---	---	---	---
Plant	---	---	---	---	---	---	---	---	---	---
Fertilize	---	---	---	---	---	---	---	---	---	---
Weed/cultivate	---	---	---	---	---	---	---	---	---	---
Pest control	---	---	---	---	---	---	---	---	---	---
Harvest	---	---	---	---	---	---	---	---	---	---
Transport	---	---	---	---	---	---	---	---	---	---
Other _____	---	---	---	---	---	---	---	---	---	---
Other crop _____:										
Plough/ridge	---	---	---	---	---	---	---	---	---	---
Plant	---	---	---	---	---	---	---	---	---	---
Fertilize	---	---	---	---	---	---	---	---	---	---
Weed/cultivate	---	---	---	---	---	---	---	---	---	---
Pest control	---	---	---	---	---	---	---	---	---	---
Harvest	---	---	---	---	---	---	---	---	---	---
Transport	---	---	---	---	---	---	---	---	---	---
Other _____	---	---	---	---	---	---	---	---	---	---
Rainy season:	---	---	---	---	---	---	---	---	---	---

6. Size and labor force.

Number of tenants_____.

Permanent workers:

Hired manager _____

Supervisors _____

Clerks _____

Capitaos _____

Drivers _____

Farm laborers _____

Watchmen _____

Total permanent workers_____.

Wage for permanent farm laborers:

Adult male: K_____ per _____, plus _____ kg maize

Total per worker for year: K_____+ _____ kg maize

Does estate provide housing for permanent workers? (y/n)

How long do permanent workers stay with you?

(full year around/or only _____ months)

Peak number of casual or temporary workers_____.

Compensation of temporary laborers: K_____ per day

+ _____ kg maize + _____.

Tennant turnover rate_____%.

Are efforts made to train/educate tenants, or are they just "told what to do"._____

What efforts are made to retain tenants, i.e. to encourage them to return?_____

Reasons for use of tenant vs. permanent vs. hired labor._____

Main problems with tenants?_____

7. Equipment/buildings owned/developed on estate (circle):

tractor/pickup/maize mill/motorcycle/bicycle/
drying barns/flue/others_____

If you had some extra money, what would be the first investment you would make with it on items like this?

8. Terms of agreement with tenants

(circle (a) or (b) and fill in charges; NC for no charge):

Agreement is: (a) Written contract or (b) verbal agreement

Is tenant told how much he will be charged in advance? (y/n)

Housing: (a) Estate provides, or (b) Tenant builds house

Rent charged to tenant? If yes, give amount:K_____

Land preparation: (a) Tenant hoes and ridges, or

(b) Estate ploughs with tractor, charge to tenant K_____

Implements/equipment provided to tenant by estate:

List items _____

How much is charge^d for a hoe? K_____

Items for construction of drying barn:

Estate provides (circle): poles/plastic/grass

For new barn estate charges tenant about K_____

Annual charge for materials to recondition barn K_____

8. Terms of tenant agreement (continued)

Burley nursery and plants:

- (a) Estate makes nursery, provides plants to tenants
- (b) Tenant makes nursery (under estate supervision) and charges tenant K_____ for seeds or plants

Maize seed: (a) Tenant provides own seed, or

(b) Estate provides local/hybrid seed to tenant, charges tenant K_____ per _____.

Fertilizer: Estate provides fertilizer

- (a) none, (b) for burley only, (c) for burley & maize
- Charge to tenant (e.g. cost plus 15%) _____

Give actual example of charge to tenant this year:

Type _____ K_____ per bag of _____ kg

Is tenant charged separately for transportation of items to the estate? (y/n) How much? _____

Other production inputs provided to tenant on account:

Item _____, charge K_____ per _____

Item _____, charge K_____ per _____

Hired labor use by tenants

- (a) tenant hires and pays for labor
- (b) estate hires and pays casual labor for tenant, then charges tenant on account (K_____ per day cost, plus _____% interest)
- (c) estate permanent labor used by tenant, K_____ /day
- (c) other arrangement _____

PURCHASE of BURLEY or FLUE CURED TOBACCO

Tenant is paid for tobacco:

- (a) according to the grade of tobacco he produces
- (b) by weight only, without regard to grade

Price per kg paid to tenants last year:

K_____ per kg for top grade

K_____ per kg for lowest grade

or K_____ per kg for all tobacco, not paid for grade

When was the first payment made to tenants last year? _____

When was the final payment made? _____

Other tenant crops purchased by estate:

_____ K_____ per _____.

FOOD/LIVING ITEMS provided to tenant on account by estate:

Maize, _____ kg per month, K_____ per kg.

_____ per _____, K_____ per kg.

_____ per _____, K_____ per kg.

Other items provided to tenant:

_____, K_____

_____, K_____

Are tenant medical expenses paid by the estate? _____

Is there an overall interest charged to the tenant on his account, or is any interest merely added into the price charged to the tenant for each item he uses?

_____ If a separate charge, how much _____%

9. Sources and procedures for finance.

Bank or other source _____
Location _____
First year you borrowed from this source _____
Other sources used in past _____
Amount of loan used during current season. K _____
Did you have to make a cash flow plan or budget in order
to obtain the loan? (y/n)
Date (month) loan was started _____
Final date of repayment for loan _____
Rate of interest _____% (annual rate__ or term of loan__?)
Loan funds have been (will be) used for: (list items
purchased) _____
Problems with finance _____

10. Records kept by estate and/or available to manager.

Are there individual tenant account records? (y/n)
If yes, do these show: each item issued (y/n)
how much issued (y/n), when issued (y/n) and
the price charged (y/n)?
Does the individual tenant record show:
the total amount (of burley) produced (y/n)
the amount of each grade (y/n) and
the amount of money paid to the tenant (y/n)?
Does the estate keep a complete record of its costs
of operation (y/n)? Is there a record of the
quantity produced for each crop (y/n)?
Is there a record of money received for crop sales? (y/n)
From the record, can the manager/owner tell how much
profit or loss he makes each year? (y/n)

11. Disease and pest control

Main disease and pest problems:

On tobacco _____
On maize _____
On other crops: _____

Describe procedures followed/materials used for each:

Do you know about nematodes in tobacco? (y/n)
Do you fumigate the soil for nursery? (y/n)
Do you fumigate the field before planting? (y/n)
Names of chemical fumigants _____

Where do you obtain information about pests and diseases?

12. Role of livestock in estate (type, numbers).
 Estate owned _____
 Tenant owned _____
 From smallholders or nearby villages _____
 Any problems with livestock? _____
 What is the estate's reason for keeping livestock? _____
- How often and under what circumstances are livestock from the estate sold? _____
 Where sold? Is there a nearby market? _____
 When are estate livestock slaughtered for food? _____
 When do tenants use or sell their livestock? _____
 Is there ever a charge to outside livestock owners for grazing on the estate? (y/n) _____
 Have you used/heard about/or considered using Rhodes grass in rotation with your tobacco, to be used for livestock grazing? _____
13. Sources of production inputs (fertilizers/chemicals/tools) Indicate main source (ADMARC, OPTICHEM, ATC, Farmer Club, Smallholde, Relative, other) for following items:
 Fertilizers _____
 Chemical herbicides/pesticides _____
 Are fertilizers available when you need them? _____
 What are your main problems in procuring inputs? _____
- How do you transport inputs to the estate? _____

14. Marketing procedures/channels.

What is your burley quota for this year? _____ kg
 What was it last year? _____ kg

Last year, did you buy any burley from smallholders
 (or other estates) to be sold on your quota? (y/n)

Did you sell any burley to another estate to be sold
 on their quota? (y/n)

Have you been successful in getting your quota increased?
 Explain _____

Do your tenants grade their own burley? (y/n)

Did you regrade their burley? (no/sometimes/always)

Was any of your burley regraded at the auction? (y/n)

How do you get your burley to market?

(a) hire a truck (b) send on truck with other farms
 (c) use own truck/pickup, (d) other _____

Are there problems in getting trucks? (y/n) _____

Timing of burley marketing is (a) determined mainly by
 the availability of transport (b) must be done
 as quickly as possible to obtain cash for tenants and
 loan repayment, or (c) can wait for a 'good price?
 (Circle most appropriate and discuss _____)

MARKETING CROPS OTHER THAN TOBACCO:

Sales of other crops last crop year by estate for cash:

<u>Crop</u>	<u>Quantity sold</u>	<u>Where sold/buyer</u>	<u>Price</u>
Maize	_____	_____	_____
Grounnuts	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Distance to markets for other crops _____

Marketing agents purchasing other crops

(e.g. ADMARC, village merchant, trader) _____

Have you ever sold crops to ADMARC? (y/n)

If so, which crops and when? _____

Are there any problems in selling crops to ADMARC? _____

Problems in selling crops to other buyers? _____

Any problems with transport? _____

Other problems _____

Can you think of crops that you would produce if there
 were a better market? _____

APPENDIX B
FEATURES OF ESTATES VISITED FOR CASE STUDIES

FSMB Family Estate, Near Santhe

Size: 12 ha

	<u>Total</u>	<u>(Tenant)</u>
Crop area:	6.0 ha	0
Burley	1.3 ha	
Maize	3.8 ha	
Groundnut	0.6 ha	
Sweet potato	0.3 ha	
Fallow:	1.7 ha	
Woodland:		
Planted	0.4 ha	
Natural	0.4 ha	
Labor:		
Owner family	3m/3w/3c	
Regular workers	5	
Casual workers	4 peak	
Tenants	none	
Bank finance:	none	

The KSMB estate is operated by two brothers. While other family members live on the estate, it is only the nine members of the extended family who work there. KB, who was interviewed, is 35 years old, but it is his older brother who is the main decision maker. Another brother who had worked on the estate in the past now has a job in town.

While they had one tenant last year, they do not have any tenants this year. Of the three regular (permanent) workers, one had worked on the farm for four years, while the others had been there from two to three years each. The permanent workers take their meals with the family, receive housing from the estate, and they are paid K200 per year, which they do not receive until the end of the season.

This estate follows the practice of burning maize stover and wood on the area where the nursery is to be planted, in order to rid the soil of nematodes. They have rarely, if ever, used any farm chemicals on tobacco or any other crops.

The estate keeps a few sheep, which are used for their own consumption, and they have one ox which they use with a cart to haul things back and forth to the nearby village of Santhe, where they do most of their marketing.

They buy fertilizer from ADMARC and use this only on tobacco at a rate of 200 kg per ha, which is less than half of the recommended amount. The fertilizer is used only for the tobacco. FSMB plants only local maize, which received no fertilizer.

Only tobacco is grown as a cash crop, and the estate's quota is 3,500 kg, although it was evident that they would not produce this much tobacco on the 1.3 ha they have planted this year.

They had a bank loan last year, but the bank refused to loan them any money this year. The brother who was interviewed said that he did not know why the bank had turned them down.

CM Estate, near Wimbe

Size: 25 ha

	<u>Total</u>	<u>(Tenants)</u>
Crop area:	12.0 ha	7.2
Burley	6.3 ha	6.3
Maize	5.2 ha	0.9
Beans	0.5 ha	

Fallow: none

Woodland:

Natural	12 ha
Planted	1 ha

Labor:

Owner's family	none
Tenant Families	9
Regular workers	7 (including 2 tenants)
Casual workers	2 peak

Bank Finance: K 15,000

This estate is managed by MK, who is 28 and who also is a tenant on the estate. He earned K 365 from managing the estate last year. CM, the owner of the estate, also owns another smaller estate in another region, and he is a shopkeeper in a nearby town. Normally, the owner visits the estate on a daily basis.

The estate follows a straight tobacco-maize-tobacco-maize rotation and does not leave any land fallow. Tenant tobacco production ranged from 500 to 800 kg per 0.6 ha plot (833 to 1333 kg per ha) last year. The manager reported that the highest earning tenant received a net payment of K1700 and that the lowest earner netted K500. However, these amounts appear to have been more than would have been earned for the yields reported. The manager could not resolve this apparent discrepancy.

Tenants are given relatively small amount of land (estimated to be about 0.15 ha, based on dimensions stated by the manager) on which to grow their own maize. While the estate grows some beans, these are generally used by the owner for his own family's consumption, and none are provided to the tenants. However, it was noted that the tenants plant squash and other vegetables along the edges of the corn fields.

SWK Estate, near Wimbe

Size: 124 ha

	<u>Total</u>	<u>(Tenants)</u>
Crop area:	30 ha	21.6
Burley	13.3 ha	13.3
Flue cured	8.3 ha	0
Maize	8.3 ha	8.3

Fallow: 90 ha

Woodland:

Natural	25 ha
Planted	3.5 ha

Labor:

Owner family	4m/0w/0c
Tenant families	14
Regular workers	29

Finance: K 25,000

SWK, the estate owner and manager, is 41 years old and has 10 years of formal education. He first learned how to grow tobacco as a trainee in the Kasungu Flue Cured Tobacco Association, starting in 1972, and he started his estate in 1982.

This year he decided to grow flue cured tobacco on the estate, in addition to burley. His burley quota was reduced from 18,000 kg last year to 12,000 kg this year, but he was given a flue cured tobacco quota of 10,000.

This estate was charging its tenants K 10.50 for a 20 kg tin of maize (K 0.53 per kg, compared to the official government selling prices of K 0.36 per kg), but it did not have enough maize to provide them. The owner said that his maize crop production had not been good last year, that the bank had reduced his loan from K32,000 last year to K25,000 this year and that he had used all of his own cash in order to build kilns for his flue cured tobacco. This left him without any means to buy maize for the tenants, who were having to work without adequate rations during the demanding harvest period.

This was the only estate visited in the Kasungu District, which reported that it was using a written contract with its tenants. It was also the only estate which reported that it was charging its tenants a management fee (K 150), and it also was charging K90 for nursery plants, even though the tenants were providing most of the labor for the nursery.

KB Estate, near Santhe

Size: 170 ha

	<u>Total</u>	<u>(Tenant)</u>
Crop area:	69 ha	(48)
Burley	30 ha	(30)
Maize	39 ha	(18)

Fallow: none

Woodland:
 Planted 3 ha

Fertilizer:
 Burley 840 kg/ha

Labor:

Owner family	4m/2w/5c
Tenant families	69
Regular workers	37
Casual workers	17 peak

Bank finance: none

The estate was formed by KB in 1978, from communal land. He had been in farming since 1962 and first learned how to grow dark fired tobacco from his father.

The owner says that he has converted enough area to cropland and that he prefers to leave the balance in forest.

Although he has no fallow land this year, he fallowed the entire estate two years ago, when he rented land in another area. He is not sure about rotation but believes that land should be continuously cropped for three years and then fallowed for a year. He is not sure what the average yields of his tenants have been, but he says that the best tenant netted K3,000 last year, while there were five tenants who ended up owing him money.

This estate has a tractor, as well as two trucks and two cars. Perhaps because of the availability of the tractor for ploughing, only 15 of the 67 tenants on the estate last year did not return this year.

Whereas the estate did not use any bank finance this year, such borrowing had taken place on occasion in prior years.

The owner claims to have achieved yields of six tons/ac with hybrid maize last year, but he continues to plant about 40% of the estate's maize land to local varieties. He provides hybrid seed for part of his tenants' land, too.

Whereas he used almost 10 bags (500 kg) of fertilizer on the estate's maize, he provides only 2.5 bags/ha for the tenants.

TGM Estate, Santhe area

Size: 27 ha

	<u>Total</u>	<u>(Tenant)</u>
Crop area:	9 ha	(5.2)
Burley	6 ha	(5)
Maize	2.5 ha	(0.2)
Beans	0.4 ha	(0)

Fallow: 1.7 ha

Woodland:

Natural	5.4 ha
Planted	3.3 ha

Burley yields: 960 kg/ha

Fertilizer: 360 kg/ha

Labor:

Owner family	1m/1w/4c
Tenant families	12
Regular workers	3
Casual workers	6 peak

Bank finance: K 4,900

GM, who is 44 and has 8 years of schooling, was a tenant on another estate for a year before starting this one three years ago. He also grew dark fired tobacco on at least one occasion in the past.

There are more than three additional hectares of land which could be developed for cultivation, but GM has no plans for doing so at this time because he thinks he already "has enough to cultivate."

Only one of the tenants was given any land for growing maize, and this was less than an acre. He was provided with improved seed and some fertilizer on account. Others were said to have maize plots outside the estate.

The owner of this estate had four head of cattle and six goats, and one tenant also had a cow.

APPENDIX C

List of Persons Visited

in
Malawi

February 23- March 26, 1991

James B. Fitch

Mr. Dennis Bisika, Estate Extension Service, Lilongwe
Dr. Malcolm Blackie, Rockefeller Foundation, Lilongwe
Mr. Ndione Chauluka, Marketing Supervision, Tobacco Control
Commission, Lilongwe
Mr. Chisala, Planning Department, Ministry of Agriculture
Mr. F. C. Chokotho, Tobacco Officer, Kasungu Agricultural
Development District
Mr. Sigman Chirambo, Deputy Program Manager, Kasungu Agricultural
Development District
Mr. Richard Clough, World Bank, Lilongwe

Dr. Tom Cusack, Department of Research, Ministry of Agriculture,
Lilongwe
Mr. Malcolm Hatley, Agricultural Management and Consultancy
Services, National Bank, Lilongwe
Dr. Paul Heisey, International Maize and Wheat Research Center,
Lilongwe
Dr. William House, International Labor Organization, Lilongwe
Mr. Felix Kishombe, Deputy Director, Chitedzi Research Station
Mr. Frank McGuire, Commonwealth Development Corporation, Lilongwe
Dr. Richard Mkandawire, Department of Rural Development,
Bunda College
Mr. Gadson Mthinde, Planning Department, Ministry of Agriculture,
Lilongwe
Mr. Ernest Mwafulima, Chitedzi Research Station
Mr. Ngwra, Research Department, Ministry of Agriculture
Mr. L. D. Nkhukuzalira, Estate Manager, Press Farming, Lilongwe
Mr. Austin N'ong'ola, Tobacco Control Commission
Ms. Rachael Tunner, Overseas Development Administration, Lilongwe
Mr. G.A. Thyangathyanga, Chief of Agricultural Services, Ministry
of Agriculture, Lilongwe